

UNITED STATES DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE

STATE: Utah

SITE TYPE: Forestland

ECOLOGICAL SITE NAME: Mountain Very Steep Stony Loam (Douglas-fir)

SITE NUMBER: 048AY475UT

MLRA: 048A

Original Site Description: Author: GWL, DJS

Date: 05/25/1981

Revised Site Description: Author: GWL, DJS

Date: 01/25/1994

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: 20->60 inches

Surface Textures:

Surface Fragments(<=3" % cover, >3" % cover): 40-75%

Subsurface Textures:

Subsurface Fragments(<=3" % vol, >3" % vol): >50%

Geologic Parent Materials: Colluvium and Residuum from Mixed Sedimentary

Moisture Regime:

Temperature Regime:

Runoff: Rapid

Permeability(min-max): Moderately Slow to Moderate

Drainage Class(min-max): Well Drained

Water Erosion Hazard:

Wind Erosion Hazard:

Electrical Conductivity (EC in mmhos/cm):

Sodium Adsorption Ration (SAR):

Soil Reaction (1:1 water):

Soil Reaction (0.1 M CaCl<sub>2</sub>):

pH Range:

Available Water Capacity (inches):

Major Soils Associated With This Site:

Soil Survey Area:

Towave CNV-L, 45-80%, Eroded – Loamy-skeletal, mixed Aridic Haploborolls

Pathead STX-L, 50-80%, Eroded – Loamy-skeletal, mixed (calcareous), frigid, Typic Ustorthents

Whetrock STX-L, 50-80%, Eroded – Loamy-skeletal, mixed Aridic Calciborolls

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

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## **2. PHYSIOGRAPHIC FEATURES**

Landform and Position: Pediment Backslopes, Mountain Side Slopes, and Cuesta Scarps

Aspect: NE/SE

|                    | <u>Minimum</u> | <u>Maximum</u> |
|--------------------|----------------|----------------|
| Slope:             | 50             | 80             |
| Elevation:         | 6000           | 8100           |
| Flooding:          |                |                |
| Frequency:         |                |                |
| Duration:          |                |                |
| Ponding:           |                |                |
| Depth (inches):    |                |                |
| Frequency:         |                |                |
| Duration:          |                |                |
| Water Table Depth: |                |                |

## **3. FOREST COMMUNITY TYPE**

Overstory: Douglas-fir (*Pseudotsuga menziesii* var. *glauca*)  
 Understory: snowberry, birchleaf mountainmahogany, serviceberry  
 Site Index: 48 to 50

## **B. CLIMATIC FEATURES**

Mean Annual Precipitation (inches): 14-20

Mean Annual Air Temperature: 40-43

Mean Annual Soil Temperature: 43-46

Frost Free Period (days): 60-90

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:

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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 30 to 40 percent. Common understory plants are snowberry, birchleaf mountainmahogany, serviceberry, Gambel oak, Salina wildrye, slender wheatgrass, sedge and creeping Oregon grape. Understory composition by air-dry weight is about 15 percent perennial grasses and grasslike plants, 10 percent forbs, and 75 percent shrubs. Understory production ranges from 500 pounds per acre in favorable years to about 100 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**

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| Common Name                | National Symbol | 0-10% | 11-20% | 21-35% | 36-60% |
|----------------------------|-----------------|-------|--------|--------|--------|
| Ross sedge                 | CARO5           | 3     | 3      | 3      | 3      |
| Wheeler bluegrass          | PONE2           | 2     | 3      | 3      | 3      |
| Bluebunch wheatgrass       | PSSP6           | 2     | 2      | 3      | 3      |
| Salina wildrye             | LESAS           | 2     | 2      | 3      | 3      |
| Engelmann aster            | ASEN2           | 4     | 4      | 3      | 3      |
| Thickleaf peavine          | LALA3           | 3     | 3      | 4      | 5      |
| Birchleaf mountainmahogany | CEMO2           | 4     | 4      | 5      | 5      |
| Creeping Oregon grape      | MARE11          | 4     | 4      | 3      | 2      |
| Mountain snowberry         | SYOR2           | 2     | 3      | 3      | 3      |
| Mountain lover             | PAMY            | 5     | 4      | 3      | 2      |
| Saskatoon serviceberry     | AMAL2           | 4     | 4      | 5      | 5      |
| Common juniper             | JUOC6           | 5     | 4      | 3      | 2      |

### 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   | 1100       | 900           | 700           | 500          |
| Average Year     | 700        | 500           | 300           | 200          |
| Unfavorable Year | 550        | 400           | 250           | 100          |

### 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

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|                  |  |
|------------------|--|
| 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.

