USDA Natural Resources
Conservation Service

# Ecological site R030XC013NV
# LOAMY BOTTOM 11-13 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.

## Ecological site concept

This site occurs on inset fans associated with drainageways. Slopes range from 2 to 4 percent. Elevations range from 5500 to 7500. The soils are deep to very deep, and well drained. Surface soils are thick, fertile and moderately fine to medium textured.

Please refer to group concept R030XC033NV to view the provisional STM.

## Associated sites

| | |
|---|---|
| F030XC240NV | **Pinus monophylla/Cercocarpus ledifolius-Quercus gambelii/Poa fendleriana** |
| R030XC024NV | **GRAVELLY FAN 9-11 P.Z.** |

**Table 1. Dominant plant species**

| | |
|---|---|
| Tree | Not specified |
| Shrub | (1) *Artemisia tridentata ssp. vaseyana* |
| Herbaceous | (1) *Leymus cinereus* |

## Physiographic features

This site occurs on inset fans associated with drainageways. Slopes range from 2 to 4 percent. Elevations range from 5500 to 7500.

**Table 2. Representative physiographic features**

| | |
|---|---|
| Landforms | (1) Inset fan |
| Flooding duration | Very brief (4 to 48 hours) |
| Flooding frequency | Rare |
| Elevation | 1,676–2,286 m |
| Slope | 2–4% |
| Aspect | Aspect is not a significant factor |

## Climatic features

The primary air masses affecting the Spring Mountains are cold maritime polar air from the Gulf of Alaska and warmer, moist maritime subtropical air from lower latitudes. Occasionally there are invasions of cold continental polar air from northern Canada or the Rocky Mountains. Precipitation in the area results primarily from the passage of cyclones with associated fronts during fall, winter and spring; from closed cyclones in late winter and spring; and

from the flow of moist tropical air from the southeast to the southwest quadrant in the summer.

The mean annual precipitation is 11 to 13 inches; mean annual air temperature is 45 to 50 degrees F., and the frost-free season is 90 to 130 days. There are no climate stations available for this site.

**Table 3. Representative climatic features**

| | |
|---|---|
| Frost-free period (average) | 130 days |
| Freeze-free period (average) | |
| Precipitation total (average) | 330 mm |

## Influencing water features

This site is influenced by runoff from snowmelt and flash flooding as a result of summer convective storms.

## Soil features

The soils are deep to very deep, and well drained. Surface soils are thick, fertile and moderately fine to medium textured. The available water capacity is low. Additional moisture is received on this site during flash flooding and as run-in from higher landscape positions. The soil temperature regime is mesic and soil moisture regime is xeric. The soils are classified as Xeric Haplocalcids.

**Table 4. Representative soil features**

| | |
|---|---|
| Surface texture | (1) Gravelly sandy loam |
| Family particle size | (1) Loamy |
| Drainage class | Well drained |
| Permeability class | Moderate |
| Soil depth | 183 cm |
| Surface fragment cover <=3" | 15–25% |
| Surface fragment cover >3" | 1–5% |
| Available water capacity (0-101.6cm) | 5.33–5.59 cm |
| Calcium carbonate equivalent (0-101.6cm) | 5–15% |
| Electrical conductivity (0-101.6cm) | 0–2 mmhos/cm |
| Sodium adsorption ratio (0-101.6cm) | 0–5 |
| Soil reaction (1:1 water) (0-101.6cm) | 7.4–9 |
| Subsurface fragment volume <=3" (Depth not specified) | 25–41% |
| Subsurface fragment volume >3" (Depth not specified) | 3–8% |

## Ecological dynamics

Please refer to group concept R030XC033NV to view the provisional STM.

Changes in plant composition can occur with improper grazing that will reduce perennial grass production and

increase basin big sagebrush and rubber rabbitbrush. Species likely to invade this site include cheatgrass. Lack of natural occurring wildfires may result in an invasion of pinyon and juniper.

