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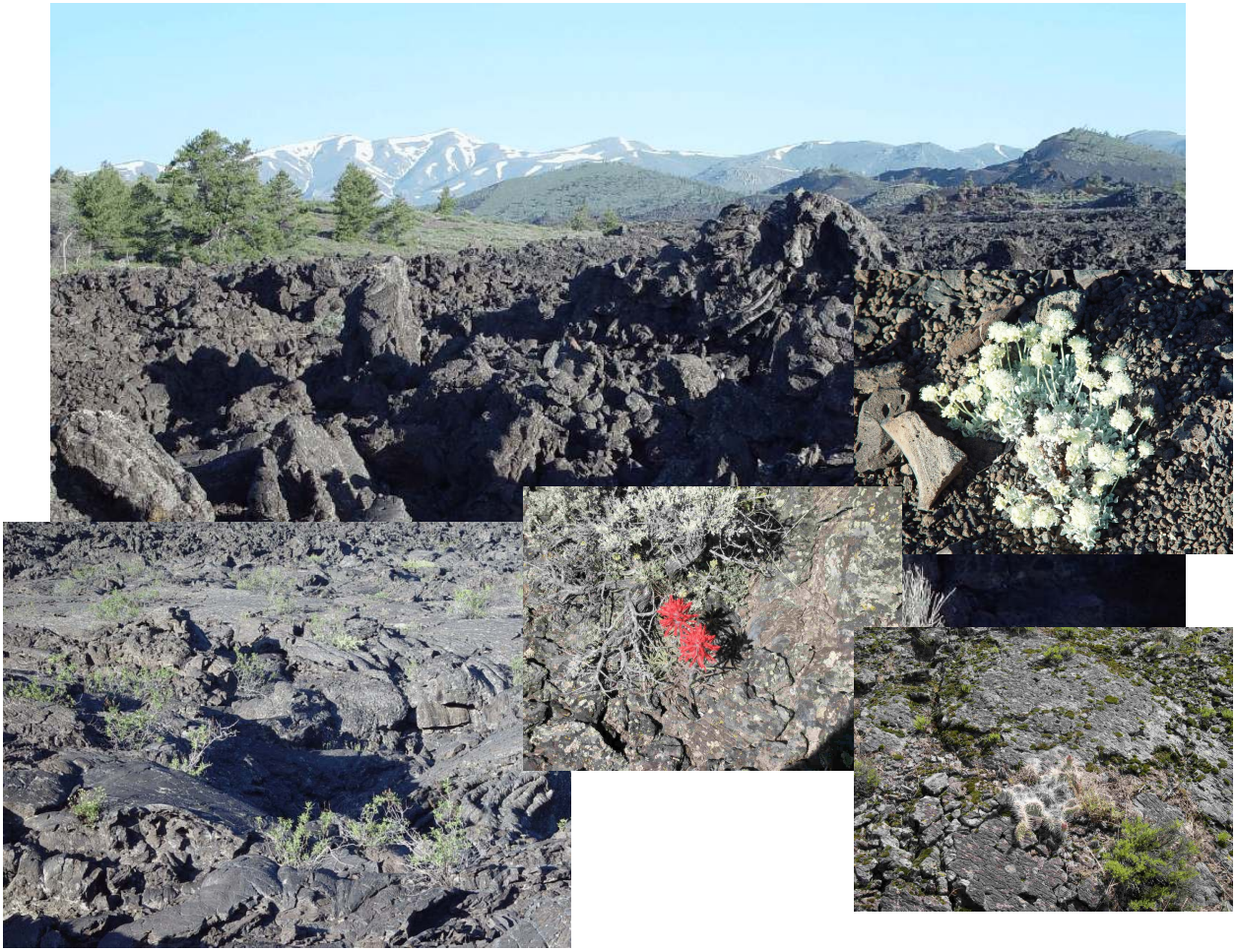
Classification of the Plant Communities of Craters of the Moon National Monument and Preserve, Idaho

Natural Resources Report NPS/UCBN/NRTR – 2008/096



ON THE COVER

Images of Craters of the Moon National Monument and Preserve (clockwise): view north looking over Craters of the Moon lava field, open limber pine woodlands on ciders cones; cushion buckwheat; moss on lava rock; Indian paintbrush; pahoehoe lava. Photograph by: Northwest Management, Inc.

