

APPENDIX 1. INFORMATION FROM INDIVIDUAL SAMPLE PLOTS.

This is appendix 1 to the report,

Jones, George P. 2005. Cushion-Plant Vegetation on Public Lands in the BLM Rawlins Field Office, Wyoming. Final Report to the the BLM Wyoming State Office from the University of Wyoming, Wyoming Natural Diversity Database. 109 pp + appendices. Unpublished.

**Plot 02BAI01.01**

**LOCATION**

**Map:** Hadsell Spring 1:24,000  
**Towship** 26 N, **Range** W, **Section**  
**Elevation (ft.):** 8,040 **Aspect (degrees):** 277 **Slope (degrees):** 2  
**Topographic Position:** Shoulder

**SUBSTRATE**

**Soil Texture:** Sandy Clay Loam  
**Soil features:** Mixed sediments; lots of cobbles and boulders.

**DESCRIPTION**

**Photos:** none

**Why was plot done?** To characterize structure and composition of cushion plant vegetation.

**Uncertainty on measurements:** There was some confusion in identifying grasses (*Pseudoregneria spicata*, *Poa sandbergii*, *Koeleria macrantha*).

**Completeness of Species lists:**

**Describe vegetation:**

The vegetation is short (< 15 cm) and moderately dense, consisting of bunch graminoids and forbs, all perennial. Dwarf shrubs are rare. The vegetation forms a band to about 25 m wide along the edge of the highest part of the rim.

**Disturbance signs:**

Wild horses were seen nearby, and horse dung was found in the plot.

**Notes:**

**Plot 02BAI01.01**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
artemisia arbuscula, low sagebrush	1	Native
3. Subshrub		
artemisia frigida, fringed sagewort	3	Native
5. Graminoid		
carex duriuscula, needleleaf sedge	3	Native
koeleria macrantha, prairie junegrass	3	Native
poa secunda, sandberg bluegrass	3	Native
pseudoroegneria spicata, bluebunch wheatgrass	10	Native
6. Forb		
arenaria hookeri, hooker's sandwort	3	Native
cryptantha sp., cryptantha	1	Native
erigonum sp., erigonum	1	Native
lomatium orientale, northern idaho biscuitroot	1	Native
mertensia humilis, rocky mountain bluebells	1	Native
oxytropis nana, wyoming locoweed	1	Native
phlox hoodii, hoods phlox	3	Native
stenotus acaulis, stemless mock goldenweed	3	Native
astragalus simplicifolius, little bun milkvetch	3	Native
sedum stenopetalum, wormleaf stonecrop	1	Native
tetraneuris acaulis var. acaulis, stemless four-nerve daisy	1	Native
erigeron concinnus var. concinnus, navajo fleabane	1	Native
erigeron ochroleucus var. scribneri, buff fleabane	1	Native
arabis pendulina var. russeola, russeola rockcress	1	Native

**Plot** 02BAI01.02

**LOCATION**

**Map:** Hadsell Spring 1:24,000  
**Towship** 26 N, **Range** W, **Section**  
**Elevation (ft.):** 8,020 **Aspect (degrees):** 189 **Slope (degrees):** 5  
**Topographic Position:** Footslope

**SUBSTRATE**

**Soil Texture:** Sandy Clay Loam  
**Soil features:** Mixed sedimentary; cobbles and boulders abundant.

**DESCRIPTION**

**Photos:**

**Why was plot done?** To characterize vegetation adjacent to cushion plant community.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

The vegetation is short and moderately dense, consisting of bunch grasses with forbs and scattered sagebrush. It forms a matrix on the south-facing slope, and merges into vegetation with more cushion-form forbs along the rim.

**Disturbance signs:**

There are wild horses in the area, and dung in the plot.

**Notes:**

Stand is greater than 5 ha in size.

**Plot 02BAI01.02**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
artemisia nova, black sagebrush	1	Native
artemisia tridentata ssp. wyomingensis, wyoming big sagebrush	20	Native
3. Subshrub		
artemisia frigida, fringed sagewort	1	Native
5. Graminoid		
carex duriuscula, needleleaf sedge	1	Native
koeleria macrantha, prairie junegrass	3	Native
poa fendleriana, muttongrass	3	Native
pseudoroegneria spicata, bluebunch wheatgrass	10	Native
6. Forb		
arenaria hookeri, hooker's sandwort	1	Native
draba, whitlowgrass	1	Native
erigonum ovalifolium, cushion buckwheat	1	Native
lewisia rediviva, oregon bitterroot	1	Native
lomatium orientale, northern idaho biscuitroot	1	Native
mertensia, bluebells	1	Native
phlox hoodii, hoods phlox	3	Native
stenotus acaulis, stemless mock goldenweed	3	Native
astragalus simplicifolius, little bun milkvetch	3	Native
oxytropis lagopus, haresfoot pointloco	1	Native
sedum stenopetalum, wormleaf stonecrop	1	Native
tetraneuris acaulis var. acaulis, stemless four-nerve daisy	1	Native
erigeron concinnus var. concinnus, navajo fleabane	1	Native

**Plot 02BAI02.01**

**LOCATION**

**Map:** Bairoil 1:24,000  
**Towship** 25 N, **Range** W, **Section**  
**Elevation (ft.):** 7,840 **Aspect (degrees):** 295 **Slope (degrees):**  
**Topographic Position:** Shoulder

**SUBSTRATE**

**Soil Texture:** Loam  
**Soil features:** Gravel abundant; one hand texture upper 6"; mixed sedimentary; cobbles and boulders common.

**DESCRIPTION**

**Photos:** 01GJ3.24 (battery dead). Photo was taken looking north down the slope at the plot.

**Why was plot done?** To characterize structure and composition of cushion plant vegetation.

**Uncertainty on measurements:** There was some difficulty in separating *Koeleria macrantha*, *Pseudoregneria spicata* and *Poa secunda*.

**Completeness of Species lists:**

**Describe vegetation:**

This is short vegetation composed of cushion-form forbs and bunch graminoids, with sparse cover of dwarf shrubs. This band of vegetation is up to 40 m wide on the upper slope. It merges

**Disturbance signs:**

Several small rock cairns.

**Notes:**

The stand is about 40 m wide and over 1000 m long

**Plot 02BAI02.01**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
artemisia nova, black sagebrush	1	Native
3. Subshrub		
artemisia frigida, fringed sagewort	3	Native
5. Graminoid		
carex duriuscula, needleleaf sedge	1	Native
koeleria macrantha, prairie junegrass	3	Native
poa secunda, sandberg bluegrass	3	Native
pseudoroegneria spicata, bluebunch wheatgrass	10	Native
6. Forb		
arenaria hookeri, hooker's sandwort	3	Native
mertensia, bluebells	1	Native
oxytropis nana, wyoming locoweed	1	Native
phlox hoodii, hoods phlox	3	Native
stenotus acaulis, stemless mock goldenweed	1	Native
astragalus simplicifolius, little bun milkvetch	3	Native
sedum stenopetalum, wormleaf stonecrop	1	Native
tetraneuris acaulis var. acaulis, stemless four-nerve daisy	1	Native
erigeron ochroleucus var. scribneri, buff fleabane	1	Native
arabis pendulina var. russeola, russeola rockcress	1	Native

**Plot 02CHLK01.01**

**LOCATION**

**Map:** Wild Irish Reservoir 1:24,000  
**Towship** 28 N, **Range** W, **Section**  
**Elevation (ft.):** 7,900 **Aspect (degrees):** 260 **Slope (degrees):** 2  
**Topographic Position:** Interfluve

**SUBSTRATE**

**Soil Texture:** Sandy Clay Loam  
**Soil features:** One hand texture of top 6"; gravel common.

**DESCRIPTION**

**Photos:** 0GJ13.21. Photo was taken looking up the plot from the west; B. Dalton and L. Johnson

**Why was plot done?** To characterize structure and composition of cushion plant vegetation.

**Uncertainty on measurements:**

**Completeness of Species lists:** Late season herbaceous species may be missing.

**Describe vegetation:**

The vegetation is short (< 10 cm) and sparse, consisting of cushion-form forbs with scattered bunchgrasses. This vegetation grows in a band (< 20 m wide) along the edge of the mesa.

**Disturbance signs:**

Pocket gophers and 4-wheeler track were present.

**Notes:**

The stand is over 10 acres in size.

**Plot 02CHLK01.01**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
chrysothamnus viscidiflorus, yellow rabbitbrush	1	Native
ericameria nauseosa, rubber rabbitbrush	1	Native
3. Subshrub		
artemisia frigida, fringed sagewort	1	Native
5. Graminoid		
carex filifolia, threadleaf sedge	1	Native
koeleria macrantha, prairie junegrass	1	Native
poa cusickii, cusick's bluegrass	1	Native
pseudoroegneria spicata, bluebunch wheatgrass	3	Native
6. Forb		
astragalus spatulatus, tufted milkvetch	3	Native
castilleja, indian paintbrush	1	Native
chaenactis douglasii, douglas' dustymaiden	1	Native
comandra umbellata, bastard toadflax	1	Native
cryptantha caespitosa, tufted catseye	3	Native
draba oligosperma, fewseed whitlowgrass	1	Native
erigeron compositus, cutleaf daisy	1	Native
lesquerella sp., bladderpod	1	Native
machaeranthera grindelioides, rayless aster	1	Native
mentzelia humilis, gypsum blazingstar	1	Native
oxytropis sp., crazyweed	1	Native
paronychia depressa, spreading nailwort	10	Native
phlox hoodii, hoods phlox	3	Native
phlox muscoides, musk phlox	10	Native
potentilla ovina, sheep cinquefoil	1	Native
sedum lanceolatum, spearleaf stonecrop	1	Native
stenotus acaulis, stemless mock goldenweed	3	Native
tetraneuris acaulis var. caespitosa, caespitose four-nerve daisy	3	Native
sphaeromeria simplex, laramie chickensage	3	Native
townsendia spathulata, sword townsendia	1	Native
erigeron ochroleucus var. scribneri, buff fleabane	3	Native
forb unknown (powder long leaf)	1	Probably Native
forb unknown (yellow flwr grn bunch)	3	Probably Native

**Plot 02CHLK0604.01**

**LOCATION**

**Map:** Wild Irish Reservoir 1:24,000  
**Towship** 28 N, **Range** W, **Section**  
**Elevation (ft.):** 7,900 **Aspect (degrees):** 325 **Slope (degrees):** 1  
**Topographic Position:** Interfluve

**SUBSTRATE**

**Soil Texture:**

**Soil features:**

**DESCRIPTION**

**Photos:** none

**Why was plot done?** Characterization of vegetation adjacent to cushion plant community.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

The vegetation is low, and is dominated by grasses with a mix of species. Distribution is not uniform.

**Disturbance signs:**

Pocket gopher mounds and evidence of grazing were observed.

**Notes:**

Stand is several thousand square meters in size. The plot is located on the top of Chalk Mountain, which is relatively flat. The landscape is rocky and the environment windy.

**Plot 02CHLK0604.01**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
artemisia tridentata ssp. wyomingensis, wyoming big sagebrush	3	Native
artemisia tripartita ssp. rupicola, wyoming threetip sagebrush	3	Native
5. Graminoid		
poa sp., bluegrass	3	Probably Native
poa secunda, sandberg bluegrass	10	Native
pseudoroegneria spicata, bluebunch wheatgrass	3	Native
6. Forb		
arenaria hookeri, hooker's sandwort	3	Native
castilleja, indian paintbrush	3	Native
draba oligosperma, fewseed whitlowgrass	1	Native
erigonum acaule, singlestem buckwheat	1	Native
lesquerella alpina, alpine bladderpod	1	Native
lesquerella condensata, dense bladderpod	1	Native
linum lewisii, prairie flax	1	Native
lupinus sp., lupine	3	Native
mertensia lanceolata, lanceleaf bluebells	1	Native
oxytropis multiceps, southwestern locoweed	1	Native
penstemon sp., penstemon	1	Native
phlox hoodii, hoods phlox	3	Native
phlox muscoides, musk phlox	1	Native
sedum lanceolatum, spearleaf stonecrop	1	Native
stenotus armerioides, thrift mock goldenweed	3	Native
tetraneuris torreyana, torrey's hymenoxys	1	Native
tetraneuris acaulis var. caespitosa, caespitose four-nerve daisy	1	Native
castilleja pallescens, pale indian paintbrush	1	Native
erigeron engelmannii var. engelmannii, engelmann's fleabane	3	Native
forb unknown (little artichoke plant)	1	Probably Native

**Plot** 02CHLK0606.01

**LOCATION**

**Map:** Wild Irish Reservoir 1:24,000  
**Township** 28 N, **Range** W, **Section**  
**Elevation (ft.):** 7,750 **Aspect (degrees):** 286 **Slope (degrees):** 2  
**Topographic Position:** Interfluve

**SUBSTRATE**

**Soil Texture:** Sandy Clay Loam  
**Soil features:**

**DESCRIPTION**

**Photos:** none

**Why was plot done?** To characterize structure and composition of cushion plant vegetation.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

The vegetation is dominated by cushion plants less than 5 cm tall, interspersed with grasses 5-10

**Disturbance signs:**

Grazed (cattle).

**Notes:**

Stand is several thousand square meters in size, approximately 10 x 500 m.

