Ecological site group R021XG911CA
Sandy

Last updated: 08/26/2024
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Key Characteristics

- Upland sites
- 12-30" ppt
- > 20" depth
- Sandy texture

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.

Physiography

This ESG is on flood plains and low stream terraces. Slopes are generally 0 to 2 percent.

Climate

The climate is semiarid with cool, moist winters and warm, dry summers. The mean annual precipitation is 12 to 18 inches (305 to 460 millimeters), much of which falls as snow. The mean annual temperature is 44 to 49 degrees F (7 to 9 degrees C). The mean January temperature is about 30 degrees F (-1 degrees C). The mean July temperature is about 69 degrees F (21 degrees C). The frost-free period is 60 to 90 days.

Soil features

The soils for this ESG are very deep, somewhat poorly drained, and formed in alluvium derived from mixed rocks. They generally have very low or low surface runoff and moderate permeability. Endosaturation is present with an apparent seasonally high water table that comes within 3 feet (1 meter) of the soil surface (moderately deep free water occurrence class) between March and May. Cumulative annual duration class is transitory. These soils are susceptible to rare flooding for very brief periods year-round or occasional flooding for brief periods between January and May.

The Beckwourth series (coarse-loamy, mixed, superactive, mesic Oxyaquic Argixerolls) is representative of this ESG.

Vegetation dynamics

There are few descriptions of Bolander silver sagebrush (*Artemisia cana* ssp. bolanderi) communities in the literature. Bolander silver sagebrush types on the Toiyabe National Forest of west-central Nevada and east-central California are co-dominated by Douglas' sedge (*Carex douglasii*), Baltic rush (Juncus balticus), or both. Descriptions of Bolander silver sagebrush communities in California are particularly sparse, although a community co-dominated by mat muhly (*Muhlenbergia richardsonis*) has been documented in Lassen County. In nearby Plumas County, Bolander silver sagebrush grows in association with mountain big sagebrush (*Artemisia tridentata*), Nebraska sedge (*Carex nebrascensis*), and tufted hairgrass (*Deschampsia cespitosa*). This ecological site group encompasses the range for both silver sagebrush (*Artemisia cana*) and Bolander silver sagebrush (*Artemisia cana* ssp. bolanderi); in this description’s narrative, the Bolander subvariant will be lumped in with silver sagebrush (*Artemisia cana*).

Silver sagebrush requires more moisture than most sagebrush species. It grows on areas that receive at least 10

inches (250 millimeters) of mean annual precipitation and have a water table within 3 feet (1 meter) of the soil surface. For example, a silver sagebrush/Sandberg bluegrass community in Plumas County, California is on streamside soils with a mean July moisture content of 36 percent and a mean water table depth of 47.6 inches (121 centimeters). Because it requires moist soils, silver sagebrush typically grows on floodplains, moist meadows, and the edges of streambanks and drainages.

Silver sagebrush grows on moister, colder soils than any other woody sagebrush species in North America. Soil drainage is often slow. Silver sagebrush communities are also common on transitional wet-to-dryland sites where soils dry by late summer. A mountain silver sagebrush/tufted hairgrass community in Yellowstone National Park is described as "the driest wetland community type" within the park. Phosphorus, potassium, nitrogen, organic matter, and cation exchange capacity are often lower in silver sagebrush soils than in soils of surrounding communities. Silver sagebrush cannot tolerate strongly saline or calcareous soils. Parent materials of soils supporting silver sagebrush include sandstones, shales, and granites. Soil textures include clay, silt, loam, sand, and gravel.

Silver sagebrush is most common on pluvial lakebeds, internally drained basins with alkaline soils, and snow catchments with granitic soils. It also grows on meadows, streambanks, and moist, gravelly soils. It is the only sagebrush in North America that can tolerate
temporary inundation. Silver sagebrush grows at 4,400 to 11,000 feet (1,300 to 3,400 meters) elevation. Silver sagebrush has superior flooding tolerance compared to other woody sagebrush species. Drought tolerance of silver sagebrush is uncertain. The species is markedly sensitive to water stress in the seedling stage and is noted as either drought-intolerant or tolerant at maturity. Within the species, Bolander silver sagebrush is ranked most drought-tolerant.

