

Ecological site R024XY110OR **DUNES**

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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.

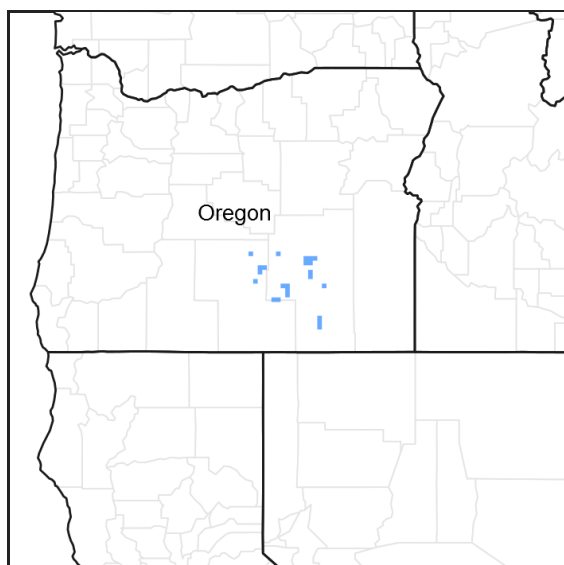


Figure 1. Mapped extent

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

R024XY012OR	SANDY 6-10 PZ Sandy 6-10 PZ (non-dune, low terrace sandy soil, water table at greater depth, lower production, different composition – LECI4 minor, ATCA2 variable)
R024XY018OR	SANDY LOAM 8-10 PZ Sandy Loam 8-10 PZ (non-dune, low terrace sandy loam soil, water table at greater depth, lower production, different composition – LECI4 minor)

Similar sites

R024XY005OR	SODIC DUNES Sodic Dunes (sodic sandy dunes, lower production, different composition – ARTRT-SAVE4/LECI4-ACHY association, DISP present)
R024XY012OR	SANDY 6-10 PZ Sandy 6-10 PZ (non-dune, low terrace sandy soil, water table at greater depth, lower production, different composition – LECI4 minor, ATCA2 variable)
R024XY018OR	SANDY LOAM 8-10 PZ Sandy Loam 8-10 PZ (non-dune, low terrace sandy loam soil, water table at greater depth, lower production, different composition – LECI4 minor)

R024XY644OR	SILTY DUNES Silty Dunes (silty to silty clay loam sodic dunes, lower production, different composition – SAVE4 and LETR5 dominant, ARTRT, LECI4 and DISP minor)
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia tridentata</i> ssp. <i>tridentata</i>
Herbaceous	(1) <i>Hesperostipa comata</i> (2) <i>Achnatherum thurberianum</i>

Physiographic features

This site typically occurs in windblown sands on the floors of dry lake basins. The windblown sands have accumulated around the edges of old shorelines. Slopes typically range from 1 to 15 percent with short reaches up to 30 percent on leeward dune faces. Elevations vary from 4,000 to 4,800 feet.

Table 2. Representative physiographic features

Landforms	(1) Dune (2) Basin floor (3) Pluvial lake (relict)
Elevation	4,000–4,800 ft
Slope	1–15%
Water table depth	48–72 in
Aspect	Aspect is not a significant factor

Climatic features

The annual precipitation ranges from 6 to 10 inches, most of which occurs in the form of rain and snow during the months of December through April. A short duration supply of ephemeral subsurface moisture augments the precipitation. The soil temperature regime is mesic to frigid near mesic with a mean air temperature of 48 degrees F. Temperature extremes range from 100 to -20 degrees F. The frost-free period ranges from 90 to 120 days. The optimum period for plant growth is from April to early June.

Table 3. Representative climatic features

Frost-free period (average)	120 days
Freeze-free period (average)	0 days
Precipitation total (average)	10 in

Influencing water features

Soil features

The soils of this site are very deep, coarse textured and somewhat excessively drained. Typically they are overblown loamy fine sands and sands. Depth to lacustrine sediment ranges from from six inches to over three feet. Substratums are fine to loamy textured old lakebed sediments. Typically the soils are near neutral to only slightly alkaline. Permeability is moderately rapid. The available water holding capacity (AWC) is about 4 to 5 inches for the profile. A seasonal water table is frequently present at 48 to greater than 72 inches. The wind erosion potential is severe. The water erosion potential is low due to the high intake rate.

Table 4. Representative soil features

Parent material	(1) Eolian sands–quartz-diorite
Surface texture	(1) Loamy fine sand (2) Sand
Family particle size	(1) Sandy
Drainage class	Somewhat excessively drained to excessively drained
Permeability class	Rapid to very rapid
Soil depth	40–60 in
Available water capacity (0–40in)	4–5 in

Ecological dynamics

The potential native plant community is dominated by basin big sagebrush, needle and thread and Indian ricegrass. Basin wildrye and beardless (creeping) wildrye are common. Sand dropseed, bottlebrush squirreltail and a variety of forbs are present. Antelope bitterbrush is occasionally present. Vegetative composition of the community is approximately 75 percent grasses, 10 percent forbs and 15 percent shrubs. The approximate ground cover is 50 to 60 percent (basal and crown).

Range in Characteristics:

The availability of seasonal subsurface moisture and soil surface characteristics influences the composition and production of the site. As available subsurface moisture increases production and basin wildrye increases. With a decrease in available subsurface moisture Indian ricegrass, needle and thread and basin big sagebrush will increase. On coarse sandy surfaces Indian ricegrass will increase. On fine sandy loam surfaces needle and thread increases.