**Plot 02CHLK0606.01**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
ericameria nauseosa, rubber rabbitbrush	1	Native
artemisia tripartita ssp. rupicola, wyoming threetip sagebrush	3	Native
3. Subshrub		
penstemon eriantherus, fuzzytongue penstemon	1	Native
5. Graminoid		
pseudoroegneria spicata, bluebunch wheatgrass	3	Native
6. Forb		
arenaria hookeri, hooker's sandwort	1	Native
castilleja, indian paintbrush	1	Native
chaenactis douglasii, douglas' dustymaiden	1	Native
cryptantha sp., cryptantha	1	Native
erigonum acaule, singlestem buckwheat	3	Native
erigeron compositus, cutleaf daisy	1	Native
erigeron nematophyllus, needleleaf fleabane	1	Native
lesquerella alpina, alpine bladderpod	3	Native
linum lewisii, prairie flax	1	Native
oxytropis multiceps, southwestern locoweed	1	Native
paronychia depressa, spreading nailwort	10	Native
penstemon laricifolius, larchleaf beardtongue	1	Native
phlox muscoides, musk phlox	3	Native
stenotus armerioides, thrift mock goldenweed	1	Native
tetraneuris acaulis var. caespitosa, caespitose four-nerve daisy	10	Native
erigeron ochroleucus var. scribneri, buff fleabane	1	Native
forb unknown (artichoke plant)	3	Native
erigeron engelmannii var. engelmannii, engelmann`s fleabane	1	Native
forb unknown chalk 5 (purple base paintbrush)	1	Probably Native

**Plot 02CHLK0606.02**

**LOCATION**

**Map:** Wild Irish Reservoir 1:24,000  
**Township** 28 N, **Range** W, **Section**  
**Elevation (ft.):** 7,900 **Aspect (degrees):** 328 **Slope (degrees):** 1  
**Topographic Position:** Interfluve

**SUBSTRATE**

**Soil Texture:** Sandy Clay Loam  
**Soil features:** Moderate gravel, scattered cobbles.

**DESCRIPTION**

**Photos:** none

**Why was plot done?** Characterization of vegetation adjacent to cushion plant community.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

The vegetation is low, and is dominated by grasses with a mix of forb species.

**Disturbance signs:**

Evidence of grazing and ground squirrels or pocket gophers was found.

**Notes:**

Sister plot of #15, away from rim. The stand is several thousand square meters in size.

**Plot 02CHLK0606.02**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
ericameria nauseosa, rubber rabbitbrush	1	Native
artemisia tridentata ssp. wyomingensis, wyoming big sagebrush	1	Native
artemisia tripartita ssp. rupicola, wyoming threetip sagebrush	3	Native
3. Subshrub		
artemisia frigida, fringed sagewort	1	Native
penstemon eriantherus, fuzzytongue penstemon	1	Native
5. Graminoid		
poa fendleriana, muttongrass	20	Native
pseudoroegneria spicata, bluebunch wheatgrass	40	Native
6. Forb		
arenaria hookeri, hooker's sandwort	3	Native
besseya wyomingensis, wyoming besseya	1	Native
castilleja, indian paintbrush	3	Native
crepis, hawkbeard	1	Native
cryptantha sp., cryptantha	1	Native
erigonum acaule, singlestem buckwheat	1	Native
erigeron compositus, cutleaf daisy	1	Native
erigonum sp., erigonum	1	Native
lesquerella alpina, alpine bladderpod	3	Native
linum lewisii, prairie flax	3	Native
lupinus sp., lupine	3	Native
mertensia humilis, rocky mountain bluebells	3	Native
paronychia depressa, spreading nailwort	3	Native
penstemon laricifolius, larchleaf beardtongue	1	Native
phlox hoodii, hoods phlox	1	Native
phlox muscoides, musk phlox	3	Native
sedum lanceolatum, spearleaf stonecrop	1	Native
stenotus armerioides, thrift mock goldenweed	10	Native
tetraneuris acaulis var. caespitosa, caespitose four-nerve daisy	3	Native
forb unknown (artichoke plant)	3	Native
erigeron engelmannii var. engelmannii, engelmann's fleabane	3	Native
forb unknown chalk 5 (purple base paintbrush)	3	Probably Native
forb unknown (purple underside paddle)	1	Probably Native

**Plot 02CHLK0610.01**

**LOCATION**

**Map:** Wild Irish Reservoir 1:24,000  
**Township** 28 N, **Range** W, **Section**  
**Elevation (ft.):** 7,850 **Aspect (degrees):** 286 **Slope (degrees):** 3  
**Topographic Position:** Interfluve

**SUBSTRATE**

**Soil Texture:**  
**Soil features:** Gravelly

**DESCRIPTION**

**Photos:** none

**Why was plot done?** To characterize structure and composition of matrix vegetation around cushion plant stands.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

The vegetation is dominated by short bunchgrasses and forbs, with a few scattered dwarf

**Disturbance signs:**

There is evidence of past grazing and small mammal disturbance.

**Notes:**

Windy. The stand is several thousand square meters in size.

**Plot 02CHLK0610.01**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
ericameria nauseosa, rubber rabbitbrush	10	Native
artemisia tridentata ssp. wyomingensis, wyoming big sagebrush	1	Native
3. Subshrub		
artemisia frigida, fringed sagewort	1	Native
5. Graminoid		
koeleria macrantha, prairie junegrass	3	Native
poa secunda, sandberg bluegrass	3	Native
pseudoroegneria spicata, bluebunch wheatgrass	10	Native
6. Forb		
arenaria hookeri, hooker's sandwort	1	Native
castilleja, indian paintbrush	1	Native
draba oligosperma, fewseed whitlowgrass	1	Native
erigonum acaule, singlestem buckwheat	1	Native
erigeron compositus, cutleaf daisy	1	Native
erigeron, fleabane	1	Native
lesquerella alpina, alpine bladderpod	1	Native
linum lewisii, prairie flax	1	Native
lupinus sp., lupine	3	Native
mertensia lanceolata, lanceleaf bluebells	1	Native
oxytropis sp., crazyweed	1	Native
paronychia depressa, spreading nailwort	1	Native
penstemon laricifolius, larchleaf beardtongue	1	Native
phlox muscoides, musk phlox	3	Native
sedum lanceolatum, spearleaf stonecrop	1	Native
stenotus armerioides, thrift mock goldenweed	3	Native
tetraneuris acaulis var. caespitosa, caespitose four-nerve daisy	1	Native
sphaeromeria simplex, laramie chickensage	3	Native
forb unknown (artichoke plant)	1	Native
forb unknown chalk 2 (thick leaf onion)	1	Probably Native
forb unknown chalk 3 (spur leaf)	1	Probably Native
forb unknown chalk 4 (taco plant)	1	Probably Native
erigeron engelmannii var. engelmannii, engelmann`s fleabane	3	Native
forb unknown chalk 5 (purple base paintbrush)	3	Probably Native
forb unknown (feather leaf mat)	1	Probably Native

**Plot 02CHLK0612.01**

**LOCATION**

**Map:** Wild Irish Reservoir 1:24,000  
**Towship** 28 N, **Range** W, **Section**  
**Elevation (ft.):** 7,800 **Aspect (degrees):** 210 **Slope (degrees):** 1  
**Topographic Position:** Interfluve

**SUBSTRATE**

**Soil Texture:** Sandy Clay Loam  
**Soil features:** Rocky texture, alpine appearance (dwarfed plants).

**DESCRIPTION**

**Photos:** none

**Why was plot done?** To characterize structure and composition of cushion plant vegetation.

**Uncertainty on measurements:**

**Completeness of Species lists:** The list may be missing late-season herbaceous species.

**Describe vegetation:**

The vegetation consists of short plants. Forbs are dominant, with grasses patchy. This type is found in a band less than 20 m wide along the edge of the mesa.

**Disturbance signs:**

Fresh vehicle tracks were observed outside of the plot, as well as grazing in past and small mammal disturbance.

**Notes:**

The stand is greater than 10 acres in size.

**Plot 02CHLK0612.01**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
ericameria nauseosa, rubber rabbitbrush	1	Native
artemisia tripartita ssp. rupicola, wyoming threetip sagebrush	1	Native
6. Forb		
arenaria hookeri, hooker's sandwort	1	Native
castilleja, indian paintbrush	1	Native
chaenactis douglasii, douglas' dustymaiden	1	Native
cryptantha sp., cryptantha	1	Native
erigonum acaule, singlestem buckwheat	3	Native
erigonum sp., erigonum	1	Native
lesquerella alpina, alpine bladderpod	1	Native
linum lewisii, prairie flax	1	Native
lupinus sp., lupine	1	Native
machaeranthera grindelioides, rayless aster	1	Native
mertensia lanceolata, lanceleaf bluebells	1	Native
paronychia depressa, spreading nailwort	3	Native
phlox muscoides, musk phlox	1	Native
sedum lanceolatum, spearleaf stonecrop	1	Native
stenotus armerioides, thrift mock goldenweed	3	Native
tetraneuris acaulis var. caespitosa, caespitose four-nerve daisy	3	Native
forb unknown (artichoke plant)	3	Native
erigeron engelmannii var. engelmannii, engelmann`s fleabane	1	Native
forb unknown (3 bundle yellow flower)	1	Probably Native

**Plot 02FER01.01**

#### **LOCATION**

**Map:** Muddy Gap 1:24,000  
**Township** 27 N, **Range** W, **Section** 2  
**Elevation (ft.):** 6,800 **Aspect (degrees):** 233 **Slope (degrees):**  
**Topographic Position:** Backslope

#### **SUBSTRATE**

**Soil Texture:**

**Soil features:** Too rocky for hand texture.

#### **DESCRIPTION**

**Photos:** 01GJ3.22. Photo was taken looking east at the plot. D. Ehle in plot. Note the light-colored knobs in the background with the same vegetation. 01GJ3.23 was taken looking at knobs with cushion plant vegetation from across the valley to the south.

**Why was plot done?** Characterize composition and structure of sparse vegetation on rocky knobs.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

The vegetation is low-growing and sparse, consisting of cushion-form forbs with graminoids and dwarf shrubs. This vegetation occurs as patches of less than 500 sq m each, on rocky limestone

**Disturbance signs:**

Old cowpies were found.

**Notes:**

Stand is several hundred square meters in size. The vegetation may have more graminoids and shrubs than cushion plant vegetation at other locations.

**Plot 02FER01.01**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
artemisia nova, black sagebrush	3	Native
ericameria nauseosa, rubber rabbitbrush	1	Native
3. Subshrub		
artemisia frigida, fringed sagewort	1	Native
gutierrezia sarothrae, broom snakeweed	3	Native
penstemon eriantherus, fuzzytongue penstemon	1	Native
erigonum microthecum var. laxiflorum, slender buckwheat	3	Native
5. Graminoid		
carex filifolia, threadleaf sedge	1	Native
poa secunda, sandberg bluegrass	1	Native
pseudoroegneria spicata, bluebunch wheatgrass	3	Native
6. Forb		
arenaria hookeri, hooker's sandwort	3	Native
chaenactis douglasii, douglas' dustymaiden	1	Native
comandra umbellata, bastard toadflax	1	Native
crepis, hawksbeard	1	Native
cryptantha sericea, silky catseye	1	Native
cryptantha sp., cryptantha	1	Native
erigonum flavum, yellow erigonum	1	Native
linum, flax	1	Native
machaeranthera grindelioides, rayless aster	1	Native
paronychia depressa, spreading nailwort	1	Native
penstemon laricifolius, larchleaf beardtongue	1	Native
phlox hoodii, hoods phlox	3	Native
stenotus armerioides, thrift mock goldenweed	3	Native
stanleya viridiflora, green princesplume	1	Native
astragalus simplicifolius, little bun milkvetch	3	Native
physaria eburniflora, devils gate twinpod	1	Native
tetraneuris acaulis var. acaulis, stemless four-nerve daisy	1	Native
erigeron concinnus var. concinnus, navajo fleabane	1	Native
oenothera caespitosa ssp. caespitosa, tufted evening primrose	1	Native

**Plot** 02FER01.02

**LOCATION**

**Map:** Muddy Gap 1:24,000  
**Towship** 27 N, **Range** W, **Section** 2  
**Elevation (ft.):** 6,800 **Aspect (degrees):** 219 **Slope (degrees):**  
**Topographic Position:** Footslope

**SUBSTRATE**

**Soil Texture:** Sandy Loam  
**Soil features:**

**DESCRIPTION**

**Photos:**

**Why was plot done?** Characterize grassland matrix vegetation around cushion plant stands. This vegetation is on dipslope generally, with cushion plants on knolls.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

The vegetation is low-growing, made up of bunch graminoids with forbs and scattered shrubs. This is matrix vegetation on a south-facing slope.

**Disturbance signs:**

Dried cow patties from last year were found; no fresh ones.

**Notes:**

none

**Plot 02FER01.02**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
artemisia nova, black sagebrush	20	Native
ericameria nauseosa, rubber rabbitbrush	1	Native
3. Subshrub		
gutierrezia sarothrae, broom snakeweed	1	Native
leptodactylon pungens, granite pricklygilia	3	Native
penstemon eriantherus, fuzzytongue penstemon	1	Native
erigonum microthecum var. laxiflorum, slender buckwheat	1	Native
5. Graminoid		
carex filifolia, threadleaf sedge	20	Native
poa secunda, sandberg bluegrass	1	Native
pseudoroegneria spicata, bluebunch wheatgrass	10	Native
6. Forb		
arenaria hookeri, hooker's sandwort	1	Native
crepis, hawksbeard	1	Native
crepis modocensis, siskiyou hawksbeard	1	Native
cryptantha sp., cryptantha	1	Native
cymopterus sp., cymopterus	1	Native
erigeron, fleabane	1	Native
escobaria vivipara, spinystar	1	Native
lithospermum incisum, narrowleaf gromwell	1	Native
lygodesmia grandiflora, largeflower skeletonplant	1	Native
machaeranthera grindelioides, rayless aster	1	Native
oxytropis sericea, silvery oxytrope	1	Native
paronychia depressa, spreading nailwort	1	Native
penstemon laricifolius, larchleaf beardtongue	1	Native
phlox hoodii, hoods phlox	3	Native
stanleya viridiflora, green princesplume	1	Native
townsendia, townsendia	1	Native
trifolium andinum, andes clover	3	Native
zigadenus venenosus, meadow deathcamas	1	Native
astragalus simplicifolius, little bun milkvetch	1	Native
erigonum ovalifolium var. purpureum, cushion buckwheat	1	Native
tetraneuris acaulis var. acaulis, stemless four-nerve daisy	1	Native
arabis pendulina var. russeola, russeola rockcress	1	Native
castilleja applegatei ssp. martinii, wavyleaf indian paintbrush	1	Native
ipomopsis spicata ssp. spicata, spiked ipomopsis	1	Native
forb unknown (green little tooth lf)	1	Probably Native
for unknown (less hairy pinnate)	1	Probably Native

**Plot 03CYR01.01**

**LOCATION**

**Map:** Five Fingers Butte 1:24,000  
**Township** 26 N, **Range** W, **Section**  
**Elevation (ft.):** 7,180 **Aspect (degrees):** 0 **Slope (degrees):** 0  
**Topographic Position:** Interfluve

**SUBSTRATE**

**Soil Texture:** Sandy Loam  
**Soil features:** Gravel < 5 % vol. in upper 10 cm, but gravel lag deposit on surface.

**DESCRIPTION**

**Photos:** 03CP1.21- Looking along plot long axis. C. Cooper at center plot.

**Why was plot done?** To characterize structure and composition of cushion plant vegetation.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

Very sparse stand. Plot dominated mainly by birdsfoot sage with Phlox muscoides subdominant.

