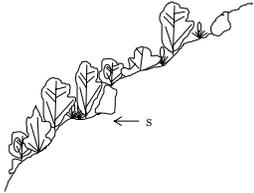


## 4. Descriptions of Ecological Types

### A. DRY FORESTS (FD)

**FD01. TREE JUNIPER–COARSE DARK SOILS–STEEP SOUTHERLY (JUSC2/PIMI7).** Rocky Mountain Juniper/littleseed ricegrass • Stony cobbly gravelly Argiborolls • Steep southerly granitic backslopes, 8,300-9,300 ft



NUMBER OF SAMPLES	8, soil descriptions from 5 of these (total 8)
ELEVATION	8,920 ft (8,360-9,240 ft) 2,719 m (2,548-2,816 m)
AVERAGE ASPECT	171°M (r=0.60)
LITHOLOGY	Mostly granite [71%]
FORMATIONS†	Mostly Xg [83%]
LANDFORMS	Soil creep slopes
SLOPE POSITIONS	Backslopes
SLOPE SHAPES	Undulating [67%] to linear horizontally, concave [67%] to linear vertically
SLOPE ANGLE	39.2% (29-47%)
SOIL PARENT MATERIAL	Colluvium
COARSE FRAGMENTS	52.0% (40-66%) cover on surface, usually stony and/or bouldery; coarse fragments 55.8% (35-73%) by volume in soil
SOIL DEPTH	51 cm (28-80 cm) 20.0 in (11-31 in)
MOLLIC THICKNESS	12 cm (2-21 cm) 4.7 in (1-8 in)
TEXTURE	Clay loam and clay surface, clay and sandy clay subsurface
SOIL CLASSIFICATION	Argiborolls, moderately deep
TOTAL LIVE COVER	91.4% (51.7-117.5%). No. Species 31.9 (25-47)
TOTAL LIVE COVER/NO. SPECIES	3.1% (1.4-4.5%)
CLIMATE	In watersheds of moderate rainshadow, but in the upper portions of those watersheds and on southerly aspects, so dry to very dry, low precipitation. Warm to very warm, highly exposed to sun, and moderately exposed to wind.
WATER	Very dry microclimate, but vegetation cover and coarse fragments hold some moisture through the season on better-condition sites. No permanent water on or near sites.

#### Key to Community Types

1. Rocky Mountain juniper cover >45%. Littleseed ricegrass always present and >2% cover.  
    Indian ricegrass (ACHY) <1% cover ..... **A**
1. Rocky Mountain juniper cover <45%. Littleseed ricegrass absent or <2% cover. Indian ricegrass >1% cover ..... (2)
2. Big sagebrush subdominant, >10% cover. Blue grama (CHGR15) >15% cover ..... **B**
2. Big sagebrush <10% cover. Blue grama absent or <5% cover..... **C**

Description of Community Types

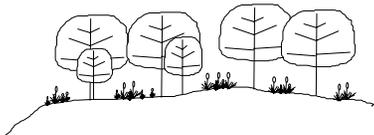
- A** *Tree juniper-muttongrass-sedge-littleseed ricegrass* has as full a canopy as Rocky Mountain juniper gets, 50-65% cover. Sparse littleseed ricegrass and other shade-loving plants are found in the shade of the junipers.
- B** *Tree juniper-blue grama-sagebrush* has a sparser canopy of juniper, 20-30% cover, with patches of sun-loving species in between, such as big sagebrush and blue grama.
- C** *Tree juniper-sagebrush-Indian ricegrass* has a still sparser canopy of juniper, 10-20% cover, with patches of different sun-loving species such as Indian ricegrass and sagebrush, and somewhat less-coarse soils.

CT	Elevation, ft Slope, %	Coarse, % Depth, cm Mollic Depth, cm	Surface Coarse, % Bare, % Serai Stage	Cover, %: Trees Shrubs Graminoids Forbs	No. Species Total Live Cover, % TLC/NS, %
A. Tree juniper-muttongrass-sedge-littleseed ricegrass	8,837 (8,400-9,060) 37.0 (35-38)	55 (35-67) 46 (28-56) 12 (9-17)	48 (40-54) 6 (1-10) PN	55 (48-63) 9 (3-21) 46 (27-59) 2 (1-2)	26 (25-28) 112 (106-117) 4.3 (4.0-4.5)
B. Tree juniper-blue grama-sagebrush	9,100 (9,060-9,140) 37.9 (29-47)	72 (70-73) 52 (47-56) 16 (10-21)	52 (46-57) 10 (7-13) LM	23 (21-25) 22 (15-29) 50 (49-50) 4 (4-5)	29 (28-30) 99 (91-108) 3.4 (3.2-3.6)
C. Tree juniper-sagebrush-Indian ricegrass	8,883 (8,360-9,240) 42.3 (36-46)	41 (35-47) 58 (36-80) 9 (2-15)	56 (47-66) 12 (9-16) EM-MS	16 (15-17) 16 (7-23) 30 (10-45) 3 (3-3)	39 (33-47) 65 (52-83) 1.7 (1.4-1.9)

\*. Unknown: measurements were not taken in this CT.

	TREES	
JUSC2	Juniperus scopulorum	Rocky Mountain juniper
	SHRUBS	
CHDE2	Chrysothamnus depressus	dwarf rabbitbrush
CHVI8	Chrysothamnus viscidiflorus	Douglas rabbitbrush
PIRI6	Picradenia richardsonii	pingue
	GRAMINOIDS	
ACHY	Achnatherum hymenoides	Indian ricegrass
CAPEH	Carex pensylvanica ssp. heliophila	sun sedge
CHGR15	Chondrosium gracile	blue grama
ELEL5	Elymus elymoides	bottlebrush squirreltail
JUSA	Juncus saximontanus	Rocky Mountain rush
KOMA	Koeleria macrantha	prairie junegrass
PIMI7	Piptatherum micranthum	littleseed ricegrass
POFE	Poa fendleriana	muttongrass
POSE	Poa secunda	Sandberg bluegrass

FD02. PONDEROSA PINE/ARIZONA FESCUE–LIGHT-COLORED CLAY SOILS (PIPO/FEAR2). Ponderosa pine/Arizona fescue–Eutroboralfs–Gentle slopes and mesas, 8,400-10,100 ft



NUMBER OF SAMPLES	8, soil descriptions from 4 of these (total 8)
ELEVATION	9,270 ft (8,460-10,060 ft); 2,825 m (2,578-3,066 m)
AVERAGE ASPECT	178°M (r = 0.48)
LITHOLOGY	Igneous, for example tuff, basalt, breccia, rhyolite
FORMATIONS <sup>1</sup>	All Tertiary volcanics
LANDFORMS	Soil creep slopes [80%]
SLOPE POSITIONS	Footslopes and backslopes [80%]
SLOPE SHAPES	Linear [60%] both horizontally and vertically
SLOPE ANGLE	14.5% (3-42%)
SOIL PARENT MATERIAL	Colluvium [80%]
COARSE FRAGMENTS	12.5% (7-19%) cover on surface, 51.1% (29-67%) by volume in soil
SOIL DEPTH	83 cm (60-143 cm); 32.8 in (24-56 in)
MOLLIC THICKNESS	11 cm (8-14 cm); 4.1 in (3-6 in)
TEXTURE	Loamy surface (clay loam-sandy loam-loam); more clayey subsurface (clay-sandy clay loam-clay loam)
SOIL CLASSIFICATION	Eutroboralfs [75%] or Argiborolls [25%]
TOTAL LIVE COVER	103.6% (48.0-138.2%)
NUMBER OF SPECIES	30.0 (24-38)
TOTAL LIVE COVER/NO. SPECIES	3.6% (1.4-5.7%)
CLIMATE	In locations of deep rainshadow, either in deep-rainshadow macroclimates such as the Cochetopa Creek watershed, or else just east of large mountain masses, microclimate dry to very dry, low precipitation. Warm to very warm, moderately to highly exposed to sun, slightly exposed to wind.
WATER	Very dry microclimate, but vegetation cover and coarse fragments hold some moisture through the season on better-condition sites. No permanent water on or near sites.