Response to Disturbance - States:

When the condition of the site deteriorates as a result of over grazing, basin wildrye, Indian ricegrass and needle and thread decrease. Creeping wildrye, basin big sagebrush and rabbitbrush increase. Sand blows and bare ground increases. Annuals invade at low densities and unpalatable forbs increase. With continued over grazing localized dune wind erosion becomes severe. Production decreases and site deterioration continues to occur in a cyclic pattern.

States: ARTRT-ERNA10(CHVI8)/Annuals - active sand blows & bare ground

State and transition model



GENERAL MODEL FOR COOL-SEASON BUNCHGRASS RANGELANDS

State 1

Reference Plant Community

Community 1.1

Reference Plant Community

The reference native plant community is dominated by basin big sagebrush, needle and thread and Indian ricegrass. Basin wildrye and beardless (creeping) wildrye are common. Sand dropseed, bottlebrush squirreltail and a variety of forbs are present. Antelope bitterbrush is occasionally present. Vegetative composition of the community is approximately 75 percent grasses, 10 percent forbs and 15 percent shrubs. The approximate ground cover is 50 to 60 percent (basal and crown).

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	525	675	900
Shrub/Vine	105	135	180
Forb	70	90	120
Total	700	900	1200

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	Dominant, moderate rooted bunchgrass			180–360	
	needle and thread	HECO26	<i>Hesperostipa comata</i>	180–360	–
2	Sub-dominant, moderate rooted bunchgrass			135–225	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	135–225	–
3	Common, deep rooted bunchgrass			90–180	
	basin wildrye	LECI4	<i>Leymus cinereus</i>	90–180	–
4	Common, perennial, rhizomatous grass			45–135	
5	Other perennial grasses			20–50	
	squirreltail	ELEL5	<i>Elymus elymoides</i>	5–20	–
	bluegrass	POA	<i>Poa</i>	0–20	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	0–20	–
Forb					
7	Dominant, perennial forbs			15–40	
	milkvetch	ASTRA	<i>Astragalus</i>	5–15	–
	desertparsley	LOMAT	<i>Lomatium</i>	5–15	–
	lupine	LUPIN	<i>Lupinus</i>	5–15	–
9	Other perennial forbs			10–70	
	buckwheat	ERIOG	<i>Eriogonum</i>	2–10	–
	granite prickly phlox	LIPU11	<i>Linanthus pungens</i>	2–10	–
	whitestem blazingstar	MEAL6	<i>Mentzelia albicaulis</i>	0–5	–
	hairy evening primrose	OEVI	<i>Oenothera villosa</i>	2–5	–
	sharp-leaf penstemon	PEAC	<i>Penstemon acuminatus</i>	0–5	–
	phlox	PHLOX	<i>Phlox</i>	2–5	–
	scurfpea	PSORA2	<i>Psoralegium</i>	0–5	–
	dock	RUMEX	<i>Rumex</i>	2–5	–
	scarlet globemallow	SPCO	<i>Sphaeralcea coccinea</i>	0–5	–
	thelypod	THELY	<i>Thelypodium</i>	0–5	–
	common yarrow	ACMI2	<i>Achillea millefolium</i>	2–5	–
	yellow spiderflower	CLLU2	<i>Cleome lutea</i>	0–5	–
	hawksbeard	CREPI	<i>Crepis</i>	2–5	–
	deathcamas	ZIGAD	<i>Zigadenus</i>	0–3	–
Shrub/Vine					
11	Dominant, evergreen, non-sprouting shrub			90–130	
	basin big sagebrush	ARTRT	<i>Artemisia tridentata</i> ssp. <i>tridentata</i>	90–130	–
12	Sub-dominant, deciduous, sprouting shrub			0–90	
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	0–90	–
15	Other shrubs			15–50	
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	5–20	–
	rubber rabbitbrush	ERNA10	<i>Ericameria nauseosa</i>	5–20	–
	littleleaf horsebrush	TEGL	<i>Tetradymia glabrata</i>	5–15	–

Animal community

Livestock Grazing:

As an inherently unstable sandy site subject to severe wind erosion, the site can be severely damaged by heavy grazing. Limited shorter duration livestock grazing use is suitable during the late spring, fall and early winter under a planned grazing system. Use should be postponed until the soils are firm enough to prevent trampling damage and soil disturbance. Grazing management should be keyed for needle and thread, Indian ricegrass and basin wildrye. The site can be damaged if heavily grazed during periods of needle and thread, Indian ricegrass and basin wildrye flowering and seed formation when root reserves are low. These species provide excellent standing dried forage during winter dormancy. Deferred grazing or rest is recommended at least once every three years.

Wildlife:

This site is used by mule deer, pronghorn antelope, rabbits, rodents, upland birds and various predators. It provides excellent cover and winter spring forage and food for mule deer, antelope and upland birds. Cover is excellent when ecological condition is high.

Hydrological functions

The soils of this site are typically near the lowest topographic position of dry lake basins. They have low runoff potential due to the rapid infiltration rate of the sands. The soils are in hydrologic group A.

The potential for wind erosion is severe. Localized severe wind erosion occurs when the potential vegetation is less than 70 percent of potential and bare soil surface increases.

Other information

Any type of prescribed grazing and other land treatment should be designed to protect the soil from wind erosion. The potential for range seeding is low due to the site's susceptibility to wind erosion and the droughty nature of the site.

Contributors

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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	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

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

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

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

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

5. **Number of gullies and erosion associated with gullies:**

6. **Extent of wind scoured, blowouts and/or depositional areas:**

7. **Amount of litter movement (describe size and distance expected to travel):**

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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:

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:**