### **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.

### **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 Douglas-fir 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. Ponderosa pine may be a major seral species with Douglas-fir in certain locations of the site. Lodgepole pine, quaking aspen, canyon maple, and Gambel oak may be minor seral species in some areas.

### **e. Mature Forest:**

The visual aspect and vegetal structure are dominated by Douglas-fir that have reached or are near maximal heights for the site. Trees attain heights of 100-120 feet with diameters of 15 to 30 inches by the age of 200 to 300 years. Diameter growth slows down and height growth practically ceases after age 200. Rocky Mountain Douglas-fir rarely lives more than 400 years. 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.

## **6. Productivity Capacity**

**Productivity Class:** 1.0

**CMAI:** 30. to 40. cu ft/ac/yr

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2.1 to 2.8 cu m/ha/yr

### **Fuelwood Production:**

33 to 44 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 232,000 British thermal units (BTU's) per cubic foot or about 23 million BTU's of heat value in a cord of Douglas-fir.

Tree volume per acre: 3000 to 4000 cubic feet/acre/year for stands averaging 30 to 40 feet in height and 50 years of age.

### **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

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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 |
| Ross sedge                 | CARO5           | P                          | P      | U     | D    |
| Wheeler bluegrass          | PONE2           | P                          | P      | P     | D    |
| Bluebunch wheatgrass       | PSSP6           | P                          | P      | D     | D    |
| Salina wildrye             | LESAS           | U                          | D      | U     | U    |
| Engelmann aster            | ASEN2           | D                          | D      | P     | P    |
| Creeping Oregon grape      | MARE11          | U                          | U      | U     | D    |
| Thickleaf peavine          | LALA3           | P                          | D      | P     | P    |
| Mountain snowberry         | SYOR2           | U                          | U      | D     | D    |
| Common juniper             | JUOC6           | U                          | U      | U     | U    |
| Saskatoon serviceberry     | AMAL2           | D                          | U      | P     | D    |
| Mountain lover             | PAMY            | U                          | U      | U     | U    |
| Birchleaf mountainmahogany | CEMO2           | D                          | D      | P     | P    |
| Douglas-fir                | PSME            | 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

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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. Douglas-fir seedlings establishment may be improved by shade cards that will protect the trees from intense heat on southern or western aspects and by the presence of litter if it does not prevent the seed from reaching moist soil and does not absorb light rain showers.
- b. Prescription burning may be used to reduce competition before replanting a harvested site.



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|                             |  |
|-----------------------------|--|
| 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 53, PIPO/QUGA

"Silvics of North America" Agriculture Handbook 654, Volume 1, Conifers

Mauk, Ronald L., Henderson, Jan A. "Coniferous Forest Habitat Types of Northern Utah," General Technical  
Report INT 170, July 1884 ABLA/BERE/RIMO, Page 47-49

## Attachment 1

|                                |
|--------------------------------|
| Ecological Reference Worksheet |
|--------------------------------|

Author(s)/participant(s): V. Keith Wadman  
 Contact for lead author: \_\_\_\_\_ Reference site used? Yes/No  
 Date: 6/28/04 MLRA: 048A Ecological Site: Mountain Very Steep Stony loam (48AY475UT) Douglas fir, Snowberry, Birchleaf mountainmahogany, Salina wildrye This must be verified based on soils and climate (see Ecological Site Description). Current plant community cannot be used to identify the ecological site.

**Indicators** For each indicator, describe the potential for the site. Where possible, (1) use numbers, (2) include expected range of values for above- and below-average years for each community within the reference state, when appropriate & (3) cite data. Continue descriptions on separate sheet.