**Disturbance signs:**

Cow pies, ant mound ~ 1 m diameter.

**Notes:**

Sandstone.

**Plot 03CYR01.01**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
3. Subshrub		
artemisia pedatifida, birdfoot sagebrush	10	Native
krascheninnikovia lanata, winterfat	1	Native
opuntia polyacantha, plains pricklypear	1	Native
5. Graminoid		
achnatherum hymenoides, indian ricegrass	3	Native
elymus elymoides, bottlebrush squirreltail	1	Native
hesperostipa comata, needle and thread	3	Native
poa secunda, sandberg bluegrass	1	Native
elymus lanceolatus ssp. lanceolatus, thickspike wheatgrass	1	Native
6. Forb		
arenaria hookeri, hooker's sandwort	3	Native
erigonum acaule, singlestem buckwheat	1	Native
erigeron pumilus, shaggy fleabane	1	Native
phlox muscoides, musk phlox	10	Native
sphaeralcea coccinea, scarlet globemallow	1	Native
tetraneuris acaulis, stemless hymenoxys	1	Native
astragalus simplicifolius, little bun milkvetch	1	Native

**Plot 03CYR02.01**

**LOCATION**

**Map:** Five Fingers Butte 1:24,000  
**Towship** 26 N, **Range** W, **Section**  
**Elevation (ft.):** 7,100 **Aspect (degrees):** 248 **Slope (degrees):** 2  
**Topographic Position:** Interfluve

**SUBSTRATE**

**Soil Texture:** Loamy Sand  
**Soil features:** Single hand texture of surface 10 cm = loamy sand. But % gravel (fine gravel) so high that this test may be misleading.

**DESCRIPTION**

**Photos:** 03CP1.22 C. Cooper in center plot. Very windy

**Why was plot done?** To characterize structure and composition of cushion plant vegetation.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

Plot dominated by Phlox muscoides; Arenaria hookeri subdominant. Several grasses occupied the plot (Sandberg bluegrass, bluebunch wheatgrass, and Indiant ricegrass) and several small shrubs in plot as well (rubber and Douglas rabbitbrush and Wyoming big sage, fringed sage, and birdsfoot sage). Few forbs present. Total canopy cover 15%.

**Disturbance signs:**

Pocket gopher holes

**Notes:**

Siltstone or Sandstone bedrock. Patch so small that the plot contained a few species from the adjoining slopes and draws.

**Plot 03CYR02.01**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
chrysothamnus viscidiflorus, yellow rabbitbrush	3	Native
ericameria nauseosa, rubber rabbitbrush	1	Native
tetradymia canescens, spineless horsebrush	1	Native
artemisia tridentata ssp. wyomingensis, wyoming big sagebrush	1	Native
3. Subshrub		
artemisia frigida, fringed sagewort	1	Native
artemisia pedatifida, birdfoot sagebrush	1	Native
krascheninnikovia lanata, winterfat	1	Native
leptodactylon pungens, granite pricklygilia	1	Native
opuntia polyacantha, plains pricklypear	3	Native
5. Graminoid		
achnatherum hymenoides, indian ricegrass	1	Native
elymus elymoides, bottlebrush squirreltail	1	Native
hesperostipa comata, needle and thread	1	Native
poa secunda, sandberg bluegrass	1	Native
pseudoroegneria spicata, bluebunch wheatgrass	1	Native
6. Forb		
arenaria hookeri, hooker's sandwort	3	Native
cryptantha celosioides, buttecandle	1	Native
erigonum brevicaule, shortstem buckwheat	1	Native
erigeron, fleabane	1	Native
lesquerella condensata, dense bladderpod	1	Native
machaeranthera grindelioides, rayless aster	1	Native
phlox muscoides, musk phlox	10	Native
stephanomeria runcinata, desert wirelettuce	1	Native
astragalus simplicifolius, little bun milkvetch	3	Native

**Plot** 03CYR02.02

**LOCATION**

**Map:** Five Fingers Butte 1:62,500  
**Towhship** 26 N, **Range** W, **Section**  
**Elevation (ft.):** 7,120 **Aspect (degrees):** 178 **Slope (degrees):** 1  
**Topographic Position:** Footslope

**SUBSTRATE**

**Soil Texture:** Sandy Loam  
**Soil features:**

**DESCRIPTION**

**Photos:** 03CP1.23 - G. Jones standing in center plot.

**Why was plot done?** To illustrate matrix vegetation around cushion-plant plots 03CYR01.01 and 03CYR02.01.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

Sparse shrub steppe of Wyoming big sage above a sparse herbaceous stratum of *Poa secunda*, rhizomatous *Elymus*, and other graminoids and forbs. Plants densest in small draw running across plot. Total canopy cover 30%.

**Disturbance signs:**

Ant mound, 1 m dia, in corner

**Notes:**

Siltstone and sandstone bedrock.

**Plot 03CYR02.02**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
atriplex confertifolia, shadscale saltbush	1	Native
chrysothamnus viscidiflorus, yellow rabbitbrush	1	Native
ericameria nauseosa, rubber rabbitbrush	1	Native
tetradymia canescens, spineless horsebrush	1	Native
artemisia tridentata ssp. wyomingensis, wyoming big sagebrush	10	Native
3. Subshrub		
artemisia pedatifida, birdfoot sagebrush	1	Native
atriplex gardneri, gardner's saltbush	1	Native
krascheninnikovia lanata, winterfat	1	Native
leptodactylon pungens, granite pricklygilia	1	Native
opuntia polyacantha, plains pricklypear	1	Native
tetradymia nuttallii, nuttall's horsebrush	1	Native
5. Graminoid		
achnatherum hymenoides, indian ricegrass	3	Native
carex filifolia, threadleaf sedge	1	Native
hesperostipa comata, needle and thread	3	Native
poa secunda, sandberg bluegrass	3	Native
pseudoroegneria spicata, bluebunch wheatgrass	3	Native
elymus lanceolatus ssp. lanceolatus, thickspike wheatgrass	3	Native
6. Forb		
arenaria hookeri, hooker's sandwort	1	Native
astragalus purshii, woollypod milkvetch	1	Native
cordylanthus ramosus, bushy bird's beak	1	Native
erigonum caespitosum, matted buckwheat	1	Native
erigonum ovalifolium, cushion buckwheat	1	Native
erigeron pumilus, shaggy fleabane	1	Native
gayophytum diffusum, spreading groundsmoke	1	Native
phlox hoodii, hoods phlox	3	Native
phlox muscoides, musk phlox	1	Native
stenotus acaulis, stemless mock goldenweed	1	Native
trifolium gymnocarpon, hollyleaf clover	1	Native
astragalus simplicifolius, little bun milkvetch	3	Native
arabis pendulina var. russeola, russeola rockcress	1	Native
forb unknown (stinky fab, fab pointed lflt)	1	Probably Native

**Plot 03CYR03.01**

**LOCATION**

**Map:** Cyclone Draw 1:24,000  
**Towship** 26 N, **Range** W, **Section**  
**Elevation (ft.):** 7,020 **Aspect (degrees):** 348 **Slope (degrees):**  
**Topographic Position:** Shoulder

**SUBSTRATE**

**Soil Texture:** Sandy Clay Loam  
**Soil features:** Gravel ~ 10% vol. In top 10 cm., gravel lag deposit on surface.

**DESCRIPTION**

**Photos:** 03CP1.24 - Looking upslope at C. Cooper in center plot.

**Why was plot done?** To characterize structure and composition of cushion plant vegetation.

**Uncertainty on measurements:** Grasses hard to determine without heads.

**Completeness of Species lists:**

**Describe vegetation:**

Plot dominated by *Phlox muscoides* with some *Arenaria hookeri*. *Artemisia pedatifida* and *Carex filifolia* seemed to subdominate the plot, and other grasses, forbs, and rabbitbrush were sparse. Canopy cover 17%.

**Disturbance signs:**

2 - track road with small borrow ditch 5 m down slope from the plot.

**Notes:**

Siltstone and sandstone bedrock.

**Plot 03CYR03.01**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub chrysothamnus viscidiflorus, yellow rabbitbrush	1	Native
3. Subshrub artemisia pedatifida, birdfoot sagebrush	3	Native
5. Graminoid achnatherum hymenoides, indian ricegrass	1	Native
carex filifolia, threadleaf sedge	3	Native
hesperostipa comata, needle and thread	1	Native
6. Forb arenaria hookeri, hooker's sandwort	3	Native
astragalus sericoleucus, silky milkvetch	1	Native
cryptantha caespitosa, tufted catseye	1	Native
erigonum brevicaule, shortstem buckwheat	1	Native
machaeranthera grindelioides, rayless aster	1	Native
phlox muscoides, musk phlox	10	Native
stenotus armerioides, thrift mock goldenweed	1	Native
tetraneuris acaulis, stemless hymenoxys	1	Native
forb unknown (stinky fab, fab pointed lflt)	1	Probably Native

**Plot** 03CYR03.02

**LOCATION**

**Map:** Cyclone Draw 1:24,000  
**Towship** 26 N, **Range** W, **Section**  
**Elevation (ft.):** 7,030 **Aspect (degrees):** 0 **Slope (degrees):** 4  
**Topographic Position:** Toeslope

**SUBSTRATE**

**Soil Texture:** Sandy Clay Loam  
**Soil features:**

**DESCRIPTION**

**Photos:** 03CP1.25 - G. Jones in plot looking south.

**Why was plot done?** To illustrate species composition in matrix around cushion-plant vegetation.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

Short, sparse vegetation of graminoids (*Pseudoroegneria spicata*, *Carex filifolia*), forbs (*Phlox hoodii*), and cushion forbs (*Arenaria hookeri*, *Phlox muscoides*) with scattered short shrubs. Plants densest in very shallow draw. Total canopy cover 20%.

**Disturbance signs:**

Rusted condensed milk cans.

**Notes:**

Siltstone bedrock.

**Plot 03CYR03.02**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
artemisia nova, black sagebrush	3	Native
chrysothamnus viscidiflorus, yellow rabbitbrush	1	Native
artemisia tridentata ssp. wyomingensis, wyoming big sagebrush	1	Native
3. Subshrub		
artemisia pedatifida, birdfoot sagebrush	1	Native
krascheninnikovia lanata, winterfat	1	Native
opuntia polyacantha, plains pricklypear	1	Native
5. Graminoid		
achnatherum hymenoides, indian ricegrass	1	Native
carex duriuscula, needleleaf sedge	1	Native
carex filifolia, threadleaf sedge	1	Native
hesperostipa comata, needle and thread	1	Native
poa secunda, sandberg bluegrass	3	Native
pseudoroegneria spicata, bluebunch wheatgrass	3	Native
6. Forb		
arenaria hookeri, hooker's sandwort	3	Native
astragalus miser, weedy milkvetch	1	Native
astragalus purshii, woollypod milkvetch	1	Native
astragalus spatulatus, tufted milkvetch	1	Native
cordylanthus ramosus, bushy bird's beak	1	Native
erigonum brevicaule, shortstem buckwheat	1	Native
erigonum ovalifolium, cushion buckwheat	1	Native
mertensia humilis, rocky mountain bluebells	1	Native
penstemon laricifolius, larchleaf beardtongue	1	Native
phlox hoodii, hoods phlox	3	Native
phlox muscoides, musk phlox	3	Native
stenotus armerioides, thrift mock goldenweed	1	Native

**Plot 03DRY01.01**

**LOCATION**

**Map:** Fourmile Point 1:24,000  
**Towship** 28 N, **Range** W, **Section**  
**Elevation (ft.):** 7,200 **Aspect (degrees):** 320 **Slope (degrees):** 5  
**Topographic Position:** Shoulder

**SUBSTRATE**

**Soil Texture:** Sandy Clay Loam  
**Soil features:** Gravel ~ 10% vol. In to p 10 cm.

**DESCRIPTION**

**Photos:**

**Why was plot done?** To characterize structure and composition of cushion plant vegetation.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

Plot dominated by cushion plants (*Arenaria hookeri*, *Phlox muscoides*, and small *Astragalus* sp.). Cover 15 - 20 %. *Pseudoroegneria spicata* present throughout and dominated part of plot. Small amounts of other small forbs short shrubs present.

**Disturbance signs:**

Abandoned mammal burrows - 4 sq m.

**Notes:**

Sandstone bedrock. Conglomerate with deposit of cobble and boulder.

**Plot 03DRY01.01**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
artemisia nova, black sagebrush	1	Native
chrysothamnus viscidiflorus, yellow rabbitbrush	1	Native
tetradymia canescens, spineless horsebrush	1	Native
3. Subshrub		
artemisia frigida, fringed sagewort	1	Native
gutierrezia sarothrae, broom snakeweed	1	Native
krascheninnikovia lanata, winterfat	1	Native
penstemon eriantherus, fuzzytongue penstemon	1	Native
5. Graminoid		
koeleria macrantha, prairie junegrass	1	Native
poa secunda, sandberg bluegrass	1	Native
pseudoroegneria spicata, bluebunch wheatgrass	10	Native
6. Forb		
arenaria hookeri, hooker's sandwort	10	Native
castilleja angustifolia, northwestern indian paintbrush	1	Native
cryptantha celosioides, buttecandle	1	Native
erigonum flavum, yellow erigonum	1	Native
erigeron nematophyllus, needleleaf fleabane	1	Native
lesquerella condensata, dense bladderpod	1	Native
lesquerella ludoviciana, foothill bladderpod	1	Native
lithospermum incisum, narrowleaf gromwell	1	Native
machaeranthera grindelioides, rayless aster	3	Native
oxytropis sericea, silvery oxytrope	1	Native
parthenium alpinum, alpine feverfew	3	Native
paronychia sessiliflora, creeping nailwort	3	Native
phlox muscoides, musk phlox	10	Native
sedum lanceolatum, spearleaf stonecrop	1	Native
stenotus acaulis, stemless mock goldenweed	1	Native
tetraneuris acaulis, stemless hymenoxys	1	Native
astragalus simplicifolius, little bun milkvetch	10	Native
sphaeromeria simplex, laramie chickensage	1	Native

**Plot** 03DRY01.02

**LOCATION**

**Map:** Fourmile Point 1:24,000  
**Towship** 28 N, **Range** W, **Section**  
**Elevation (ft.):** 7,120 **Aspect (degrees):** 244 **Slope (degrees):** 2  
**Topographic Position:** Basin Floor

**SUBSTRATE**

**Soil Texture:** Silty Clay Loam  
**Soil features:** Siltstone

**DESCRIPTION**

**Photos:** 03CP1.06 - G. Jones in plot

**Why was plot done?** To illustrate matrix around cushion-plant vegetation. This plot is in moderately sheltered spot.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

Moderately dense stand of Wyoming big sage (?) with grass. Shrubs appear uniformly scattered.