Key to Community Types

1. Arizona fescue always present and >15% cover. Mountain muhly sometimes >20% cover.  
 Total graminoid cover >30% ..... **A**  
 1. Arizona fescue absent or <10% cover. Mountain muhly always <20% cover. Total graminoid cover <30% ..... **B**

Description of Community Types

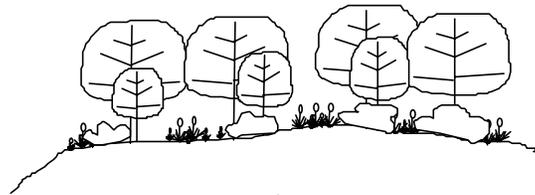
- A** *Ponderosa pine-Arizona fescue-mountain muhly* has conspicuous Arizona fescue in the understory, and often mountain muhly as well. Sagebrush is inconspicuous. Total graminoid cover is >30%.  
**B** *Ponderosa pine-big sagebrush-sparse*. Big sagebrush is sometimes prominent. All graminoids are sparse, but sometimes mountain muhly is conspicuous. Total graminoid cover is <30%.

CT	Elevation, ft Slope, %	Coarse, % Depth, cm Mollic Depth, cm	Surface Coarse, % Bare, % Seral Stage	Cover, %: Trees Shrubs Gramin. Forbs	No. Species Total Live Cover, % TLC/NS, %
A. Ponderosa pine-Arizona fescue-mountain muhly	9,514 (8,900-10,060) 17.6 (3-42)	53 (29-67) 88 (60-143) 11 (8-14)	12 (7-16) 6 (1-10) PN	50 (37-69) 6 (1-12) 49 (37-57) 13 (4-32)	30 (26-34) 118 (101-138) 4.0 (3.4-5.1)
B. Ponderosa pine-big sagebrush-sparse	8,863 (8,460-9,370) 9.2 (6-11)	45 (45-45) 69 (69-69) 8 (8-8)	10 (2-19) 26 (1-52) EM	28 (1-50) 23 (0-67) 17 (12-27) 12 (2-23)	30 (24-38) 80 (48-138) 3.0 (1.4-5.7)

\*. Unknown: measurements were not taken in this CT.

	TREES	
PIAR	Pinus aristata	bristlecone pine
PIPO	Pinus ponderosa	ponderosa pine
	SHRUBS	
ARTR2	Artemisia tridentata	big sagebrush
RICE	Ribes cereum	wax currant
RIIN2	Ribes inerme	whitestem currant
	GRAMINOIDS	
FEAR2	Festuca arizonica	Arizona fescue
HECO26	Hesperostipa comata	needle-and-thread
MUMO	Muhlenbergia montana	mountain muhly
POFE	Poa fendleriana	muttongrass
	FORBS	
AMLA6	Amerosedum lanceolatum	yellow stonecrop
ERFL	Erigeron flagellaris	trailing fleabane
ERGL2	Erigeron glabellus	smooth fleabane
GECA3	Geranium caespitosum	Fremont geranium
LUAR3	Lupinus argenteus	silvery lupine
POCO13	Potentilla concinna	elegant cinquefoil
FORB	forb unknown	unknown forb

FD03. **PONDEROSA PINE/BITTERBRUSH–DARK SOILS WITH NO CLAY LAYER (PIPO/PUTR2)**. Ponderosa pine/bitterbrush–Moderately deep to shallow Haploborolls–Gentle convex mesas and ridges, 8,300-9,400 ft



NUMBER OF SAMPLES	11, soil descriptions from 5 of these (total 11)
ELEVATION	8,969 ft (8,360-9,400 ft); 2,734 m (2,548-2,865 m)
AVERAGE ASPECT	136°M (r = 0.38)
LITHOLOGY	Igneous, led by tuff [57%], breccia, granite, gneiss
FORMATIONS <sup>1</sup>	Fish Canyon Tuff - Taf [50%], Tp, Xg, Xfh
LANDFORMS	Mesas, ridges, and soil creep slopes
SLOPE POSITIONS	Mostly shoulders and summits [75%]
SLOPE SHAPES	Convex [67%] to linear horizontally, Linear [67%] to convex vertically
SLOPE ANGLE	19.2% (3-36%)
SOIL PARENT MATERIAL	Various: colluvium, residuum, or colluvium over residuum
COARSE FRAGMENTS	10.2% (1-33%) cover on surface, 52.5% (24-84%) by volume in soil
SOIL DEPTH	58 cm (38-115 cm) = 22.7 in (15-45 in)
MOLLIC THICKNESS	19 cm (6-30 cm) = 7.5 in (2-12 in)
TEXTURE	A variety of surface textures, but always sandier (loamy sand-sandy loam) subsurface
SOIL CLASSIFICATION	Haploborolls [67%], Ustorthents, and Ustochrepts; half of these are Lithic
TOTAL LIVE COVER	124.5% (62.0-177.0%)
NUMBER OF SPECIES	27.8 (12-47)
TOTAL LIVE COVER/NO. SPECIES	5.6% (1.6-14.8%)
CLIMATE	In moderate rainshadow. Warm, moderately exposed to sun, slightly exposed to wind.
WATER	Partially dry microclimate, vegetation cover and coarse fragments hold moisture through the season on better-condition sites. No permanent water on or near sites.

Key to Community Types

1. Ponderosa pine canopy >45% cover. Arizona fescue always present and >10% cover..... **A**
1. Ponderosa pine canopy <45% cover. Arizona fescue absent or <10% cover..... (2)
  
2. Ponderosa pine canopy 25-45% cover. Muttongrass <20% cover ..... **B**
2. Ponderosa pine canopy <25% cover. Muttongrass >20% cover ..... **C**

Description of Community Types

- A** *Ponderosa pine-bitterbrush-sagebrush-Arizona fescue* has a relatively dense pine canopy with 45- 60% cover and a conspicuous layer of bitterbrush underneath. Sagebrush is mixed with the bitterbrush, but sagebrush is always subordinate. Arizona fescue is prominent at 10-20% cover. Muttongrass is absent to inconspicuous, with <5% cover. This community appears to be a bitterbrush-sagebrush-fescue community with ponderosa pine added, apparently as a result of somewhat deeper, less-coarse soils.
- B** *Ponderosa pine-sagebrush-bitterbrush-muttongrass* has a less-dense pine canopy with 20 to 45% cover, with some bitterbrush; sometimes sagebrush is more prominent. Arizona fescue is absent to inconspicuous, <5% cover. Muttongrass is often prominent, 2 to 20% cover.

