

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

INTERIM REPORT

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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.

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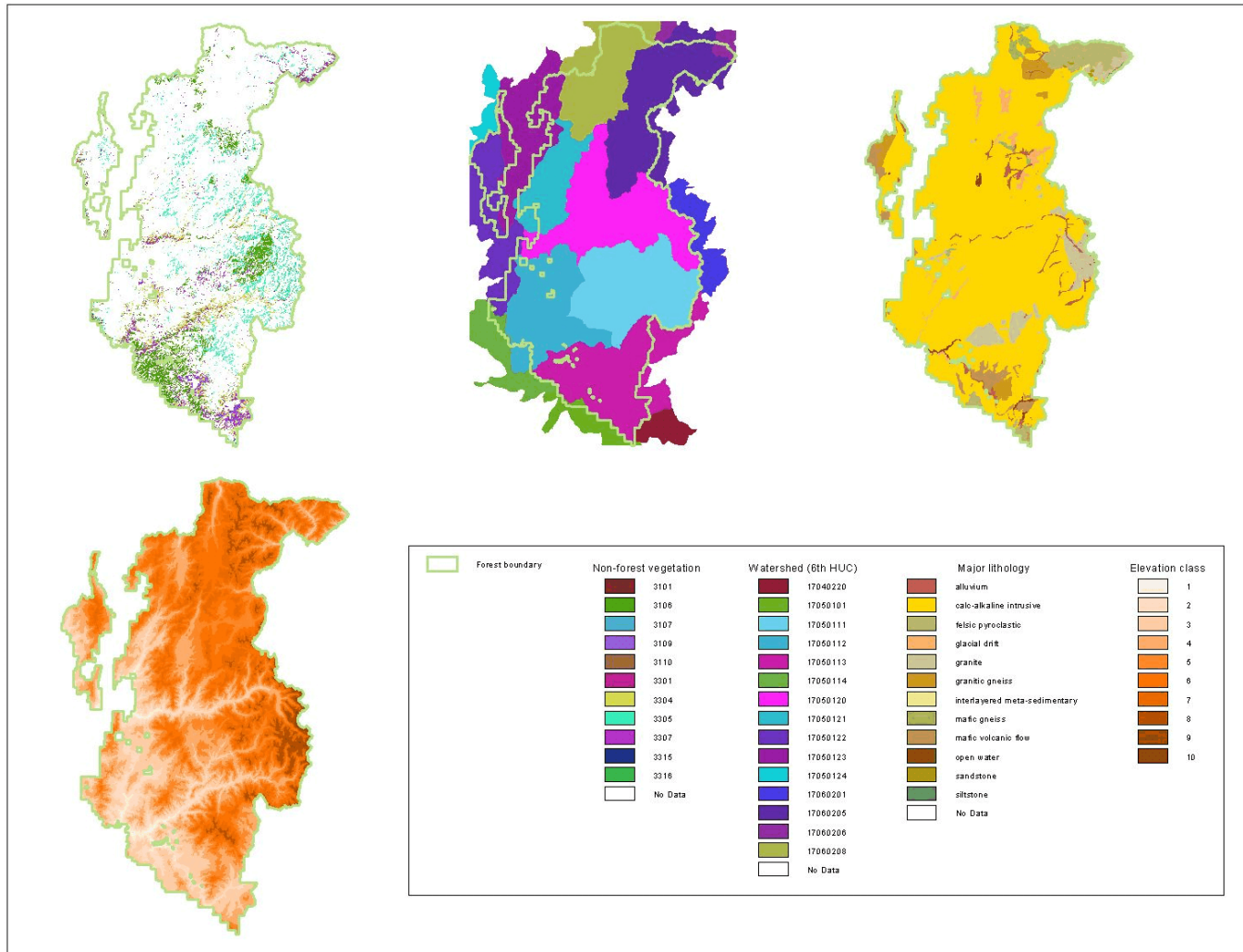
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**Figure 2.** Location of shrub-steppe and grassland vegetation study sites.

