

Upper Shields Allotments
Soils Analysis
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May 2, 2006

Ecological Context

For a spatial depiction of the ecological context of the three allotments, please see the map UShieldsEcoContextv11_85x11.mxd, titled "Upper Shields Allotments Ecological Units vs 1.1". Following is a written summary for each allotment. These summaries come from the tables following the text.

Methods

The Gallatin Forest Soil Survey (Davis and Shovic, 1996), general field experience in the area, and two field trips were used to make these interpretations. The discussion below is based on the tables at the end of this document and these field trips.

Description of Area

The total area of the Upper Shields analysis area is 23,631 acres. This is broken into five allotments. Individual allotment area may vary from other estimates because of inclusions of private land and variation in measurement methods. The term "steeply sloping" or "steep" means slopes average over 40%. The map unit 86-3B is described in the lower elevation of its range.

Bennett Creek Allotment

The analyzed area is about 1,600 acres. Soils have formed in material weathered from sedimentary sandstones and shales (57% of the area), or in moderately-coarse textured glacial till. The sandstone/shale soils are moderately productive, and support transitional grassland/Douglas fir vegetation types, with low potential forage production. Up to 10% of these areas is meadow and grassland which provides most of the range production in the allotment. Forest understory production is low. The area has 74 acres (5%) of forested alluvial bottom land. True grasslands make up very little of the area.

Steep rocky ground is 17%. Forested land makes up the remainder (21%), with glacial soils having low productivity that support lodgepole pine. Soils are compactible when wet on all grassland/Douglas fir areas, but there are few perennial wet areas in the allotment. Forested lands have little potential for transitional range.

Meadow Creek Allotment

The analyzed area is about 1,374 acres in size. Soils have formed in material weathered from sedimentary sandstones and shales (38% of the area), or in moderately-coarse textured material weathered from granite and other coarse-grained igneous rocks. The

sandstone/shale soils are moderately productive, and support grassland or transitional grassland/Douglas fir vegetation types, with a potential production of 730 lbs/ac/yr. True grasslands make up only a small of the area, but are supplemented by open, transitional areas to make up 54% of the allotment.

Soils are compactible when wet on all rolling grassland/Douglas fir areas (39% of the allotment), but there are few perennial wet areas in the allotment. Forested lands on rolling slopes (33%) have potential for transitional range.

Shields Allotment

The analyzed area is about 11,045 acres in size. Soils have formed in material weathered from sedimentary sandstones and shales or in moderately-coarse textured glacial till and coarse material weathered from granite and other coarse-grained igneous rocks. The sandstone/shale soils (32% of the area) are moderately productive, and support transitional grassland/Douglas fir vegetation types, with low production of forage. Up to 10% of these areas is meadow and grassland which provides most of the range production in the allotment. Forest understory production is low. The area has 594 acres (5%) of forested alluvial bottom land. True grasslands make up very little of the area.

Heavily forested land having moderately-coarse textured soils makes up the remainder (51%). Of this, most is steep (41%).

Soils are compactible when wet on all grassland/Douglas fir areas, but there are few perennial wet areas in the allotment. Forested lands have little potential for transitional range.

Smith Creek Allotment

The analyzed area is about 7,586 acres in size. Soils have formed in material weathered from sedimentary sandstones and shales or in moderately-coarse textured glacial till and coarse material weathered from granite and other coarse-grained igneous rocks. The sandstone/shale soils (77% of the area) are moderately productive, and support transitional grassland/Douglas fir vegetation types, with moderate production of forage (600 to 1,111 lbs/ac/yr), but are steeply sloping in over 1/2 of that. The area has 203 acres (3%) of forested alluvial bottom land. True grasslands make up 15% of the area, but are almost all steeply-sloping.

Heavily forested or rocky land having moderately-coarse textured soils makes up the remainder (15%). Of this, most is steeply sloping.

Soils are compactible when wet on all grassland/Douglas fir areas, but there are few perennial wet areas in the allotment. Forested land has potential for transitional range in 19% of the area.

Three Peaks Allotment

The analyzed area is about 2,023 acres in size. Soils have formed in material weathered from sedimentary sandstones and shales or in moderately-coarse textured glacial till and coarse material weathered from granite and other coarse-grained igneous rocks. The sandstone/shale soils (64% of the area) are moderately productive, and support transitional grassland/Douglas fir vegetation types, with low production of forage. The area has 125 acres (6%) of forested and riparian alluvial bottom land. True grasslands make up very little of the area.