Major Land Resource Area

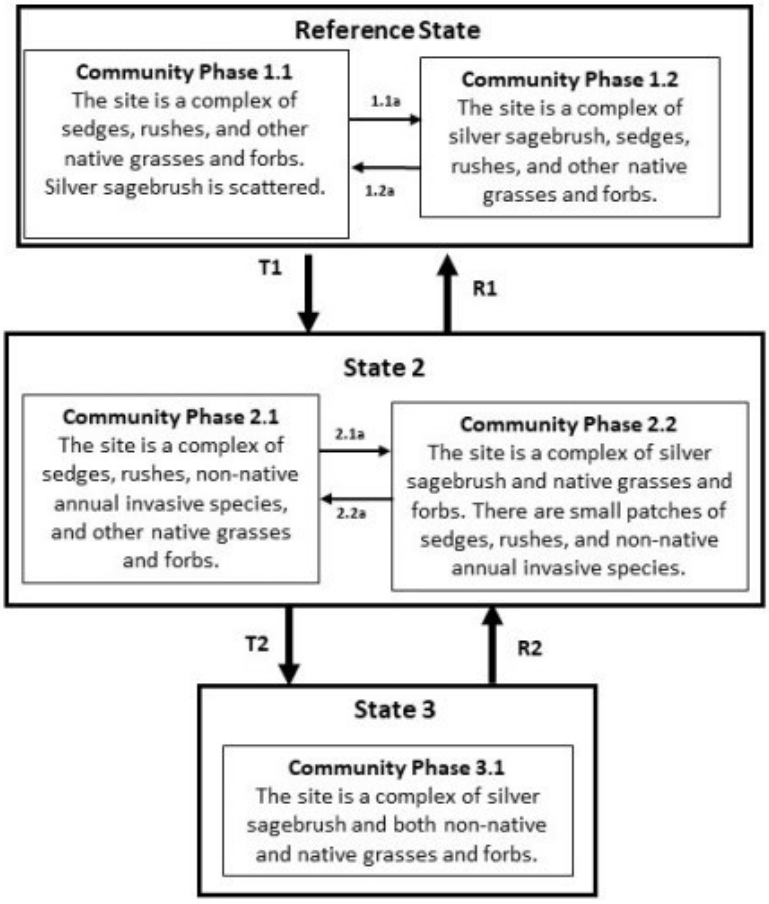
MLRA 021X
Klamath and Shasta Valleys and Basins

Stage

Provisional

State and transition model

Sandy


Reference State
Community Phase 1.1
The site is a complex of sedges, rushes, and other native grasses and forbs. Silver sagebrush is scattered.
1.1a
1.2a
Community Phase 1.2
The site is a complex of silver sagebrush, sedges, rushes, and other native grasses and forbs.
T1
R1
State 2
Community Phase 2.1
The site is a complex of sedges, rushes, non-native annual invasive species, and other native grasses and forbs.
2.1a
2.2a
Community Phase 2.2
The site is a complex of silver sagebrush and native grasses and forbs. There are small patches of sedges, rushes, and non-native annual invasive species.
T2
R2
State 3
Community Phase 3.1
The site is a complex of silver sagebrush and both non-native and native grasses and forbs.

Reference State

Community Phase 1.1: This phase represents the plant communities within the reference state that are under natural conditions. The site has the hydrologic functions of a wet meadow complex. The patch sizes of each group depend on water inundation frequency and duration. The wettest plant communities include mainly obligate wetland species such as sedges, rushes, and some forbs, Areas that are wet only parts of the year are a mix of obligate wetland and facultative wetland species. Areas that are only saturated during minimal periods when snows melt are mainly dominated by facultative wetland and facultative upland native plant communities, including small coverage of silver sagebrush. This depends on the elevations across the meadows and the depths to water tables - from inundated year-round to fluctuating water tables over the year (at the surface in spring and down to 30 inches (76 centimeters) in draw-down periods).

T1: Climate changes (prolonged drought, decreased snowpack) and/or alterations to site hydrology (construction of roads, trails, or ditches), or both create a drier site. Reduced spring runoff and lowered water tables reach a threshold that triggers a transition of the site to a drier alternative state (State 2), allowing non-native annual invasive species to encroach and become a component of the site.

State 2: This drier state has significantly less sensitive obligate wetland species, increased facultative upland plants, and some hardy facultative wetland species that have deep, established root systems, including silver sagebrush, that can compete against herbaceous species by tapping into deeper water in the soil profile that herbaceous species cannot reach.

Community Phase 2.1: This phase represents the complex of communities that is dominated more significantly by wetter plant communities, with smaller patches of facultative upland species and scattered willows.

Community Phase 2.2: This phase represents the complex of communities that is dominated more significantly by silver sagebrush and the drier herbaceous plant communities. The drier herbaceous plant communities are primarily facultative upland and some upland species, with smaller patches of facultative wetland species, such as Baltic rush, in low spots, and non-native annual invasive species.

Community Pathway 2.1a: This pathway occurs after several years of below average winter precipitation, decreased snowpack, warmer than typical spring temperatures that melt the snowpack too rapidly, or any combination thereof.

Community Pathway 2.2a: This pathway occurs after several years of above average winter precipitation, deeper snowpack, and typical spring temperatures.

R1: Restoration will be successful if the hydrologic processes that drown out non-native annual invasive species are restored. This may not be feasible in cases where the site is impacted by long term climate changes. However, if roads, trails, ditches, canals, or dams are removed and site hydrology is restored it may be possible to return the site to the reference state.

T2: Climate changes (prolonged drought, decreased snowpack) and/or alterations to site hydrology (construction of roads, trails, or ditches) create a drier site. Reduced spring runoff and lowered water tables reach a threshold that triggers a transition of the site to a drier alternative state (State 3).

State 3: This state resembles a silver sagebrush site mixed with dry meadow species and non-native annual invasive species. Silver sagebrush often competitively dominates sites with heavier clays. This results in a continued loss of many of the obligate and facultative wetland species. The silver sagebrush, upland plants, and some hardy facultative wetland species that have deep, established root systems increase.

Community Phase 3.1: This phase represents a complex of communities that is dominated by the drier plant communities, with a significant amount of silver sagebrush and non-native annual grasses and forbs.

R2: Restoration will be successful if normal hydrologic processes are restored. This may not be feasible in cases where the site is impacted by long term climate changes. However, if roads, trails, ditches, canals, or dams are removed, and hydrology is restored it may be possible to return the site to the reference state.

Citations

Howard, J.L. 2002. Artemisia cana. Fire Effects Information System. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory.