UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

STATE: Utah
SITE TYPE: Forestland
ECOLOGICAL SITE NAME: High Mountain Stony Loam (Engelmann spruce)
SITE NUMBER: 048AY524UT
MLRA: 048A
Original Site Description: Author: DJS Date: 01/26/1994
Revised Site Description: Author: Date:
Approved by: Title: Signed: Date:

Ecological Site Definition - A distinctive kind of land, with specific physical characteristics, which differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation, and in its response to management.

A. PHYSICAL CHARACTERISTICS

(description narrative of this particular site)

1. SOILS

Depth: 40-60 inches
Surface Textures:
Surface Fragments(<=3" % cover, >3" % cover):
Subsurface Textures:
Subsurface Fragments(<=3" % vol, >3" % vol):
Geologic Parent Materials: Colluvium, Residuum, and Glacial Till from Intrusive Igneous and Calcareous Sandstone
Moisture Regime:
Temperature Regime:
Runoff: Slow to Rapid
Permeability(min-max):
Drainage Class(min-max): Well Drained
Water Erosion Hazard: Moderate
Wind Erosion Hazard:
Electrical Conductivity (EC in mmhos/cm):
Sodium Adsorption Ration (SAR):
Soil Reaction (1:1 water):
Soil Reaction (0.1 M CaCl2):
pH Range:
Available Water Capacity (inches): 2.5-7

Major Soils Associated With This Site:

Soil Survey Area:
Leighcan CB-L, 25-50% — loamy-skeletal, mixed Dystric Cryochrepts
Namon GR-L 8-30%, 30-50% — loamy-skeletal, mixed Typic Cryborolls
Olnes Family 50-70% — loamy-skeletal, mixed, nonacid Typic Cryorthents
Senchert FSL, 1-15% — fine-loamy, mixed, arcid Pachic Cyroborolls

Additional information may be found in Section II of the Field Office Technical Guide.

2. PHYSIOGRAPHIC FEATURES

Landform and Position: Mountainsides and Moraines
Aspect:

	Minimum	Maximum
Slope:	8	70
Elevation:	9000	11500

Flooding:
- Frequency:
- Duration:

Ponding:
- Depth (inches):
- Frequency:
- Duration:
- Water Table Depth:

3. FOREST COMMUNITY TYPE

Overstory: Engelmann spruce (*Picea engelmannii*)
Understory: dwarf blueberry, creeping Oregon grape, Ross sedge
Site Index: 40 to 50

B. CLIMATIC FEATURES

Mean Annual Precipitation (inches): 20-40
Mean Annual Air Temperature: 34-40
Mean Annual Soil Temperature: 0-0
Frost Free Period (days): 20-60
Freeze Free Period (days): 0-0

Temperature and Moisture Distribution:

Temp	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
High												
Mean												
Low												

PPT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
High												
Mean												
Low												

Climate Stations: St. ID.: Location: Period:

From: To:

(Includes factors such as storm intensity, precipitation dependability, origin and pattern of storms, driest and wettest months, orographic effects, etc.)

Influencing Water Features (if any):

Wetland Description(Cowardin System) System Subsystem Class

Stream Types(Rosgen System) System

C. PLANT COMMUNITY CHARACTERISTICS

1. Potential Plant Community Description and Ecological Factors

(Includes dominant vegetative aspect, cool-season and warm-season components, typical plant spacing, etc.)

a. Nature of Forest Community

The overstory tree canopy cover is about 55 percent. Common understory plants are dwarf blueberry, creeping Oregon grape, Ross sedge, pinegrass, and gooseberry current. Understory composition by air-dry weight is about 20 percent perennial grasses and grasslike plants, 5 percent forbs, and 75 percent shrubs. Understory production ranges from 110 pounds per acre in favorable years to about 90 pounds per acre in unfavorable years. Understory production includes the total annual production of all species within 4 ½ feet of the ground surface.

b. Productivity Rating of Major Understory Species:

Productivity Rating Index: This rating provides an index to the relative importance of species in the understory community as affected by overstory canopy cover.

c. Productivity Index

1	Always present:	More than 50% of total understory production
2	Always present:	25 to 50% of total understory production
3	Generally present:	10-24% of total understory production
4	Frequently present:	5-9% of total understory production
5	Occasionally present:	1-5% of total understory production
6	Rarely present:	Less than 1% of total understory production

2. Plant Community Composition by Overstory Canopy Class

Common Name	National Symbol	0-10%	11-20%	21-35%	36-60%
Geyer sedge	CAGE2	3	3	2	1
Spike trisetum	TRSP2	3	3	3	2
Wheeler bluegrass	PONE2	3	3	2	2
Thickspike wheatgrass	ELLA3	2	2	3	3
Prairie junegrass	KOMA	3	3	4	5
Pinegrass	CARU	3	3	3	4
Sheep fescue	FEOV	4	4	5	5
Ross sedge	CARO5	3	3	4	4
Heartleaf arnica	ARCO9	4	4	3	2
Skunkleaf Jacobs ladder	POPU3	3	4	4	4
Common yarrow	ACMI2	4	4	4	3
Dwarf blueberry	VACE	4	3	2	1
Common juniper	JUCO6	5	4	3	3
Gooseberry current	RIMO2	4	4	5	5

3. Plant Community Annual Production

At the highest potential similarity index, this site will produce approximately the following amount of air-dry herbage, expressed as pounds/acre:

Total Average Understory Production by Overstory Canopy Class (lbs./acre air–dry weight)

	Open 0-10%	Sparse 11-20%	Medium 21-35%	Dense 36-60%
Favorable Year	1200	1000	800	600
Average Year	900	700	500	400
Unfavorable Year	600	450	300	150

4. Ground Cover and Structure

a. Vegetative

Vegetation Type	Percent Canopy Cover	Height Range	Percent Basal Area Cover
Grasses & Grass-like (perennial)			
Forbs (perennial)			
Shrubs			
Trees			
Cryptogams			

b. Other

Litter	

Coarse Fragments	
Bare Ground	

5. Ecological Dynamics of the Site

a. Herbaceous:

Vegetation is dominated by grasses and forbs under full sunlight. This stage is experienced after a major disturbance such as crown fire or tree harvest. Skeleton forest (dead trees) remaining after fire or residual trees left following harvest have little or no affect on the composition and production of the herbaceous vegetation. Engelmann spruce will germinate in all light intensities found in nature but 40 to 60 percent of full shade is most favorable for seedling establishment at high elevations.

b. Shrub-Herbaceous:

Herbaceous vegetation and woody shrubs dominate the site. Various amounts of tree seedlings (less than 20 inches in height) may be present up to the point where they are obviously a major component of the vegetal structure. Engelmann spruce is restricted to cold, humid habitats because of its low tolerance to high temperatures and drought. It does not normally grow in pure stands but in various mixtures with associated species.

c. Sapling:

In the absence of disturbance, the tree seedlings develop into saplings (20 inches to 4.5 feet in height) with a range in canopy cover of about 5 to 10 percent. Vegetation consists of grasses, forbs, and shrubs in association with tree saplings.

d. Immature Forest:

The visual aspect and vegetal structure are dominated by Engelmann spruce greater than 4.5 feet in height. Seedlings and saplings are present in the understory. Understory vegetation is moderately influenced by a tree overstory canopy about 10 to 20 percent. Lodgepole pine is usually a major seral associate below 10,600 feet elevation. Quaking aspen is locally an important seral component at lower elevations only.

e. Mature Forest:

The visual aspect and vegetal structure are dominated by Engelmann spruce that have reached or are near maximal heights for the site. Tree canopy cover ranges from 20 to 40 percent. Understory vegetation is strongly influenced by tree competition, overstory shading, duff accumulation, etc. Few seedlings and/or saplings of the major overstory tree species occur in the understory.

f. Climax Forest:

In the absence of wildfire or other naturally occurring disturbances, the tree canopy on this site can become very dense. This stage is dominated by trees that have reached maximal heights for the site. Understory vegetation is sparse to absent due to tree competition, overstory shading, duff accumulation, etc. Tree canopy cover is at a maximum for the site and is commonly greater than 50 percent. Engelmann spruce is susceptible to windthrow, especially after initial cutting in old growth forests.

6. Productivity Capacity

Productivity Class: 1.0

CMAI: 15 to 50 cu ft/ac/yr

1.0 to 3.5 cu m/ha/yr

Fuelwood Production:

35 to 45 cords per acre per year for stands averaging 30 to 40 feet in height and 50 years of age. Firewood is commonly measured in cords, or a stacked unit equivalent to 128 cubic feet. Assuming an average of 90 cubic feet of solid volume wood per cord, there are about 176,000 British thermal units (BTU's) per cubic foot or about 15 million BTU's of heat value in a cord of Engelmann spruce.

Plant Communities & Transitional Pathways

(Show a steady state diagram with influences to move from one steady state to another)

7. Plant Growth Curves

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Percent Growth												
Name												
ID Number												
Description												

8. Aspect Differences Near MLRA Boundaries

(Give related range sites in MLRA's above and below)

9. Associated Sites Within MLRA

(Give site name and number)

10. Correlated Sites in Other States

(Give site name and number)

D. MAJOR USES OF THIS SITE

1. Forage Products

a. Livestock Grazing

This site is suited to cattle and sheep grazing during the summer and fall. Livestock will often concentrate on this site taking advantage of the shade and shelter offered by the tree overstory. Many areas are not used because of steep slopes or lack of adequate water. Attentive grazing management is required due to steep slopes and erosion hazards. Harvesting trees under a sound management program can open up the tree canopy to allow increased production of understory species desirable for grazing.

b. Initial Stocking Rates

Stocking rates vary in accordance with such factors as kind and class of grazing animal, season of use, and fluctuation in climate. Actual use records for individual sites, together with a determination of the degree to which the sites have been grazed and an evaluation of trend in site condition, offer the most reliable basis for developing initial stocking rates.

Selection of initial stocking rates for given grazed units is a planning decision. This decision should be made only after careful consideration of the total resources available, evaluation of alternatives for use and treatment, and establishment of objectives by the decisionmaker.

c. Forage Value Rating (P) Preferred, (D) Desirable, (U) Undesirable

Common Name	National Symbol	Relative Forage Value for:			
		Cattle	Horses	Sheep	Deer
Geyer sedge	CAGE2	P	P	U	D
Spike trisetum	TRSP2	P	P	D	D
Wheeler bluegrass	PONE2	P	P	P	D
Thickspike wheatgrass	ELLA3	P	P	D	D
Prairie junegrass	KOMA	D	D	D	D
Sheep fescue	FEOV	P	P	P	D
Ross sedge	CARO5	D	U	U	U
Heartleaf arnica	ARCO9	U	U	U	U
Skunkleaf Jacobs ladder	POPU3	U	U	D	D
Common yarrow	ACMI2	U	U	D	D
Dwarf blueberry	VACE	U	U	D	P
Common juniper	JUCO6	U	U	U	U
Gooseberry current	RIMO2	U	U	D	D
Pinegrass	CARU	P	D	D	D
Engelmann spruce	PIEN	U	U	U	D

d. Guide to Forage Quality(Plant preference by season)

Species	Oct-Nov	Dec-Feb	Mar-May	Jun-Sep

VG = Very Good G = Good F = Fair P = Poor

2. Wildlife

a. Site Factors Influencing Management

b. List of Potential Species Present

Wildlife species seeking food and cover in this forest site include elk, mule deer, bear, porcupine, snowshoe hare, owl, and woodpecker.

This is a short list of the more common species found. Many other species are present as well and migratory birds are present at times.

c. Guide to Forage Preference of Managed Wildlife Species

Wildlife Species →				
Plant Species ↓	Use	Season	Use	Season

Use - A = preferred or desirable
B = some use, but less important
C = little use or used occasionally

Season - F = Fall (Oct-Nov)
W = Winter (Dec-Feb)
Sp. = Spring (Mar-May)
Su. = Summer (Jun-Sep)

3. Recreational Uses

4. Limitations and Considerations

a. Potential for sheet and rill erosion is moderate to severe depending on slope.

b. Moderate to severe equipment limitations on steeper slopes and on sites having extreme surface stoniness.

c. Proper spacing is the key to a well managed multiple use and multi-product forest.

5. Essential Requirements

a. Adequately protect from uncontrolled burning.

b. Protect soils from accelerated erosion.

c. Apply proper grazing management practices (see management guides)

6. Silvicultural Practices

a. Harvest cut selectively or in small patches (size dependent upon site conditions) to enhance forage production.

   1. Precommercial thinning and improvement cutting – removal of poorly formed, diseased, and low vigor trees of little or no value.

   2. Commercial thinning – selectively harvest surplus trees to achieve desired spacing. Save large, healthy, full-crowned trees. Do not select only “high grade” trees during thinning.

b. Prescription burning program may be used to reduce competition before replanting a harvest site.

c. Selective tree removal on suitable sites to enhance forage production and manage site reproduction.

d. Pest Control – use necessary and approved control for specific pests or diseases.

e. Fire hazard – fire is usually not a problem in mature grazed stands. Install firebreaks or firelines as necessary.

7. Other uses

E. THREATENED AND ENDANGERED SPECIES

1. Plants

2. Animals

F. MODAL LOCATION AND DOCUMENTATION

State: County:
Latitude: Longitude:
Section: Township: Range:
General Legal Description:

Field Office Site Location

Legal Description:

Data Collected and References

Sampling Source	Number of Records	Range Similarity Index			
		> 76%	51-75%	26-50%	0-25%
NRCS - ECS - 417					
UTAH - RANGE - 2					
Permanent Transect Location					

Other References

Youngblood, Andrew P., Mauk, Ronald L., “Coniferous Forest Habitat Types of Central and Southern Utah” General Technical Report, INT-187, October 1985, page 36, PIEN/PIMO

“Silvics of North America” Agriculture Handbook 654, Volume 1, Conifers