1. Number and extent of rills: Minor rill development in exposed areas. Rills present should be short on flatter slopes but may become longer (6 to 12 feet) as slope steepens. They should be somewhat widely spaced (3 to 6 feet), and follow the surface micro-features. Old rills should be weathered and muted in appearance. The presence of surface coarse fragments may reduce rill formation.

2. Presence of water flow patterns: Flow patterns wind around surface rock & perennial plant bases and show minor evidence of erosion. They are somewhat short and stable and there is only minor evidence of deposition. Evidence of flow will increase somewhat with slope.

3. Number and height of erosional pedestals or terracettes: Plants may show minor pedestaling on their down slope side. Terracettes should be few and stable.

4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bareground): 20 - 30%. (Soil surface is typically covered by 70% rock).

5. Number of gullies and erosion associated with gullies: Few. Gullies should show only minor signs of active erosion and should be mostly stabilized with vegetation. Gullies may show slightly more indication of erosion as slope steepens. The presence of surface rock may mask erosion indicators.

6. Extent of wind scoured, blowouts and/or depositional areas: Little evidence of wind generated soil movement. Wind caused blowouts and deposition are not present.

7. Amount of litter movement (describe size and distance expected to travel): Some down slope redistribution caused by water. Some litter removal may occur in flow channels with deposition occurring at points of obstruction. Litter movement will increase with slope.

8. Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values for both plant canopy and interspaces, if different): 60 to 70% of this site should have an erosion rating of 4 or 5. 30 to 40% may have a rating of 2 to 4. The average should be a 4. Litter accumulation and cryptogamic crusts reduce erosion. The presence of surface rock also reduces site erosion.

9. Soil surface structure and SOM content (include type and strength of structure, and A-horizon color and thickness for both plant canopy and interspaces, if different): Soil surface typically is 4 inches. Structure typically varies from weak coarse platy to medium sub-angular blocky. Color varies from dark brown (10YR3/3) to brown (10YR5/3). Soils typically have ochric or mollic epipedons ranging from 3 to 13 inches.

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|  |  |
|--|--|
| <p>10. Effect of plant community composition (relative proportion of different functional groups) &amp; spatial distribution on infiltration &amp; runoff: When perennial grasses decrease, reducing ground cover and increasing bare ground, runoff will increase and infiltration will be reduced. Significant increases in Douglas fir canopy reduces understory vegetation and increases runoff.</p>   |  |
| <p>11. Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site): None. Some soils have bedrock at about 26 inches.</p>  |  |
| <p>12. Functional/Structural Groups (list in order of descending dominance by above-ground weight using symbols: », &gt;, = to indicate much greater than, greater than, and equal to): Assumed fire cycle of 60-75+ years. Overstory forest &gt; perennial grasses and sedges, non-sprouting shrubs &gt; sprouting shrubs, annual forbs &gt; invaders such as Cheatgrass &amp; Annual forbs. Dominants: Douglas fir, Snowberry, Salina wildrye; Sub-dominants: Birchleaf mountainmahogany, Service berry, Ross sedge. The perennial grass &amp; sedge/non-sprouting shrub functioning group is expected as understory on this site.</p> |  |
| <p>13. Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence): All age classes of perennial grasses should be present. Slight decadence in the principle shrubs and overstory trees could occur near the end of the fire cycle.</p>   |  |
| <p>14. Average percent litter cover (40-55%) and depth (.75-1.50 inch).</p>  |  |
| <p>15. Expected annual production (this is TOTAL above-ground production, not just forage production): 400 - 600 #/acre on an average year.</p>  |  |
| <p>16. Potential invasive (including noxious) species (native and non-native). List species which characterize degraded states and which, after a threshold is crossed, "can, and often do, continue to increase regardless of the management of the site and may eventually dominate the site": Utah juniper, Gambel oak, Sandberg bluegrass &amp; Xeric perennial &amp; Annual forbs.</p>  |  |
| <p>17. Perennial plant reproductive capability: All perennial plants should have the ability to reproduce in all years, except in extreme drought years. Understory reproduction is reduced as overstory canopy closes.</p>  |  |