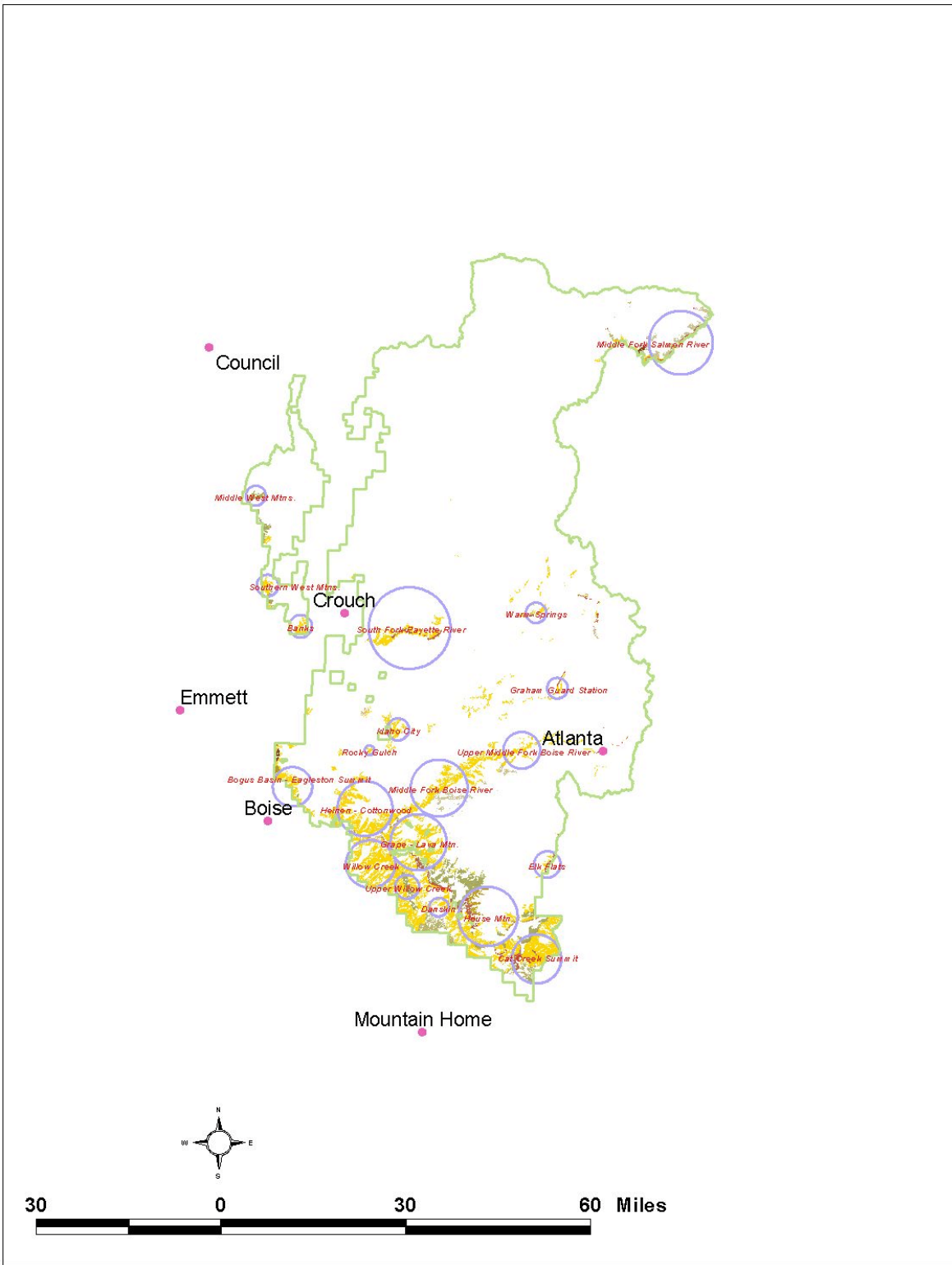




**Figure 1.** Summary of study site selection. Spatial data layers employed in the selection and stratification of areas of non-forest vegetation are shown (clockwise: non-forest vegetation, watershed (sixth hydrological unit code), major lithology, and elevation class). Class values for vegetation, 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).

