USDA Natural Resources Conservation Service

Ecological site R029XY044NV
PEATY WETLAND

Last updated: 2/20/2025
Accessed: 05/12/2025

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): 029X–Southern Nevada Basin and Range

The Southern Nevada Basin and Range MLRA (29) represents the transition from the Mojave Desert to the Great Basin. It is cooler and wetter than the Mojave. It is warmer and typically receives more summer precipitation than the Great Basin. This area is in Nevada (73 percent), California (25 percent), and Utah (2 percent). It makes up about 26,295 square miles (68,140 square kilometers). Numerous national forests occur in the area, including the San Bernardino, Angeles, Sequoia, Inyo, Humboldt-Toiyabe, and Dixie National Forests. Portions of Death Valley National Monument, the Nuclear Regulatory Commission's Nevada Test Site, the Hawthorne Ammunition Depot, and the Nellis Air Force Range in Nevada and the China Lake Naval Weapons Center in California also are in this MLRA. The northeast part of the Paiute Indian Reservation and the southern third of the Walker River Indian Reservation are in the part of this MLRA in Nevada, and the Lone Pine, Fort Independence, and Big Pine Indian Reservations are in the part in California.
Physiography:
The entire area is in the Great Basin Section of the Basin and Range Province of the Intermontane Plateaus. The area of broad, nearly level, aggraded desert basins and valleys between a series of mountain ranges trending north to south. The basins are bordered by sloping fans and pluvial lake terraces. The mountains are uplifted fault blocks with steep side slopes and not well dissected due to limited annual precipitation. Most of the valleys in this MLRA are closed basins or bolsons containing sinks or playa lakes.
Geology:
The mountains are dominated by Pliocene and Miocene andesite and basalt rocks, Paleozoic and Precambrian carbonate rocks prominent in some areas. Scattered outcrops of older Tertiary intrusives and very young tuffaceous sediments (Pliocene and Miocene) are in the western and eastern thirds of this MLRA. The valleys consist mostly of alluvial fill and playa deposits at the lowest elevations in the closed basins.
Climate:
The average annual precipitation is 3 to 12 inches (75 to 305 millimeters) in most of this area. It may be as high as 29 inches (735 millimeters), on the higher mountain slopes. Most of the rainfall occurs as high-intensity, convective thunderstorms during the growing season. Summers are dry, but sporadic storms are common in July and August.
Water Resources:
Water resources are scarce. Ground water and surface water sources are limited. Streams are small and intermittent. Quality of surface water in naturally degraded as streams cross area of valley fill effected by dissolved salts. Irrigation water may raise the levels of dissolved salts and suspended sediments causing contamination.
Soils:
Dominant soil orders include Entisols and Aridisols.

Ecological site concept

The Wetland site occurs along axial-stream floodplains, on alluvial flats and adjacent to springs, seeps, sloughs or ponds. Slope gradients of less than 2 percent are most typical. Elevations are 4600 to about 6700 feet. The water table is typically at the soil surface for most of the year. The soils are very deep and very poorly drained. These soils are generally organic material and alluvium from mixed rocks.

Associated sites

R029XY001NV	**WET MEADOW 8-12 P.Z.** This site occurs on stream terraces and flood plains around localized seeps and springs. Slopes range from 0 to 2 percent. Elevations range from 3500 to 6700 feet. The soils are very deep and have a high available water capacity. These soils are poorly to very poorly drained and have a water table at or near the surface early in the spring that usually stabilizes to within 20 inches of the soil surface during the growing season. The soils are occasionally flooded for brief periods in the spring by stream overflow or unconfined runoff from surrounding areas.
R029XY002NV	**SALINE MEADOW** This site occurs on alluvial flats, lake plains and terraces, and axial stream terraces. Slope gradients of 0 to 2 percent are typical. Elevations are 3000 to 6700 feet. The soils are deep to very deep and are usually calcareous. Surface soils are typically 10 inches, or more, thick and medium to fine textured. These soils are moderately to strongly salt and sodium affected in the upper profile with soil reaction and salinity decreasing with depth. There is often a water table near the surface for short periods in the early spring that usually stabilizes at depths below 40 inches during the early summer.
R029XY004NV	**SALINE BOTTOM** This site occurs on alluvial flats, lake plains, and axial stream floodplains. Slopes range from 0 to 4 percent. Elevations are 3000 to 5500 feet. The soils that characterize this site have formed in mixed alluvium and are usually deep to very deep. Surface soils are less than 10 inches thick and are medium to moderately-fine textured. These soils are normally strongly salt and sodium-affected in their upper profile with soil reaction and salt and sodium usually decreasing with depth. The soils are mostly somewhat poorly to poorly drained and have a seasonally high water table at depths of 20 to 60 inches.
R029XY076NV	**SODIC FLAT** This site occurs on lake plains and lake plain terraces, usually immediately adjacent to playas. Slopes range from 0 to 30 percent. Slopes gradients of 0 to 2 percent are typical. Elevations are 2300 to about 6600 feet. The soils in this site are deep to very deep and are well to moderately well drained. Surface soils are medium to moderately fine textured and normally less than 10 inches thick to the subsoil or underlying material. The upper portion of most of these soils is strongly salt and sodium effected due to capillary movement of dissolved salts upward from a ground water table.