Heavily forested or rocky land having steep slopes and moderately-coarse textured soils makes up the remainder (18%).

Soils are compactible when wet on all grassland/Douglas fir areas, but there are few perennial wet areas in the allotment. Forested land has potential for transitional range in 20% of the area, but most of this is steeply sloping.

Soil Issues:

None of these allotments have a high potential for grazing. They are generally composed of forested vegetation types with most grazing occurring in included meadows and small grassland pockets. Most of the larger existing grasslands are on steep slopes. Soils are compactible when wet, so seasonal restrictions are recommended. The Smith, Three Peaks, and Meadow Creek allotments could be improved by removing the forest canopy in places, creating a higher, but temporary understory productivity.

Bennett Creek Allotment

Productivity: Grassland and transitional Douglas fir/grassland areas have low forage productivity but have some grassy meadows. They appear suitable for grazing, but production is limited.

Soil erosion and compaction: This allotment has little potential for soil erosion. However, there is some potential for soil compaction if wet. Few wet areas occur outside of riparian zones. Cattle should be restricted from accessing this area until soils are dry (generally after June 15.)

Meadow Creek Allotment

Productivity: Grassland and transitional Douglas fir/grassland areas have a moderate forage productivity (estimated at 730 lbs/ac/year.) They appear suitable for grazing, but production is limited. Production could be increased by removing some forest vegetation encroachment in habitat types appropriate for this (see the enclosed map).

Soil Erosion and Compaction: This allotment has little potential for soil erosion. However, there is some potential for soil compaction if wet. Few wet areas occur outside of riparian zones. Cattle should be restricted from accessing this area until soils are dry (generally after June 15.)

Shields Allotment

Productivity: Grassland and transitional Douglas fir/grassland areas have low forage productivity but have some grassy meadows. They appear suitable for grazing, but production is limited.

Soil erosion and compaction: This allotment has little potential for soil erosion. However, there is some potential for soil compaction if wet. Few wet areas occur outside of riparian zones. Cattle should be restricted from accessing this area until soils are dry (generally after June 15.)

Smith Creek Allotment

Productivity: Grassland and transitional Douglas fir/grassland areas have a moderate forage productivity (estimated at 600 to 1,111 lbs/ac/year.) They appear suitable for grazing. Production could be increased by removing some forest vegetation encroachment in habitat types appropriate for this (see the enclosed map).

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| Allotment | SOIL | Acres | Soil Characteristics | ELU | ELU Description | SOILS |
|----------------------|-------|-------|---------------------------|------|--|--|
| Bennett Creek | 34-1C | 289 | Moderately coarse texture | SAR | Subalpine fir/lodgepole pine, rolling | CONSOCIATION OF TYPIC CRYOCHREPTS, LOAMY SKELETAL, MIXED |
| | 35-1B | 124 | Moderately coarse texture | DFTR | Douglas fir transitional to grassland, rolling | COMPLEX OF ARGIC CRYOBOROLLS, LOAMY SKELETAL, MIXED AND ARGIC PACHIC CRYOBOROLLS, LOAMY SKELETAL, MIXED |
| | 35-1C | 46 | Moderately coarse texture | SAS | Subalpine fir/lodgepole pine, steep | CONSOCIATION OF TYPIC CRYOCHREPTS, LOAMY SKELETAL, MIXED |
| | 46-2A | 2 | Moderately coarse texture | GRSR | Grassland, rolling | UNDIFFERENTIATED GROUP OF TYPIC ARGIBOROLLS, LOAMY SKELETAL, MIXED AND ARIDIC ARGIBOROLLS, LOAMY SKELETAL, MIXED |
| | 54-1G | 274 | Moderately coarse texture | SAS | Subalpine fir/lodgepole pine, steep | COMPLEX OF TYPIC CRYOCHREPTS, LOAMY SKELETAL, MIXED AND ROCK OUTCROP |
| | 64-2C | 74 | Medium to fine texture | SAR | Subalpine fir/lodgepole pine, rolling | UNDIFFERENTIATED GROUP OF CRYOBORALFS AND CRYOBOROLLS |
| | 86-3B | 794 | Moderately fine texture | DFTR | Douglas fir transitional to grassland, rolling | COMPLEX OF TYPIC CRYOBORALFS, FINE LOAMY, MIXED AND MOLLIC CRYOBORALFS, FINE LOAMY, MIXED |
| Total Bennett Creek | | 1,602 | | | | |
| Meadow Creek | 12-1A | 111 | Moderately coarse texture | WBPR | White bark pine, rolling | CONSOCIATION OF DYSTRIC CRYOCHREPTS, LOAMY SKELETAL, MIXED |