| Data Layer                 | Code        | Description                     |
|----------------------------|-------------|---------------------------------|
| Vegetation (label)         | 3101        | Foothill Grassland              |
|                            | 3106        | Herbaceous Burn                 |
|                            | 3107        | Shrub/Steppe Annual Grass-Forb  |
|                            | 3109        | Perennial Grassland             |
|                            | 3110        | Perennial Grass Slope           |
|                            | 3301        | Curleaf Mountain Mahogany       |
|                            | 3304        | Bitterbrush                     |
|                            | 3305        | Mountain Big Sagebrush          |
|                            | 3307        | Basin and Wyoming Big Sagebrush |
|                            | 3315        | Low Sagebrush                   |
|                            | 3316        | Mountain Low Sagebrush          |
| Watershed (watershed name) | 17060208    | South Fork Salmon               |
|                            | 17060206    | Lower Middle Fork Salmon        |
|                            | 17050123    | North Fork Payette              |
|                            | 17060205    | Upper Middle Fork Salmon        |
|                            | 17060201    | Upper Salmon                    |
|                            | 17050121    | Middle Fork Payette             |
|                            | 17050120    | South Fork Payette              |
|                            | 17050111    | North and Middle Fork Boise     |
|                            | 17050112    | Boise-Mores                     |
|                            | 17050113    | South Fork Boise                |
|                            | 17040220    | Camas                           |
|                            | 17050101    | C. J. Strike Reservoir          |
|                            | 17050124    | Weiser                          |
|                            | 17050122    | Payette                         |
| 17050114                   | Lower Boise |                                 |
| Elevation (range)          | 1           | 2778 - 3552                     |
|                            | 2           | 3555 - 4329                     |
|                            | 3           | 4332 - 5106                     |
|                            | 4           | 5110 - 5881                     |
|                            | 5           | 5884 - 6658                     |
|                            | 6           | 6661 - 7435                     |
|                            | 7           | 7439 - 8209                     |
|                            | 8           | 8213 - 8987                     |
|                            | 9           | 8990 - 9764                     |
|                            | 10          | 9771 - 10532                    |



**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 1.** Sensitive plant species with potential for occurrence within the study area. Sensitive plant species that may occur in low-elevation non-forest habitats on Boise National Forest are listed with global, state, and Idaho Native Plant Society (INPS) ranking. The element code (a unique key identifier) used by Idaho Conservation Data Center (2003) is also shown.

| Species   | Common Name              | Global Rank | State Rank | INPS Rank | Element Code |
|---|--------------------------|-------------|------------|-----------|--------------|
| <i>Allium madidum</i>                               | swamp onion              | G3          | S3         | GP3       | PMLIL021E0   |
| <i>Allium aaseae</i>                                | Aase's onion             | G3          | S3         | GP3       | PMLIL02010   |
| <i>Allium tolmiei</i> var <i>persimile</i>          | Tolmie's onion           | G4T3        | S3         | GP3       | PMLIL022C1   |
| <i>Astragalus cusickii</i> var <i>packardiae</i>    | Packard's milkvetch      | G5T1        | S1         | GP1       | PDFAB0F2N3   |
| <i>Astragalus purshii</i> var <i>ophiogenes</i>     | Snake River milkvetch    | G5T3        | S3         | S         | PDFAB0F7A5   |
| <i>Astragalus mulfordiae</i>                        | Mulford's milkvetch      | G2          | S2         | GP2       | PDFAB0F5Q0   |
| <i>Astragalus atratus</i> var <i>inseptus</i>       | mourning milkvetch       | G4G5T3      | S3         | GP3       | PDFAB0F0Z2   |
| <i>Bryum calobryoides</i>                           | beautiful bryum          | G3          | SH         | GP3       | NBMUS1A1W0   |
| <i>Calamagrostis tweedyi</i>                        | Cascade reedgrass        | G3          | S2         | GP3       | PMPOA17150   |
| <i>Camassia cusickii</i>                            | Cusick's camas           | G4          | S2         | M         | PMLIL0E010   |
| <i>Catapyrenium congestum</i>                       |                          | G4          | S2         | S         | NLTEST91A0   |
| <i>Ceanothus prostratus</i>                         | mahala-mat ceanothus     | G5?         | S1         | 1         | PDRHA04140   |
| <i>Cladonia luteoalba</i>                           | reindeer lichen          | G2          | S1         | GP2       | NLTEST6460   |
| <i>Erigeron salmonensis</i>                         | Salmon River fleabane    | G3          | S3         | GP3       | PDAST3M4Q0   |
| <i>Eriogonum ochrocephalum</i> var <i>calcareum</i> | calcareous buckwheat     | G5T3        | S2         | GP3       | PDPGN084C2   |
| <i>Glyptopleura marginata</i>                       | white-margined wax plant | G4          | S3         | S         | PDAST43010   |
| <i>Hackelia davisii</i>                             | Davis' stickseed         | G3          | S3         | GP3       | PDBOR0G0A0   |
| <i>Haplopappus insecticuriis</i>                    | bugleg goldenweed        | G3          | S3         | GP3       | PDASTDT080   |
| <i>Lepidium papilliferum</i>                        | slick spot peppergrass   | G2          | S2         | GP2       | PDBRA1M140   |
| <i>Lewisia kelloggii</i>                            | Idaho bitterroot         | G4          | S2         | 1         | PDPOR04070   |
| <i>Mimulus clivicola</i>                            | bank monkeyflower        | G4          | S3         | M         | PDSCR1B0S0   |
| <i>Phacelia minutissima</i>                         | least phacelia           | G3          | S2         | GP3       | PDHYD0C300   |
| <i>Sanicula graveolens</i>                          | Sierra sanicle           | G4          | S1         | S         | PDAPI1Z070   |
| <i>Sedum borschii</i>                               | Borsch's stonecrop       | G4?         | S2         | M         | PDCRA0A070   |