Similar sites

R029XY002NV	**SALINE MEADOW** SPAI & DISP dominant plants
R029XY001NV	**WET MEADOW 8-12 P.Z.** TYPHA spp. rare to absent; PONE3 codominant grass

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Typha* (2) *Eleocharis*

Physiographic features

The Wetland site occurs along axial-stream floodplains, on alluvial flats and adjacent to springs, seeps, sloughs or ponds. Slope gradients of less than 2 percent are most typical. Elevations are 4600 to about 6700 feet. The water table is typically at the soil surface for most of the year.

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Depression (3) Seep
Runoff class	Low

Flooding duration	Long (7 to 30 days)
Flooding frequency	None to frequent
Ponding duration	Long (7 to 30 days)
Ponding frequency	Frequent
Elevation	1,423–2,054 m
Slope	0–2%
Ponding depth	0–61 cm
Water table depth	0–43 cm
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 4 to about 8(10) inches. Mean annual air temperature is 49 to 60 degrees F. The average growing season is about 120 to 220 days.

Table 3. Representative climatic features

Frost-free period (characteristic range)	169 days
Freeze-free period (characteristic range)	193 days
Precipitation total (characteristic range)	152 mm
Frost-free period (actual range)	169 days
Freeze-free period (actual range)	193 days
Precipitation total (actual range)	152 mm
Frost-free period (average)	169 days
Freeze-free period (average)	193 days
Precipitation total (average)	152 mm