| | | | | | | |
|--------------------|-------|-------|---------------------------|------|--|---|
| | 13-1A | 59 | Moderately fine texture | ATFR | Alpine turf and meadow, rolling | COMPLEX OF DYSTRIC CRYOCHREPTS, SANDY SKELETAL, MIXED AND ROCK OUTCROP |
| | 54-1B | 209 | Moderately coarse texture | GRSS | Grassland, steep | COMPLEX OF ROCK OUTCROP; TYPIC CRYOCHREPTS, LOAMY SKELETAL, MIXED; AND TYPIC CRYOBOROLLS, LOAMY SKELETAL, MIXED |
| | 54-1G | 18 | Moderately coarse texture | SAS | Subalpine fir/lodgepole pine, steep | COMPLEX OF TYPIC CRYOCHREPTS, LOAMY SKELETAL, MIXED AND ROCK OUTCROP |
| | 71-2D | 462 | Moderately fine texture | DFTR | Douglas fir transitional to grassland, rolling | COMPLEX OF ARGIC CRYOBOROLLS AND MOLLIC CRYOBORALFS |
| | 85-3B | 446 | Medium texture | DFTS | Douglas fir transitional to grassland, steep | COMPLEX OF MOLLIC CRYOBORALFS, LOAMY SKELETAL, MIXED, AND ARGIC CRYOBOROLLS, LOAMY SKELETAL, MIXED |
| | 86-3C | 69 | Moderately fine texture | GRSR | Grassland, rolling | ASSOCIATION OF ARGIC CRYOBOROLLS, FINE LOAMY, MIXED AND TYPIC CRYOBOROLLS, LOAMY SKELETAL, MIXED |
| Total Meadow Creek | | 1,374 | | | | |
| Shields | 12-1A | 43 | Moderately coarse texture | WBPR | White bark pine, rolling | CONSOCIATION OF DYSTRIC CRYOCHREPTS, LOAMY SKELETAL, MIXED |
| | 13-1A | 150 | Moderately fine texture | ATFR | Alpine turf and meadow, rolling | COMPLEX OF DYSTRIC CRYOCHREPTS, SANDY SKELETAL, MIXED AND ROCK OUTCROP |
| | 34-1C | 1,085 | Moderately coarse texture | SAR | Subalpine fir/lodgepole pine, rolling | CONSOCIATION OF TYPIC CRYOCHREPTS, LOAMY SKELETAL, MIXED |

| | | | | | | |
|--------------------|-------|--------|---------------------------|------|--|--|
| | 35-1B | 44 | Moderately coarse texture | DFTR | Douglas fir transitional to grassland, rolling | COMPLEX OF ARGIC CRYOBOROLLS, LOAMY SKELETAL, MIXED AND ARGIC PACHIC CRYOBOROLLS, LOAMY SKELETAL, MIXED |
| | 35-1C | 421 | Moderately coarse texture | SAS | Subalpine fir/lodgepole pine, steep | CONSOCIATION OF TYPIC CRYOCHREPTS, LOAMY SKELETAL, MIXED |
| | 46-2A | 60 | Moderately coarse texture | GRSR | Grassland, rolling | UNDIFFERENTIATED GROUP OF TYPIC ARGIBOROLLS, LOAMY SKELETAL, MIXED AND ARIDIC ARGIBOROLLS, LOAMY SKELETAL, MIXED |
| | 54-1E | 2,776 | Medium texture | WBPS | White bark pine, steep | COMPLEX OF DYSTRIC CRYOCHREPTS, LOAMY SKELETAL, MIXED AND ROCK OUTCROP |
| | 54-1G | 1,751 | Moderately coarse texture | SAS | Subalpine fir/lodgepole pine, steep | COMPLEX OF TYPIC CRYOCHREPTS, LOAMY SKELETAL, MIXED AND ROCK OUTCROP |
| | 64-2C | 594 | Medium to fine texture | SAR | Subalpine fir/lodgepole pine, rolling | UNDIFFERENTIATED GROUP OF CRYOBORALFS AND CRYOBOROLLS |
| | 71-2A | 30 | Moderately fine texture | SAR | Subalpine fir/lodgepole pine, rolling | COMPLEX OF CRYOBORALFS |
| | 86-3B | 3,511 | Moderately fine texture | DFTR | Douglas fir transitional to grassland, rolling | COMPLEX OF TYPIC CRYOBORALFS, FINE LOAMY, MIXED AND MOLLIC CRYOBORALFS, FINE LOAMY, MIXED |
| | 93-1A | 580 | Coarse texture, bedrock | BAS | Rocky open slopes, steep | RUBBLE LAND |
| Total Shields | | 11,045 | | | | |
| Smith Creek | 12-1A | 14 | Moderately coarse texture | WBPR | White bark pine, rolling | CONSOCIATION OF DYSTRIC CRYOCHREPTS, LOAMY SKELETAL, MIXED |