| Species   | Common Name           | Global Rank | State Rank | INPS Rank | Element Code |
|---|-----------------------|-------------|------------|-----------|--------------|
| <i>Sphaeromeria potentilloides</i>                | cinquefoil tansy      | G5          | S1         | 2         | PDAST8S060   |
| <i>Stylocline filaginea</i>                       | stylocline            | G4          | S2         | M         | PDASTD5010   |
| <i>Sullivantia hapemanii</i> var <i>hapemanii</i> | Hapeman's sullivantia | G3T3        | S2         | GP3       | PDSAX0X012   |
| <i>Texosporium sancti-jacobi</i>                  | wovenspore lichen     | G2          | S2         | GP2       | NLTEST7980   |
| <i>Thamnotia subuliformis</i>                     |                       | G3G5        | S1         | 1         | NLT0000290   |
| <i>Trifolium douglasii</i>                        | Douglas' clover       | G3          | S2         | GP3       | PDFAB400T0   |

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.

*Review Species*

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).

| Site                           | Series                                   | Association   | Count |
|--------------------------------|--|---|-------|
| Boise Basin - Eagleston Summit | <i>Artemisia tridentata wyomingensis</i> | <i>Artemisia tridentata wyomingensis/Festuca idahoensis</i>                       | 1     |
|                                | <i>Purshia tridentata</i>                | <i>Purshia tridentata/Festuca idahoensis</i>                                      | 1     |
| Cat Creek Summit               | <i>Artemisia tridentata vaseyana</i>     | <i>Artemisia tridentata vaseyana-Purshia tridentata/Agropyron spicatum</i>        | 2     |
| Danskin                        | <i>Agropyron spicatum</i>                | <i>Agropyron spicatum-Poa secunda, Balsamorhiza sagittata</i>                     | 1     |
|                                | <i>Artemisia arbuscula</i>               |   | 2     |
|                                | <i>Artemisia tridentata vaseyana</i>     | <i>Artemisia tridentata vaseyana-Symphoricarpos oreophilus/Festuca idahoensis</i> | 1     |
|                                | <i>Festuca idahoensis</i>                |   | 2     |
|                                | <i>Purshia tridentata</i>                |   | 1     |
| Heinen - Cottonwood            | <i>Artemisia tridentata vaseyana</i>     | <i>Artemisia tridentata vaseyana/Festuca idahoensis</i>                           | 1     |
| House Mountain                 | <i>Festuca idahoensis</i>                | <i>Festuca idahoensis-Carex geyeri/Lupinus argenteus</i>                          | 1     |
|                                | <i>Festuca idahoensis</i>                | <i>Festuca idahoensis/Lupinus argenteus</i>                                       | 1     |
|                                | <i>Stipa occidentalis</i>                | <i>Stipa occidentalis/Lupinus argenteus</i>                                       | 1     |
| Rocky Gulch                    | <i>Purshia tridentata</i>                | <i>Purshia tridentata/Agropyron spicatum</i>                                      | 2     |
| South Fork Payette River       | <i>Agropyron spicatum</i>                |   | 4     |
|                                | <i>Agropyron spicatum</i>                | <i>Agropyron spicatum-Melica bulbosa</i>  | 2     |
|                                | <i>Rosa woodsii</i>                      |   | 1     |
|                                | <i>Prunus emarginata</i>                 |   | 1     |
|                                | <i>Prunus virginiana</i>                 |   | 2     |