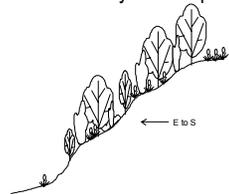
C *Ponderosa pine-muttongrass-sparse bitterbrush* has a sparser pine canopy at 10 to 25% cover, and less bitterbrush than the other communities, which always has less cover than sagebrush. Muttongrass is prominent at >15% cover.

CT	Elevation, ft Slope, %	Coarse, % Depth, cm Mollic Depth, cm	Surface Coarse, % Bare, % Serai Stage	Cover, %: Trees Shrubs Graminoids Forbs	No. Species Total Live Cover, % TLC/NS, %
A. Ponderosa pine-bitterbrush-sagebrush- Arizona fescue	9,050 (8,870-9,400) 13.7 (3-32)	33 (24-49) 47 (40-62) 28 (25-30)	13 (1-33) 6 (2-14) PN	50 (46-56) 23 (19-26) 43 (33-51) 5 (3-6)	30 (29-32) 120 (109-136) 4.0 (3.4-4.5)
B. Ponderosa pine-sagebrush-bitterbrush- muttongrass	8,920 (8,360-9,340) 22.6 (10-36)	64 (46-84) 64 (38-115) 13 (6-20)	8 (3-17) 4 (1-9) MS	39 (25-52) 33 (14-48) 31 (6-64) 14 (6-18)	35 (21-47) 118 (62-163) 3.8 (1.6-7.2)
C. Ponderosa pine-muttongrass-sparse bitterbrush	*	*	40 *	29 (10-56) 29 (8-41) 50 (30-70) 32 (2-50)	14 (12-15) 140 (80-177) 10.5 (5.7-14.8)

\*. Unknown: measurements were not taken in this CT.

	TREES	
PIPO	<i>Pinus ponderosa</i>	ponderosa pine
POTR5	<i>Populus tremuloides</i>	quaking aspen
	SHRUBS	
ARUV	<i>Arctostaphylos uva-ursi</i>	kinnikinnick
JUCO6	<i>Juniperus communis</i>	common juniper
PUTR2	<i>Purshia tridentata</i>	antelope bitterbrush
SYRO	<i>Symphoricarpos rotundifolius</i>	mountain snowberry
	GRAMINOIDS	
ACNE9	<i>Achnatherum nelsonii</i>	Nelson's needlegrass
AGCR	<i>Agropyron cristatum</i>	crested wheatgrass
BRCA10	<i>Bromopsis canadensis</i>	fringed brome
CAREX	<i>Carex</i>	sedge
CAGE	<i>Carex geophila</i>	dryland sedge
CAGE2	<i>Carex geyeri</i>	elk sedge
ELEL5	<i>Elymus elymoides</i>	bottlebrush squirreltail
FEAR2	<i>Festuca arizonica</i>	Arizona fescue
HECO26	<i>Hesperostipa comata</i>	needle-and-thread
KOMA	<i>Koeleria macrantha</i>	prairie junegrass
MUMO	<i>Muhlenbergia montana</i>	mountain muhly
POFE	<i>Poa fendleriana</i>	muttongrass
	FORBS	
ALLIU	<i>Allium</i>	onion
ERCO24	<i>Eremogone congesta</i>	desert sandwort
HEVI4	<i>Heterotheca villosa</i>	hairy golden aster
PECA4	<i>Penstemon caespitosus</i>	beardtongue

FD04. **BRISTLECONE PINE/CURRENT-ARIZONA FESCUE--COLD SOILS--SOUTHEASTERLY** (PIAR/RICE-  
FEAR2). Bristlecone pine/wax currant-Arizona fescue--Moderately deep to shallow colluvial Cryic soils--  
Southeasterly backslopes, 9,400-10,400 ft



NUMBER OF SAMPLES	8, soil descriptions from 3 of these; 1 more that doesn't fit into a community type (total 9)
ELEVATION	9,985 ft (9,440-10,380 ft); 3,043 m (2,877-3,164 m)
AVERAGE ASPECT	143°M (r = 0.78)
LITHOLOGY	Rhyolite [63%] or tuff
FORMATIONS <sup>1</sup>	Tpl [63%] or Taf
LANDFORMS	Soil creep slopes
SLOPE POSITIONS	Backslopes and upper backslopes
SLOPE SHAPES	Linear both horizontally and vertically
SLOPE ANGLE	26.1% (9-51%)
SOIL PARENT MATERIAL	Colluvium
COARSE FRAGMENTS	42.7% (10-90%) cover on surface, 54.2% (35-68%) by volume in soil
SOIL DEPTH	71 cm (62-75 cm); 27.8 in (24-30 in)
MOLLIC THICKNESS	9 cm (0-13 cm); 3.4 in (0-5 in)
TEXTURE	Loam surface, sandy clay loam to loam subsurface
SOIL CLASSIFICATION	Cryoborolls [50%], Cryorthents, and Cryochrepts
TOTAL LIVE COVER	107.2% (80.9-154.4%)
NUMBER OF SPECIES	25.5 (20-32)
TOTAL LIVE COVER/NO. SPECIES	4.2% (3.1-5.3%)
CLIMATE	Deep rainshadow, restricted to southern and southeastern portions of the Basin. Cold, moderately exposed to sun, moderately exposed to wind, dry to very dry because cold and coarse.
WATER	Dry to very dry microclimate, but vegetation cover and coarse fragments hold some moisture through the season on better-condition sites. No permanent water on or near sites.

**Key to Community Types**

1. Parry oatgrass >5% cover. Arizona fescue *and* mountain muhly both >20% cover. Total graminoid cover >50% ..... **A**
1. Parry oatgrass 0-5% cover. Arizona fescue and mountain muhly both present, but one or both <20% cover. Total graminoid cover <50% ..... (2)
2. Wax currant usually >5%, always >2% cover. Parry oatgrass absent or <1% cover..... **B**
2. Wax currant absent or <5% cover. Parry oatgrass >2% cover ..... **C**

**Description of Community Types**

- A** *Bristlecone pine-mountain muhly-Arizona fescue-wax currant-Parry oatgrass* is represented by only one plot, but it is clearly the highest seral stage in the sample. Bristlecone pine has 55% cover, wax currant 5%, Parry oatgrass 8%, Arizona fescue 20%, and mountain muhly 25%.
- B** *Bristlecone pine-wax currant-Arizona fescue* has the most conspicuous tall-shrub layer of wax currant, 2.5-20% cover. Arizona fescue and mountain muhly are always present, but sometimes one or both of these is sparse. Parry oatgrass is absent or <1% cover.