**Disturbance signs:**

Wildlife

**Notes:**

none

**Plot 03DRY01.02**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
chrysothamnus viscidiflorus, yellow rabbitbrush	10	Native
symphoricarpos oreophilus, whortleleaf snowberry	1	Native
artemisia tridentata ssp. wyomingensis, wyoming big sagebrush	40	Native
5. Graminoid		
koeleria macrantha, prairie junegrass	1	Native
poa fendleriana, muttongrass	10	Native
poa secunda, sandberg bluegrass	3	Native
elymus lanceolatus ssp. lanceolatus, thickspike wheatgrass	3	Native
6. Forb		
achillea millefolium, common yarrow	1	Native
agoseris glauca, pale agoseris	1	Native
allium textile, textile onion	1	Native
antennaria microphylla, littleleaf pussytoes	1	Native
astragalus convallarius, timber milkvetch	1	Native
astragalus drummondii, drummond's milkvetch	1	Native
astragalus miser, weedy milkvetch	3	Native
balsamorhiza sagittata, arrowleaf balsamroot	1	Native
besseyia wyomingensis, wyoming besseyia	1	Native
comandra umbellata, bastard toadflax	1	Native
erigeron eatonii, eaton's fleabane	1	Native
lesquerella ludoviciana, foothill bladderpod	1	Native
lomatium foeniculaceum, desert biscuitroot	1	Native
phlox hoodii, hoods phlox	3	Native
phlox multiflora, flowery phlox	1	Native
senecio integerrimus, lambstongue groundsel	1	Native
taraxacum, dandelion	1	Introduced
trifolium gymnocarpon, hollyleaf clover	3	Native
tradescantia occidentalis, prairie spiderwort	1	Native
vicia americana, american vetch	1	Native
viola nuttallii, nuttall's violet	1	Native
zigadenus venenosus, meadow deathcamas	1	Native
castilleja pallescens, pale indian paintbrush	1	Native
cirsium aridum,	1	Native
forb unknown (fab small fleshy)	1	Probably Native
forb unknown (oblanc grey lf)	1	Probably Native
forb unknown (apiaceae fine)	1	Probably Native

**Plot** 03FETT01.01

**LOCATION**

**Map:** Laramie Peak 1:100,000  
**Township** 23 N, **Range** W, **Section** 2  
**Elevation (ft.):** 7,185 **Aspect (degrees):** 208 **Slope (degrees):** 2  
**Topographic Position:** Interfluve

**SUBSTRATE**

**Soil Texture:**  
**Soil features:** Limey sand - sandstone.

**DESCRIPTION**

**Photos:** G. Jones in plot. 03CP1.01

**Why was plot done?** To characterize structure and composition of cushion plant vegetation.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

Short, sparse herbaceous vegetation with very few dwarf shrubs. Sedges (*Carex* rhiz the most common species) densest in patches that may follow cracks in bedrock. Canopy cover 20%.

**Disturbance signs:**

None recorded

**Notes:**

none

**Plot 03FETT01.01**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
tetradymia canescens, spineless horsebrush	1	Native
3. Subshrub		
gutierrezia sarothrae, broom snakeweed	1	Native
5. Graminoid		
carex rupestris, rock sedge	10	Native
poa secunda, sandberg bluegrass	1	Native
pseudoroegneria spicata, bluebunch wheatgrass	1	Native
6. Forb		
arenaria hookeri, hooker's sandwort	1	Native
chaenactis douglasii, douglas' dustymaiden	1	Native
comandra umbellata, bastard toadflax	1	Native
cryptantha caespitosa, tufted catseye	1	Native
erigonum acaule, singlestem buckwheat	1	Native
erigonum flavum, yellow erigonum	1	Native
erigeron nematophyllus, needleleaf fleabane	1	Native
euphorbia robusta, rocky mountain spurge	1	Native
lesquerella condensata, dense bladderpod	3	Native
linum lewisii, prairie flax	1	Native
machaeranthera grindelioides, rayless aster	1	Native
musineon tenuifolium, slender wildparsley	3	Native
oxytropis campestris, cold mountain crazyweed	1	Native
packera cana, woolly groundsel	3	Native
paronychia depressa, spreading nailwort	3	Native
phlox muscoides, musk phlox	3	Native
stenotus armerioides, thrift mock goldenweed	1	Native
tetraneuris acaulis, stemless hymenoxys	3	Native
astragalus simplicifolius, little bun milkvetch	1	Native

**Plot** 03FETT01.02

**LOCATION**

**Map:** Laramie Peak 1:100,000  
**Towship** 23 N, **Range** W, **Section** 2  
**Elevation (ft.):** 7,185 **Aspect (degrees):** 216 **Slope (degrees):** 2  
**Topographic Position:** Toeslope

**SUBSTRATE**

**Soil Texture:** Silt Loam  
**Soil features:** Sandstone

**DESCRIPTION**

**Photos:** 03CP01.02

**Why was plot done?** To compare structure and composition of matrix vegetation near sandstone outcrops to those of cushion plant vegetation on those outcrops.

**Uncertainty on measurements:** Uncertain of some grasse, and of winterfat vs. horsebrush.

**Completeness of Species lists:**

**Describe vegetation:**

Plot dominated by various graminoids - wheatgrass, needle and thread, sedge., junegrass and Sandberg bluegrass. Small shrubs (black sagebrush, winterfat) were also distributed throughout the plot. Hood's phlox was distributed evenly throughout the plot, and was found in every microplot. 29% canopy cover.

**Disturbance signs:**

None recorded

**Notes:**

none

**Plot 03FETT01.02**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
artemisia nova, black sagebrush	1	Native
tetradymia, horsebrush	1	Native
3. Subshrub		
artemisia frigida, fringed sagewort	3	Native
gutierrezia sarothrae, broom snakeweed	3	Native
krascheninnikovia lanata, winterfat	1	Native
5. Graminoid		
bouteloua gracilis, blue grama	1	Native
carex duriuscula, needleleaf sedge	1	Native
carex filifolia, threadleaf sedge	3	Native
hesperostipa comata, needle and thread	10	Native
koeleria macrantha, prairie junegrass	10	Native
poa secunda, sandberg bluegrass	3	Native
elymus lanceolatus ssp. lanceolatus, thickspike wheatgrass	3	Native
6. Forb		
allium textile, textile onion	1	Native
antennaria parvifolia, smallleaf pussytoes	1	Native
arenaria hookeri, hooker's sandwort	1	Native
astragalus purshii, woollypod milkvetch	1	Native
astragalus spatulatus, tufted milkvetch	1	Native
cryptantha celosioides, buttecandle	1	Native
cymopterus acaulis, plains springparsley	1	Native
erigeron nematophyllus, needleleaf fleabane	1	Native
escobaria vivipara, spinystar	1	Native
lesquerella ludoviciana, foothill bladderpod	1	Native
linum lewisii, prairie flax	1	Native
phlox hoodii, hoods phlox	3	Native
trifolium gymnocarpon, hollyleaf clover	1	Native
zigadenus venenosus, meadow deathcamas	1	Native
forb unknown (linear leaf forb)	1	Probably Native
forb unknown (tall tooth leaf)	1	Probably Native

**Plot 03FM01.01**

**LOCATION**

**Map:** Fourmile Point 1:24,000  
**Towship** 27 N, **Range** W, **Section**  
**Elevation (ft.):** 7,200 **Aspect (degrees):** 290 **Slope (degrees):** 2  
**Topographic Position:** Interfluve

**SUBSTRATE**

**Soil Texture:** Clay  
**Soil features:** Gravel 5 % volume of upper 5 cm. Soil only 5 - 10 cm deep over limestone bedrock. Gravel lag (limestone) on surface.

**DESCRIPTION**

**Photos:** 03CP1.16 - looking NE across plot. C. Cooper Cooper at center plot.

**Why was plot done?** To characterize structure and composition of cushion plant vegetation.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

Plot dominated by cushion plants (Phlox muscoides, Paronychia sp., and some Arenaria hookeri). Plot also contained a lot of wheatgrass and some junegrass. Many small forbs present.

**Disturbance signs:**

None recorded

**Notes:**

Limestone bedrock. This vegetation covers patches of < 1000 sq m on several limestone outcrops along Four Mile Cr.

**Plot 03FM01.01**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
3. Subshrub		
artemisia frigida, fringed sagewort	1	Native
gutierrezia sarothrae, broom snakeweed	1	Native
penstemon eriantherus, fuzzytongue penstemon	1	Native
5. Graminoid		
koeleria macrantha, prairie junegrass	1	Native
pseudoroegneria spicata, bluebunch wheatgrass	10	Native
6. Forb		
allium textile, textile onion	1	Native
arenaria hookeri, hooker's sandwort	1	Native
astragalus miser, weedy milkvetch	1	Native
crepis modocensis, siskiyou hawksbeard	1	Native
erigonum flavum, yellow erigonum	1	Native
erigeron nematophyllus, needleleaf fleabane	3	Native
erigonum ovalifolium, cushion buckwheat	1	Native
hymenopappus filifolius, fineleaf hymenopappus	1	Native
lesquerella condensata, dense bladderpod	1	Native
machaeranthera grindelioides, rayless aster	3	Native
mertensia humilis, rocky mountain bluebells	1	Native
musineon divaricatum, leafy wildparsley	1	Native
paronychia sessiliflora, creeping nailwort	3	Native
phlox muscoides, musk phlox	10	Native
potentilla sp., cinquefoil	1	Probably Native
sedum lanceolatum, spearleaf stonecrop	1	Native
sphaeromeria capitata, rock tansy	3	Native
stenotus armerioides, thrift mock goldenweed	1	Native
tetraneuris torreyana, torrey's hymenoxys	3	Native
trifolium andinum, andes clover	1	Native
zigadenus venenosus, meadow deathcamas	1	Native
astragalus simplicifolius, little bun milkvetch	1	Native
castilleja pallescens, pale indian paintbrush	1	Native
oxytropis lagopus, haresfoot pointloco	1	Native

**Plot** 03FM01.02

**LOCATION**

**Map:** Fourmile Point 1:24,000  
**Township** 27 N, **Range** W, **Section**  
**Elevation (ft.):** 7,200 **Aspect (degrees):** 36 **Slope (degrees):** 4  
**Topographic Position:** Toeslope

**SUBSTRATE**

**Soil Texture:** Silty Clay Loam  
**Soil features:** Siltstone

**DESCRIPTION**

**Photos:** 03CP1.17 G. Jones in plot

**Why was plot done?** Grassland to compare with cushion plant.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

Moderately dense sagebrush steppe of Wyoming big sage, *Poa* spp., and various forbs. Canopy cover 60%.

**Disturbance signs:**

None recorded

**Notes:**

none

**Plot 03FM01.02**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
chrysothamnus viscidiflorus, yellow rabbitbrush	1	Native
artemisia tridentata ssp. wyomingensis, wyoming big sagebrush	20	Native
3. Subshrub		
penstemon eriantherus, fuzzytongue penstemon	1	Native
5. Graminoid		
koeleria macrantha, prairie junegrass	1	Native
poa fendleriana, muttongrass	3	Native
poa secunda, sandberg bluegrass	3	Native
elymus lanceolatus ssp. lanceolatus, thickspike wheatgrass	3	Native
6. Forb		
allium textile, textile onion	1	Native
antennaria dimorpha, low pussytoes	1	Native
antennaria microphylla, littleleaf pussytoes	1	Native
arenaria congesta, ballhead sandwort	1	Native
arnica fulgens, foothill arnica	1	Native
arabis holboellii, holboell's rockcress	1	Native
arenaria hookeri, hooker's sandwort	1	Native
astragalus miser, weedy milkvetch	1	Native
besseyia wyomingensis, wyoming besseyia	1	Native
cordylanthus ramosus, bushy bird's beak	1	Native
crepis modocensis, siskiyou hawksbeard	3	Native
delphinium sp., larkspur	1	Native
descurainia pinnata, western tansymustard	1	Native
erigeron eatonii, eaton's fleabane	1	Native
erigonum ovalifolium, cushion buckwheat	1	Native
lesquerella ludoviciana, foothill bladderpod	1	Native
lomatium foeniculaceum, desert biscuitroot	3	Native
phlox hoodii, hoods phlox	1	Native
phlox multiflora, flowery phlox	3	Native
schoenocrambe linifolia, flaxleaf plainsmustard	1	Native
senecio integerrimus, lambstongue groundsel	1	Native
sedum lanceolatum, spearleaf stonecrop	1	Native
stenotus acaulis, stemless mock goldenweed	1	Native
taraxacum, dandelion	1	Introduced
trifolium gymnocarpon, hollyleaf clover	3	Native
vicia americana, american vetch	1	Native
castilleja pallescens, pale indian paintbrush	1	Native
forb unknown (apiaceae bright grn)	1	Probably Native

**Plot** 03MB01.01

**LOCATION**

**Map:** Medicine Bow 1:100,000  
**Towship** 23 N, **Range** W, **Section**  
**Elevation (ft.):** 6,560 **Aspect (degrees):** 160 **Slope (degrees):** 3  
**Topographic Position:** Interfluve

**SUBSTRATE**

**Soil Texture:** Sandy Clay  
**Soil features:** Slightly gritty. Some gravel in top 10 cm, <10% by vol. Gravel lay on surface.

