

Ecological site R030XC017NV

LIMESTONE HILL 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 backslopes of mountains, ridges and rock outcrops. Slopes range from 30 to 75 percent. Elevations range from 6800 to 8200 feet. The soils associated with this site have formed in residuum and colluvium derived from limestone. These soils are typically very shallow to bedrock and well drained.

Please refer to group concept R030XC036NV to view the provisional STM.

Associated sites

F030XC249NV	Pinus monophylla/Quercus gambelii/Poa fendleriana
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Cercocarpus intricatus</i>
Herbaceous	Not specified

Physiographic features

This site occurs on backslopes of mountains, ridges and rock outcrops. Slopes range from 30 to 75 percent. Elevations range from 6800 to 8200 feet.

Table 2. Representative physiographic features

Landforms	(1) Mountain (2) Mountain slope (3) Ridge
Elevation	2,073–2,499 m
Slope	30–75%
Aspect	E, S, W

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 12 to 14 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 near this site.

Table 3. Representative climatic features

Frost-free period (average)	130 days
Freeze-free period (average)	
Precipitation total (average)	356 mm

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils associated with this site have formed in residuum and colluvium derived from limestone. These soils are typically very shallow to bedrock and well drained. The soil profile is modified with high amounts of rock fragments. Runoff is very high. Available water holding capacity is very low. The soils usually have high amounts of gravels, cobbles or stones on the surface that occupy plant growth space, yet help to reduce evaporation and conserve soils moisture. The soil temperature regime is mesic and the soil moisture regime is ustic. Soil series associated with this site include Ednagrey.

Table 4. Representative soil features

Surface texture	(1) Extremely gravelly fine sandy loam
Family particle size	(1) Loamy
Drainage class	Somewhat excessively drained
Permeability class	Moderately rapid
Soil depth	10–25 cm
Surface fragment cover <=3"	50–70%
Surface fragment cover >3"	5–10%
Available water capacity (0-101.6cm)	1.19–2.01 cm
Calcium carbonate equivalent (0-101.6cm)	5–20%
Electrical conductivity (0-101.6cm)	0 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	7.9–8.4
Subsurface fragment volume <=3" (Depth not specified)	35–60%
Subsurface fragment volume >3" (Depth not specified)	5–10%

Ecological dynamics

Please refer to group concept R030XC036NV to view the provisional STM.

Fire effects:

The historic fire regime of littleleaf mountainmahogany communities probably varied with community type and structure. The estimated fire return interval is 50 to 75 years. Fires are very infrequent due to the sparseness of fine fuels. Trees such as pinyon and juniper may increase over time with lack of fire. Littleleaf mountainmahogany may depend on fire to reduce conifer competition and produce favorable soil conditions for seedling establishment. Littleleaf mountainmahogany decreases with heavy browsing by mule deer. Littleleaf mountainmahogany is moderately damaged by fire and there is very little sprouting following fire. Littleleaf mountainmahogany occurs on harsh sites that are rarely burned by fire. Mormon tea generally sprouts vigorously from the roots or woody root crown after fire and rapidly produces aboveground biomass from surviving meristematic tissue. Charleston Mountain goldenbrush is usually top-killed by fire. Oceanspray is top-killed by fire. Oceanspray is only moderately resistant to fire, but is well adapted to disturbance by fire. Oceanspray survives fire by regenerating from soil-stored seed or

sprouting from surviving root crowns. Full recovery from a fire disturbance can be expected in 5 to 10 years. 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. Bottlebrush squirreltail's small size, coarse stems, and sparse leafy material aid in its tolerance of fire. Postfire regeneration occurs from surviving root crowns and from on- and off-site seed sources. Frequency of disturbance greatly influences postfire response of bottlebrush squirreltail. Undisturbed plants within a 6 to 9 year age class generally contain large amounts of dead material, increasing bottlebrush squirreltail's susceptibility to fire.

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 littleleaf mountain-mahogany. Common grasses include blue grama, Indian ricegrass, bottlebrush squirreltail and muttongrass. Common shrubs include Mormon tea, and Charleston Mountain goldenbush. Potential vegetative composition is approximately 10 percent grasses and grass-like plants, 5 percent forbs and 80 percent shrubs and up to 2 percent low stature trees. Approximate ground cover (basal and canopy) is 20 to 30 percent. Total annual air-dry production is 600 pounds favorable years, 450 pounds normal years, and 300 pounds on unfavorable years.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	279	418	558
Grass/Grasslike	34	50	67
Forb	17	26	34
Tree	7	10	13
Total	337	504	672

Table 6. Ground cover

Tree foliar cover	0-5%
Shrub/vine/liana foliar cover	20-30%
Grass/grasslike foliar cover	1-5%
Forb foliar cover	1-5%
Non-vascular plants	0%
Biological crusts	0%

Litter	1-5%
Surface fragments >0.25" and <=3"	50-70%
Surface fragments >3"	1-5%
Bedrock	1-10%
Water	0%
Bare ground	1-10%

Table 7. Canopy structure (% cover)

Height Above Ground (M)	Tree	Shrub/Vine	Grass/Grasslike	Forb
<0.15	0-1%	1-2%	0-1%	1-5%
>0.15 <= 0.3	0-5%	1-5%	1-5%	1-5%
>0.3 <= 0.6	1-5%	5-10%	1-2%	0-1%
>0.6 <= 1.4	1-5%	10-20%	—	—
>1.4 <= 4	1-5%	—	—	—
>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			20–52	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	10–26	—
	squirreltail	ELEL5	<i>Elymus elymoides</i>	10–26	—
2	Secondary Perennial Grasses			1–16	
	threeawn	ARIST	<i>Aristida</i>	2–6	—
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	2–6	—
	muttongrass	POFE	<i>Poa fendleriana</i>	2–6	—
Forb					
3	Perennial Forbs			10–26	