| | | | | | | |
|--|-------|-----|---------------------------|------|--|---|
| | 13-1A | 76 | Moderately fine texture | ATFR | Alpine turf and meadow, rolling | COMPLEX OF DYSTRIC CRYOCHREPTS, SANDY SKELETAL, MIXED AND ROCK OUTCROP |
| | 25-3A | 33 | Medium texture | ATFR | Alpine turf and meadow, rolling | COMPLEX OF CRYOBOROLLS, CRYOBORALFS, AND ROCK OUTCROP |
| | 53-1A | 8 | Moderately coarse texture | DFTR | Douglas fir transitional to grassland, rolling | ASSOCIATION OF TYPIC CRYOBOROLLS, LOAMY SKELETAL, MIXED; ARGIC CRYOBOROLLS, LOAMY SKELETAL, MIXED; AND ROCK OUTCROP |
| | 54-1E | 842 | Medium texture | WBPS | White bark pine, steep | COMPLEX OF DYSTRIC CRYOCHREPTS, LOAMY SKELETAL, MIXED AND ROCK OUTCROP |
| | 54-1G | 190 | Moderately coarse texture | SAS | Subalpine fir/lodgepole pine, steep | COMPLEX OF TYPIC CRYOCHREPTS, LOAMY SKELETAL, MIXED AND ROCK OUTCROP |
| | 64-2A | 34 | Medium to fine texture | DFTR | Douglas fir transitional to grassland, rolling | UNDIFFERENTIATED GROUP OF CRYOBOROLLS |
| | 64-2C | 203 | Medium to fine texture | SAR | Subalpine fir/lodgepole pine, rolling | UNDIFFERENTIATED GROUP OF CRYOBORALFS AND CRYOBOROLLS |
| | 71-2B | 223 | Moderately fine texture | SAR | Subalpine fir/lodgepole pine, rolling | COMPLEX OF CRYOBORALFS |
| | 71-2D | 20 | Moderately fine texture | DFTR | Douglas fir transitional to grassland, rolling | COMPLEX OF ARGIC CRYOBOROLLS AND MOLLIC CRYOBORALFS |
| | 85-3A | 844 | Medium texture | DFTS | Douglas fir transitional to grassland, steep | COMPLEX OF MOLLIC CRYOBORALFS, LOAMY SKELETAL, MIXED; ARGIC CRYOBOROLLS, LOAMY SKELETAL, MIXED; AND ROCK OUTCROP |