C *Bristlecone pine-Arizona fescue-mountain muhly* always has Arizona fescue and mountain muhly, but sometimes one or both of these is sparse. Wax currant cover is <5%; in one plot, wax currant is absent.

Plot Not Assigned to a Community Type (1)

- One plot was apparently transitional to *Douglas-fir/wax currant-Arizona fescue-Coarse thin-dark soils-Steep*, with bristlecone pine 41% cover, Douglas-fir 32%, Arizona fescue 4%, and Parry oatgrass and mountain muhly, both Trace (<1%).

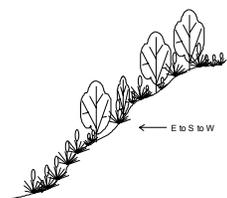
CT	Elevation, ft Slope, %	Coarse, % Depth, cm Mollic Depth, cm	Surface Coarse, % Bare, % Serai Stage	Cover, %: Trees Shrubs Graminoids Forbs	No. Species Total Live Cover, % TLC/NS, %
A. Bristlecone pine-mountain muhly-Arizona fescue-wax currant-Parry oatgrass	9,880 9	*	10 6 LS	55 6 62 32	32 154 4.8
B. Bristlecone pine-wax currant-Arizona fescue	9,780 (9,440-9,980) 16.5 (14-21)	* * *	40 (10-90) 27 (6-65) LS	64 (60-66) 5 (2-8) 35 (28-42) 14 (7-18)	26 (21-29) 118 (111-124) 4.7 (4.3-5.3)
C. Bristlecone pine-Arizona fescue-mountain muhly	10,165 (9,920-10,380) 37.7 (25-51)	54 (35-68) 71 (62-75) 9 (0-13)	53 (10-90) 6 (3-10) LM	36 (21-58) 9 (3-20) 33 (25-40) 9 (4-14)	24 (20-30) 87 (81-92) 3.7 (3.1-4.3)

\*. Unknown: measurements were not taken in this CT.

	TREES	
PIAR	<i>Pinus aristata</i>	bristlecone pine
PIFL2	<i>Pinus flexilis</i>	limber pine
PSME	<i>Pseudotsuga menziesii</i>	Douglas-fir
	SHRUBS	
PAVI11	<i>Padus virginiana</i>	common chokecherry
	GRAMINOIDS	
ACHY	<i>Achnatherum hymenoides</i>	Indian ricegrass
CAGE2	<i>Carex geveii</i>	elk sedge
DAPA2	<i>Danthonia parryi</i>	Parry oatgrass
FEAR2	<i>Festuca arizonica</i>	Arizona fescue
KOMA	<i>Koeleria macrantha</i>	prairie junegrass
MUMO	<i>Muhlenbergia montana</i>	mountain muhly
POA	<i>Poa</i>	bluegrass
	FORBS	
ASHA2	<i>Astragalus hallii</i>	Hall's milkvetch
LUAR3	<i>Lupinus argenteus</i>	silvery lupine
MACA2	<i>Machaeranthera canescens</i>	hoary aster

FD05. BRISTLECONE PINE/THURBER FESCUE–COLD SOILS (PIAR/FETH)

Bristlecone pine/Thurber fescue–Cryic soils–Subalpine slopes, > 11,000 ft



NUMBER OF SAMPLES	2, soil descriptions from 1 of these; 1 more that doesn't fit into a CT (total 3)
ELEVATION	11,190 ft (10,520-11,860 ft); 3,411 m (3,206-3,615 m)
AVERAGE ASPECT	143°M (r = 0.78)
LITHOLOGY	Tuff, granite, breccia
FORMATIONS <sup>1</sup>	Taf, Xg, Tpl
LANDFORMS	Soil creep slopes
SLOPE POSITIONS	Backslopes
SLOPE SHAPES	Convex to linear horizontally, Linear vertically
SLOPE ANGLE	34.5% (21-48%)
SOIL PARENT MATERIAL	Colluvium
COARSE FRAGMENTS	9.2% (2-16%) cover on surface, 0.0% (66-66%) by volume in soil
SOIL DEPTH	81 cm; 32 in
MOLLIC THICKNESS	25 cm; 10 in
TEXTURE	Sandy clay loam surface, sandy clay subsurface
SOIL CLASSIFICATION	Cryoborolls or Cryochrepts
TOTAL LIVE COVER	161.0% (112.9-209.1%)
NUMBER OF SPECIES	35.5 (28-43)
TOTAL LIVE COVER/NO. SPECIES	5.0% (2.6-7.5%)
CLIMATE	In deepest rainshadow, in the far southeastern portion of the Basin. Subalpine, cold to very cold, moderately to highly exposed to sun, moderately to highly exposed to wind.
WATER	Cold, moderately dry microclimate. Vegetation cover holds significant moisture in the soil through the season on most sites. No permanent water on or near sites.

Community Type Description

**A** *Bristlecone pine-Thurber fescue* has a well-developed graminoid layer, with Thurber fescue conspicuous at >15% cover.

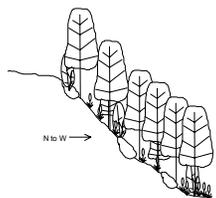
Plot Not Assigned to a Community Type (1)

- A community transitional to *Douglas-fir/Thurber fescue–Cold dark soils–Gentle*, with bristlecone pine dominant, but sharing dominance with Douglas-fir; there is usually some common juniper mixed with Thurber fescue in the understory.

CT	Elevation, ft Slope, %	Coarse, % Depth, cm Mollic Depth, cm	Surface Coarse, % Bare, % Serai Stage	Cover, %: Trees Shrubs Graminoids Forbs	No. Species Total Live Cover, % TLC/NS, %
A. Bristlecone pine-Thurber fescue	11,190 (10,520-11,860) 34.5 (21-48)	66 81 25	9 (2-16) 3 (1-6) LS	64 (55-73) 4 (4-5) 75 (24-126) 17 (6-29)	36 (28-43) 161 (113-209) 5.0 (2.6-7.5)

	TREES	
PIEN	<i>Picea engelmannii</i>	Engelmann spruce
PIAR	<i>Pinus aristata</i>	bristlecone pine
PIFL2	<i>Pinus flexilis</i>	limber pine
POTR5	<i>Populus tremuloides</i>	quaking aspen
PSME	<i>Pseudotsuga menziesii</i>	Douglas-fir
	SHRUBS	
JUCO6	<i>Juniperus communis</i>	common juniper
RICE	<i>Ribes cereum</i>	wax currant
	GRAMINOIDS	
CAOB4	<i>Carex obtusata</i>	blunt sedge
DAPA2	<i>Danthonia parryi</i>	Parry oatgrass
FEAR2	<i>Festuca arizonica</i>	Arizona fescue
FETH	<i>Festuca thurberi</i>	Thurber fescue
MUMO	<i>Muhlenbergia montana</i>	mountain muhly
POGL	<i>Poa glauca</i>	Greenland bluegrass