**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).

|  |                         |
|--|-------------------------|
| Trees  |                         |
| <i>Pinus ponderosa</i>                           | ponderosa pine          |
| <i>Pseudotsuga menziesii</i>                     | Douglas-fir             |
| Shrubs   |                         |
| <i>Acer glabrum</i>                              | Rocky Mountain maple    |
| <i>Amelanchier alnifolia</i>                     | Saskatoon serviceberry  |
| <i>Artemisia arbuscula</i>                       | little sagebrush        |
| <i>Artemisia longiloba</i>                       | early sagebrush         |
| <i>Artemisia tridentata</i> ssp. <i>vaseyana</i> | mountain big sagebrush  |
| <i>Berberis repens</i>                           | Oregon grape            |
| <i>Ceanothus velutinus</i>                       | snowbrush ceanothus     |
| <i>Chrysothamnus nauseosus</i>                   | green rabbit-brush      |
| <i>Chrysothamnus viscidiflorus</i>               | yellow rabbitbrush      |
| <i>Haplopappus suffruticosus</i>                 | shrubby goldenweed      |
| <i>Holodiscus dumosus</i>                        | rockspirea              |
| <i>Prunus emarginata</i>                         | bitter cherry           |
| <i>Prunus virginiana</i>                         | chokecherry             |
| <i>Purshia tridentata</i>                        | antelope bitterbrush    |
| <i>Ribes aureum</i>                              | golden currant          |
| <i>Ribes cereum</i>                              | wax currant             |
| <i>Rosa woodsii</i>                              | Woods' rose             |
| <i>Sambucus cerulea</i>                          | blue elderberry         |
| <i>Spiraea betulifolia</i>                       | white spirea            |
| <i>Symphoricarpos oreophilus</i>                 | mountain snowberry      |
| Herbs  |                         |
| <i>Achillea millefolium</i>                      | common yarrow           |
| <i>Agastache urticifolia</i>                     | nettleleaf giant hyssop |
| <i>Agoseris glauca</i>                           | pale agoseris           |
| <i>Agoseris grandiflora</i>                      | bigflower agoseris      |
| <i>Agoseris retrorsa</i>                         | spearleaf agoseris      |
| <i>Allium</i> sp.                                | onion                   |
| <i>Amsinckia retrorsa</i>                        | fiddleneck              |
| <i>Antennaria microphylla</i>                    | littleleaf pussytoes    |
| <i>Antennaria stenophylla</i>                    | narrowleaf pussytoes    |
| <i>Apocynum androsaemifolium</i>                 | spreading dogbane       |
| <i>Arabis</i> sp.                                | rockcress               |
| <i>Arabis holboellii</i>                         | Holboell's rockcress    |
| <i>Arabis sparsiflora</i>                        | sicklepod rockcress     |
| <i>Arenaria aculeata</i>                         | prickly sandwort        |
| <i>Arenaria congesta</i>                         | ballhead sandwort       |
| <i>Arenaria macrophylla</i>                      | bigleaf sandwort        |
| <i>Arenaria serpyllifolia</i>                    | thymeleaf sandwort      |
| <i>Asclepias</i> sp.                             | milkweed                |
| <i>Aster perelegans</i>                          | elegant aster           |
| <i>Astragalus eremiticus</i>                     | hermit milkvetch        |
| <i>Astragalus purshii</i>                        | woollypod milkvetch     |
| <i>Balsamorhiza sagittata</i>                    | arrowleaf balsamroot    |
| <i>Blepharipappus scaber</i>                     | rough eyelashweed       |



