

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

STATE: Utah

SITE TYPE: Forestland

ECOLOGICAL SITE NAME: High Mountain Loam (Aspen)

SITE NUMBER: 047AY508UT

MLRA: 047A

Original Site Description: Author: DLT, TW

Date: 08/23/1993

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: Loam, Silt Loam, or Clay Loams and in Places are Stony, Gravelly, Cobbly, or Very Cobbly

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

Subsurface Textures: Loam, Clay Loam, Silty Clay Loam, or Clay, and Stony, Cobbly, or Gravelly

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

Geologic Parent Materials: Sandstone, Shale, Limestone, Quartzite, and Igneous Rocks

Moisture Regime:

Temperature Regime:

Runoff:

Permeability(min-max): Moderate to Slow

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 CaCl₂):

pH Range: Slightly Acid to Very Strongly Acid

Available Water Capacity (inches):

Major Soils Associated With This Site:

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Soil Survey Area:

Ercan Family GR-L 25-60%
 Baird Hollow L 6-60%
 Mult L, CI, CB-L 5-40%
 Croydon L 30-60%
 Lucky Star SiL 15-60%
 Scave L 15-60%
 Yeljack L, North 10-30%

Skutum L 8-50%
 Hailman L, CB-L 6-60%
 Roundy L, CB-L 5-60%
 Flygare L 30-60%
 Richens L 3-15%
 Red Spur L 10-30%

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

2. PHYSIOGRAPHIC FEATURES

Landform and Position: Gently Sloping to Steep Mountain Slopes
 Aspect: All

	<u>Minimum</u>	<u>Maximum</u>
Slope:	5	10
Elevation:	6200	9500
Flooding:		
Frequency:		
Duration:		
Ponding:		
Depth (inches):		
Frequency:		
Duration:		
Water Table Depth:		

3. FOREST COMMUNITY TYPE

Overstory: quaking aspen (*Populus tremuloides*)
 Understory: mountain brome, slender wheatgrass
 Site Index: 40 to 50

B. CLIMATIC FEATURES

Mean Annual Precipitation (inches): 25-35
 Mean Annual Air Temperature: 36-46
 Mean Annual Soil Temperature: 38-48
 Frost Free Period (days): 30-80
 Freeze Free Period (days): 0-0

Temperature and Moisture Distribution:

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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

Quaking aspen is the dominant overstory plant. Overstory tree canopy cover will vary from 25 to 70 percent, but is most common from 40 to 55 percent. Shade tolerant plants such as blue wildrye, bearded wheatgrass, mountain brome, nodding bluegrass, sweetanice, meadowrue, and edible valerian are the dominant understory species.

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%
Mountain brome	BRCA5	3	3	2	1
Blue wildrye	ELGL	3	3	2	1
Slender wheatgrass	ELTR7	3	3	3	2
Nodding bluegrass	PORE	3	2	2	2
Geyer sedge	CAGE2	3	3	2	2
Columbia needlegrass	ACNE9	4	3	3	3
Kentucky bluegrass	POPR	3	3	3	3
Thickleaf peavine	LALA3	3	3	2	2
Tobacco root	VAED	4	3	2	1
Sweetanice	OSOC	4	3	2	1
Nettleleaf giant hyssop	AGUR	4	4	3	2
Fendler snowberry	THFE	4	3	2	1
Mountain snowberry	SYOR2	4	3	2	2
Creeping Oregon grape	MARE11	4	4	3	2
Chokecherry	PRVI	6	5	5	4

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	1700	1300	800	600
Average Year	1200	900	600	400
Unfavorable Year	900	600	400	200

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	

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Bare Ground	
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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 effect 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. Quaking aspen is very intolerant of shade. Natural pruning is excellent and long, clean stems are usually produced when side shade is present.

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 quaking aspen 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.

e. Mature Forest:

The visual aspect and vegetal structure are dominated by quaking aspen that have reached or are near maximal heights for the site. Trees have developed tall, straight, clear stems with short, high rounded crowns. 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 quaking aspen 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 quaking aspen that have reached maximal heights for the site. Trees have straight, clear stems with short, high rounded crowns. 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: 16. to 21. cu ft/ac/yr

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 1.1 to 1.5 cu m/ha/yr

Fuelwood Production:

8 to 10 cords per acre per year. 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 196,400 British thermal units (BTU's) per cubic foot or about 17 million BTU's of heat value in a cord of quaking aspen.

Saw Timber: 200 to 300 board-feet per acre per year.

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. Grazing management should allow aspen saplings to attain a minimum height of 55 to 60 inches before use to prevent destructive browsing by livestock. Harvesting trees under a sound management program for fuelwood or other products can open up the tree canopy to allow increased production of understory species desirable for grazing while rejuvenating the aspen forest.