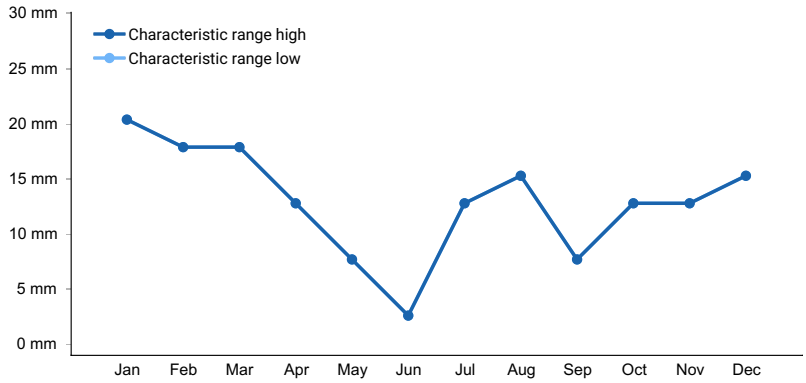


Figure 1. Monthly precipitation range

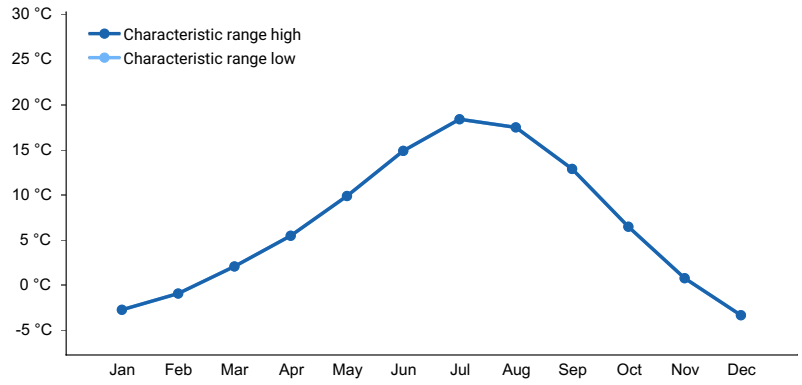


Figure 2. Monthly minimum temperature range

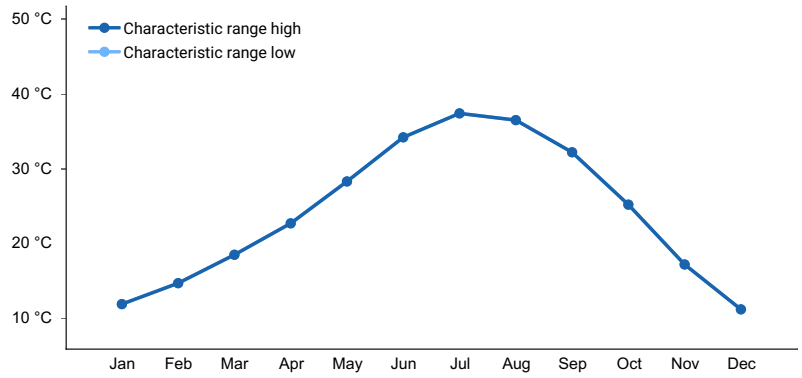


Figure 3. Monthly maximum temperature range

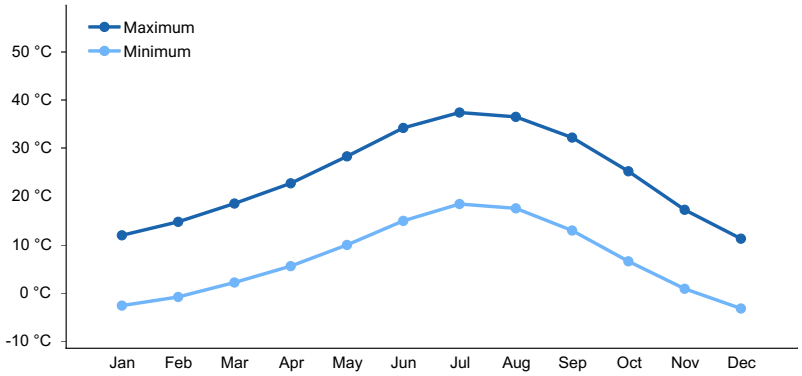


Figure 4. Monthly average minimum and maximum temperature

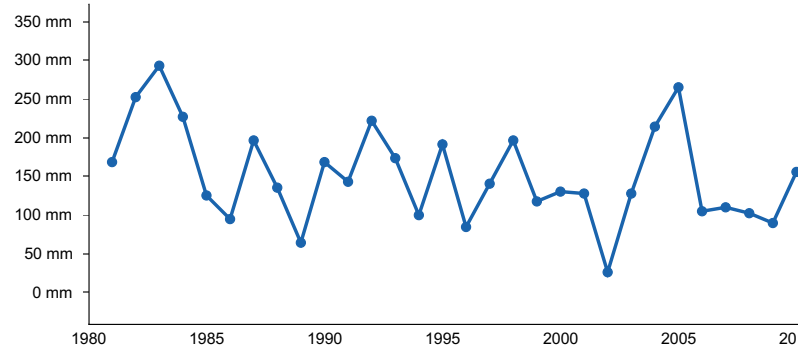


Figure 5. Annual precipitation pattern

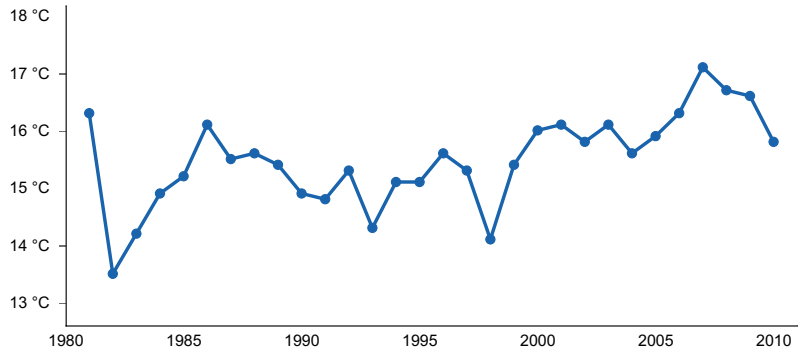


Figure 6. Annual average temperature pattern

Climate stations used

- (1) PAHRANAGAT WR [USC00265880], Alamo, NV

Influencing water features

This site is influenced by axial stream floodplains, as well as adjacent springs, seeps, sloughs or ponds. Water is ponded most of the year.