|   |                           |
|---|---------------------------|
| <i>Calochortus</i> sp.                            | mariposa lily             |
| <i>Calochortus eurycarpus</i>                     | white mariposa lily       |
| <i>Calochortus macrocarpus</i>                    | sagebrush mariposa lily   |
| <i>Castilleja</i> sp.                             | Indian paintbrush         |
| <i>Castilleja pallescens</i>                      | pale Indian paintbrush    |
| <i>Chaenactis</i> sp.                             | pincushion                |
| <i>Chaenactis douglasii</i>                       | Douglas' dustymaiden      |
| <i>Chenopodium album</i>                          | lambsquarters             |
| <i>Chondrilla juncea</i>                          | hogbite                   |
| <i>Cirsium</i> sp.                                | thistle                   |
| <i>Cirsium canovirens</i>                         | graygreen thistle         |
| <i>Clarkia rhomboidea</i>                         | diamond clarkia           |
| <i>Collinsia parviflora</i>                       | maiden blue eyed Mary     |
| <i>Collomia grandiflora</i>                       | grand collomia            |
| <i>Collomia linearis</i>                          | tiny trumpet              |
| <i>Crepis</i> sp.                                 | hawksbeard                |
| <i>Crepis acuminata</i>                           | tapertip hawksbeard       |
| <i>Crepis modocensis</i>                          | Modoc hawksbeard          |
| <i>Cryptantha</i> sp.                             | cryptantha                |
| <i>Cryptantha sobolifera</i>                      | Waterton Lakes cryptantha |
| <i>Delphinium</i> sp.                             | larkspur                  |
| <i>Draba verna</i>                                | spring draba              |
| <i>Epilobium paniculatum</i>                      | parched fireweed          |
| <i>Erigeron caespitosus</i>                       | tufted fleabane           |
| <i>Erigeron chrysopsidis</i> var. <i>austinae</i> | dwarf yellow fleabane     |
| <i>Erigeron pumilus</i>                           | shaggy fleabane           |
| <i>Eriogonum</i> sp.                              | buckwheat                 |
| <i>Eriogonum elatum</i>                           | tall woolly buckwheat     |
| <i>Eriogonum flavum</i>                           | alpine golden buckwheat   |
| <i>Eriogonum heracleoides</i>                     | parsnipflower buckwheat   |
| <i>Eriogonum umbellatum</i>                       | sulphur-flower buckwheat  |
| <i>Eriogonum vimineum</i> var. <i>shoshonense</i> | broom buckwheat           |
| <i>Fritillaria atropurpurea</i>                   | spotted fritillary        |
| <i>Galium bifolium</i>                            | twinleaf bedstraw         |
| <i>Gayophytum diffusum</i>                        | spreading groundsmoke     |
| <i>Geranium viscosissimum</i>                     | sticky purple geranium    |
| <i>Grindelia squarrosa</i>                        | curlycup gumweed          |
| <i>Hackelia micrantha</i>                         | Jessica sticktight        |
| <i>Haplopappus acaulis</i>                        | stemless goldenweed       |
| <i>Haplopappus carthamoides</i>                   | large-flowered goldenweed |
| <i>Helianthus cusickii</i>                        | Cusick's sunflower        |
| <i>Heuchera cylindrica</i>                        | roundleaf alumroot        |
| <i>Hieracium albertinum</i>                       | western hawkweed          |
| <i>Hieracium cynoglossoides</i>                   | houndstongue hawkweed     |
| <i>Hydrophyllum capitatum</i>                     | ballhead waterleaf        |
| <i>Lactuca serriola</i>                           | prickly lettuce           |
| <i>Lewisia rediviva</i>                           | bitter root               |
| <i>Lithophragma</i> sp.                           | woodland-star             |
| <i>Lithophragma bulbifera</i>                     | prairiestar               |
| <i>Lithophragma parviflorum</i>                   | smallflower woodland-star |
| <i>Lithospermum ruderales</i>                     | western stoneseed         |
| <i>Lomatium</i> sp.                               | desertparsley             |
| <i>Lomatium dissectum</i>                         | fernleaf biscuitroot      |
| <i>Lomatium macrocarpum</i>                       | bigseed biscuitroot       |