FD06. DOUGLAS-FIR/WAX CURRANT-ARIZONA FESCUE--COARSE THIN-DARK SOILS--STEEP (PSME/RICE- FEAR2). Douglas-fir/wax currant-Arizona fescue--Gravelly or cobbly barely-Mollic Eutroboralfs or Argiborolls-- Steep slopes, 7,600-10,000 ft



NUMBER OF SAMPLES	31, soil descriptions from 9 of these; 1 more that doesn't fit into a CT (total 32)
ELEVATION	8,729 ft (7,600-10,000 ft); 2,661 m (2,316-3,048 m)
AVERAGE ASPECT	301°M (r = 0.33)
LITHOLOGY	Mostly igneous, with tuff, rhyolite, schist, granite, gneiss, and breccia; only one sedimentary, sandstone
FORMATIONS <sup>1</sup>	Taf-Tpl [55%], Xb-Xg [36%], Kd [9%]
LANDFORMS	Soil creep slopes
SLOPE POSITIONS	Backslopes and upper backslopes
SLOPE SHAPES	Linear both horizontally and vertically
SLOPE ANGLE	38.9% (14-100%)
SOIL PARENT MATERIAL	Colluvium [80%] or colluvium over residuum [20%]
COARSE FRAGMENTS	27.3% (4-72%) cover on surface, 63.6% (28-90%) by volume in soil
SOIL DEPTH	49 cm (8-124 cm); 19.2 in (3-49 in)
MOLLIC THICKNESS	13 cm (3-26 cm); 4.9 in (1-10 in)
TEXTURE	A wide variety of textures on surface and in subsurface
SOIL CLASSIFICATION	Eutroboralfs [58%], Argiborolls [33%], or Ustochrepts
TOTAL LIVE COVER	96.0% (37.4-268.8%)
NUMBER OF SPECIES	24.5 (13-40)
TOTAL LIVE COVER/NO. SPECIES	4.3% (1.9-10.6%)
CLIMATE	Outside rainshadow or in partial rainshadow. In the warmest, driest forested microclimates. Warm, moderately exposed to sun, slightly exposed to wind.
WATER	Moderately moist sites, because of some snow deposition and retention on northerly aspects. No permanent water in or near sites.

Key to Community Types

1. Wax currant absent to <5% cover. Arizona fescue >15% cover, often >25%. Douglas-fir >50% cover ..... **A**
1. Wax currant absent to >30% cover. Arizona fescue usually <15% cover, always <25%. Douglas-fir 10-75% cover ..... (2)
2. Wax currant >10% cover ..... **C**
2. Wax currant <10% cover ..... (3)
3. Arizona fescue >15% cover. Ponderosa pine >20% cover, sometimes dominating Douglas-fir **B**
3. Arizona fescue <15% cover. Ponderosa pine absent to <10% cover ..... (4)
4. Wheeler bluegrass (PONE2) present and >1% cover. Ocean-spray present and >1% cover ..... **E**
4. Wheeler bluegrass usually absent, but occasionally up to 5% cover. Ocean-spray usually absent, but sometimes present. Wheeler bluegrass and ocean-spray never present together (5)
5. Arizona fescue present and >1% cover ..... **F**
5. Arizona fescue usually absent, always <1% cover ..... (6)
6. Douglas-fir >40% cover ..... **D**
6. Douglas-fir <40% cover ..... **G**

Community Type Descriptions

**A** *Douglas-fir-Arizona fescue*. Douglas-fir cover is >50%, and Arizona fescue cover is >15%. Shrubs are inconspicuous, though wax currant, sagebrush, or pingue cover reach 5%.

- B** *Ponderosa pine-Douglas-fir-Arizona fescue-wax currant* resembles **A**, but includes more ponderosa pine than Douglas-fir. Arizona fescue cover is >15%, and wax currant is present at >3% cover.
- C** *Douglas-fir-wax currant-sagebrush-Arizona fescue* has conspicuous shrub layers, with wax currant at >10% cover and big sagebrush cover usually >10%. Arizona fescue is always present, but may be inconspicuous.
- D** *Douglas-fir-sparse wax currant-grasses* is the sparsest of the community types, with total graminoid, shrub, and forb cover usually <30%, respectively. Wax currant is always present but in small quantity. Arizona fescue is usually absent.
- E** *Douglas-fir-tree juniper-Wheeler bluegrass-sparse wax currant* is distinguished by the presence of Wheeler bluegrass (PONE2) at >1% cover. Rocky Mountain juniper (JUSC2) is always present, contributing as much as 10% cover. Ocean-spray is always present, but is usually sparse. Arizona fescue is absent or <1% cover. Soils, landforms, and associated species are too closely related to separate this community into a separate type.
- F** *Douglas-fir-sparse Arizona fescue* includes sparse shrubs and forbs. Ocean-spray is absent, and wax currant is absent to sparse. Arizona fescue is always present at >1% cover.
- G** *Douglas-fir-sparse wax currant*. Wax currant is always present at >1% cover. Arizona fescue is absent. Ocean-spray may be conspicuous.

Plot Not Assigned to a Community Type

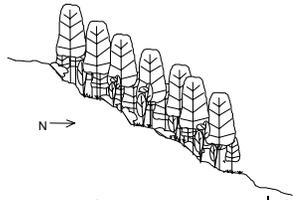
- One related community had Douglas-fir and aspen in the overstory, and a sparse understory with Wheeler bluegrass, but no Arizona fescue, wax currant, or ocean-spray.

CT	Elevation, ft Slope, %	Coarse, % Depth, cm Mollic Depth, cm	Surface Coarse, % Bare, % Serai Stage	Cover, %: Trees Shrubs Graminoids Forbs	No. Species Total Live Cover, % TLC/NS, %
A. Douglas-fir-Arizona fescue	9,235 (8,580-9,920) 33.0 (14-45)	63 (47-72) 76 (46-124) 17 (12-21)	26 (13-46) 6 (2-8) LS	57 (51-68) 11 (0-32) 55 (17-115) 20 (2-71)	29 (23-34) 143 (88-269) 4.8 (2.8-7.9)
B. Ponderosa pine-Douglas-fir-Arizona fescue-wax currant	9,880 31	* * *	5 60 LM	36 (32-40) 26 (7-45) 50 (35-65) 3 (3-4)	19 (17-21) 116 (87-144) 6.3 (4.1-8.5)
C. Douglas-fir-wax currant-sagebrush-Arizona fescue	8,388 (7,600-9,400) 26.0 (15-40)	35 55 9	38 15 LM	38 (30-45) 44 (20-81) 17 (11-33) 4 (1-17)	19 (13-36) 103 (85-138) 6.2 (2.8-10.6)
D. Douglas-fir-sparse wax currant-grasses	8,711 (8,400-9,305) 54.0 (34-70)	60 (55-66) 50 (31-69) 20 (13-26)	21 (8-31) 5 (1-12) MS	66 (52-75) 8 (6-13) 16 (0-33) 8 (0-30)	31 (26-37) 98 (79-121) 3.2 (2.2-4.2)
E. Douglas-fir-tree juniper-Wheeler bluegrass-sparse wax currant	8,110 (7,900-8,539) 54.8 (32-100)	58 55 6	8 5 MS	54 (41-61) 8 (4-18) 12 (3-45) 3 (2-5)	18 (14-30) 77 (57-129) 4.3 (3.0-5.2)
F. Douglas-fir-sparse Arizona fescue	8,963 (8,410-10,000) 30.3 (18-40)	58 (28-82) 40 (23-55) 11 (3-18)	27 (4-52) 4 (0-9) EM	47 (27-71) 19 (1-41) 21 (13-31) 8 (0-21)	30 (19-40) 95 (70-137) 3.6 (1.9-7.2)
G. Douglas-fir-sparse wax currant	8,958 (8,020-10,000) 36.7 (23-57)	85 (80-90) 29 (8-48) 9 (3-13)	48 (30-72) 2 (1-4) ES	28 (20-41) 21 (17-28) 5 (0-12) 4 (0-13)	24 (16-34) 57 (37-70) 2.6 (2.0-4.0)

\*. Unknown: measurements were not taken in this CT.