Soil features

The soils are very deep and very poorly drained. These soils are generally organic material and alluvium from mixed rocks. The soils are saturated throughout the growing season and water is ponded on the site for most of the year. Water ponded on the soils may be as much as two feet deep. Soils correlated to this site are classified as Terric Haplosaprists.

Table 4. Representative soil features

Parent material	(1) Organic material (2) Alluvium
Surface texture	(1) Peat (2) Silt loam
Family particle size	(1) Loamy
Drainage class	Very poorly drained
Permeability class	Moderately slow
Soil depth	183–213 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	12.7–19.05 cm
Calcium carbonate equivalent (0-101.6cm)	15–30%
Electrical conductivity (0-101.6cm)	0 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	6.6–7.3
Subsurface fragment volume <=3" (Depth not specified)	0%

Subsurface fragment volume >3" (Depth not specified)	0%

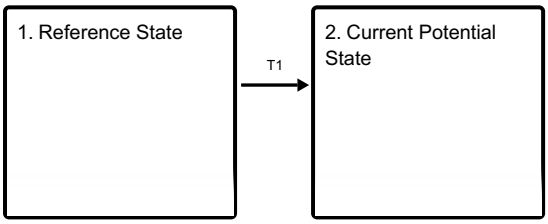
Ecological dynamics

As ecological condition declines, "pioneer" or "early seral" forbs and grass-like plants, such as Baltic rush, become more prevalent.

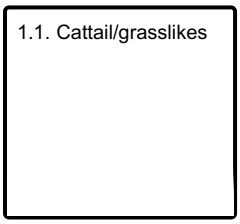
Fire Ecology:
Fire in wetland communities often only top-kills plants. Wetland species have deep buried rhizomes which usually survive all but the most severe fires. The mean fire return interval is typically less than 35 years. Common cattail rhizomes are buried in the soil and are often under water where they cannot be harmed by the heat of fire. When above ground foliage is consumed by fire, common cattail quickly initiates new top-growth from these surviving underground regenerative organs.
Common spikerush is fire tolerant when dormant and top-killed by fire during the growing season. Common spikerush establishes after fire through seed and/or lateral spread by rhizomes. Bulrush can survive fire by sprouting from rhizomes. Common reed stands are typically dense and contain much dead material. Standing dead canes and litter often constitute twice as much biomass as living shoots. This abundant dead fuel carries fire well, allowing stands to burn during midsummer when the current year’s shoots are green. Common reed’s rhizomes are deeply buried in soil and are often under water as well. The heat from most fires does not penetrate deep enough into the soil to injure these regenerative structures. When fire consumes the above ground foliage, new top growth is initiated from the surviving rhizomes. Threesquare can survive fire by sprouting from rhizomes. Sedge is top-killed by fire, with rhizomes protected by insulating soil. The rhizomes of sedge species may be killed by high-severity fires that remove most of the soil organic layer. Reestablishment after fire occurs by seed establishment and/or rhizomatous spread. Rush is fire tolerant when dormant and top-killed by fire during the growing season. It establishes after fire through seed and/or lateral spread by rhizomes.

State and transition model

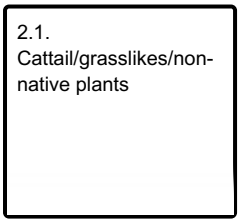
Ecosystem states



State 1 submodel, plant communities



State 2 submodel, plant communities



State 1
Reference State

The Reference State describes the natural biotic communities that may become established on the Wetland - cattail bulrush ecological site when all successional sequences are completed under the natural disturbance regime. The