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|-------------------|-------|-------|-------------------------|------|--|---|
| | 85-3B | 1,236 | Medium texture | DFTS | Douglas fir transitional to grassland, steep | COMPLEX OF MOLLIC CRYOBORALFS, LOAMY SKELETAL, MIXED, AND ARGIC CRYOBOROLLS, LOAMY SKELETAL, MIXED |
| | 86-2A | 159 | Moderately fine texture | SAR | Subalpine fir/lodgepole pine, rolling | ASSOCIATION OF TYPIC CRYOBORALFS, FINE LOAMY, MIXED; AND ARGIC CRYOBOROLLS, FINE LOAMY, MIXED |
| | 86-2C | 127 | Moderately fine texture | GRSR | Grassland, rolling | CONSOCIATION OF ARGIC CRYOBOROLLS, FINE LOAMY, MIXED |
| | 86-2D | 827 | Moderately fine texture | SAR | Subalpine fir/lodgepole pine, rolling | COMPLEX OF TYPIC CRYOBORALFS, FINE LOAMY, MIXED; AND MOLLIC CRYOBORALFS, LOAMY SKELETAL, MIXED |
| | 86-3B | 1,442 | Moderately fine texture | DFTR | Douglas fir transitional to grassland, rolling | COMPLEX OF TYPIC CRYOBORALFS, FINE LOAMY, MIXED AND MOLLIC CRYOBORALFS, FINE LOAMY, MIXED |
| | 86-3C | 80 | Moderately fine texture | GRSR | Grassland, rolling | ASSOCIATION OF ARGIC CRYOBOROLLS, FINE LOAMY, MIXED AND TYPIC CRYOBOROLLS, LOAMY SKELETAL, MIXED |
| | 87-2B | 320 | Moderately fine texture | SAS | Subalpine fir/lodgepole pine, steep | COMPLEX OF TYPIC CRYOBORALFS, FINE LOAMY, MIXED; TYPIC CRYOCHREPTS, LOAMY SKELETAL, MIXED; AND ROCK OUTCROP |
| | 87-2C | 885 | Moderately fine texture | GRSS | Grassland, steep | COMPLEX OF ARGIC CRYOBOROLLS, FINE LOAMY, MIXED AND ARGIC CRYOBOROLLS, LOAMY SKELETAL, MIXED |
| | 93-1A | 23 | Coarse texture, bedrock | BAS | Rocky open slopes, steep | RUBBLE LAND |
| Total Smith Creek | | 7,586 | | | | |