**DESCRIPTION**

**Photos:** 03CP1.08 - Looking along ridgeline and long axis of plot. C. Cooper in center.

**Why was plot done?** To characterize structure and composition of cushion plant vegetation.

**Uncertainty on measurements:** Phlox hoodii may be more common than estimate shows, but plants were small and flowers rare. Might have been mistaken for Arenaria

**Completeness of Species lists:**

**Describe vegetation:**

Plot dominated by Arenaria hookeri with some Carex sp. and Poa secunda. Other small forbs were present throughout the plot. Some Phlox hoodii (at early growth stage?). Total canopy cover 15 %.

**Disturbance signs:**

Mammal burrows

**Notes:**

Shale.

**Plot 03MB01.01**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
ericameria nauseosa, rubber rabbitbrush	3	Native
3. Subshrub		
artemisia frigida, fringed sagewort	1	Native
artemisia pedatifida, birdfoot sagebrush	1	Native
opuntia polyacantha, plains pricklypear	1	Native
5. Graminoid		
carex duriuscula, needleleaf sedge	3	Native
elymus elymoides, bottlebrush squirreltail	1	Native
hesperostipa comata, needle and thread	1	Native
poa secunda, sandberg bluegrass	1	Native
elymus lanceolatus ssp. lanceolatus, thickspike wheatgrass	1	Native
6. Forb		
allium textile, textile onion	1	Native
arenaria hookeri, hooker's sandwort	10	Native
artemisia ludoviciana, louisiana sagewort	1	Native
chenopodium sp., goosefoot	1	Native
erysimum inconspicuum, shy wallflower	1	Native
eriogonum ovalifolium, cushion buckwheat	1	Native
escobaria vivipara, spinystar	1	Native
monolepis nuttalliana, nuttall's povertyweed	1	Native
phlox hoodii, hoods phlox	1	Native
thermopsis rhombifolia, prairie thermopsis	1	Native

**Plot** 03MB01.02

**LOCATION**

**Map:** Medicine Bow 1:100,000  
**Towship** 23 N, **Range** W, **Section**  
**Elevation (ft.):** 6,560 **Aspect (degrees):** 170 **Slope (degrees):** 2  
**Topographic Position:** Interfluve

**SUBSTRATE**

**Soil Texture:** Sandy Clay  
**Soil features:**

**DESCRIPTION**

**Photos:** 03CP1.09 - G. Jones in plot.

**Why was plot done?** Grassland for comparison with cushion plant plot.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

Short, rather sparse grass vegetation with scattered forbs and low shrubs. Total canopy cover 40%.

**Disturbance signs:**

Badger holes, prairie dog holes.

**Notes:**

Siltstone ?

**Plot 03MB01.02**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
chrysothamnus viscidiflorus, yellow rabbitbrush	3	Native
ericameria nauseosa, rubber rabbitbrush	3	Native
artemisia tridentata ssp. wyomingensis, wyoming big sagebrush	1	Native
3. Subshrub		
artemisia frigida, fringed sagewort	1	Native
artemisia pedatifida, birdfoot sagebrush	3	Native
atriplex gardneri, gardner's saltbush	1	Native
krascheninnikovia lanata, winterfat	1	Native
opuntia polyacantha, plains pricklypear	1	Native
penstemon eriantherus, fuzzytongue penstemon	1	Native
5. Graminoid		
achnatherum hymenoides, indian ricegrass	1	Native
carex duriuscula, needleleaf sedge	3	Native
festuca octoflora	1	Native
hesperostipa comata, needle and thread	1	Native
poa secunda, sandberg bluegrass	3	Native
pseudoroegneria spicata, bluebunch wheatgrass	1	Native
elymus lanceolatus ssp. lanceolatus, thickspike wheatgrass	10	Native
6. Forb		
arenaria hookeri, hooker's sandwort	1	Native
descurainia pinnata, western tansymustard	1	Native
erigonum ovalifolium, cushion buckwheat	1	Native
lomatium orientale, northern idaho biscuitroot	1	Native
machaeranthera grindelioides, rayless aster	1	Native
phlox hoodii, hoods phlox	3	Native
sphaeralcea coccinea, scarlet globemallow	1	Native
viola nuttallii, nuttall's violet	1	Native
xylorhiza glabriuscula, smooth woodyaster	1	Native
lappula occidentalis var. occidentalis, flatspine stickseed	1	Native
forb unknown (forb upright tooth)	1	Probably Native
forb unknown (fab fuzzy pinn)	1	Probably Native

**Plot** 03MILL01.01

**LOCATION**

**Map:** Rawlins

1:100,000

**Township** 19 N, **Range** W, **Section**

**Elevation (ft.):** 7,152 **Aspect (degrees):** 22 **Slope (degrees):** 4

**Topographic Position:** Shoulder

**SUBSTRATE**

**Soil Texture:** Silty Clay Loam

**Soil features:**

**DESCRIPTION**

**Photos:** 03CP1.28

**Why was plot done?** To characterize structure and composition of cushion plant vegetation.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

Short, sparse vegetation of forbs (*Arenaria hookeri*, *Artemisia frigida*, *Haplopappus* sp.) and graminoids (*Poa secunda*, *Pseudoroegneria spicata*) with a few scattered, low shrubs (*Artemisia nova*). 20% canopy cover.

**Disturbance signs:**

Big hole in plot from animal?

**Notes:**

Limestone / dolomite bedrock.

**Plot 03MILL01.01**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
artemisia nova, black sagebrush	1	Native
chrysothamnus viscidiflorus, yellow rabbitbrush	1	Native
symphoricarpos oreophilus, whortleleaf snowberry	1	Native
3. Subshrub		
artemisia frigida, fringed sagewort	3	Native
opuntia polyacantha, plains pricklypear	1	Native
5. Graminoid		
carex duriuscula, needleleaf sedge	3	Native
hesperostipa comata, needle and thread	1	Native
koeleria macrantha, prairie junegrass	1	Native
poa secunda, sandberg bluegrass	3	Native
pseudoroegneria spicata, bluebunch wheatgrass	3	Native
6. Forb		
arenaria hookeri, hooker's sandwort	3	Native
astragalus agrestis, purple milkvetch	1	Native
astragalus miser, weedy milkvetch	3	Native
astragalus spatulatus, tufted milkvetch	1	Native
erigonum flavum, yellow erigonum	1	Native
erigeron nematophyllus, needleleaf fleabane	1	Native
erigonum ovalifolium, cushion buckwheat	1	Native
lomatium orientale, northern idaho biscuitroot	1	Native
mertensia humilis, rocky mountain bluebells	1	Native
penstemon laricifolius, larchleaf beardtongue	1	Native
phlox hoodii, hoods phlox	1	Native
stenotus acaulis, stemless mock goldenweed	10	Native
tetraneuris torreyana, torrey's hymenoxys	1	Native
lappula occidentalis var. occidentalis, flatspine stickseed	1	Native
oxytropis lagopus, haresfoot pointloco	1	Native

**Plot** 03MILL02.01

#### LOCATION

**Map:** Baggs 1:100,000  
**Township** 16 N, **Range** W, **Section**  
**Elevation (ft.):** 7,874 **Aspect (degrees):** 253 **Slope (degrees):** 2  
**Topographic Position:** Interfluve

#### SUBSTRATE

**Soil Texture:** Sandy Clay Loam  
**Soil features:** Limestone gravel ~ 30% volume of upper 10 cm. Soil generally ~15 cm deep over bedrock or rocks.

#### DESCRIPTION

**Photos:** 03CP1.29 and 03CP1.30 - C. Cooper reading microplot. 03CP1.31 looking along plot with C. Cooper at center.

**Why was plot done?** To illustrate sparse vegetation, like cushion - plant vegetation on edge of rim.

**Uncertainty on measurements:**

**Completeness of Species lists:**

#### Describe vegetation:

Plot dominated by *Pseudoroegneria spicata* and *Arenaria hookeri*. *Phlox hoodii* present, but no *Phlox muscoides*. Various forbs present, especially *Machaeranthera* sp.. Several species of *Artemisa* present. Total canopy cover 20%.

#### Disturbance signs:

Broken bottle, cut post on ground in edge of plot. 2 - track road within 10 m of plot.

#### Notes:

Limestone / dolomite Bedrock. Have seen areas like this on rims.

**Plot 03MILL02.01**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
artemisia nova, black sagebrush	1	Native
artemisia tridentata ssp. vaseyana, mountain big sagebrush	1	Native
artemisia tripartita ssp. rupicola, wyoming threetip sagebrush	1	Native
3. Subshrub		
artemisia frigida, fringed sagewort	1	Native
krascheninnikovia lanata, winterfat	1	Native
5. Graminoid		
hesperostipa comata, needle and thread	1	Native
koeleria macrantha, prairie junegrass	1	Native
poa secunda, sandberg bluegrass	3	Native
pseudoroegneria spicata, bluebunch wheatgrass	3	Native
6. Forb		
alyssum desertorum, desert madwort	1	Introduced
allium, wild onion	1	Native
antennaria dimorpha, low pussytoes	1	Native
arenaria hookeri, hooker's sandwort	3	Native
astragalus spatulatus, tufted milkvetch	3	Native
erigonum brevicaule, shortstem buckwheat	1	Native
erigeron nematophyllus, needleleaf fleabane	1	Native
lomatium orientale, northern idaho biscuitroot	1	Native
machaeranthera grindelioides, rayless aster	10	Native
penstemon laricifolius, larchleaf beardtongue	1	Native
phlox hoodii, hoods phlox	3	Native
potentilla ovina, sheep cinquefoil	1	Native
sedum lanceolatum, spearleaf stonecrop	1	Native
stenotus acaulis, stemless mock goldenweed	3	Native
tetraneuris torreyana, torrey's hymenoxys	1	Native
lappula occidentalis var. occidentalis, flatspine stickseed	1	Native
oxytropis lagopus, haresfoot pointloco	1	Native
arabis pendulina var. russeola, russeola rockcress	1	Native
forb unknown (bud fab)	1	Probably Native

**Plot** 03MILL03.01

**LOCATION**

**Map:** Baggs 1:100,000  
**Township** 16 N, **Range** W, **Section** 2  
**Elevation (ft.):** 8,040 **Aspect (degrees):** 204 **Slope (degrees):** 8  
**Topographic Position:** Shoulder

**SUBSTRATE**

**Soil Texture:** Sandy Loam  
**Soil features:** Very sandy soil.

**DESCRIPTION**

**Photos:** 03CP1.32 - G. Jones in center plot.

**Why was plot done?** To characterize structure and composition of cushion plant vegetation.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

Short, sparse vegetation of forbs (Paronychia sp., Arenaria hookeri, low Geum sp, and Machaeranthera sp.) with some Pseudoroegneria spicata, growing on windswept brow of hill. Plants are densest near top of hill where slope is flatter. Canopy cover 20%

**Disturbance signs:**

None recorded

**Notes:**

Lighter Limestone / Dolomite.

**Plot 03MILL03.01**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
5. Graminoid		
carex filifolia, threadleaf sedge	1	Native
koeleria macrantha, prairie junegrass	1	Native
pseudoroegneria spicata, bluebunch wheatgrass	3	Native
6. Forb		
alyssum desertorum, desert madwort	1	Introduced
arenaria hookeri, hooker's sandwort	3	Native
astragalus australis, indian milkvetch	1	Native
astragalus spatulatus, tufted milkvetch	1	Native
chaenactis douglasii, douglas' dustymaiden	1	Native
erigonum flavum, yellow erigonum	1	Native
erigeron nematophyllus, needleleaf fleabane	1	Native
ipomopsis aggregata, skyrocket gilia	1	Native
lesquerella ludoviciana, foothill bladderpod	1	Native
linum lewisii, prairie flax	1	Native
machaeranthera grindelioides, rayless aster	3	Native
oxytropis sericea, silvery oxytrope	1	Native
packera cana, woolly groundsel	1	Native
paronychia sessiliflora, creeping nailwort	3	Native
penstemon laricifolius, larchleaf beardtongue	1	Native
potentilla ovina, sheep cinquefoil	3	Native
sedum lanceolatum, spearleaf stonecrop	1	Native
stenotus acaulis, stemless mock goldenweed	1	Native
tetraneuris torreyana, torrey's hymenoxys	3	Native
tradescantia occidentalis, prairie spiderwort	1	Native
oxytropis lagopus, haresfoot pointloco	1	Native

**Plot** 03MILL04.01

**LOCATION**

**Map:** Baggs

1:100,000

**Township** 17 N, **Range** W, **Section**

**Elevation (ft.):** 7,680 **Aspect (degrees):** 0 **Slope (degrees):** 1

**Topographic Position:** Interfluve

**SUBSTRATE**

**Soil Texture:** Sandy Clay Loam

**Soil features:**

**DESCRIPTION**

**Photos:** 03CP1.33 - G. Jones in center of plot.

**Why was plot done?** To characterize structure and composition of cushion plant vegetation.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

Short, very sparse vegetation of forbs (*Hymenoxys* sp., *Haplopappus* sp., *Arenaria hookeri*) with some *Pseudoroegneria spicata*. Total canopy cover 10%.

**Disturbance signs:**

Cow pies are present.

**Notes:**

Limestone / Dolomite bedrock. Mountain plover near plot.