Reference State is self sustaining and resistant to change due to its high resistance to natural disturbances and high resilience following natural disturbances. When natural disturbances occur, the rate of recovery is variable due to disturbance intensity. Prolonged flooding could cause a large plant die-off at any community phase. This community could become at risk where increased disturbance and/or the introduction of the invasive species of common reed occurs. Once this invasive species becomes established, return to the reference state may not be possible. Reference State: Community phases influenced by fluctuating water levels, natural disturbances, and weather. Indicators: A dense stand of common cattail, various bulrush species and the native sub-species of common reed dominant visual aspect. Feedbacks: Extended drought, lower standing water levels and/or other disturbances that reduce plant vigor which may allow invasive species to become established in the community. Properly managed water levels where possible help maintain the native perennial plant community. At-risk Community Phase: All communities in this state are at risk when native plants are stressed and/or nutrients become available for invasive plants to establish. Trigger: Introduction and establishment of non-native invasive plants such as the invasive sub-species of common reed.

Community 1.1
Cattail/grasslikes

The reference plant community is dominated by cattail, spikerush, bulrush, common reed, sedges and other grass-like plants common to wetlands. Potential vegetative composition is about 80 percent grasses and grass-like plants, 15 percent forbs and up to 3 percent shrubs.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1883	2605	3721
Forb	336	471	673
Shrub/Vine	22	63	90
Total	**2241**	**3139**	**4484**

State 2
Current Potential State

The Current Potential State is similar to the Reference State, except it has established non-native plants.

Community 2.1
Cattail/grasslikes/non-native plants

Community Phase 2.1 is dominated by cattail, spikerush, bulrush, common reed, sedges and other grass-like plants common to wetlands. Non-native common reed is a common plant to invade wetland sites. Potential vegetative composition is about 80 percent grasses and grass-like plants, 15 percent forbs and up to 3 percent shrubs.

Transition T1
State 1 to 2

Establishment of non-native plants.

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/Grasslikes**			1350–3609	
	cattail	TYPHA	*Typha*	628–942	–
	common spikerush	ELPA3	*Eleocharis palustris*	314–785	–

	common spikerush	ELPA3	*Eleocharis palustris*	314–785	
	common reed	PHAU7	*Phragmites australis*	63–471	–
	bulrush	SCIRP	*Scirpus*	157–471	–
	common threesquare	SCPUL4	*Schoenoplectus pungens var. longispicatus*	63–314	–
	rush	JUNCU	*Juncus*	63–314	–
	sedge	CAREX	*Carex*	63–314	–
2	**Secondary Perennial Grasses**			157–471	
	saltgrass	DISP	*Distichlis spicata*	16–63	–
	scratchgrass	MUAS	*Muhlenbergia asperifolia*	16–63	–
	alkaligrass	PUCCI	*Puccinellia*	16–63	–
	Nevada bulrush	SCNE	*Scirpus nevadensis*	16–63	–
	arrowgrass	TRIGL	*Triglochin*	16–63	–
Forb					
3	**Perennial**			157–471	
	European water plantain	ALPL	*Alisma plantago-aquatica*	16–94	–
	sea milkwort	GLMA	*Glaux maritima*	16–94	–
	povertyweed	IVAX	*Iva axillaris*	16–94	–
	pondweed	POTAM	*Potamogeton*	16–94	–
	western coneflower	RUOC2	*Rudbeckia occidentalis*	16–94	–
	broadleaf arrowhead	SALA2	*Sagittaria latifolia*	16–94	–
	saltgrass	DISP	*Distichlis spicata*	16–63	–
	alkaligrass	PUCCI	*Puccinellia*	16–63	–
4	**Annual**			63–157	
	cattail	TYPHA	*Typha*	628–942	–
	cattail	TYPHA	*Typha*	628–942	–
	common spikerush	ELPA3	*Eleocharis palustris*	314–785	–
	common spikerush	ELPA3	*Eleocharis palustris*	314–785	–
	bulrush	SCHOE6	*Schoenoplectus*	157–471	–
	rush	JUNCU	*Juncus*	63–314	–
	rush	JUNCU	*Juncus*	63–314	–
	sedge	CAREX	*Carex*	63–314	–
	common threesquare	SCPUL4	*Schoenoplectus pungens var. longispicatus*	63–314	–
	sedge	CAREX	*Carex*	63–314	–
	goosefoot	CHENO	*Chenopodium*	16–94	–
	saltmarsh bird's-beak	COMA5	*Cordylanthus maritimus*	16–94	–
	nodding waternymph	NAFL	*Najas flexilis*	16–94	–
	arrowgrass	TRIGL	*Triglochin*	16–63	–
	Nevada bulrush	SCNE	*Scirpus nevadensis*	16–63	–
Shrub/Vine					
5	**Primary Shrubs**			1–94	
	Woods' rose	ROWO	*Rosa woodsii*	16–31	–
	willow	SALIX	*Salix*	16–31	–