	TREES			
JUSC2	Juniperus scopulorum	Rocky Mountain juniper	MUMO	Muhlenbergia montana
PIPO	Pinus ponderosa	ponderosa pine	POFE	Poa fendleriana
POTR5	Populus tremuloides	quaking aspen	PONE2	Poa nervosa
PSME	Pseudotsuga menziesii	Douglas-fir	POSE	Poa secunda
	SHRUBS			FORBS
HODI	Holodiscus discolor	ocean-spray	ANRO2	Antennaria rosea
	GRAMINOIDS		ERCO27	Erigeron concinnus
CAGE2	Carex geyeri	elk sedge	FRVI	Fragaria virginiana
FEAR2	Festuca arizonica	Arizona fescue	MELA3	Mertensia lanceolata
KOMA	Koeleria macrantha	prairie junegrass	PHMU3	Phlox multiflora
			SOMU	Solidago multiradiata
				mountain muhly
				muttongrass
				Wheeler bluegrass
				Sandberg bluegrass
				rose pussytoes
				Navajo fleabane
				Virginia strawberry
				lanceleaf bluebells
				flowery phlox
				mountain goldenrod

FD08. **DOUGLAS-FIR/SERVICEBERRY-STEEP NORTHERLY** (PSME/AMAL2). Douglas-fir/serviceberry-Thin-dark Frigid soils-Steep northerly backslopes or shoulders, 7,900-10,000 ft



NUMBER OF SAMPLES	35; soil descriptions from 10 of these; 1 more that doesn't fit into a CT (total 36)
ELEVATION	8,875 ft (7,960-9,920 ft) = 2,705 m (2,426-3,023 m)
AVERAGE ASPECT	357°M (r = 0.64)
LITHOLOGY	Igneous, for example Tuff and welded tuff [60%], gneiss, breccia, and granite
FORMATIONS <sup>1</sup>	Taf [50%], Tpl, Xfh, Xg, and Tos
LANDFORMS	Soil creep slopes
SLOPE POSITIONS	Backslopes [50%], upper backslopes, and shoulders
SLOPE SHAPES	Concave [60%] to linear [40%] horizontally
LINEAR	[90%] vertically
SLOPE ANGLE	36.9% (8-66%)
SOIL PARENT MATERIAL	Colluvium [80%]
COARSE FRAGMENTS	13.9% (0-80%) cover on surface, 59.1% (22-85%) by volume in soil
SOIL DEPTH	69 cm (33-180 cm) = 27.1 in (13-71 in)
MOLLIC THICKNESS	15 cm (0-48 cm) = 5.9 in (0-19 in)
TEXTURE	A wide variety of textures both on surface and in subsurface
SOIL CLASSIFICATION	Haploborolls [36%], Glossoboralfs [36%], or Ustochrepts [18%]
TOTAL LIVE COVER	243.7% (68.2-491.5%)
NUMBER OF SPECIES	25.1 (12-51)
TOTAL LIVE COVER/NO. SPECIES	11.2% (2.8-26.1%)
CLIMATE	In partial rainshadow or outside rainshadow. Cool, dry forest.
WATER	Soil moisture may be maintained through the season by litter and duff on the surface, only in stands where the surface is not disturbed. No permanent water in or near sites.

Key to Community Types

1. Serviceberry >25% cover. Aspen absent or <25% cover ..... **A**
1. Serviceberry usually <25% cover, always <30%. Aspen often present, 0-90% cover..... (2)
  
2. Serviceberry 10-30% cover. Aspen conspicuous, dominating Douglas-fir, usually >40% cover. Douglas-fir >1% cover, usually >10%. Maple usually absent ..... **B**
2. Serviceberry 0-20% cover, often absent or <10%. Aspen absent or conspicuous. Maple absent or present ..... (3)
  
3. Lodgepole pine present and >25% cover ..... **H**
3. Lodgepole pine usually absent, in any case <25% cover ..... (4)
  
4. Aspen >40% cover. Douglas-fir inconspicuous, <1% cover. Serviceberry >10% cover ..... **D**
4. Without the above combination of characteristics ..... (5)
  
5. Maple the dominant tall shrub, 2-40% cover ..... **C**
5. Maple absent or <1% cover ..... (6)

6. Elk sedge absent to <5% cover. Aspen absent or <0.5% cover .....**F**  
 6. Elk sedge conspicuous, >15%. Aspen conspicuous or absent .....(7)  
 7. Aspen dominant over Douglas-fir ..... **G**  
 7. Douglas-fir dominant over aspen.....**E**

Community Type Descriptions

- A** *Douglas-fir-serviceberry-snowberry-muttongrass* has serviceberry cover >15% and snowberry cover >20%. Muttongrass is usually conspicuous, but Thurber fescue is absent to <0.1% cover. One plot had >15% cover of chokecherry.
- B** *Douglas-fir-aspen-common juniper-serviceberry-Thurber fescue-elk sedge* usually has aspen dominating Douglas-fir. Serviceberry is >10% cover. The medium shrub layer is well developed, with common juniper and/or snowberry conspicuous, one or both >20% cover.
- C** *Douglas-fir-maple-rose-snowberry* has serviceberry instead of maple in the tall shrub layer. Two stands had aspen dominating Douglas-fir, and another had conspicuous tree juniper (JUSC2).
- D** *Aspen-serviceberry-common juniper-snowberry-bedstraw* has aspen dominant over Douglas-fir, which is absent to <0.5%. Serviceberry cover is >10%. One stand had >20% cover of chokecherry.
- E** *Douglas-fir-sparse serviceberry-elk sedge-Oregon-grape* has a moderately sparse layer of Douglas-fir (30-55% cover) and sparse serviceberry (<5% cover). Aspen may be present or even conspicuous, but is always dominated by Douglas-fir. Elk sedge is conspicuous and >15% cover.
- F** *Douglas-fir-sparse serviceberry-Oregon-grape-sparse snowberry* has a moderate to dense layer of Douglas-fir (40-90% cover) and sparse serviceberry (<10% cover). Aspen is usually absent to very minor. Elk sedge is absent.
- G** *Aspen-common juniper-elk sedge-sparse serviceberry-sparse snowberry* has aspen dominant over Douglas-fir, sparse serviceberry (<2% cover), and abundant elk sedge (>60% cover).
- H** *Lodgepole pine-aspen-Douglas-fir-kinnikinnick-elk sedge-sparse serviceberry* has lodgepole pine dominant over both aspen and Douglas-fir, with serviceberry 1-10% cover.
- Plot Not Assigned to a Community Type (1)
- One plot with lodgepole pine (45% cover) over Douglas-fir (10%) and Engelmann spruce (5%). The understory is sparse, with 0.2% serviceberry, 4% kinnikinnick, and 7% common juniper.