Fire Ecology:
Grassland communities with a basin wildrye component historically experienced mostly infrequent to frequent stand replacing fires. Grassland vegetation types experienced both short fire intervals of less than 35 years as well as intervals ranging from 35 to 100 years, depending on climate and ignition sources. Presettlement fire return intervals in mountain big sagebrush communities varied from 15 to 25 years. Basin wildrye is top-killed by fire. Older basin wildrye plants with large proportions of dead material within the perennial crown can be expected to show higher mortality due to fire than younger plants having little debris. Basin wildrye is generally tolerant of fire but may be damaged by early season fire combined with dry soil conditions. Creeping wildrye is top-killed by fire. Creeping wildrye is generally tolerant of fire but may be damaged by early season fire combined with dry soil conditions. 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. Mountain big sagebrush is highly susceptible to injury from fire. Plants are readily killed in all seasons, even light severity fires. Mountain big sagebrush plants top-killed by fire will not resprout. Rubber rabbitbrush is often top-killed by fire. Rubber rabbitbrush is a fire-adapted species that is typically unharmed or enhanced by fire. Recovery time is often rapid to very rapid. Rubber rabbitbrush is often one of the first species to colonize burned areas by sprouting or from off-site seed.

## State and transition model

**Ecosystem states**

1. Reference Plant Community

**State 1 submodel, plant communities**

1.1. Reference Plant Community

## State 1
## Reference Plant Community

## Community 1.1
## Reference Plant Community

The reference plant community is dominated by basin wildrye. Creeping wildrye and basin big sagebrush are other important species. Potential vegetative composition is approximately 70 percent grasses and grass-like plants, 5 percent forbs and 25 percent shrubs. Approximate ground cover (basal and canopy) is 40 to 60 percent. Total annual air-dry production is 2500 pounds on favorable years, 1500 pounds on normal years, and 1000 pounds on unfavorable years.

**Table 5. Annual production by plant type**

| Plant Type | Low (Kg/Hectare) | Representative Value (Kg/Hectare) | High (Kg/Hectare) |
|---|---|---|---|
| Grass/Grasslike | 785 | 1177 | 1961 |
| Shrub/Vine | 280 | 420 | 701 |
| Forb | 56 | 84 | 140 |
| **Total** | **1121** | **1681** | **2802** |

**Table 6. Ground cover**

| | |
|---|---|
| Tree foliar cover | 0% |
| Shrub/vine/liana foliar cover | 10-20% |
| Grass/grasslike foliar cover | 30-45% |
| Forb foliar cover | 1-5% |
| Non-vascular plants | 0% |
| Biological crusts | 0% |
| Litter | 10-20% |
| Surface fragments >0.25" and <=3" | 15-25% |
| Surface fragments >3" | 1-5% |
| Bedrock | 0% |
| Water | 0% |
| Bare ground | 15-30% |

**Table 7. Canopy structure (% cover)**

| Height Above Ground (M) | Tree | Shrub/Vine | Grass/ Grasslike | Forb |
|---|---|---|---|---|
| <0.15 | – | 1-5% | 1-2% | 1-2% |
| >0.15 <= 0.3 | – | 1-5% | 1-5% | 1-5% |
| >0.3 <= 0.6 | – | 5-10% | 20-30% | – |
| >0.6 <= 1.4 | – | 10-20% | 30-40% | – |
| >1.4 <= 4 | – | – | – | – |
| >4 <= 12 | – | – | – | – |
| >12 <= 24 | – | – | – | – |
| >24 <= 37 | – | – | – | – |
| >37 | – | – | – | – |