Classification of the Plant Communities of Craters of the Moon National Monument and Preserve, Idaho

Natural Resource Technical Report NPS/UCBN/NRTR – 2008/096

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Table of Contents

List of Figures. iii

List of Tables. iii

Abstract. iv

Introduction. 1

Study Area. 1

Methods. 3

Results. 4
The Classification of Plant Communities. 4
Dichotomous Key to the Classification. 12

Literature Cited. 18

List of Figures

Figure 1. Study area location.. 1

List of Tables

Table 1. Plant Community Classification. 6

Appendices

Appendix 1. Cross-walk to vegetation types.. 24
Appendix 2. Summary of pertinent classification literature.. 27
Appendix 3. Stand tables.. 29

Abstract

Work on the vegetation map for Craters of the Moon National Monument and Preserve was initiated in May 2006. Craters of the Moon National Monument and Preserve lies on the Upper Snake River Plain in south central Idaho. The area encompasses sparse, vegetated lava and cinder cones; sagebrush steppe; grasslands; wetlands; and montane shrublands, woodlands, and forest. Three data sets were selected to augment field data collected specifically for the mapping project. Together with data collected in 2006, 1,241 vegetation samples were identified for plant community classification analyses. Initial plant community groups were identified using hierarchical cluster analysis. Plant community groups were successively partitioned to optimize within-group homogeneity, between-group difference, and the number of groups using indicator species analysis and multi-response permutation procedures. Decisions regarding the identification of plant associations within the data were informed by cross-walking candidate community groupings to the National Vegetation Classification. Classification and regression tree analysis (recursive partitioning) was employed in the development of dichotomous keys and the evaluation of cluster analysis results. Ninety-three plant communities are identified as occurring within the study area. One plant community is classified at the alliance level; the remainder are classified at the association level. Nearly 50% of the associations identified within the Monument and Preserve are currently listed in the National Vegetation Classification. Minor name-changes are proposed. The classification largely corresponds to vegetation types identified by Day and Wright (1985). Associations described but not recognized by the National Vegetation Classification include: (1) semi-natural vegetation (18 associations) and (2) plant communities (21 associations) that have not been described previously at the association level. Plant associations that should be considered for inclusion in the National Vegetation Classification are listed. A dichotomous key to the classification is presented. Summaries of stand composition are provided.

Introduction

The National Park Service Inventory and Monitoring Program Upper Columbia Basin Network (UCBN) is working in conjunction with the U.S. Geological Survey and the National Park Service Vegetation Mapping Program to complete vegetation maps for each of the national park units within the network. The National Park Service vegetation mapping protocol consists of the following major phases: preliminary collection and review of existing information; field data collection, management and analysis; photo-interpretation and mapping; map validation; and accuracy assessment (The Nature Conservancy and Environmental Systems Research Institute 1994a). Work on the vegetation map for Craters of the Moon National Monument and Preserve was initiated in May 2006. The initial phases of the project are reported by Northwest Management Inc. (2006). The objective of this document is to report on the field data analysis phase and provide a classification of the vegetation and a dichotomous key to the classification of plant communities.

Study Area

Craters of the Moon National Monument and Preserve lies on the Upper Snake River Plain in south central Idaho (Figure 1). The National Monument and Preserve encompasses vast areas of recent, relatively unweathered, flow basalt and cinder cones forming the Great Rift, Craters of the Moon Lava Field, and Wapi Lava Field (Kuntz et al. 1982 and 1988). Soils adjacent to the younger lava flows are predominately moderately deep to very deep eolian sand and loess forming loam, silt loam, sandy loam, and sandy soils (Johnson 1991, Jurs and Sands 2004). Elevation ranges from 1,615 m to 2,350 m (5,300 ft to 7,700 ft).

The climate is arid. Summers are hot and dry; winters are cold. In the northern portion of the Monument and Preserve average annual minimum and maximum temperatures are -1.0ºC (30.2ºF) and 13.0ºC (55.4ºF), respective; mean annual precipitation is 39.5cm (15.5in). In the south, hotter and drier conditions prevail. On the southern end of the Wapi Flow average minimum and maximum temperatures are (approximately) -1.0ºC (30.2ºF) and 15.4ºC (59.7ºF), respective; mean annual precipitation is 24.1cm (9.5in) (Western Regional Climate Center 2007).