Animal community

Livestock Interpretations:
This site is suitable for livestock grazing. Grazing management should be keyed to perennial grass production. Plants such as bulrush and cattails can be severely injured. The extensive root systems are literally shredded by the cows hooves as they trait through the wetland. Species such as spikerush, sedges, and other desirable plants can flourish after the undesirable species have been injured or killed. If plant regrowth is limited, the wetland will provide open water during spring and fall migration.

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:
Common cattail is generally considered poor big game forage. It is considered an undesirable weed in marshes managed primarily for ducks. Common spikerush is an important source of food for waterfowl. The seeds, stems, and rhizomes of common spikerush are an important food source for a variety of North American waterfowl, marsh, and shorebirds. Common spikerush provides cover for a variety of waterfowl and small mammals.

Hydrological functions

There are no rills, waterflow patterns, pedestals or gullies. These plant communities are ponded during most, if not all, of the year and there is no 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 waterfowl and big game hunting.

Other products

Native Americans used common cattail as food. Rhizomes were dried and ground into flour or eaten as cooked vegetables; young stems were eaten raw or cooked; and immature fruiting spikes were eaten after roasting. The leaves were woven for matting and the "soft down" from ripe fruiting heads was used as padding and in diapers.

Other information

Native Americans used common cattail as food. Rhizomes were dried and ground into flour or eaten as cooked vegetables; young stems were eaten raw or cooked; and immature fruiting spikes were eaten after roasting. The leaves were woven for matting and the "soft down" from ripe fruiting heads was used as padding and in diapers. Cattails were used for thatching their homes and making ropes. Cattails and tules provided the materials for making boats, duck decoys, nets, storage bags, and baskets. Common spikerush has high erosion control potential in riparian and wetland areas.

Inventory data references

NASIS soil component data.

Type locality

Location 1: Esmeralda County, NV	
Township/Range/Section	T2S R35E S26
General legal description	Section 26, T2S. R35E. MDBM. Along edges of springs and pond, Fish Lake Valley area, Esmeralda County, Nevada.
Location 2: Nye County, NV	

Township/Range/Section	T5S R60E S2
General legal description	Section 2, T5S. R60E. MDBM. Around margins of Crystal Spring, Pahranagat Valley area, Nye County, Nevada.

Other references

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

United States Department of Agriculture, Natural Resources Conservation Service. 2022. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture, Agriculture Handbook 296.

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

US. Fish and Wildlife 2008 http://www.fws.gov/

Contributors

GED

Approval

Kendra Moseley, 2/20/2025

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

Indicators

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

2. **Presence of water flow patterns:** None

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

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Water ±50%; bare ground ±5%; foliar cover of perennial herbaceous plants ± 75%; surface rock fragments and woody plants absent

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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 only expected to move during periods of flooding by adjacent streams.

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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):** Surface soil stability values will range from 4 to 6. (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):** Immediate surface soil is often well-decomposed organic soil material with more than 12% OM. Mineral soils have platy or massive surface soil structure with organic carbon ranging from 2.5 to over 5 percent in the upper 10 inches.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** These plant communities are ponded during most, if not all, of the year and there is no 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):** 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: Grass-like plants. (By above ground production)

    Sub-dominant: Water-loving, perennial, forbs > water-loving, annual, forbs > perennial grasses. By above ground production)

    Other:

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Herbaceous plant mortality or decadence is uncommon.

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14. **Average percent litter cover (%) and depth (in):** Litter cover is commonly 100% within plant interspaces and depth of litter is 6-inches to more than 24-inches.

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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 ± 2800 lbs/ac.

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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:** Willow, foxtail barley, thistle, tall whitetop, salt cedar are invaders on this site.

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17. **Perennial plant reproductive capability:** All functional groups should reproduce in most years.