## Additional community tables

**Table 8. Community 1.1 plant community composition**

| Group | Common Name | Symbol | Scientific Name | Annual Production (Kg/Hectare) | Foliar Cover (%) |
|---|---|---|---|---|---|
| **Grass/Grasslike** | | | | | |
| 1 | **Primary Perennial Grasses** | | | 790–1177 | |
| | basin wildrye | LECI4 | *Leymus cinereus* | 673–925 | – |
| | beardless wildrye | LETR5 | *Leymus triticoides* | 84–168 | – |
| | Indian ricegrass | ACHY | *Achnatherum hymenoides* | 34–84 | – |
| 2 | **Secondary Perennial Grasses** | | | 84–168 | |
| | blue grama | BOGR2 | *Bouteloua gracilis* | 9–50 | – |
| | sedge | CAREX | *Carex* | 9–50 | – |
| | squirreltail | ELEL5 | *Elymus elymoides* | 9–50 | – |
| **Forb** | | | | | |
| 3 | **Primary Perennial Forbs** | | | 50–84 | |
| | lupine | LUPIN | *Lupinus* | 50–84 | – |
| 4 | **Secondary Perennial Forbs** | | | 1–84 | |
| | milkvetch | ASTRA | *Astragalus* | 9–34 | – |
| | mariposa lily | CALOC | *Calochortus* | 9–34 | – |
| | cryptantha | CRYPT | *Cryptantha* | 9–34 | – |
| | phlox | PHLOX | *Phlox* | 9–34 | – |
| | desert globemallow | SPAM2 | *Sphaeralcea ambigua* | 9–34 | – |
| **Shrub/Vine** | | | | | |
| 5 | **Primary Shrubs** | | | 303–420 | |
| | mountain big sagebrush | ARTRV | *Artemisia tridentata ssp. vaseyana* | 252–336 | – |
| | rubber rabbitbrush | ERNA10 | *Ericameria nauseosa* | 50–84 | – |
| | lupine | LUPIN | *Lupinus* | 56–84 | – |
| | phlox | PHLOX | *Phlox* | 0–6 | – |
| | desert globemallow | SPAM2 | *Sphaeralcea ambigua* | 0–6 | – |
| | milkvetch | ASTRA | *Astragalus* | 0–6 | – |
| | mariposa lily | CALOC | *Calochortus* | 0–6 | – |
| | cryptantha | CRYPT | *Cryptantha* | 0–6 | – |
| 6 | **Secondary Shrubs** | | | 1–84 | |
| | mormon tea | EPVI | *Ephedra viridis* | 17–34 | – |
| | Nevada broomsage | LELA4 | *Lepidospartum latisquamum* | 17–34 | – |
| | rose | ROSA5 | *Rosa* | 17–34 | – |

## Animal community

Livestock Interpretations:
This site is suited to livestock grazing. Wild horses may use this site year round if water is available. Grazing management should be keyed to basin wildrye production. The early growth and abundant production of basin wildrye make it a valuable source of forage for livestock. It is important forage for cattle and is readily grazed by cattle and horses in early spring and fall. Though coarse-textured during the winter, basin wildrye may be utilized more frequently by livestock and wildlife when snow has covered low shrubs and other grasses. Creeping wildrye can be used for forage and is very palatable to all livestock. Once established it is very rhizomatous and maintains stands for many years. 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.

Mountain big sagebrush is eaten by domestic livestock but has long been considered to be of low palatability, and a competitor to more desirable species. In general, livestock forage only lightly on rubber rabbitbrush during the summer, but winter use can be heavy in some locations. Fall use is variable, but flowers are often used by livestock. A few leaves and the more tender stems may also be used.

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:
Basin wildrye provides winter forage for mule deer, though use is often low compared to other native grasses. Basin wildrye provides summer forage for black-tailed jackrabbits. Because basin wildrye remains green throughout early summer, it remains available for small mammal forage for longer time than other grasses. Creeping wildrye is used for forage for many wildlife species and is often used for cover. 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. Mountain big sagebrush is highly preferred and nutritious winter forage for mule deer and elk. Wildlife forage only lightly on rubber rabbitbrush during the summer, but winter use can be heavy in some locations. Fall use is variable, but flowers are often used by wildlife. A few leaves and the more tender stems may also be used. The forage value of rubber rabbitbrush varies greatly among subspecies and ecotypes.
Sagebrush-grassland communities provide critical sage-grouse breeding and nesting habitats. Meadows surrounded by sagebrush may be used as feeding and strutting grounds. Sagebrush is a crucial component of their diet year-round, and sage-grouse select sagebrush almost exclusively for cover. Sage-grouse prefer mountain big sagebrush and Wyoming big sagebrush communities to basin big sagebrush communities.