Vegetation within the Monument and Preserve is diverse. The area encompasses sparse, vegetated lava and cinder cones; sagebrush steppe; grasslands; wetlands; and montane shrublands, woodlands, and forest. The study area encompasses several hundred kipukas (isolated areas of vegetation surrounded by more recent lava flows) and numerous parks. Many of these areas of relatively pristine native vegetation are protected from disturbances of exotic species invasion, livestock grazing, and recreational use. The Monument and Preserve commands a history of studies describing and conserving high quality, reference vegetation conditions (Tisdale et al. 1965; Caicco and Wellner 1983a, 1983b, 1983c). Day and Wright (1985) compiled an early vegetation map and describe plant communities of a portion of the study area. Other studies regarding the natural vegetation of the study area include Caicco

(1987), Day (1985), Eggler (1941), Hironaka et al. (1983), Jurs and Sands (2004), Moseley (1989), Rust et al. (2001), Rust (1999) and USDI National Park Service and Bureau of Land Management (2005). USDI National Park Service and Bureau of Land Management (2005) provide a history of fire disturbance and describe livestock grazing practices within the area.

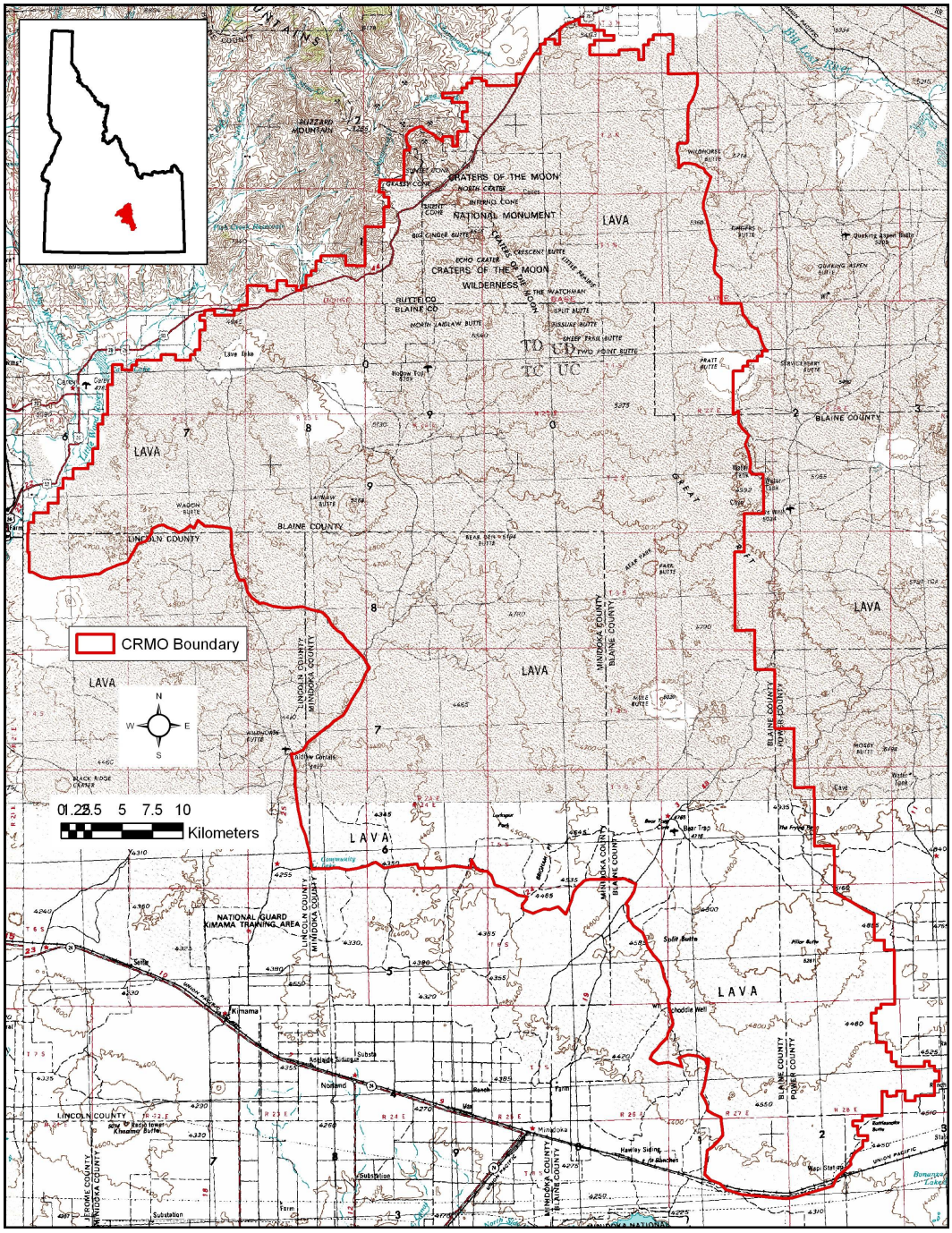

Figure 1. Study area location. The location of Craters of the Moon National Monument and Preserve (CRMO) is shown in relation to major geographical features. Inset shows the location of the study area within Idaho.

Methods

At the onset of the vegetation mapping project existing data were evaluated for potential use in the project (Northwest Management Inc. 2006, The Nature Conservancy 1996). Three data sets were selected to augment field data collected specifically for the mapping project: (1) Jurs and Sands (2004) data from Laidlaw Park, Little Park, and Paddelford Flat; (2) Rust (1999) data from Bureau of Land Management areas of critical environmental concern (Sand Kipuka and Big Juniper Kipuka); and (3) USDI Bureau of Land Management (2001) fuels inventory data collected within the Monument and Preserve. All four data sets, including the data collected in 2006, contributed 1,241 vegetation samples that were utilized for plant community classification analyses. Field methods employed in the collection of these data are described by Jurs and Sands (2004), Rust (1999), USDI Bureau of Land Management (2001), and Northwest Management Inc. (2006), respectively.

Analytical methods were employed in a manner consistent with the objective of identifying natural associations of existing vegetation (Jennings et al. 2006, Tart et al. 2005, The Nature Conservancy and Environmental Systems Research Institute 1994b). Multivariate statistical analyses were conducted using PC-ORD (McCune and Mefford 1999). Initial plant community groups were identified using hierarchical cluster analysis. Plant community groups were successively partitioned to optimize within-group homogeneity, between-group difference, and the number of groups. These 3 factors were evaluated using