	Indian paintbrush	CASTI2	<i>Castilleja</i>	2–6	–
	Jaeger's mousetail	IVJA	<i>Ivesia jaegeri</i>	2–6	–
	phlox	PHLOX	<i>Phlox</i>	2–6	–
Shrub/Vine					
4	Primary Shrubs			282–430	
	littleleaf mountain mahogany	CEIN7	<i>Cercocarpus intricatus</i>	252–353	–
	mormon tea	EPVI	<i>Ephedra viridis</i>	10–26	–
	Charleston Mountain goldenbush	ERCO40	<i>Ericameria compacta</i>	10–26	–
	oceanspray	HOLOD	<i>Holodiscus</i>	10–26	–
5	Secondary Shrubs			1–26	
	Clokey's buckwheat	ERHEC	<i>Eriogonum heermannii</i> var. <i>clokeyi</i>	6–16	–
	fivepetal cliffbush	JAAM	<i>Jamesia americana</i>	6–16	–
	mat rockspirea	PECA12	<i>Petrophytum caespitosum</i>	6–16	–
	purple sage	SADOD2	<i>Salvia dorrii</i> ssp. <i>dorrii</i>	6–16	–
Tree					
6	Trees			1–16	
	Utah juniper	JUOS	<i>Juniperus osteosperma</i>	2–6	–
	Rocky Mountain juniper	JUSC2	<i>Juniperus scopulorum</i>	2–6	–
	singleleaf pinyon	PIMO	<i>Pinus monophylla</i>	2–6	–

Animal community

Livestock Interpretations:

This site has limited value for livestock grazing, due to the low forage production and steep slopes. Grazing management should be keyed to perennial grasses or palatable shrubs production. Cattle and sheep will feed on littleleaf mountain mahogany slightly in the winter, and is generally of minor significance to livestock. Mormon tea is heavily browsed by livestock on winter range but only moderately or lightly browsed during other seasons. Charleston Mountain goldenbush may be a source of browse for livestock, particularly in the late fall and early winter after more palatable species have been depleted. Oceanspray is generally unpalatable to the majority of livestock. 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. Bottlebrush

squirretail is very palatable winter forage for domestic sheep of Intermountain ranges. Domestic sheep relish the green foliage. Overall, bottlebrush squirretail is considered moderately palatable to livestock.

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:

Littleleaf mountain mahogany is good winter browse for deer and elk. Mormon tea is an important browse species for big game animals. Mormon tea is heavily used by wildlife on winter ranges. Charleston Mountain goldenbrush may be a source of browse for wildlife, particularly in the late fall and early winter after more palatable species have been depleted. Oceanspray is generally unpalatable to the majority of big game. However, it comprised an average relative density of 10 percent of the summer diet of bighorn sheep populations. Plants are utilized by a variety of small bird species. 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. Bottlebrush squirretail is a dietary component of several wildlife species.

Hydrological functions

Rills – Few to none present due to high cover of rocks and gravels.

Water flow Patterns – Few to none.

Pedestals and/or Terracettes – No pedestalling. Terracettes found at bases of shrubs and large rocks.

Plant Community Composition and Distribution Relative to Infiltration and Runoff – High runoff common due to gravels and rocks. Plant community composition contributes little to infiltration.

Recreational uses

This site is used mainly for hiking.

Other information

There are four plant species of concern located in this ecological type within the Spring Mountains National Recreational Area (SMNRA). One species is endemic to the SMNRA. There are two mammal species of concern located within this ecological type.

Type locality

Location 1: Clark County, NV	
Township/Range/Section	T18S. R54E. S3 NE
UTM zone	N
UTM northing	4031161n
UTM easting	0599098e
General legal description	Approximately 3 miles southeast of Mount Stirling, Spring Mountains, Clark County, Nevada.

Other references

Clokey, Ira. 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., 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., G. Reese. 1996. Plant Community Classification of the Spring Mountains National Recreation Area, Clark and Nye Counties, Nevada. The Nature Conservancy. Reno, Nevada. III. 14. *Cercocarpus intricatus* Series. Dwarf mountain mahogany Series. Pg. I-79-80.

Contributors

TJ WOLFE

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)	TJ WOLFE
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:** Few to none present due to high cover of rocks and gravels.

- 2. Presence of water flow patterns:** Few to none

- 3. Number and height of erosional pedestals or terracettes:** No pedestalling. Terracettes found at bases of shrubs and large rocks.

- 4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 1 to 10 percent

- 5. Number of gullies and erosion associated with gullies:** None present

- 6. Extent of wind scoured, blowouts and/or depositional areas:** No wind-scoured or blow out areas. Depositional areas found up slope of large shrubs and rocks.

- 7. Amount of litter movement (describe size and distance expected to travel):** Litter, 2 inches or less may move with runoff.

- 8. Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil surface very resistant due to high amounts of rocks and gravels.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Little to none due to high amounts of rock and gravels. Low amount of organic matter in soils

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** High runoff common due to gravels and rocks. Plant community composition contributes little to infiltration.

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

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:
