Classification and Inventory of Low-elevation Shrub-steppe and Grassland Vegetation on Boise National Forest

INTERIM REPORT

Steven K. Rust

March 2003

Idaho Conservation Data Center
Department of Fish and Game
600 South Walnut, P.O. Box 25
Boise, Idaho 83707

Steven M. Huffaker, Director

Prepared for:
USDA Forest Service
Boise National Forest
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Introduction

Upland non-forest vegetation within the Boise and Salmon River mountains of west-central and southwestern Idaho has received relatively little systematic inventory and classification attention. Classification studies which have occurred within the region include Mueggler and Harris (1969) and Roberts (1971). A number of other vegetation and community classification studies are potentially applicable to shrubland and grassland vegetation within the mountains of central Idaho (e.g., Hironaka et al. 1983; Tisdale 1986; Johnson and Simon 1987; Rust et al. 2000). These studies, however, are limited in terms of their geographic relevance. The similarity of shrub-steppe and grassland vegetation, for example, of the Snake River Plain or Hells Canyon to the mountains of central Idaho has not been investigated. These shrubland and grassland plant communities represent important plant and animal species habitats, provide basic natural resource commodities, and constitute important components of biological diversity. A systematic classification of shrub-steppe and grassland vegetation is needed to assist management. A classification of natural shrub-steppe and grassland vegetation within the mountains of central Idaho will provide consistent information on composition and structure of this vegetation; provide a basis for understanding the influence of fire, grazing, and exotic species introductions in this vegetation; developing plans for restoration of degraded sites; and provide a basis for assessing potential for key species habitats.

Nearly 25 percent of Boise National Forest is upland non-forested potential natural vegetation (Boise, Payette, and Sawtooth National Forests 2000). The objective of this study is to document the composition, structure, and ecological condition of upland perennial grass- and shrub-dominated plant associations that occur at, or below, lower-treeline on Boise National Forest and assess the habitat potential of these communities for key rare plant species. An additional objective is to provide management and conservation recommendations for grassland and shrubland plant associations on the Forest. This is a two year study. The objective of this interim report is to summarize work completed in the first year - to provide a summary of methods and list sites sampled, plant associations encountered, and vascular plant species observed.

Methods

The study area consists of low-elevation non-forest habitats on Boise National Forest. Plant community classification and inventory study sites were identified through environmental stratification and expert opinion processes. Areas of non-forest vegetation were selected using Idaho GAP Program vegetation coverage (Landscape Dynamics Lab 1999). A subsequent stratification of areas of non-forest vegetation based on major lithology (Bond and Wood 1978), elevation, and watershed was completed (Figure 1). Areas of non-forest vegetation that occur at less than 5900 feet elevation were selected for study. From these results twenty potential study sites were identified using the following criteria: (1) representation of the range of strata, (2) the number of strata present, and (3) on proximity to road accessibility (Figure 2). The suitability of these sites was verified or alternative sites were identified through discussion with Boise National Forest staff.

Vegetation data were collected on 0.1 acre fixed-area plots using standard plant community ecology methods (Bourgeron et al. 1992; USDA Forest Service 1992). Plots were located to represent the range in composition and structure observed within each survey site. The location plots was recorded in the field using navigation grade geographical positioning system (GPS) units (e.g., Garmin 12XL) and by hand on 1:24,000 USGS quadrangles. Data cards and data dictionaries for field sampling methods are available upon request.

A list of sensitive plant species that may occur within the study area was compiled based an initial broad assessment of the habitats and the geographic range of known populations (Idaho Conservation Data Center 2003). Existing plant community ecology data were evaluated for incorporation within the study.
Results and Discussion

Thirty-one sensitive plant species were identified as potentially occurring within low-elevation shrub-steppe and grassland habitats on Boise National Forest (Table 1). Habitat associations and the phenology of these species is summarized by Lind (2000) and others.

Plant community composition data from seven sites were collected during the 2002 field season or acquired from other sources (Miller and Rust 2002; Rust 1995a; Rust 1995b) (Table 2). The data represent eleven plant associations and seven series in which associations will be developed through additional analysis.

The vascular plant species observed on ecology plots within the study area are listed in Table 3. One-hundred, seventy-six species were observed. No sensitive plant species were encountered.
Literature Cited


Landscape Dynamics Lab. 1999. GRID IDVEG -- Idaho Land Cover. Idaho Cooperative Fish and Wildlife Research Unit, Moscow.


Figures

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**Figure 1.** Summary of study site selection.

**Figure 2.** Location of shrub-steppe and grassland vegetation study sites.
Figure 1. Summary of study site selection. Spatial data layers employed in the selection and stratification of areas of non-forest vegetation are shown (clockwise: non-forest vegetation, watershed (sixth hydrological unit code), major lithology, and elevation class). Class values for vegetation, watershed, and elevation class are listed in the accompanying table. Vegetation coverage taken from Landscape Dynamics Lab (1999). Major lithology adapted from Bond and Wood (1978).
Figure 1 (continued). Summary of codes. Data values for vegetation, watershed, and elevation coverages are listed. The vegetation coverage is from Landscape Dynamics Lab (1999).

<table>
<thead>
<tr>
<th>Data Layer</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
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<td>Foothill Grassland</td>
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<td>3106</td>
<td>Herbaceous Burn</td>
</tr>
<tr>
<td></td>
<td>3107</td>
<td>Shrub/Steppe Annual Grass-Forb</td>
</tr>
<tr>
<td></td>
<td>3109</td>
<td>Perennial Grassland</td>
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<td>3110</td>
<td>Perennial Grass Slope</td>
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<td>3301</td>
<td>Curleaf Mountain Mahogany</td>
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<td>3305</td>
<td>Mountain Big Sagebrush</td>
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<td></td>
<td>3307</td>
<td>Basin and Wyoming Big Sagebrush</td>
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<td>3315</td>
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<td>Mountain Low Sagebrush</td>
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<td>Upper Salmon</td>
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<td>Boise-Mores</td>
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<td>South Fork Boise</td>
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<td>17040220</td>
<td>Camas</td>
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<td>C. J. Strike Reservoir</td>
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<td>Payette</td>
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<td></td>
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</table>
Figure 2. Location of shrub-steppe and grassland vegetation study sites. The location of study sites selected through an environmental stratification of areas of non-forest vegetation are shown in relation to Boise National Forest boundary and key towns.
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<table>
<thead>
<tr>
<th>Species</th>
<th>Common Name</th>
<th>Global Rank</th>
<th>State Rank</th>
<th>INPS Rank</th>
<th>Element Code</th>
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<td>swamp onion</td>
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<td>S3</td>
<td>GP3</td>
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<td>Allium aaseae</td>
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<td>S3</td>
<td>GP3</td>
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<td>Allium tolmiei var persimile</td>
<td>Tolmie's onion</td>
<td>G4T3</td>
<td>S3</td>
<td>GP3</td>
<td>PMLIL022C1</td>
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<td>Astragalus cusickii var packardiae</td>
<td>Packard's milkvetch</td>
<td>G5T1</td>
<td>S1</td>
<td>GP1</td>
<td>PDFAB0F2N3</td>
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<td>Astragalus purshii var ophiogenes</td>
<td>Snake River milkvetch</td>
<td>G5T3</td>
<td>S3</td>
<td>S</td>
<td>PDFAB0F7A5</td>
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<tr>
<td>Astragalus mulfordiae</td>
<td>Mulford's milkvetch</td>
<td>G2</td>
<td>S2</td>
<td>GP2</td>
<td>PDFAB0F5Q0</td>
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<tr>
<td>Astragalus atratus var inseptus</td>
<td>mourning milkvetch</td>
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<td>Bryum calobryoides</td>
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<td>Calamagrostis tweedyi</td>
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<td>Camassia cusickii</td>
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<td>Catapyrenium congestum</td>
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<td>Ceanothus prostratus</td>
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<td>Cladonia luteolaiba</td>
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<td>Erigeron salmonensis</td>
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<td>Hackelia davisii</td>
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<td>S3</td>
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<tr>
<td>Haplopappus insecticrus</td>
<td>bugleg goldenweed</td>
<td>G3</td>
<td>S3</td>
<td>GP3</td>
<td>PDASTD080</td>
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<tr>
<td>Lepidium papilliferum</td>
<td>slick spot peppergrass</td>
<td>G2</td>
<td>S2</td>
<td>GP2</td>
<td>PDBRA1M140</td>
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<tr>
<td>Lewisia kelloggii</td>
<td>Idaho bitterroot</td>
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<td>S2</td>
<td>1</td>
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<tr>
<td>Mimulus clivicola</td>
<td>bank monkeyflower</td>
<td>G3</td>
<td>S3</td>
<td>M</td>
<td>PDCR1B0S0</td>
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<tr>
<td>Phacelia minutissima</td>
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<td>G3</td>
<td>S2</td>
<td>GP3</td>
<td>PDHYD0C300</td>
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<td>Sanicula graveolens</td>
<td>Sierra sanicle</td>
<td>G4</td>
<td>S1</td>
<td>S</td>
<td>PDAPI1Z070</td>
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<tr>
<td>Sedum borschii</td>
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<td>M</td>
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<td>------------------------</td>
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<tr>
<td><em>Sphaeromeria potentilloides</em></td>
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<td>G5</td>
<td>S1</td>
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<td>stylocline</td>
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<td>G3</td>
<td>S2</td>
<td>GP3</td>
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</tbody>
</table>