CT	Elevation, ft Slope, %	Coarse, % Depth, cm Mollic Depth, cm	Surface Coarse, % Bare, % Serai Stage	Cover, %: Trees Shrubs Graminoids Forbs	No. Species Total Live Cover, % TLC/NS, %
A. Douglas-fir-serviceberry-snowberry-muttongrass	8,733 (8,300-9,000) 34.9 (19-60)	71 (64-85) 96 (35-180) 11 (2-28)	4 (0-9) 8 (5-9) LS	55 (14-98) 90 (65-141) 40 (28-68) 17 (0-50)	33 (27-38) 201 (169-235) 6.1 (5.8-6.3)
B. Douglas-fir-aspen-common juniper-serviceberry-Thurber fescue-elk sedge	9,275 (8,300-9,500) 19.0 (8-30)	*	*	87 (56-112) 76 (40-141) 118 (91-140) 86 (3-185)	20 (17-24) 368 (254-471) 18.9 (14.1-26.1)
C. Douglas-fir-maple-rose-snowberry	8,900 (8,600-9,400) 54.5 (25-66)	68 (63-77) 56 (33-81) 13 (8-26)	15 (1-40) 4 LM	106 (56-211) 40 (10-70) 25 (2-67) 34 (0-108)	32 (21-51) 206 (103-456) 7.7 (3.4-21.7)
D. Aspen-serviceberry-common juniper-snowberry-bedstraw	8,720 (8,720-8,720) 36.0 (36-36)	52 51 35	2 5 MS	67 (46-102) 92 (36-165) 113 (51-166) 77 (37-115)	23 (17-31) 349 (218-492) 16.8 (7.0-23.4)
E. Douglas-fir-sparse serviceberry-elk sedge-Oregon-grape	9,105 (7,960-9,920) 27.1 (11-58)	50 56 (56-56) 24 (24-24)	29 (1-80) 9 (1-15) MS	66 (38-95) 55 (39-68) 43 (30-66) 27 (2-96)	25 (12-40) 191 (125-314) 9.2 (4.4-17.4)
F. Douglas-fir-sparse serviceberry-Oregon-grape-sparse snowberry	8,610 (8,380-8,960) 45.6 (32-55)	51 (35-74) 69 (45-79) 17 (0-48)	11 (3-31) 2 (1-4) MS	73 (52-86) 13 (3-31) 20 (0-40) 3 (0-5)	29 (24-36) 110 (68-153) 3.8 (2.8-4.6)
G. Aspen-common juniper-elk sedge-sparse serviceberry-sparse snowberry	8,830 16	22 46 0	3 0 EM	104 (77-131) 32 (23-41) 80 (69-91) 19 (6-32)	23 (19-26) 235 (194-277) 11.0 (7.4-14.6)
H. Lodgepole pine-aspen-Douglas-fir-kinnikinnick-elk sedge-sparse serviceberry	*	*	*	82 (42-110) 34 (23-47) 41 (5-77) 2 (1-2)	18 (12-26) 158 (71-204) 9.0 (5.9-13.2)

\*. Unknown: measurements were not taken in this CT.

	TREES	
JUSC2	Juniperus scopulorum	Rocky Mountain juniper
PICO	Pinus contorta	lodgepole pine
PIPO	Pinus ponderosa	ponderosa pine
	SHRUBS	
AMAL2	Amelanchier alnifolia	Saskatoon serviceberry
ARUV	Arctostaphylos uva-ursi	kinnikinnick
JUCO6	Juniperus communis	common juniper
MARE11	Mahonia repens	Oregon-grape
PAMY	Paxistima myrsinites	mountain-lover
SYRO	Symphoricarpos rotundifolius	mountain snowberry
	GRAMINOIDS	
ACNE9	Achnatherum nelsonii	Nelson's needlegrass
BRCA10	Bromopsis canadensis	fringed brome
BRIN7	Bromopsis inermis	smooth brome
BRPU9	Bromopsis pumpelliana	Pumpelly brome
CADI6	Carex disperma	soft leaved sedge
CAGE2	Carex geyeri	elk sedge
ELGL	Elymus glaucus	blue wildrye
FEID	Festuca idahoensis	Idaho fescue
FETH	Festuca thurberi	Thurber fescue
PIMI7	Piptatherum micranthum	littleseed ricegrass
POFE	Poa fendleriana	muttongrass
PONEI2	Poa nemoralis ssp. interior	interior bluegrass
POPR	Poa pratensis	Kentucky bluegrass

	FORBS	
ACLA5	Achillea lanulosa	western yarrow
AQCO	Aquilegia coerulea	Colorado columbine
ARCO9	Arnica cordifolia	heartleaf arnica
ASSP16	Aster spathulatus	western aster
COHI5	Coriflora hirsutissima	leather flower
FRVI	Fragaria virginiana	Virginia strawberry
GASE6	Galium septentrionale	northern bedstraw
GERI	Geranium richardsonii	Richardson geranium
LALE2	Lathyrus leucanthus	aspen peavine
LUAR3	Lupinus argenteus	silvery lupine
PHMU3	Phlox multiflora	flowery phlox
TAOF	Taraxacum officinale	common dandelion
THFE	Thalictrum fendleri	Fendler meadow-rue
VIAM	Vicia americana	American vetch



FD09. DOUGLAS-FIR/PACHISTIMA-DARK SOILS-NORTHERLY (PSME/PAMY). Douglas-fir/pachistima-Dark Frigid soils-Northerly backslopes, 7,900-10,000 ft



NUMBER OF SAMPLES	34, soil descriptions from 7 of these (total 34)
ELEVATION	9,391 ft (7,960-9,920 ft) = 2,862 m (2,426-3,023 m)
AVERAGE ASPECT	320°M (r = 0.70)
LITHOLOGY	Mostly igneous: gneiss-granite-tuff-schist [82%], some sedimentary sandstone & siltstone
FORMATIONS <sup>1</sup>	Xfh-Xg [63%], some Taf, Tos, and KjDj
LANDFORMS	Soil creep slopes
SLOPE POSITIONS	Backslopes and upper backslopes
SLOPE SHAPES	x horizontally, y vertically
SLOPE ANGLE	31.8% (13-52%)
SOIL PARENT MATERIAL	Predominantly colluvium [86%]
COARSE FRAGMENTS	3.9% (0-80%) cover on surface, 46.8% (13-75%) by volume in soil
SOIL DEPTH	70 cm (46-104 cm) = 27.6 in (18-41 in)
MOLLIC THICKNESS	15 cm (5-33 cm) = 5.7 in (2-13 in)
TEXTURE	Surface is loamy (loam-sandy loam-sandy clay loam); subsurface is a variety, with mostly sandy (sandy clay loam-sandy clay-sand-sandy loam-loamy sand)
SOIL CLASSIFICATION	Eutroboralfs [29%], Argiborolls [43%], or Cryochrepts [29%]
TOTAL LIVE COVER	227.0% (107.0-412.5%)
NUMBER OF SPECIES	17.9 (8-29)
TOTAL LIVE COVER/NO. SPECIES	13.7% (4.7-24.3%)
CLIMATE	Cool, moderately dry. Usually outside rainshadow, but a few plots in partial rainshadow.
WATER	Cover of litter and duff keeps soil moisture through the season on most sites. Usually no permanent water in or near sites.