**Plot 03MILL04.01**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
artemisia nova, black sagebrush	1	Native
tetradymia canescens, spineless horsebrush	1	Native
3. Subshrub		
artemisia frigida, fringed sagewort	1	Native
5. Graminoid		
achnatherum hymenoides, indian ricegrass	1	Native
carex filifolia, threadleaf sedge	1	Native
koeleria macrantha, prairie junegrass	1	Native
poa secunda, sandberg bluegrass	1	Native
pseudoroegneria spicata, bluebunch wheatgrass	3	Native
6. Forb		
arenaria congesta, ballhead sandwort	1	Native
astragalus spatulatus, tufted milkvetch	1	Native
castilleja angustifolia, northwestern indian paintbrush	1	Native
chaenactis douglasii, douglas' dustymaiden	1	Native
cryptantha caespitosa, tufted catseye	1	Native
erigonum brevicaule, shortstem buckwheat	3	Native
erigonum flavum, yellow erigonum	1	Native
erigeron nematophyllus, needleleaf fleabane	1	Native
machaeranthera grindelioides, rayless aster	1	Native
oxytropis sericea, silvery oxytrope	1	Native
packera cana, woolly groundsel	1	Native
paronychia sessiliflora, creeping nailwort	1	Native
phlox hoodii, hoods phlox	1	Native
potentilla ovina, sheep cinquefoil	1	Native
stenotus acaulis, stemless mock goldenweed	3	Native
stephanomeria runcinata, desert wirelettuce	1	Native
stanleya viridiflora, green princesplume	1	Native
tetraneuris torreyana, torrey's hymenoxys	3	Native
tradescantia occidentalis, prairie spiderwort	1	Native
forb unknown (must gray)	1	Probably Native

**Plot 03PH01.01**

**LOCATION**

**Map:** Pine Hill

1:24,000

**Township** 26 N, **Range** W, **Section**

**Elevation (ft.):** 7,420 **Aspect (degrees):** 285 **Slope (degrees):** 5

**Topographic Position:** Shoulder

**SUBSTRATE**

**Soil Texture:** Sandy Loam

**Soil features:** Sandy loam with 40 - 50% gravel by volume - soil ~ 4 cm over bedrock. Hard to do hand texture because of gravel.

**DESCRIPTION**

**Photos:** 03CP1.10 C. Cooper in plot with beautiful background.

**Why was plot done?** To characterize structure and composition of cushion plant vegetation.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

Plot dominated by *Phlox muscoides* and *Arenaria hookerii*. Other cushion plants occurred as well. *Elymus* sp. and *Carex* spp. (two types) were the only graminoids noted. 16 % total canopy

**Disturbance signs:**

Cow pie (old)

**Notes:**

Limestone bedrock.

**Plot 03PH01.01**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
5. Graminoid		
carex filifolia, threadleaf sedge	3	Native
carex rossii, ross' sedge	1	Native
koeleria macrantha, prairie junegrass	1	Native
pseudoroegneria spicata, bluebunch wheatgrass	3	Native
6. Forb		
arenaria hookeri, hooker's sandwort	3	Native
astragalus spatulatus, tufted milkvetch	1	Native
cryptantha caespitosa, tufted catseye	1	Native
draba oligosperma, fewseed whitlowgrass	1	Native
erigonum flavum, yellow erigonum	1	Native
erigeron nematophyllus, needleleaf fleabane	1	Native
lesquerella condensata, dense bladderpod	1	Native
mertensia humilis, rocky mountain bluebells	1	Native
musineon tenuifolium, slender wildparsley	1	Native
parthenium alpinum, alpine feverfew	1	Native
packera cana, woolly groundsel	1	Native
paronychia sessiliflora, creeping nailwort	1	Native
phlox muscoides, musk phlox	3	Native
stenotus armerioides, thrift mock goldenweed	1	Native
tetraneuris acaulis, stemless hymenoxys	1	Native
tetraneuris torreyana, torrey's hymenoxys	1	Native
oxytropis lagopus, haresfoot pointloco	1	Native
sphaeromeria simplex, laramie chickensage	1	Native
forb unknown (small green)	1	Probably Native

**Plot** 03PH01.02

**LOCATION**

**Map:** Pine Hill

1:24,000

**Towship** 26 N, **Range** W, **Section**

**Elevation (ft.):** 7,480 **Aspect (degrees):** 194 **Slope (degrees):** 7

**Topographic Position:** Interfluve

**SUBSTRATE**

**Soil Texture:** Silty Clay Loam

**Soil features:**

**DESCRIPTION**

**Photos:** 03CP1.11 G. Jones in vegetative plot.

**Why was plot done?** Grass vegetation to compare with cushion-plant stand

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

Moderately dense grass vegetation with forbs and low shrubs. Mainly *Carex filifolia* and *Poa secunda*, with *Artemisia tridentata vaseyana* and *Phlox hoodii*. Very rich in species. Total canopy cover 70%.

**Disturbance signs:**

Animal burrows.

**Notes:**

Limestone bedrock.

**Plot 03PH01.02**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
artemisia nova, black sagebrush	1	Native
chrysothamnus viscidiflorus, yellow rabbitbrush	1	Native
ericameria nauseosa, rubber rabbitbrush	1	Native
tetradymia canescens, spineless horsebrush	1	Native
artemisia tridentata ssp. vaseyana, mountain big sagebrush	10	Native
3. Subshrub		
artemisia frigida, fringed sagewort	3	Native
gutierrezia sarothrae, broom snakeweed	1	Native
krascheninnikovia lanata, winterfat	1	Native
opuntia polyacantha, plains pricklypear	1	Native
penstemon eriantherus, fuzzytongue penstemon	1	Native
5. Graminoid		
carex duriuscula, needleleaf sedge	1	Native
carex filifolia, threadleaf sedge	10	Native
hesperostipa comata, needle and thread	3	Native
koeleria macrantha, prairie junegrass	3	Native
poa fendleriana, muttongrass	3	Native
poa secunda, sandberg bluegrass	3	Native
pseudoroegneria spicata, bluebunch wheatgrass	3	Native
elymus lanceolatus ssp. lanceolatus, thickspike wheatgrass	3	Native
6. Forb		
allium textile, textile onion	1	Native
antennaria microphylla, littleleaf pussytoes	1	Native
arenaria hookeri, hooker's sandwort	1	Native
astragalus purshii, woollypod milkvetch	1	Native
astragalus sp., milkvetch	1	Native
besseya wyomingensis, wyoming besseya	1	Native
cryptantha celosioides, buttecandle	1	Native
crepis modocensis, siskiyou hawksbeard	1	Native
cryptantha sp., cryptantha	1	Native
delphinium geyeri, geyer's larkspur	1	Native
erigeron nematophyllus, needleleaf fleabane	1	Native
erigonum ovalifolium, cushion buckwheat	1	Native
halimolobos virgata, rod halimolobos	1	Native
lesquerella ludoviciana, foothill bladderpod	1	Native
lithospermum incisum, narrowleaf gromwell	1	Native
lomatium orientale, northern idaho biscuitroot	1	Native
lygodesmia grandiflora, largeflower skeletonplant	1	Native
machaeranthera grindelioides, rayless aster	1	Native
mertensia humilis, rocky mountain bluebells	1	Native
musineon divaricatum, leafy wildparsley	1	Native
packera cana, woolly groundsel	1	Native

**Plot 03PH01.02**

penstemon laricifolius, larchleaf beardtongue	1	Native
phlox hoodii, hoods phlox	10	Native
sisymbrium altissimum, tall tumbled mustard	1	Introduced
tetraneuris acaulis, stemless hymenoxys	1	Native
trifolium gymnocarpon, hollyleaf clover	1	Native
zigadenus venenosus, meadow deathcamas	1	Native
lappula occidentalis var. occidentalis, flatspine stickseed	1	Native
astragalus simplicifolius, little bun milkvetch	1	Native
oxytropis lagopus, haresfoot pointloco	1	Native
sphaeromeria simplex, laramie chickensage	1	Native
forb unknown (forb cotyledon)	1	Probably Native
forb unknown (forb obov lvs)	1	Probably Native

This page left blank

**Plot 03PH02.01**

**LOCATION**

**Map:** Pine Hill 1:24,000  
**Township** 25 N, **Range** W, **Section** 2  
**Elevation (ft.):** 7,840 **Aspect (degrees):** 240 **Slope (degrees):** 6  
**Topographic Position:** Backslope

**SUBSTRATE**

**Soil Texture:** Sandy Clay Loam  
**Soil features:** Gravel ~ 5 % of volume in top 5 cm. Gravel lag deposit on surface.

**DESCRIPTION**

**Photos:** 03CP1.12 - looking down and across slope and plot. C. Cooper by center plot. Cercocarpus beyond plot.

**Why was plot done?** To characterize structure and composition of cushion plant vegetation.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

Plot dominated by *Phlox muscoides* and other small cushion-plant-like species (*Arenaria hookeri*, *Paronychia* sp.). Two grasses and many small forbs (especially *Packera cana*) present. Total canopy 15%.

**Disturbance signs:**

Old cowpie in area. Scraping ~ 1 sq. m. by pronghorn? 2-track road 5 m away (downslope), fence - 15 m up slope.

**Notes:**

Limestone Bedrock. Patches of cushion plants, ea. up to ~ 1000 sq. m, grow in low, sparse shrub stands of *Cercocarpus montanus*.

**Plot 03PH02.01**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
cercocarpus montanus, true mountain mahogany	1	Native
5. Graminoid		
carex filifolia, threadleaf sedge	3	Native
grass unknown (bunchgrass)	3	Probably Native
6. Forb		
arenaria hookeri, hooker's sandwort	1	Native
castilleja angustifolia, northwestern indian paintbrush	1	Native
chaenactis douglasii, douglas' dustymaiden	1	Native
comandra umbellata, bastard toadflax	1	Native
cryptantha caespitosa, tufted catseye	1	Native
erigonum caespitosum, matted buckwheat	1	Native
lesquerella condensata, dense bladderpod	1	Native
linum lewisii, prairie flax	1	Native
machaeranthera grindelioides, rayless aster	1	Native
musineon tenuifolium, slender wildparsley	1	Native
oxytropis multiceps, southwestern locoweed	3	Native
packera cana, woolly groundsel	3	Native
paronychia sessiliflora, creeping nailwort	3	Native
phlox muscoides, musk phlox	3	Native
potentilla ovina, sheep cinquefoil	1	Native
tetraneuris acaulis, stemless hymenoxys	3	Native
erigeron ochroleucus, buff fleabane	1	Native
forb unknown (rubber leaf)	1	Probably Native
forb unknown (snakeweed?)	1	Probably Native

**Plot** 03PH02.02

**LOCATION**

**Map:** Pine Hill 1:24,000  
**Township** 25 N, **Range** W, **Section** 2  
**Elevation (ft.):** 7,840 **Aspect (degrees):** 44 **Slope (degrees):** 8  
**Topographic Position:** Footslope

**SUBSTRATE**

**Soil Texture:** Silty Clay Loam  
**Soil features:**

**DESCRIPTION**

**Photos:** 03CP1.12 - G. Jones in plot.

**Why was plot done?** In grass vegetation, to compare with cushion-plant plot.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

Moderately dense black sagebrush steppe with many forbs. Vegetation only 25 cm tall at tallest.

**Disturbance signs:**

Animal burrows

**Notes:**

Limestone bedrock.

**Plot 03PH02.02**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
artemisia nova, black sagebrush	10	Native
chrysothamnus viscidiflorus, yellow rabbitbrush	3	Native
ericameria nauseosa, rubber rabbitbrush	1	Native
symphoricarpos oreophilus, whortleleaf snowberry	3	Native
tetradymia canescens, spineless horsebrush	1	Native
artemisia tridentata ssp. wyomingensis, wyoming big sagebrush	1	Native
artemisia tripartita ssp. rupicola, wyoming threetip sagebrush	3	Native
3. Subshrub		
gutierrezia sarothrae, broom snakeweed	1	Native
leptodactylon pungens, granite pricklygilia	1	Native
penstemon radicosus, matroot penstemon	1	Native
5. Graminoid		
carex duriuscula, needleleaf sedge	1	Native
hesperostipa comata, needle and thread	3	Native
koeleria macrantha, prairie junegrass	3	Native
poa fendleriana, muttongrass	3	Native
poa secunda, sandberg bluegrass	3	Native
pseudoroegneria spicata, bluebunch wheatgrass	3	Native
elymus lanceolatus ssp. lanceolatus, thickspike wheatgrass	3	Native
6. Forb		
agoseris glauca, pale agoseris	1	Native
allium textile, textile onion	1	Native
antennaria dimorpha, low pussytoes	1	Native
antennaria microphylla, littleleaf pussytoes	1	Native
arenaria congesta, ballhead sandwort	1	Native
arabis holboellii, holboell's rockcress	1	Native
arenaria hookeri, hooker's sandwort	1	Native
astragalus purshii, woollypod milkvetch	1	Native
astragalus spatulatus, tufted milkvetch	1	Native
besseyia wyomingensis, wyoming besseyia	1	Native
castilleja angustifolia, northwestern indian paintbrush	1	Native
collinsia parviflora, smallflower blue eyed mary	1	Native
cordylanthus ramosus, bushy bird's beak	1	Native
comandra umbellata, bastard toadflax	1	Native
crepis modocensis, siskiyou hawksbeard	1	Native
erigeron nematophyllus, needleleaf fleabane	1	Native
erigonum ovalifolium, cushion buckwheat	1	Native
erigonum umbellatum, sulphur wildbuckwheat	1	Native
ipomopsis aggregata, skyrocket gilia	1	Native
lesquerella condensata, dense bladderpod	1	Native
lesquerella ludoviciana, foothill bladderpod	1	Native
lithospermum incisum, narrowleaf gromwell	1	Native

**Plot 03PH02.02**

linum lewisii, prairie flax	1	Native
lomatium orientale, northern idaho biscuitroot	1	Native
machaeranthera grindelioides, rayless aster	1	Native
mertensia humilis, rocky mountain bluebells	1	Native
packera cana, woolly groundsel	1	Native
penstemon laricifolius, larchleaf beardtongue	1	Native
phlox hoodii, hoods phlox	3	Native
phlox multiflora, flowery phlox	1	Native
senecio integerrimus, lambstongue groundsel	1	Native
sedum lanceolatum, spearleaf stonecrop	1	Native
stenotus acaulis, stemless mock goldenweed	1	Native
taraxacum laevigatum, rock dandelion	1	Introduced
tetraneuris torreyana, torrey's hymenoxys	1	Native
trifolium gymnocarpon, hollyleaf clover	1	Native
zigadenus venenosus, meadow deathcamas	1	Native
forb unknown (chenopodium small)	1	Probably Native
forb unknown (fab green tall)	1	Probably Native

This page left blank

**Plot 03SHR01.01**

**LOCATION**

**Map:** The Q Ranch 1:24,000  
**Towship** 26 N, **Range** W, **Section**  
**Elevation (ft.):** 8,520 **Aspect (degrees):** 235 **Slope (degrees):** 4  
**Topographic Position:** Backslope

**SUBSTRATE**

**Soil Texture:** Silty Clay Loam  
**Soil features:** Small amount of gravel in soil (top 10 cm). Sample taken in pocket of soil > or = 10 cm deep. NO soil in some areas - just bedrock. Gravel lag (l.s) on

**DESCRIPTION**

**Photos:** 03CP1.17 - Looking along length of center plot. C. Cooper at far end of macroplot.

**Why was plot done?** To characterize structure and composition of cushion plant vegetation.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

Plot dominated by small forbs (white Erigeron sp. and Cymopterus sp.) with some Phlox hoodii and Paronychia sp. No Phlox muscoides. Plot also contained a large amount of club moss and lichen. Total canopy cover 22%.