**Global Rank (GRANK) and State Rank (SRANK) - Components of Ranks:**

G = Global rank indicator; denotes rank based on rangewide status.
T = Trinomial rank indicator; denotes rangewide status of infraspecific taxa.
S = State rank indicator; denotes rank based on status within Idaho.
1 = Critically imperiled because of extreme rarity or because some factor of its biology makes it especially vulnerable to extinction (typically 5 or fewer occurrences).
2 = Imperiled because of rarity or because other factors demonstrably make it very vulnerable to extinction (typically 6 to 20 occurrences).
3 = Rare or uncommon but not imperiled (typically 21 to 100 occurrences).
4 = Not rare and apparently secure, but with cause for long-term concern (usually more than 100 occurrences).
5 = Demonstrably widespread, abundant, and secure.
E = Exotic or introduced.
U = Unknown.
H = Historical occurrence (i.e., formerly part of the native biota with the implied expectation that it might be rediscovered).
X = Presumed extinct or extirpated.
Q = Indicates uncertainty about taxonomic status.
? = Not yet ranked.

**Idaho Native Plant Society (INPS) Rank**

**Globally Rare Species**

GP1 = Global Priority 1. Taxa with a GRANK of G1 or T1.
GP2 = Global Priority 2. Taxa with a GRANK of G2 or T2.
GP3 = Global Priority 3. Taxa with a GRANK of G3 or T3
GX = Taxa thought to be globally extinct (i.e., GRANK = GX).

**State Rare Species**

1 = State Priority Taxa in danger of becoming extinct or extirpated from Idaho in the foreseeable future if identifiable factors contributing to their decline continue to operate; these are taxa whose populations are present only at critically low levels or whose habitats have been degraded or depleted to a significant degree.

2 = State Priority Taxa likely to be classified as Priority 1 within the foreseeable future in Idaho, if factors contributing to their population decline or habitat degradation or loss continue.

S = Sensitive Taxa with small populations or localized distributions within Idaho that presently do not meet the criteria for classification as Priority 1 or 2 but whose populations and habitats might be jeopardized without active management or removal of threats.

M = Monitor Taxa that are common within a limited range as well as those taxa which are uncommon but have no identifiable threats.

R = Review. Defined above.
Table 2. Summary of plant associations sampled. The number of plots sampled (during 2002 or in previous years) is summarized by site and plant association (or series).