Key to Community Types

1. Douglas-fir dominant, >60% cover. Aspen absent or <2% cover. Lodgepole pine absent..... **B**
1. Douglas-fir 0-75% cover, usually <60%. Absent sometimes dominant. Lodgepole pine often present or dominant ..... (2)
2. Lodgepole pine >25%, dominant over Douglas-fir and/or aspen. Douglas-fir or aspen sometimes absent ..... (3)
2. Lodgepole pine absent or <10% cover ..... (4)
3. Dwarf bilberry (VACE) conspicuous as a short shrub, >15% cover ..... **C**
3. Dwarf bilberry absent ..... **D**
4. Douglas-fir dominant over (greater cover than) aspen. Both Douglas-fir and aspen always present, Douglas-fir >35% cover, aspen >10% cover. Rose 0-30% cover, sometimes absent **A**
4. Aspen dominant over (greater cover than) Douglas-fir. Aspen >50% cover, always present, but Douglas-fir sometimes absent. Rose always present, 10-30% cover ..... (5)
5. Douglas-fir >30% cover ..... **E**
6. Douglas-fir absent or <10% cover ..... **F**

Description of Community Types

- A *Douglas-fir-aspen-common juniper-pachistima-elk sedge* has Douglas-fir >35% cover, dominant over aspen, which is always present and >10% cover. One plot had dwarf bilberry 10% and a little bit of lodgepole pine (5%).
- B *Douglas-fir-common juniper-pachistima-Oregon-grape* has Douglas-fir dominant essentially alone, sometimes there is a little bit (<2% cover) of aspen.
- C *Lodgepole pine-dwarf bilberry* has lodgepole pine dominant over Douglas-fir or aspen (sometimes one of these is absent), with conspicuous dwarf bilberry in the short shrub layer, >10% cover. Heartleaf arnica (ARCO9) may be prominent (>10% cover).
- D *Lodgepole pine-aspen-common juniper-pachistima-elk sedge-arnica* has lodgepole pine dominant over Douglas-fir or aspen (sometimes one of these is absent). Dwarf bilberry is absent, and heartleaf arnica may be prominent (>10% cover).
- E *Aspen-Douglas-fir-common juniper-pachistima-rose-elk sedge* has aspen >50% cover and mixed with almost as much Douglas-fir (>35% cover). Rose is >15% cover.
- F *Aspen-pachistima-rose-elk sedge-brome-lupine* has aspen >55% cover, but Douglas-fir is absent or in any case <10% cover. Rose is >10% cover.

CT	Elevation, ft Slope, %	Coarse, % Depth, cm Mollic Depth, cm	Surface Coarse, % Bare, % Serai Stage	Cover, %: Trees Shrubs Graminoids Forbs	No. Species Total Live Cover, % TLC/NS, %
A. Douglas-fir-aspen-common juniper-pachistima-elk sedge	9,460 (8,650-9,640) 30.0 (30-30)	* * *	* * LS	77 (50-120) 65 (30-122) 56 (35-110) 16 (0-31)	14 (11-18) 214 (144-313) 16.3 (10.3-24.1)
B. Douglas-fir-common juniper-pachistima-Oregon-grape	9,244 (8,720-9,520) 39.4 (31-50)	67 (62-75) 59 (47-70) 14 (8-18)	8 (0-22) 1 (0-1) LS	76 (56-89) 37 (13-66) 41 (4-81) 23 (2-67)	23 (16-29) 177 (126-270) 8.6 (4.7-16.9)
C. Lodgepole pine-dwarf bilberry	* *	* * *	40 * MS	73 (37-120) 75 (35-135) 20 (1-61) 22 (1-71)	14 (8-19) 190 (107-308) 13.3 (7.5-19.3)
D. Lodgepole pine-aspen-common juniper-pachistima-elk sedge-arnica	9,320 (9,000-9,640) 21.5 (13-30)	32 (27-36) 77 (61-92) 20 (7-33)	0 (0-40) 3 (0-5) MS	83 (58-96) 48 (10-110) 44 (25-75) 42 (5-102)	21 (17-26) 217 (154-306) 10.9 (5.9-17.1)
E. Aspen-Douglas-fir-common juniper-pachistima-rose-elk sedge	9,260 (9,210-9,310) 41.4 (31-52)	49 (33-66) 82 (60-104) 16 (9-22)	1 (1-1) 0 (0-1) LM	103 (86-119) 53 (39-70) 55 (26-72) 60 (30-76)	23 (15-29) 271 (198-319) 12.9 (7.9-19.8)
F. Aspen-pachistima-rose-elk sedge-brome-lupine	9,890 (9,880-9,900) 15.5 (15-16)	28 (13-44) 68 (46-89) 9 (5-12)	12 * EM	77 (60-82) 80 (47-115) 89 (45-111) 79 (16-125)	19 (15-27) 325 (223-413) 18.7 (8.2-24.3)

\*. Unknown: measurements were not taken in this CT.

	TREES		ELEL5	Elymus elymoides	bottlebrush squirreltail
POTR5	Populus tremuloides	quaking aspen	FETH	Festuca thurberi	Thurber fescue
PSME	Pseudotsuga menziesii	Douglas-fir		FORBS	
	SHRUBS		ACLA5	Achillea lanulosa	western yarrow
ARUV	Arctostaphylos uva-ursi	kinnikinnick	ARCO9	Arnica cordifolia	heartleaf arnica
JUCO6	Juniperus communis	common juniper	ASTER	Aster	aster
MARE11	Mahonia repens	Oregon-grape	FRVI	Fragaria virginiana	Virginia strawberry
PAMY	Paxistima myrsinites	mountain-lover	GASE6	Galium septentrionale	northern bedstraw
VACE	Vaccinium cespitosum	dwarf bilberry	GERI	Geranium richardsonii	Richardson geranium
	GRAMINOIDS		LALE2	Lathyrus leucanthus	aspen peavine
ACNE9	Achnatherum nelsonii	Nelson's needlegrass	LUAR3	Lupinus argenteus	silvery lupine
BRCA10	Bromopsis canadensis	fringed brome	MAST4	Maianthemum stellatum	star Solomon-plume
CAGE2	Carex geyeri	elk sedge	SOMI2	Solidago missouriensis	Missouri goldenrod