|                                 |                       |
|---------------------------------|-----------------------|
| <i>Lomatium triternatum</i>     | nineleaf biscuitroot  |
| <i>Lupinus</i> sp.              | lupine                |
| <i>Lupinus arbustus</i>         | longspur lupine       |
| <i>Lupinus argenteus</i>        | silvery lupine        |
| <i>Machaeranthera canescens</i> | hoary tansyaster      |
| <i>Madia</i> sp.                | tarweed               |
| <i>Madia exigua</i>             | small tarweed         |
| <i>Mentzelia albicaulis</i>     | whitestem blazingstar |
| <i>Mertensia longiflora</i>     | small bluebells       |
| <i>Mertensia oblongifolia</i>   | oblongleaf bluebells  |
| <i>Microseris nutans</i>        | nodding microceris    |
| <i>Microseris troximoides</i>   | false-agoseris        |
| <i>Microsteris gracilis</i>     | microsteris           |
| <i>Navarretia breweri</i>       | Brewer's navarretia   |
| <i>Nemophila</i> sp.            | baby blue eyes        |
| <i>Osmorhiza occidentalis</i>   | western sweetroot     |
| <i>Paeonia brownii</i>          | Brown's peony         |
| <i>Penstemon acuminatus</i>     | sharpleaf penstemon   |
| <i>Penstemon globosus</i>       | globe penstemon       |
| <i>Perideridia gairdneri</i>    | Gardner's yampah      |
| <i>Phacelia hastata</i>         | silverleaf phacelia   |
| <i>Phacelia heterophylla</i>    | varileaf phacelia     |
| <i>Phacelia linearis</i>        | threadleaf phacelia   |
| <i>Phlox longifolia</i>         | longleaf phlox        |
| <i>Phlox hoodii</i>             | phlox                 |
| <i>Plectritis macrocera</i>     | longhorn plectritis   |
| <i>Polemonium</i> sp.           | Jacob's-ladder        |
| <i>Polygonum</i> sp.            | knotweed              |
| <i>Polygonum douglasii</i>      | Douglas' knotweed     |
| <i>Potentilla</i> sp.           | cinquefoil            |
| <i>Potentilla glandulosa</i>    | sticky cinquefoil     |
| <i>Potentilla gracilis</i>      | slender cinquefoil    |
| <i>Rumex crispus</i>            | curly dock            |
| <i>Sanguisorba minor</i>        | small burnet          |
| <i>Saxifraga</i> sp.            | saxifrage             |
| <i>Scutellaria angustifolia</i> | narrowleaf skullcap   |
| <i>Senecio integerrimus</i>     | lambstongue ragwort   |
| <i>Senecio serra</i>            | tall ragwort          |
| <i>Silene</i> sp.               | catchfly              |
| <i>Silene douglasii</i>         | seabluff catchfly     |
| <i>Sisymbrium altissimum</i>    | tall tumbledustard    |
| <i>Thalictrum occidentale</i>   | western meadow-rue    |
| <i>Tragopogon dubius</i>        | yellow salsify        |
| <i>Verbascum blattaria</i>      | moth mullein          |
| <i>Verbascum thapsus</i>        | common mullein        |
| <i>Viola</i> sp.                | violet                |
| <i>Viola purpurea</i>           | goosefoot violet      |
| <i>Wyethia amplexicaulis</i>    | mule-ears             |
| <i>Zigadenus elegans</i>        | mountain deathcamas   |
| <i>Zigadenus venenosus</i>      | meadow deathcamas     |

Grasses, rushes, and sedges

|                               |                         |
|-------------------------------|-------------------------|
| <i>Agropyron intermedium</i>  | intermediate wheatgrass |
| <i>Agropyron spicatum</i>     | bluebunch wheatgrass    |
| <i>Agropyron trachycaulum</i> | slender wheatgrass      |
| <i>Bromus briziformis</i>     | rattlesnake brome       |
| <i>Bromus carinatus</i>       | California brome        |
| <i>Bromus japonicus</i>       | Japanese brome          |
| <i>Bromus tectorum</i>        | cheatgrass              |
| <i>Carex douglasii</i>        | Douglas' sedge          |
| <i>Carex geyseri</i>          | Geyer's sedge           |
| <i>Danthonia unispicata</i>   | onespike danthonia      |
| <i>Elymus cinereus</i>        | giant wildrye           |
| <i>Elymus glaucus</i>         | blue wildrye            |
| <i>Festuca idahoensis</i>     | Idaho fescue            |
| <i>Festuca occidentalis</i>   | western fescue          |
| <i>Juncus tenuis</i>          | poverty rush            |
| <i>Koeleria cristata</i>      | prairie junegrass       |
| <i>Melica bulbosa</i>         | oniongrass              |
| <i>Oryzopsis hymenoides</i>   | Indian ricegrass        |
| <i>Poa bulbosa</i>            | bulbous bluegrass       |
| <i>Poa pratensis</i>          | Kentucky bluegrass      |
| <i>Poa secunda</i>            | Sandberg bluegrass      |
| <i>Sitanion hystrix</i>       | squirreltail grass      |
| <i>Stipa columbiana</i>       | western needlegrass     |
| <i>Stipa occidentalis</i>     | needlegrass             |
| <i>Stipa thurberiana</i>      | Thurber's needlegrass   |