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.

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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
Mountain brome	BRCA5	P	P	D	D
Blue wildrye	ELGL	P	P	D	D
Slender wheatgrass	ELTR7	P	P	D	D
Nodding bluegrass	PORE	P	P	P	D
Geyer sedge	CAGE2	P	P	U	D
Columbia needlegrass	AVNE9	P	P	D	D
Kentucky bluegrass	POPR	P	P	P	P
Thickleaf peavine	LALA3	P	D	P	P
Tobacco root	VAED	D	U	P	P
Sweetanice	OSOC	D	D	P	P
Northern bedstraw	GABO2	U	U	D	D
Western coneflower	RUOC2	U	U	P	D
Butterweed	SESE2	U	U	P	D
Nettleleaf giant hyssop	AGUR	D	D	P	U
Fendler meadowrue	THFE	U	U	D	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 moose, 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

- Potential for sheet and rill erosion is moderate to severe depending on slope.
- Moderate to severe equipment limitations on steeper slopes and on sites having extreme surface stoniness.
- Proper spacing is the key to a well managed multiple use and multi-product forest.

5. Essential Requirements

- Adequately protect from high intensity wildfire.
- Protect soils from accelerated erosion.
- Apply proper grazing management practices (see management guides)

6. Silvicultural Practices

- Harvest cut selectively or in small patches (size dependent upon site conditions) to enhance forage production.
 - Thinning and improvement cutting – removal of poorly formed, diseased, and low vigor trees for fuelwood.
 - Harvest cutting – selectively harvest surplus trees to achieve desired spacing. Harvest stands in small blocks of 1/5 to 1/2 acre with slash left in place to shelter emerging aspen suckers from browsing.
 - Spacing guide: A spacing of about 15 X 15 feet is considered desirable for multiple use management during period of stand maturity.

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Attachment 1

Ecological Reference Worksheet

Author(s)/participant(s): V. Keith Wadman
 Contact for lead author: _____ Reference site used? Yes/No
 Date: 6/26/04 MLRA: 047A Ecological Site: High Mountain Loam (047AY508UT) Aspen, Slender wheatgrass, Mountain brome 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: Very minor rill development in exposed areas. Any rills present should be short on flatter slopes but may become longer (2 to 4 feet) as slope steepens. They should be somewhat widely spaced (6 to 10 feet), and follow the surface micro-features. Old rills should be weathered and muted in appearance.

2. Presence of water flow patterns: Flow patterns wind around 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: None.

4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bareground): 10 - 20%.

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.

6. Extent of wind scoured, blowouts and/or depositional areas: None. Wind caused blowouts and deposition are not present.

7. Amount of litter movement (describe size and distance expected to travel): Some down slope litter 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): 80 to 90% of this site should have an erosion rating of 5 or 6. 10 to 20% may have a rating of 3 to 4. The average should be a 5. Organic surface layer reduces 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 varies from 3 to 5 inches. Structure is typically fine granular. Color typically varies from very dark brown (7.5YR2/2) to very dark grayish brown (10YR3/2). A mollic epipedon typically occurs to a depth of 12 to 20 inches.

10. Effect of plant community composition (relative proportion of different functional groups) & spatial distribution on infiltration & runoff: Aspen community development ranges from an open herbaceous type following major disturbance such as crown fire or logging, to a climax forest type (50+% canopy) with little understory vegetation. As understory vegetation is reduced, infiltration is reduced and increased runoff can occur.

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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. Some soils have an argillic horizon at about 30 inches that could be mistaken for a compaction layer.

12. Functional/Structural Groups (list in order of descending dominance by above ground weight using symbols: », >, = to indicate much greater than, greater than, and equal to): Assumed fire cycle of 40-60+ years. Mature forest vegetative stands consist of a 20 to 40% canopy of mature Aspen > perennial bunchgrasses, perennial forbs, > sprouting shrubs, xeric perennial forbs > invaders such as Tarweed, Coneflower & Annual forbs. Dominants: Aspen, Blue wildrye, Slender wheatgrass, Mountain brome; Sub-dominants: Geyer sedge, Prairie junegrass, Snowberry. The deciduous forest, perennial bunchgrass/ perennial forb functioning group is expected on this site.

13. Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence): All age classes of Aspen, perennial grasses forbs should be present. As overstory canopy increases, understory species decrease in both abundance and production.

14. Average percent litter cover (60-80%) and depth (1.75-2.25 inch).

15. Expected annual production (this is TOTAL above-ground production, not just forage production): 800 - 1000 #/acre (mature canopy) on an average year.

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": Snowberry, Kentucky bluegrass & Xeric perennial forbs.

17. Perennial plant reproductive capability: All perennial plants should have the ability to reproduce in all years.