**Disturbance signs:**

Old cowpies in area. Two - track roads within 30 m, and graded BLM road within 50 m.

**Notes:**

Limestone bedrock. Very hard surface.

**Plot 03SHR01.01**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
5. Graminoid		
pseudoroegneria spicata, bluebunch wheatgrass	3	Native
6. Forb		
arenaria hookeri, hooker's sandwort	1	Native
astragalus spatulatus, tufted milkvetch	1	Native
draba oligosperma, fewseed whitlowgrass	1	Native
erigonum flavum, yellow erigonum	1	Native
lesquerella condensata, dense bladderpod	3	Native
musineon tenuifolium, slender wildparsley	10	Native
paronychia sessiliflora, creeping nailwort	1	Native
phlox hoodii, hoods phlox	3	Native
potentilla concinna, elegant cinquefoil	1	Native
potentilla ovina, sheep cinquefoil	1	Native
selaginella densa, lesser spikemoss	3	Native
sedum lanceolatum, spearleaf stonecrop	1	Native
tetraneuris torreyana, torrey's hymenoxys	3	Native
erigeron ochroleucus, buff fleabane	10	Native
sphaeromeria simplex, laramie chickensage	3	Native
forb unknown (silver fab)	1	Probably Native

**Plot** 03SHR01.02

#### **LOCATION**

**Map:** The Q Ranch 1:24,000  
**Township** 26 N, **Range** W, **Section**  
**Elevation (ft.):** 8,580 **Aspect (degrees):** 242 **Slope (degrees):** 2  
**Topographic Position:** Footslope

#### **SUBSTRATE**

**Soil Texture:** Clay Loam  
**Soil features:** One hand texture of surface 10 cm. Neither silty nor sandy, but seems too weak to just be a clay.

#### **DESCRIPTION**

**Photos:** 03CP1.18

**Why was plot done?** Grass vegetation, to compare to cushion plant plot

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

Short bunchgrass vegetation with forbs and some scattered low shrubs. Most of plot with soil and no gravel. Small rocky area.

**Disturbance signs:**

Some animal burrows

**Notes:**

Limestone bedrock.

**Plot 03SHR01.02**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
chrysothamnus viscidiflorus, yellow rabbitbrush	1	Native
artemisia tripartita ssp. rupicola, wyoming threetip sagebrush	3	Native
3. Subshrub		
penstemon radicosus, matroot penstemon	1	Native
5. Graminoid		
festuca idahoensis, idaho fescue	10	Native
leucopoa kingii, spike fescue	10	Native
poa fendleriana, muttongrass	10	Native
poa secunda, sandberg bluegrass	3	Native
elymus lanceolatus ssp. lanceolatus, thickspike wheatgrass	1	Native
elymus trachycaulus ssp. trachycaulus, slender wheatgrass	1	Native
6. Forb		
achillea millefolium, common yarrow	1	Native
agoseris glauca, pale agoseris	3	Native
allium, wild onion	1	Native
antennaria anaphaloides, pearly pussytoes	1	Native
antennaria dimorpha, low pussytoes	1	Native
antennaria umbrinella, umber pussytoes	3	Native
arabis, rockcress	1	Native
arenaria congesta, ballhead sandwort	3	Native
astragalus miser, weedy milkvetch	1	Native
astragalus spatulatus, tufted milkvetch	1	Native
besseya wyomingensis, wyoming besseya	1	Native
castilleja angustifolia, northwestern indian paintbrush	1	Native
cerastium arvense, field chickweed	1	Native
crepis modocensis, siskiyou hawksbeard	1	Native
erigeron nematophyllus, needleleaf fleabane	3	Native
fritillaria atropurpurea, spotted missionbells	1	Native
lewisia rediviva, oregon bitterroot	1	Native
lomatium foeniculaceum, desert biscuitroot	1	Native
mertensia humilis, rocky mountain bluebells	1	Native
oxytropis sericea, silvery oxytrope	1	Native
phlox hoodii, hoods phlox	1	Native
phlox multiflora, flowery phlox	3	Native
ranunculus glaberrimus, sagebrush buttercup	1	Native
senecio integerrimus, lambstongue groundsel	3	Native
sedum lanceolatum, spearleaf stonecrop	1	Native
stenotus armerioides, thrift mock goldenweed	3	Native
taraxacum laevigatum, rock dandelion	1	Introduced
tetraneuris torreyana, torrey's hymenoxys	1	Native
trifolium gymnocarpon, hollyleaf clover	1	Native
zigadenus venenosus, meadow deathcamas	1	Native

**Plot 03SHR01.02**

erisimum capitatum var. capitatum, western wallflower	1	Native
cirsium aridum,	1	Native
forb unknown (linear leaf forb)	1	Probably Native

This page left blank

**Plot 03SHR02.01**

**LOCATION**

**Map:** The Q Ranch 1:24,000  
**Towship** 26 N, **Range** W, **Section**  
**Elevation (ft.):** 8,000 **Aspect (degrees):** 215 **Slope (degrees):** 5  
**Topographic Position:** Backslope

**SUBSTRATE**

**Soil Texture:** Silty Clay Loam  
**Soil features:** Gravel ~ 33% vol in top 10 cm. Limestone gravel lag deposit on surface.

**DESCRIPTION**

**Photos:** 03CP1.19 - Looking upslope. C. Cooper in center plot.

**Why was plot done?** To characterize structure and composition of cushion plant vegetation.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

Plot dominated by *Pseudoroegneria spicata* and some species of *Cymopterus*. *Arenaria hookerii* present, but no *Phlox muscoides* noted. Other small forbs and two other grasses were also noted in the plot. Total canopy cover 8 %.

**Disturbance signs:**

Two - track road ~ 5 m from plot side.

**Notes:**

Limestone bedrock.

**Plot 03SHR02.01**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
artemisia nova, black sagebrush	1	Native
5. Graminoid		
koeleria macrantha, prairie junegrass	1	Native
poa secunda, sandberg bluegrass	1	Native
pseudoroegneria spicata, bluebunch wheatgrass	3	Native
6. Forb		
allium textile, textile onion	1	Native
arenaria hookeri, hooker's sandwort	1	Native
astragalus spatulatus, tufted milkvetch	1	Native
draba oligosperma, fewseed whitlowgrass	1	Native
erigonum flavum, yellow erigonum	1	Native
lesquerella condensata, dense bladderpod	1	Native
lesquerella ludoviciana, foothill bladderpod	1	Native
lomatium orientale, northern idaho biscuitroot	1	Native
musineon tenuifolium, slender wildparsley	3	Native
oxytropis sericea, silvery oxytrope	1	Native
paronychia sessiliflora, creeping nailwort	1	Native
potentilla hippiana, woolly cinquefoil	1	Native
sedum lanceolatum, spearleaf stonecrop	1	Native
stenotus acaulis, stemless mock goldenweed	3	Native
stenotus armerioides, thrift mock goldenweed	3	Native
trifolium andinum, andes clover	1	Native
erigeron ochroleucus, buff fleabane	1	Native
sphaeromeria simplex, laramie chickensage	1	Native

**Plot** 03SHR02.02

**LOCATION**

**Map:** The Q Ranch 1:24,000  
**Township** 26 N, **Range** W, **Section**  
**Elevation (ft.):** 7,900 **Aspect (degrees):** 142 **Slope (degrees):** 5  
**Topographic Position:** Footslope

**SUBSTRATE**

**Soil Texture:** Clay Loam  
**Soil features:**

**DESCRIPTION**

**Photos:** 03CP1.20

**Why was plot done?** Sage - grass vegetation, to compare to cushion-plant stand.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

Dense, low *Artemisia nova* and *Poa cusickii* with numerous other forbs and a few other graminoids. Shrubs appear to be evenly distributed. 60% canopy cover.

**Disturbance signs:**

None recorded

**Notes:**

Limestone bedrock.

**Plot 03SHR02.02**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
1. Tree		
pinus flexilis, limber pine	1	Native
2. Shrub		
artemisia nova, black sagebrush	30	Native
chrysothamnus viscidiflorus, yellow rabbitbrush	1	Native
tetradymia canescens, spineless horsebrush	1	Native
3. Subshrub		
penstemon eriantherus, fuzzytongue penstemon	1	Native
penstemon radicosus, matroot penstemon	1	Native
5. Graminoid		
carex duriuscula, needleleaf sedge	1	Native
koeleria macrantha, prairie junegrass	3	Native
poa fendleriana, muttongrass	10	Native
poa secunda, sandberg bluegrass	3	Native
pseudoroegneria spicata, bluebunch wheatgrass	3	Native
elymus lanceolatus ssp. lanceolatus, thickspike wheatgrass	3	Native
6. Forb		
allium textile, textile onion	1	Native
antennaria dimorpha, low pussytoes	1	Native
antennaria microphylla, littleleaf pussytoes	1	Native
arenaria congesta, ballhead sandwort	1	Native
arabis holboellii, holboell's rockcress	1	Native
arenaria hookeri, hooker's sandwort	1	Native
astragalus convallarius, timber milkvetch	1	Native
besseyia wyomingensis, wyoming besseyia	1	Native
castilleja angustifolia, northwestern indian paintbrush	3	Native
collinsia parviflora, smallflower blue eyed mary	1	Native
crepis modocensis, siskiyou hawksbeard	1	Native
draba oligosperma, fewseed whitlowgrass	1	Native
erysimum asperum,	1	Native
erigeron nematophyllus, needleleaf fleabane	1	Native
escobaria vivipara, spinystar	1	Native
lesquerella ludoviciana, foothill bladderpod	1	Native
linum lewisii, prairie flax	1	Native
lomatium orientale, northern idaho biscuitroot	1	Native
lupinus argenteus, silvery lupine	1	Native
mertensia humilis, rocky mountain bluebells	1	Native
oxytropis sp., crazyweed	1	Native
phlox hoodii, hoods phlox	3	Native
senecio integerrimus, lambstongue groundsel	1	Native
sedum lanceolatum, spearleaf stonecrop	1	Native
stenotus acaulis, stemless mock goldenweed	1	Native
trifolium gymnocarpon, hollyleaf clover	3	Native

**Plot 03SHR02.02**

zigadenus venenosus, meadow deathcamas  
arabis pendulina var. russeola, russeola rockcress

1  
1

Native  
Native

This page left blank

**Plot** 03SHR04.01

**LOCATION**

**Map:** Pine Hill

1:24,000

**Township** 25 N, **Range** W, **Section**

**Elevation (ft.):** 8,320 **Aspect (degrees):** 165 **Slope (degrees):**

**Topographic Position:** Backslope

**SUBSTRATE**

**Soil Texture:** Clay Loam

**Soil features:** Soil lies in pockets in bedrock which appears to be at or within 10 cm of surface throughout.

**DESCRIPTION**

**Photos:** 03CP1.26

**Why was plot done?** To characterize structure and composition of cushion plant vegetation.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

Plot dominated by *Pseudoroegneria spicata*. Various forbs grew in the plot including an *Apicacea*, *Erigeron* spp, *Haplopappus* sp., *Hymenoxys* sp. and *Eriogonum* sp. *Paronychia* sp. and *Arenaria hookeri* were the only cushion-plants of note. Total canopy cover 22%.

**Disturbance signs:**

Old cattle droppings present

**Notes:**

Limestone bedrock.

**Plot 03SHR04.01**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
	1. Tree	
pinus flexilis, limber pine	1	Native
	2. Shrub	
artemisia nova, black sagebrush	1	Native
	3. Subshrub	
artemisia frigida, fringed sagewort	1	Native
gutierrezia sarothrae, broom snakeweed	1	Native
	5. Graminoid	
koeleria macrantha, prairie junegrass	1	Native
leucopoa kingii, spike fescue	1	Native
poa secunda, sandberg bluegrass	1	Native
pseudoroegneria spicata, bluebunch wheatgrass	10	Native
	6. Forb	
allium textile, textile onion	1	Native
antennaria microphylla, littleleaf pussytoes	1	Native
arenaria hookeri, hooker's sandwort	1	Native
astragalus spatulatus, tufted milkvetch	1	Native
castilleja angustifolia, northwestern indian paintbrush	1	Native
campanula rotundifolia, bluebell bellflower	1	Native
cerastium arvense, field chickweed	1	Native
draba nemorosa, woodland whitlowgrass	1	Native
erigonum flavum, yellow erigonum	1	Native
lesquerella condensata, dense bladderpod	1	Native
linum lewisii, prairie flax	1	Native
mertensia humilis, rocky mountain bluebells	1	Native
musineon tenuifolium, slender wildparsley	3	Native
oxytropis sericea, silvery oxytrope	1	Native
packera cana, woolly groundsel	1	Native
paronychia sessiliflora, creeping nailwort	3	Native
phlox hoodii, hoods phlox	1	Native
potentilla hippiana, woolly cinquefoil	1	Native
polygonum sp., knotweed	1	Probably Native
selaginella densa, lesser spikemoss	1	Native
sedum lanceolatum, spearleaf stonecrop	1	Native
stenotus acaulis, stemless mock goldenweed	3	Native
taraxacum laevigatum, rock dandelion	1	Introduced
tetraneuris acaulis, stemless hymenoxys	1	Native
erigeron ochroleucus, buff fleabane	3	Native
oxytropis lagopus, haresfoot pointloco	1	Native
forb unknown (palmate leaf)	1	Probably Native

**Plot** 03SHR04.02

**LOCATION**

**Map:** Pine Hill 1:24,000  
**Towhship** 25 N, **Range** W, **Section**  
**Elevation (ft.):** 8,200 **Aspect (degrees):** 200 **Slope (degrees):** 6  
**Topographic Position:** Terrace

**SUBSTRATE**

**Soil Texture:** Silty Clay Loam  
**Soil features:**

**DESCRIPTION**

**Photos:** 03CP1.27 - G. Jones in center plot

**Why was plot done?** To illustrate grassland compared to cushion-plant stand.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

Short (10 - 15 cm), moderately dense vegetation of grasses (*Pseudoroegneria spicata*, *Poa cusickii*) with many forbs. Dwarf-shrubs (*Artemisia tripartita rupicola*) secondary. Slightly taller shrubs (mainly *Artemisia tridentata vaseyana*) are rare. 40% canopy cover.