statistics generated by indicator species analysis (the mean p-value and number of significant ($p \leq 0.05$) indicator species) and multi-response permutation procedures (T, a measure of separation between groups; the chance-corrected within-group agreement (A), a measure of within-group homogeneity; and the compositional similarity of samples within a group (as measured by average relative Sorensen distance)). Environmental relations, within-group homogeneity, and between-group difference were evaluated graphically using indirect gradient analysis through detrended correspondence analysis (McCune and Grace 2002). Final decisions regarding the naming of plant associations were informed by cross-walking candidate community groupings to the National Vegetation Classification (NatureServe 2007). Classification and regression tree analysis (recursive partitioning) was employed in the development of dichotomous keys and the evaluation of classification results using the `rpart` package in R ® Development Core Team 2007).

The plant species nomenclature standard identified by the Monument and Preserve was maintained for the analysis to reflect local and regional taxonomic distinctions. Plant nomenclature of the Integrated Taxanomic Information System (ITIS) as reflected by the PLANTS Database (USDA, NRCS 2007) is employed in the naming of plant associations. This is the National Vegetation Classification standard and is necessary to discriminate differences among associations currently reported within the National Vegetation Classification.

Results

The Classification of Plant Communities

Ninety-three plant communities are identified as occurring within the study area. One plant community is classified at the alliance level; the remainder are classified at the association level. Table 1 provides a summary of the associations described for the Monument and Preserve.

Plant communities are named for the indicator (dominant or diagnostic) species of the vegetative strata present. The indicator species of the uppermost strata is listed first, followed by successively lower strata. Species that occur in the same strata (or are the same lifeform) are separated by a hyphen (-). Indicator species that occur in different strata (or are a different lifeform) are separated by a slash (/). Alliance names are concluded with the word "Alliance" to differentiate them from association names. Plant association names incorporate the physiognomic class in which the association is classified (e.g., Forest, Woodland, or Herbaceous) (FGDC 1997, 2006).

Forty-seven (nearly 50%) of the associations identified within the Monument and Preserve are currently listed in the National Vegetation Classification (as indicated by an assigned element code, Table 1) (NatureServe 2007). Physiognomic classes employed in names of plant associations currently listed in the National Vegetation Classification are used here, though the physiognomic class of the occurrence of any given association within the Monument and Preserve may not actually correspond to the assigned class.