<table>
<thead>
<tr>
<th>Site</th>
<th>Series</th>
<th>Association</th>
<th>Count</th>
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<td>Artemisia tridentata wyomingensis</td>
<td>Artemisia tridentata wyomingensis/Festuca idahoensis</td>
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<tr>
<td></td>
<td>Purshia tridentata</td>
<td>Purshia tridentata/Festuca idahoensis</td>
<td>1</td>
</tr>
<tr>
<td>Cat Creek Summit</td>
<td>Artemisia tridentata vaseyana</td>
<td>Artemisia tridentata vaseyana-Purshia tridentata/Agropyron spicatum</td>
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<tr>
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<td>Agropyron spicatum</td>
<td>Agropyron spicatum-Poa secunda, Balsamorhiza sagittata</td>
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<td></td>
<td>Prunus virginiana</td>
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</table>
### Table 3. Vascular plant species observed on Boise National Forest low-elevation shrub-steppe and grassland ecology plots. Species are listed by physiognomic group with common name. Nomenclature follows (for the most part) Hitchcock and Cronquist (1973).

<table>
<thead>
<tr>
<th>Trees</th>
<th>Shrubs</th>
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<td><em>Pinus ponderosa</em></td>
<td><em>Pseudotsuga menziesii</em></td>
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<tr>
<td>ponderosa pine</td>
<td>Douglas-fir</td>
</tr>
<tr>
<td><strong>Shrubs</strong></td>
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</tr>
<tr>
<td><em>Acer glabrum</em></td>
<td><em>Rocky Mountain maple</em></td>
</tr>
<tr>
<td><em>Amelanchier alnifolia</em></td>
<td><em>Saskatoon serviceberry</em></td>
</tr>
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<td><em>Artemisia arbuscula</em></td>
<td><em>little sagebrush</em></td>
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<td><em>Artemisia longiloba</em></td>
<td><em>early sagebrush</em></td>
</tr>
<tr>
<td><em>Artemisia tridentata ssp. vaseyana</em></td>
<td><em>mountain big sagebrush</em></td>
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<td><em>Berberis repens</em></td>
<td><em>Oregon grape</em></td>
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<td><em>Ceanothus velutinus</em></td>
<td><em>snowbrush ceanothus</em></td>
</tr>
<tr>
<td><em>Chrysothamnus nauseosus</em></td>
<td><em>green rabbit-brush</em></td>
</tr>
<tr>
<td><em>Chrysothamnus viscidiflorus</em></td>
<td><em>yellow rabbitbrush</em></td>
</tr>
<tr>
<td><em>Haplopappus suffruticosus</em></td>
<td><em>shrubby goldenweed</em></td>
</tr>
<tr>
<td><em>Holodiscus dumosus</em></td>
<td><em>rockspirea</em></td>
</tr>
<tr>
<td><em>Prunus emarginata</em></td>
<td><em>bitter cherry</em></td>
</tr>
<tr>
<td><em>Prunus virginiana</em></td>
<td><em>chokecherry</em></td>
</tr>
<tr>
<td><em>Purshia tridentata</em></td>
<td><em>antelope bitterbrush</em></td>
</tr>
<tr>
<td><em>Ribes aureum</em></td>
<td><em>golden currant</em></td>
</tr>
<tr>
<td><em>Ribes cereum</em></td>
<td><em>Woods' rose</em></td>
</tr>
<tr>
<td><em>Rosa woodsii</em></td>
<td><em>blue elderberry</em></td>
</tr>
<tr>
<td><em>Sambucus cerulea</em></td>
<td><em>white spirea</em></td>
</tr>
<tr>
<td><em>Symphoricarpos oreophilus</em></td>
<td><em>mountain snowberry</em></td>
</tr>
<tr>
<td><strong>Herbs</strong></td>
<td></td>
</tr>
<tr>
<td><em>Achillea millefolium</em></td>
<td><em>common yarrow</em></td>
</tr>
<tr>
<td><em>Agastache urticifolia</em></td>
<td><em>nettleleaf giant hyssop</em></td>
</tr>
<tr>
<td><em>Agoseris glauca</em></td>
<td><em>pale agoseris</em></td>
</tr>
<tr>
<td><em>Agoseris grandiflora</em></td>
<td><em>bigflower agoseris</em></td>
</tr>
<tr>
<td><em>Agoseris retrorsa</em></td>
<td><em>spearleaf agoseris</em></td>
</tr>
<tr>
<td><em>Allium sp.</em></td>
<td><em>onion</em></td>
</tr>
<tr>
<td><em>Amsinckia retrorsa</em></td>
<td><em>fiddleneck</em></td>
</tr>
<tr>
<td><em>Antennaria microphylla</em></td>
<td><em>littleleaf pussytoes</em></td>
</tr>
<tr>
<td><em>Antennaria stenophylla</em></td>
<td><em>narrowleaf pussytoes</em></td>
</tr>
<tr>
<td><em>Apocynum androsaemifolium</em></td>
<td><em>spreading dogbane</em></td>
</tr>
<tr>
<td><em>Arabis sp.</em></td>
<td><em>rockcress</em></td>
</tr>
<tr>
<td><em>Arabis holboellii</em></td>
<td><em>Holboell's rockcress</em></td>
</tr>
<tr>
<td><em>Arabis sparsiflora</em></td>
<td><em>sicklepod rockcress</em></td>
</tr>
<tr>
<td><em>Arenaria aculeata</em></td>
<td><em>prickly sandwort</em></td>
</tr>
<tr>
<td><em>Arenaria congesta</em></td>
<td><em>ballhead sandwort</em></td>
</tr>
<tr>
<td><em>Arenaria macrophylla</em></td>
<td><em>bigleaf sandwort</em></td>
</tr>
<tr>
<td><em>Arenaria serpyllifolia</em></td>
<td><em>thymeleaf sandwort</em></td>
</tr>
<tr>
<td><em>Asclepias sp.</em></td>
<td><em>milkweed</em></td>
</tr>
<tr>
<td><em>Aster perelegans</em></td>
<td><em>elegant aster</em></td>
</tr>
<tr>
<td><em>Astragalus eremiticus</em></td>
<td><em>hermit milkvetch</em></td>
</tr>
<tr>
<td><em>Astragalus purshii</em></td>
<td><em>woollypod milkvetch</em></td>
</tr>
<tr>
<td><em>Balsamorhiza sagittata</em></td>
<td><em>arrowleaf balsamroot</em></td>
</tr>
<tr>
<td><em>Blepharipappus scaber</em></td>
<td><em>rough eyelashweed</em></td>
</tr>
</tbody>
</table>
Calochortus sp.
Calochortus eurycarpus
Calochortus macrocarpus
Castilleja sp.
Castilleja pallescens
Chaenactis sp.
Chaenactis douglasii
Chenopodium album
Chondrilla juncea
Cirsium sp.
Cirsium canovirens
Clarkia rhomboidea
Collinsia parviflora
Collomia grandiflora
Collomia linearis
Crepis sp.
Crepis acuminata
Crepis modocensis
Cryptantha sp.
Cryptantha sobolifera
Delphinium sp.
Draba verna
Epilobium paniculatum
Erigeron caespitosus
Erigeron chrysopsidis var. austiniae
Erigeron pumilus
Eriogonum sp.
Eriogonum elatum
Eriogonum flavum
Eriogonum heracleoides
Eriogonum umbellatum
Eriogonum vimenum var. shoshonense
Fritillaria atropurpurea
Galium bifolium
Gayophytum diffusum
Geranium viscosissimum
Grindelia squarrosa
Hackelia micrantha
Haplopappus acaulis
Haplopappus carthamoides
Helianthus cusickii
Heuchera cylindrica
Hieracium albertinum
Hieracium cynoglossoides
Hydrophyllum capitatum
Lactuca serriola
Lewisia rediviva
Lithophragma sp.
Lithophragma bulbifera
Lithophragma parviflorum
Lithospermum ruderale
Lomatium sp.
Lomatium dissectum
Lomatium macrocarpum

mariposa lily
white mariposa lily
sagebrush mariposa lily
Indian paintbrush
pale Indian paintbrush
pincushion
Douglas' dusty maiden
lamb's quarters
hogbit
thistle
graygreen thistle
diamond clarkia
maiden blue eyed Mary
grand collomia
tiny trumpet
hawsbeard
tapertip hawksbeard
Modoc hawksbeard
cryptantha
Waterton Lakes cryptantha
larkspur
spring draba
 parched fireweed
tufted fleabane
dwarf yellow fleabane
shaggy fleabane
buckwheat
tall woolly buckwheat
alpine golden buckwheat
parsnipflower buckwheat
sulphur-flower buckwheat
broom buckwheat
spotted fritillary
twinleaf bedstraw
spreading groundsmoke
sticky purple geranium
curlycup gumweed
Jessica sticktight
stemless goldenweed
large-flowered goldenweed
Cusick's sunflower
roundleaf alumroot
western hawkweed
houndstongue hawkweed
ballhead waterleaf
prickly lettuce
bitter root
woodland-star
prairstar
smallflower woodland-star
western stoneseed
desertparsley
fernleaf biscuitroot
bigseed biscuitroot
Lomatium triternatum
nineleaf biscuitroot
Lupinus sp.
lupine
Lupinus arbustus
longspur lupine
Lupinus argenteus
silvery lupine
Machaeranthera canescens
hoary tansyaster
Madia sp.
tarweed
Madia exigua
small tarweed
Mentzelia albicaulis
whitestem blazingstar
Mertensia longiflora
Lupinus arbustus
longspur lupine
Mertensia oblongifolia
silvery lupine
Microseris nutans
Machaeranthera canescens
hoary tansyaster
Microseris troximoides
small bluebells
Microsteris gracilis
false-agoseris
Mima sp.
microsteris
Navarretia breweri
Brewer's navarretia
Nemophila sp.
white blue eyes
Osmorhiza occidentalis
western sweetroot
Paeonia brownii
Brown's peony
Penstemon acuminatus
sharpleaf penstemon
Penstemon globosus
globe penstemon
Perideridia gairdneri
Gardner's yampah
Phacelia hastata
silverleaf phacelia
Phacelia heterophylla
varileaf phacelia
Phacelia linearis
threadleaf phacelia
Phlox longifolia
longleaf phlox
Phlox hoodii
phlox
Plectritis macrocera
longhorn plectritis
Polemonium sp.
Jacob's-ladder
Polygonum sp.
knotweed
Polygonum douglasii
Douglas' knotweed
Potentilla gracilis
slender cinquefoil
Potentilla glandulosa
cinquefoil
Potentilla serra
slender cinquefoil
Rumex crispus
curly dock
Sanguisorba minor
small burnet
Saxifraga sp.
saxifrage
Scutellaria angustifolia
narrowleaf skullcap
Senecio integerrimus
lambstongue ragwort
Senecio serra
tall ragwort
Silene sp.
catchfly
Silene douglasii
seabluff catchfly
Sisymbrium altissimum
tall tumblemustard
Thalictrum occidentale
western meadow-rue
Tragopogon dubius
yellow salsify
Verbascum blattaria
moth mullein
Verbascum thapsus
common mullein
Viola sp.
violet
Viola hirta
goosefoot violet
Viola purpurea
mule-ears
Wyethia amplexicaulis
mountain deathcamas
Zigadenus elegans
Zigadenus venenosus
meadow deathcamas
Grasses, rushes, and sedges

*Agropyron intermedium*  
intermediate wheatgrass

*Agropyron spicatum*  
bluebunch wheatgrass

*Agropyron trachycaulum*  
slender wheatgrass

*Bromus briziformis*  
rattlesnake brome

*Bromus carinatus*  
California brome

*Bromus japonicus*  
Japanese brome

*Bromus tectorum*  
cheatgrass

*Carex douglasii*  
Douglas' sedge

*Carex geyeri*  
Geyer's sedge

*Danthonia unispicata*  
onepike danthonia

*Elymus cinereus*  
giant wildrye

*Elymus glaucus*  
blue wildrye

*Festuca idahoensis*  
Idaho fescue

*Festuca occidentalis*  
western fescue

*Juncus tenuis*  
poverty rush

*Koeleria cristata*  
prairie junegrass

*Melica bulbosa*  
oniongrass

*Oryzopsis hymenoides*  
Indian ricegrass

*Poa bulbosa*  
bulbous bluegrass

*Poa pratensis*  
Kentucky bluegrass

*Poa secunda*  
Sandberg bluegrass

*Sitanion hystrix*  
squirreltail grass

*Stipa columbiana*  
western needlegrass

*Stipa occidentalis*  
needlegrass

*Stipa thurberiana*  
Thurber's needlegrass