**Disturbance signs:**

Ant hills, pocket gopher burrows, old cow pies

**Notes:**

Limestone bedrock.

**Plot 03SHR04.02**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
	1. Tree	
pinus flexilis, limber pine	1	Native
	2. Shrub	
artemisia nova, black sagebrush	3	Native
chrysothamnus viscidiflorus, yellow rabbitbrush	1	Native
tetradymia canescens, spineless horsebrush	1	Native
artemisia tridentata ssp. vaseyana, mountain big sagebrush	3	Native
artemisia tripartita ssp. rupicola, wyoming threetip sagebrush	10	Native
	3. Subshrub	
artemisia frigida, fringed sagewort	1	Native
gutierrezia sarothrae, broom snakeweed	1	Native
penstemon eriantherus, fuzzytongue penstemon	1	Native
penstemon radicosus, matroot penstemon	1	Native
	5. Graminoid	
koeleria macrantha, prairie junegrass	3	Native
poa fendleriana, muttongrass	3	Native
poa secunda, sandberg bluegrass	3	Native
pseudoroegneria spicata, bluebunch wheatgrass	10	Native
elymus lanceolatus ssp. lanceolatus, thickspike wheatgrass	3	Native
	6. Forb	
achillea millefolium, common yarrow	1	Native
agosotis glauca, pale agoseris	1	Native
allium cernuum, nodding onion	1	Native
alyssum desertorum, desert madwort	1	Introduced
antennaria microphylla, littleleaf pussytoes	3	Native
arenaria congesta, ballhead sandwort	1	Native
arnica fulgens, foothill arnica	1	Native
arabis glabra, tower rockcress	1	Native
astragalus miser, weedy milkvetch	1	Native
astragalus purshii, woollypod milkvetch	1	Native
balsamorhiza sagittata, arrowleaf balsamroot	1	Native
castilleja angustifolia, northwestern indian paintbrush	1	Native
calochortus, mariposa lily	1	Native
cerastium arvense, field chickweed	1	Native
collinsia parviflora, smallflower blue eyed mary	1	Native
comandra umbellata, bastard toadflax	1	Native
crepis modocensis, siskiyou hawksbeard	1	Native
draba nemorosa, woodland whitlowgrass	1	Native
erigeron eatonii, eaton's fleabane	1	Native
erysimum inconspicuum, shy wallflower	1	Native
halimolobos virgata, rod halimolobos	1	Native
linum lewisii, prairie flax	1	Native
lomatum orientale, northern idaho biscuitroot	1	Native

**Plot 03SHR04.02**

lupinus argenteus, silvery lupine	1	Native
mertensia humilis, rocky mountain bluebells	1	Native
oxytropis sericea, silvery oxytrope	1	Native
packera cana, woolly groundsel	1	Native
phlox hoodii, hoods phlox	1	Native
senecio integerrimus, lambstongue groundsel	1	Native
sedum lanceolatum, spearleaf stonecrop	1	Native
stenotus acaulis, stemless mock goldenweed	1	Native
taraxacum laevigatum, rock dandelion	1	Introduced
trifolium gymnocarpon, hollyleaf clover	1	Native
zigadenus venenosus, meadow deathcamas	1	Native
oxytropis besseyi, bessey's locoweed	1	Native
arabis pendulina var. russeola, russeola rockcress	1	Native
forb unknown (het vel?)	1	Probably Native
forb unknown (forb ciliate leaf)	1	Probably Native

This page left blank

**Plot 03SHRM01.01**

**LOCATION**

**Map:** Mud Springs 1:24,000  
**Township** 28 N, **Range** W, **Section**  
**Elevation (ft.):** 7,280 **Aspect (degrees):** 170 **Slope (degrees):** 6  
**Topographic Position:** Shoulder

**SUBSTRATE**

**Soil Texture:** Sandy Clay Loam  
**Soil features:** Gravel > 50% of volume in upper 10 cm.

**DESCRIPTION**

**Photos:**

**Why was plot done?** To characterize structure and composition of cushion plant vegetation.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

Short (15 cm), sparse vegetation of forbs (Phlox muscoides, Eriogonum sp., Cymopterus sp. (?)) on gravelly bench. 10% canopy cover.

**Disturbance signs:**

None recorded

**Notes:**

Siltstone or limestone bedrock -- White River Formation, tuffaceous white member.

**Plot 03SHRM01.01**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub tetradymia canescens, spineless horsebrush	1	Native
3. Subshrub astragalus kentrophyta, spiny milkvetch	1	Native
5. Graminoid pseudoroegneria spicata, bluebunch wheatgrass	1	Native
6. Forb		
astragalus australis, indian milkvetch	1	Native
cryptantha celosioides, buttecandle	1	Native
erigonum ovalifolium, cushion buckwheat	1	Native
lupinus argenteus, silvery lupine	1	Native
musineon tenuifolium, slender wildparsley	1	Native
packera cana, woolly groundsel	1	Native
phlox muscoides, musk phlox	3	Native
taraxacum laevigatum, rock dandelion	1	Introduced
tetraneuris torreyana, torrey's hymenoxys	3	Native
oxytropis besseyi, bessey's locoweed	1	Native
cirsium aridum,	1	Native
physaria condensata, tufted twinpod	1	Native
forb unknown (forb tooth green)	1	Probably Native

**Plot** 03SHRM01.02

#### LOCATION

**Map:** Mud Springs 1:24,000  
**Towship** 28 N, **Range** W, **Section**  
**Elevation (ft.):** 7,285 **Aspect (degrees):** 155 **Slope (degrees):** 6  
**Topographic Position:** Shoulder

#### SUBSTRATE

**Soil Texture:** Sandy Clay  
**Soil features:** No gravel. Siltstone/ limestone - white, tuffaceous member of White River Formation.

#### DESCRIPTION

**Photos:** 03CP1.02 - C. Cooper Cooper in plot.

**Why was plot done?** To allow comparison of matrix vegetation with nearby cushion plant stands

**Uncertainty on measurements:** Difficult to distinguish between different grasses and different Fabaceae.

#### Completeness of Species lists:

##### Describe vegetation:

Plot dominated by several graminoids - *Leucopa kingii*, *Carex* sp., *Poa secunda*, and possibly both *Pseudoroegneria spicata* and *Elymus lanceolatus* ssp. *lanceolatus*. *Astragalus* sp. and *Oxytropis* sp. were most common forbs. Horsebrush and a small amount of green rabbitbrush and Douglas rabbitbrush were also found. 33% canopy cover.

##### Disturbance signs:

None recorded

##### Notes:

~ 70 m back from excarpment and 20 m from 03SHRM01.01

**Plot 03SHRM01.02**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
chrysothamnus viscidiflorus, yellow rabbitbrush	1	Native
ericameria nauseosa, rubber rabbitbrush	1	Native
tetradymia canescens, spineless horsebrush	3	Native
3. Subshrub		
gutierrezia sarothrae, broom snakeweed	1	Native
5. Graminoid		
carex duriuscula, needleleaf sedge	1	Native
leucopoa kingii, spike fescue	10	Native
poa secunda, sandberg bluegrass	1	Native
elymus lanceolatus ssp. lanceolatus, thickspike wheatgrass	20	Native
6. Forb		
allium textile, textile onion	1	Native
astragalus miser, weedy milkvetch	3	Native
erigonum flavum, yellow erigonum	1	Native
lesquerella ludoviciana, foothill bladderpod	1	Native
linum lewisii, prairie flax	1	Native
machaeranthera grindelioides, rayless aster	1	Native
mertensia humilis, rocky mountain bluebells	3	Native
musineon divaricatum, leafy wildparsley	1	Native
packera cana, woolly groundsel	1	Native
penstemon fremontii, fremont's beardtongue	1	Native
phlox hoodii, hoods phlox	3	Native
taraxacum laevigatum, rock dandelion	1	Introduced
vicia americana, american vetch	1	Native
viola nuttallii, nuttall's violet	1	Native
zigadenus venenosus, meadow deathcamas	1	Native
astragalus simplicifolius, little bun milkvetch	1	Native
cirsium aridum,	1	Native
townsendia nuttallii, nuttall's townsend daisy	1	Native
forb unknown (woody stem)	1	Native

**Plot 03SHRM02.01**

**LOCATION**

**Map:** Mud Springs 1:24,000  
**Towship** 28 N, **Range** W, **Section**  
**Elevation (ft.):** 7,723 **Aspect (degrees):** 184 **Slope (degrees):** 2  
**Topographic Position:** Step in Slope

**SUBSTRATE**

**Soil Texture:** Sandy Clay  
**Soil features:** Gravel 5% vol. of upper 10 cm.

**DESCRIPTION**

**Photos:** 03CP1.05

**Why was plot done?** To characterize structure and composition of cushion plant vegetation.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

Plot dominated by cushion plants - Phlox muscoides and Arenaria hookeri. Other small forbs and grass (Pseudoroegneria spicata) present throughout the plot. Approx. 15% cover.

**Disturbance signs:**

Cow pies, drill hole (uranium) plug.

**Notes:**

Limestone, white tuffaceous member of White River Formation.

**Plot 03SHRM02.01**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
artemisia tripartita ssp. rupicola, wyoming threetip sagebrush	1	Native
3. Subshrub		
artemisia frigida, fringed sagewort	3	Native
gutierrezia sarothrae, broom snakeweed	3	Native
penstemon eriantherus, fuzzytongue penstemon	1	Native
5. Graminoid		
pseudoroegneria spicata, bluebunch wheatgrass	3	Native
6. Forb		
arenaria hookeri, hooker's sandwort	10	Native
astragalus spatulatus, tufted milkvetch	1	Native
erigeron compositus, cutleaf daisy	1	Native
erigonum flavum, yellow erigonum	1	Native
lesquerella ludoviciana, foothill bladderpod	1	Native
linum lewisii, prairie flax	3	Native
lomatium foeniculaceum, desert biscuitroot	1	Native
lomatium nuttallii, nuttall's biscuitroot	1	Native
machaeranthera grindelioides, rayless aster	1	Native
mertensia humilis, rocky mountain bluebells	1	Native
phlox muscoides, musk phlox	3	Native
potentilla concinna, elegant cinquefoil	1	Native
stenotus acaulis, stemless mock goldenweed	1	Native
taraxacum laevigatum, rock dandelion	1	Introduced
tetraneuris torreyana, torrey's hymenoxys	1	Native
oxytropis besseyi, bessey's locoweed	1	Native
cirsium aridum,	1	Native
erigeron ochroleucus, buff fleabane	1	Native
townsendia nuttallii, nuttall's townsend daisy	1	Native
forb unknown (green once comp.)	1	Probably Native

**Plot** 03SHRM02.02

**LOCATION**

**Map:** Mud Springs 1:100,000  
**Towship** 28 N, **Range** W, **Section**  
**Elevation (ft.):** 7,220 **Aspect (degrees):** 10 **Slope (degrees):** 4  
**Topographic Position:** Interfluve

**SUBSTRATE**

**Soil Texture:** Silty Clay Loam  
**Soil features:**

**DESCRIPTION**

**Photos:**

**Why was plot done?** To characteriz matrix sage -grass vegetation back from rim where cushion-plant stands grow.

**Uncertainty on measurements:**

**Completeness of Species lists:**

**Describe vegetation:**

Short (to 20 cm), rather sparse vegetation of graminoids (*Koeleria macrantha*, *Elymus* sp.) and forbs (*Phlox hoodii*) with scattered dwarf shrubs. 30% canopy cover.

**Disturbance signs:**

None recorded

**Notes:**

Siltstone, limestone

**Plot 03SHRM02.02**

<u>Species</u>	<u>Canopy Cover</u>	<u>Origin</u>
2. Shrub		
chrysothamnus viscidiflorus, yellow rabbitbrush	1	Native
artemisia tridentata ssp. wyomingensis, wyoming big sagebrush	10	Native
3. Subshrub		
artemisia frigida, fringed sagewort	1	Native
artemisia pedatifida, birdfoot sagebrush	3	Native
atriplex gardneri, gardner's saltbush	1	Native
gutierrezia sarothrae, broom snakeweed	1	Native
5. Graminoid		
carex filifolia, threadleaf sedge	3	Native
hesperostipa comata, needle and thread	1	Native
koeleria macrantha, prairie junegrass	3	Native
poa secunda, sandberg bluegrass	1	Native
elymus lanceolatus ssp. lanceolatus, thickspike wheatgrass	3	Native
6. Forb		
allium textile, textile onion	1	Native
antennaria dimorpha, low pussytoes	1	Native
arenaria hookeri, hooker's sandwort	1	Native
astragalus miser, weedy milkvetch	3	Native
astragalus spatulatus, tufted milkvetch	1	Native
crepis modocensis, siskiyou hawksbeard	1	Native
erigeron eatonii, eaton's fleabane	1	Native
erigeron nematophyllus, needleleaf fleabane	1	Native
lesquerella ludoviciana, foothill bladderpod	1	Native
lomatium foeniculaceum, desert biscuitroot	1	Native
machaeranthera grindelioides, rayless aster	1	Native
mertensia humilis, rocky mountain bluebells	1	Native
musineon divaricatum, leafy wildparsley	1	Native
oxytropis sp., crazyweed	1	Native
phlox hoodii, hoods phlox	3	Native
sedum lanceolatum, spearleaf stonecrop	1	Native
stenotus armerioides, thrift mock goldenweed	1	Native
erigeron ochroleucus, buff fleabane	1	Native
townsendia nuttallii, nuttall's townsend daisy	1	Native