More specific differences between the National Vegetation Classification and this classification of field observations from the Monument and Preserve are: (1) *Eriogonum ovalifolium* var. *depressum* Dwarf-Shrubland (as named within the National Vegetation Classification) occurs with <10% total vegetative cover. The association is referred to as *Eriogonum ovalifolium* var. *depressum* Sparse Vegetation here. (2) Day and Wright (1985) described their "Antelope Bitterbrush/Great Basin Wildrye" vegetation type as having substantial abundance of *Pseudoregneria spicata*, though *Leymus cinereus* was more conspicuous. This vegetation type is described as *Purshia tridentata / Pseudoroegneria spicata - Leymus cinereus* Shrub Herbaceous Vegetation in the National Vegetation Classification (NatureServe 2007). Samples taken from stands mapped as the vegetation type, however have little *Pseudoregneria spicata* and are described here as *Purshia tridentata / Leymus cinereus* Shrub Herbaceous Vegetation. Coincidentally, these two associations are considered endemic to Idaho and are only known from the Monument and Preserve.

The classification largely corresponds to vegetation types identified by Day and Wright (1985). A cross walk between their classification and the associations identified here is provided in Appendix 1. Primary differences in the classifications are: (1) floristic associations are identified for "Low Density Lava Flows", "Medium Density Lava Flows", and "Riparian"; and (2) the classification presented here provides a finer resolution of *Pseudoroegneria spicata*, and *Populus tremuloides* associations. Day and Wright's (1985) "Antelope Bitterbrush" vegetation

type appears to be represented primarily by the *Purshia tridentata / Pseudoroegneria spicata* Shrub Herbaceous Vegetation association.

Many of the plant associations identified in this classification have been described previously by others. Reid et al. (2002) provide range-wide descriptions of many of the associations. A summary of previous classification work regarding vegetation that occurs within the study area is provided in Appendix 2. Two plant associations are listed in Table 1, but are not in the dichotomous key. These distinct associations are represented from only one sample, dissimilar to other associations within the study area, and are described in the literature or known to occur in the region at other locations. Twenty samples (~2% of available data) were not classified. These data represent (1) unique vegetation sampled in only one stand and (2) one group of samples in which key indicator species are unknown. These samples tentatively represent communities that are not described in the literature, but there is not sufficient data to verify an association.

Over one-half of the associations described in this classification are not recognized by the National Vegetation Classification or have not been described previously. These associations include: (1) semi-natural vegetation (18 associations, Table 1) that, due to the priority of conserving natural vegetation, has not been systematic reviewed nor incorporated into the National Vegetation Classification and (2) plant communities (21 associations, listed below) that have not been described previously at the association level. Distinctive plant associations that should be considered for inclusion in the National Vegetation Classification include:

Artemisia tripartita ssp. tripartita / Achnatherum thurberianum Shrubland
Artemisia tripartita ssp. tripartita / Koeleria macrantha Shrubland
Artemisia tripartita ssp. tripartita / Pascopyrum smithii Shrubland
Artemisia tripartita ssp. tripartita / Poa secunda Shrubland
Artemisia tridentata ssp. vaseyana - Chamaebatiaria millefolium / Penstemon deustus Shrubland
Artemisia tridentata ssp. vaseyana - Purshia tridentata / Poa secunda Shrubland
Artemisia tridentata ssp. wyomingensis / Festuca idahoensis Shrubland
Chamaebatiaria millefolium / Penstemon deustus Sparse Vegetation
Ericameria nana - Holodiscus dumosus / Penstemon deustus Shrubland
Ericameria nana / Poa secunda / Penstemon deustus Sparse Vegetation
Juniperus (osteosperma, scopulorum) / Artemisia tridentata ssp. wyomingensis - Chamaebatiaria millefolium Wooded Shrubland
Juniperus osteosperma / Artemisia tridentata ssp. wyomingensis / Hesperostipa comata Shrubland
Juniperus (scopulorum, osteosperma) / Ericameria nana Wooded Herbaceous Vegetation
Juniperus scopulorum / Poa secunda / Penstemon deustus Woodland
Philadelphus lewisii / Penstemon deustus Sparse Vegetation
Pinus flexilis / Chamaebatiaria millefolium / Poa secunda Sparse Vegetation
Poa secunda / Leptodactylon pungens Sparse Vegetation
Prunus virginiana / Leymus cinereus Shrubland
Purshia tridentata - Ericameria nana / Penstemon deustus Shrubland
Purshia tridentata - Philadelphus lewisii / Poa secunda Shrubland

Table 1. Plant Community Classification. Plant communities observed at Craters of the Moon National Monument and Preserve are listed alphabetically by National Vegetation Classification class with scientific name, common name, field code, element code (abbreviated as "elcode") and the number of stands sampled (N). One alliance is described (*Populus balsamifera* ssp. *trichocarpa* Temporarily Flooded Woodland Alliance); the remaining communities are plant associations.

Scientific Name	Common Name	Code	Elcode	N
	Forest and Woodland			
Juniperus (osteosperma, scopulorum) / Artemisia tridentata ssp. *wyomingensis - Chamaebatiaria millefolium* Woodland	Juniper (Utah, Rocky Mountain) / Wyoming Big Sagebrush - Fernbush Woodland	JUOS-JUSC2/ARTRW8/ CHMI2		7
Juniperus scopulorum / Poa secunda / Penstemon deustus Woodland	Rocky Mountain Juniper / Sandberg Bluegrass / Scabland Penstemon Woodland	JUSC2/POSE/PEDE4		14
Pinus flexilis / Purshia tridentata Woodland	Limber Pine / Antelope Bitterbrush Woodland	PIFL2/PUTR2	CEGL000814	16
Populus balsamifera ssp. trichocarpa Temporarily Flooded Woodland Alliance	Black Cottonwood Temporarily Flooded Woodland Alliance	POBAT	A.635	2
Populus tremuloides - Pinus flexilis Forest	Quaking Aspen - Limber Pine Forest	POTR5-PIFL2	CEGL000540	1
Populus tremuloides / Artemisia tridentata Forest	Quaking Aspen / Big Sagebrush Forest	POTR5/ARTR	CEGL000572	2
Populus tremuloides / Calamagrostis rubescens Forest	Quaking Aspen / Pinegrass Forest	POTR5/CARU	CEGL000575	6
Populus tremuloides / Prunus virginiana Forest	Quaking Aspen / Chokecherry Forest	POTR5/PRVI	CEGL000596	4
Populus tremuloides / Symphoricarpos oreophilus / Calamagrostis rubescens Forest	Quaking Aspen / Mountain Snowberry / Pinegrass Forest	POTR5/SYOR2/CARU	CEGL000612	8
Populus tremuloides / Tall Forbs Forest	Quaking Aspen / Tall Forbs Forest	POTR5/TALL FORBS	CEGL000618	1
Pseudotsuga menziesii / Carex geyeri Forest	Douglas-fir / Geyer's Sedge Forest	PSME/CAGE2	CEGL000430	2
Pseudotsuga menziesii / Symphoricarpos oreophilus Forest	Douglas-fir / Mountain Snowberry Forest	PSME/SYOR2	CEGL000462	8
	Shrubland			
Alnus incana / Mesic Forbs Shrubland	Gray Alder / Mesic Forbs Shrubland	ALIN2/Mesic Forbs	CEGL001147	4
Artemisia arbuscula ssp. *arbuscula / Bromus tectorum* Semi-natural Shrubland	Low Sagebrush / Cheatgrass Semi-natural Shrubland	ARARA/BRTE		3
Artemisia arbuscula ssp. *arbuscula / Hesperostipa comata* Shrubland	Low Sagebrush / Needle and Thread Shrubland	ARARA/HECO26		3
Artemisia arbuscula ssp. *arbuscula / Poa secunda* Shrub Herbaceous Vegetation	Low Sagebrush / Sandberg Bluegrass Shrub Herbaceous Vegetation	ARARA/POSE	CEGL001411	8