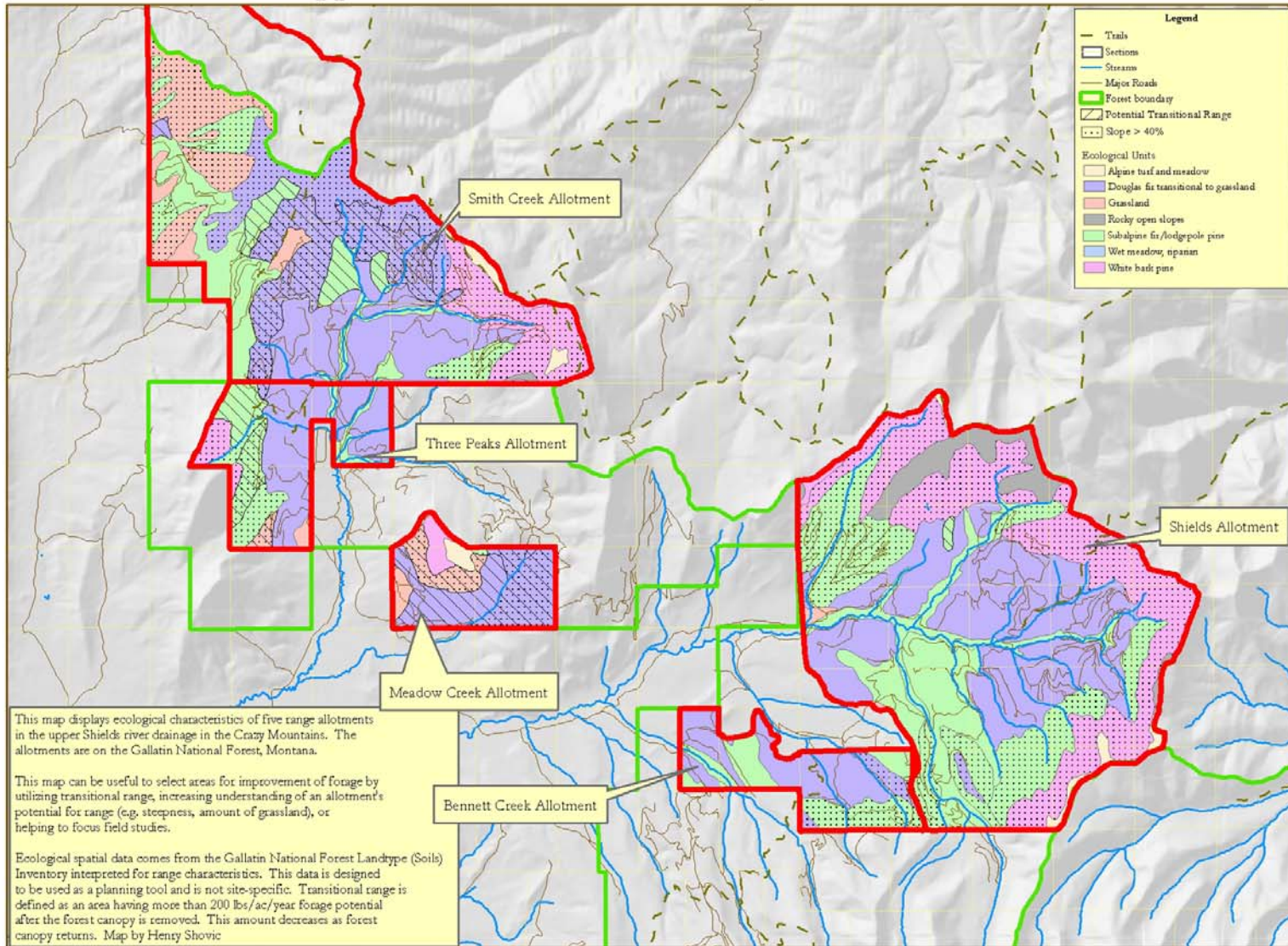
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|-------------|-------|-----|---------------------------|------|--|---|
| Three Peaks | 54-1B | 50 | Moderately coarse texture | GRSS | Grassland, steep | COMPLEX OF ROCK OUTCROP; TYPIC CRYOCHREPTS, LOAMY SKELETAL, MIXED; AND TYPIC CRYOBOROLLS, LOAMY SKELETAL, MIXED |
| | 54-1C | 183 | Moderately coarse texture | SAS | Subalpine fir/lodgepole pine, steep | COMPLEX OF TYPIC CRYOCHREPTS, LOAMY SKELETAL, MIXED AND ROCK OUTCROP |
| | 54-1E | 149 | Medium texture | WBPS | White bark pine, steep | COMPLEX OF DYSTRIC CRYOCHREPTS, LOAMY SKELETAL, MIXED AND ROCK OUTCROP |
| | 54-1G | 216 | Moderately coarse texture | SAS | Subalpine fir/lodgepole pine, steep | COMPLEX OF TYPIC CRYOCHREPTS, LOAMY SKELETAL, MIXED AND ROCK OUTCROP |
| | 64-2C | 124 | Medium to fine texture | SAR | Subalpine fir/lodgepole pine, rolling | UNDIFFERENTIATED GROUP OF CRYOBORALFS AND CRYOBOROLLS |
| | 66-1A | 1 | Medium to fine texture | WMRP | Wet meadow, riparian | UNDIFFERENTIATED GROUP OF CRYAQUOLLS AND CRYAQUENTS |
| | 71-2B | 187 | Moderately fine texture | SAR | Subalpine fir/lodgepole pine, rolling | COMPLEX OF CRYOBORALFS |
| | 71-2D | 1 | Moderately fine texture | DFTR | Douglas fir transitional to grassland, rolling | COMPLEX OF ARGIC CRYOBOROLLS AND MOLLIC CRYOBORALFS |
| | 85-3B | 16 | Medium texture | DFTS | Douglas fir transitional to grassland, steep | COMPLEX OF MOLLIC CRYOBORALFS, LOAMY SKELETAL, MIXED, AND ARGIC CRYOBOROLLS, LOAMY SKELETAL, MIXED |
| | 86-2D | 1 | Moderately fine texture | SAR | Subalpine fir/lodgepole pine, rolling | COMPLEX OF TYPIC CRYOBORALFS, FINE LOAMY, MIXED; AND MOLLIC CRYOBORALFS, LOAMY SKELETAL, MIXED |

| | | | | | | |
|--|-------|-------|-------------------------|------|--|---|
| | 86-3B | 1,050 | Moderately fine texture | DFTR | Douglas fir transitional to grassland, rolling | COMPLEX OF TYPIC CRYOBORALFS, FINE LOAMY, MIXED AND MOLLIC CRYOBORALFS, FINE LOAMY, MIXED |
| | 86-3C | 45 | Moderately fine texture | GRSR | Grassland, rolling | ASSOCIATION OF ARGIC CRYOBOROLLS, FINE LOAMY, MIXED AND TYPIC CRYOBOROLLS, LOAMY SKELETAL, MIXED |
| | 87-2B | 0 | Moderately fine texture | SAS | Subalpine fir/lodgepole pine, steep | COMPLEX OF TYPIC CRYOBORALFS, FINE LOAMY, MIXED; TYPIC CRYOCHREPTS, LOAMY SKELETAL, MIXED; AND ROCK OUTCROP |

Total Three Peaks 2,023

Total All Allotments 23,631

Upper Shields Allotments Ecological Units vs 1.1



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