## Hydrological functions

Rills – Few to none present due to high cover of vegetation.
Water flow Patterns – Short, not connected.
Pedestals and/or Terracettes – Few to none.
Gullies – None present.
Low runoff due to plant cover and composition. Plant community composition contributes to infiltration and reduces runoff.

## Recreational uses

This site is used for camping and hiking.

## Type locality

| Location 1: Clark County, NV | |
|---|---|
| Township/Range/Section | T18 S R55 E S29 NW |
| UTM zone | N |
| UTM northing | 4024973n |
| UTM easting | 605292e |
| General legal description | Near the junction of Wheeler Pass and Wheeler Well roads, Spring Mountains, Clark County, Nevada. |

## Other references

Clokey, I. 1951. Flora of the Charleston Mountains, Clark County, Nevada. University of California Press, Berkeley and Los Angeles.

Fire Effects Information System [Online] http://www.fs.fed.us/feis.

Glenne, G. and Johnson, D. 2002. Guide to Species of Concern in the Spring Mountains National Recreation Area, Clark and Nye Counties, Nevada. USFS, Las Vegas, NV.

Nachlinger, J. and G. Reese. 1996. Plant Community Classification of the Spring Mountains National Recreation Area, Clark and Nye Counties, Nevada. The Nature Conservancy. Reno, Nevada.

## Contributors

TJ WOLFE

## Approval

Sarah Quistberg, 2/25/2025

## 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) | P NOVAK-ECHENIQUE |
| Contact for lead author | State Rangeland Management Specialist |
| Date | 06/22/2006 |
| Approved by | Sarah Quistberg |
| Approval date | |
| Composition (Indicators 10 and 12) based on | Annual Production |

## Indicators

1. **Number and extent of rills:** None to rare. A few may occur after summer convection storms or rapid snowmelt.

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2. **Presence of water flow patterns:** None to few. A few may occur after summer convection storms or rapid snowmelt flow patterns are short (<1 m) and stable.

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3. **Number and height of erosional pedestals or terracettes:** None to rare. Occurrence is usually limited to areas of water flow patterns.

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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 ± 20-30%; surface rock fragments 30-40%.

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5. **Number of gullies and erosion associated with gullies:** Gullies are rare to common depending on severity of

associated stream channel entrenchment. Gullies and head cuts are healing or stable.

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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 (foliage of grasses and annual & perennial forbs) only expected to move during periods of flooding by adjacent streams. Persistent litter (large woody material) will remain in place except during large flooding events.

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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 range from 4 to 6.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil surface structure is typically very thick platy. Soil surface colors are dark browns and the soils have thick mollic epipedons. Organic matter can range from 3 to 5 percent for much of the upper 20 inches. (OM values derived from lab characterization data.)

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Deep-rooted perennial grasses slow runoff and increase infiltration. Tall stature and relatively coarse foliage of wildrye and associated litter break raindrop impact and provide opportunity for snow catch and snow 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 - Platy or subangular blocky structure are not to be interpreted as compaction.

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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: Tall-statured, deep-rooted, cool season, perennial bunchgrasses, basin wildrye

    Sub-dominant: tall shrubs >warm season rhizomatous grasses > deep-rooted, cool season, perennial forbs >warm season rhiz fibrous, shallow-rooted, cool season, annual and perennial forbs

    Other:

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Dead branches within individual shrubs common; standing dead shrub canopy material may be as much as 25% of total woody canopy.

14. **Average percent litter cover (%) and depth ( in):** Between plant interspaces (± 40-50%) and litter depth is > ½ inch.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** For normal or average growing season (through June) ± 1500 lbs/ac; Favorable years: 2500 lbs/ac; Unfavorable years: 1000 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:** Potential invaders include: annual mustards, cheatgrass, single-leaf pinyon and Utah juniper.

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