Scientific Name	Common Name	Code	Elcode	N
Artemisia arbuscula ssp. arbuscula / Pseudoroegneria spicata Shrub Herbaceous Vegetation	Low Sagebrush / Bluebunch Wheatgrass Shrub Herbaceous Vegetation	ARARA/PSSP6	CEGL001412	7
Artemisia arbuscula ssp. *longiloba / Festuca idahoensis* Shrub Herbaceous Vegetation	Early Low Sagebrush / Idaho Fescue Shrub Herbaceous Vegetation	ARARL/FEID	CEGL001522	3
Artemisia tridentata ssp. *tridentata / Festuca idahoensis* Shrubland	Basin Big Sagebrush / Idaho Fescue Shrubland	ARTRT/FEID	CEGL001014	1
Artemisia tridentata ssp. *tridentata / Leymus cinereus* Shrubland	Basin Big Sagebrush / Basin Wildrye Shrubland	ARTRT/LECI4	CEGL001016	5
Artemisia tridentata ssp. *tridentata / Poa secunda* Shrubland	Basin Big Sagebrush / Sandberg Bluegrass Shrubland	ARTRT/POSE	CEGL001008	6
Artemisia tridentata ssp. *tridentata / Pseudoroegneria spicata* Shrub Herbaceous Vegetation	Basin Big Sagebrush / Bluebunch Wheatgrass Shrub Herbaceous Vegetation	ARTRT/PSSP6	CEGL001018	1
Artemisia tridentata ssp. *vaseyana - Chamaebatiaria millefolium / Penstemon deustus* Shrubland	Mountain Big Sagebrush - Fernbush / Scabland Penstemon Shrubland	ARTRV-CHMI2/PEDE4		5
Artemisia tridentata ssp. *vaseyana - Purshia tridentata / Poa secunda* Shrubland	Mountain Big Sagebrush - Antelope Bitterbrush / Sandberg Bluegrass Shrubland	ARTRV-PUTR2/POSE		5
Artemisia tridentata ssp. *vaseyana - Purshia tridentata / Pseudoroegneria spicata* Shrubland	Mountain Big Sagebrush - Antelope Bitterbrush / Bluebunch Wheatgrass Shrubland	ARTRV-PUTR2/PSSP6	CEGL001032	5
Artemisia tridentata ssp. *vaseyana - Symphoricarpos oreophilus / Pseudoroegneria spicata* Shrubland	Mountain Big Sagebrush - Mountain Snowberry / Bluebunch Wheatgrass Shrubland	ARTRV-SYOR2/PSSP6	CEGL001038	2
Artemisia tridentata ssp. *vaseyana / Bromus tectorum* Semi-natural Shrubland	Mountain Big Sagebrush / Cheatgrass Semi-natural Shrubland	ARTRV/BRTE		24
Artemisia tridentata ssp. *vaseyana / Festuca idahoensis* Shrub Herbaceous Vegetation	Mountain Big Sagebrush / Idaho Fescue Shrub Herbaceous Vegetation	ARTRV/FEID	CEGL001533	9
Artemisia tridentata ssp. *vaseyana / Hesperostipa comata* Shrubland	Mountain Big Sagebrush / Needle and Thread Shrubland	ARTRV/HECO26	CEGL002931	4
Artemisia tridentata ssp. *vaseyana / Leymus cinereus* Shrubland	Mountain Big Sagebrush / Basin Wildrye Shrubland	ARTRV/LECI4	CEGL001027	1
Artemisia tridentata ssp. *vaseyana / Poa secunda* Shrubland	Mountain Big Sagebrush / Sandberg Bluegrass Shrubland	ARTRV/POSE	CEGL001029	15
Artemisia tridentata ssp. *vaseyana / Pseudoroegneria spicata* Shrubland	Mountain Big Sagebrush / Bluebunch Wheatgrass Shrubland	ARTRV/PSSP6	CEGL001030	32
Artemisia tridentata ssp. *wyomingensis / Achnatherum hymenoides* Shrubland	Wyoming Big Sagebrush / Indian Ricegrass Shrubland	ARTRW8/ACHY	CEGL001046	5

Scientific Name	Common Name	Code	Elcode	N
Artemisia tridentata ssp. *wyomingensis / Achnatherum thurberianum - Bromus tectorum* Semi-natural Shrubland	Wyoming Big Sagebrush / Thurber's Needlegrass - Cheatgrass Semi-natural Shrubland	ARTRW8/ACTH7-BRTE		28
Artemisia tridentata ssp. *wyomingensis / Achnatherum thurberianum* Shrubland	Wyoming Big Sagebrush / Thurber's Needlegrass Shrubland	ARTRW8/ACTH7	CEGL001052	13
Artemisia tridentata ssp. *wyomingensis / Agropyron cristatum* Semi-natural Shrubland	Wyoming Big Sagebrush / Crested Wheatgrass Semi-natural Shrubland	ARTRW8/AGCR		5
Artemisia tridentata ssp. *wyomingensis / Bromus tectorum* Semi-natural Shrubland	Wyoming Big Sagebrush / Cheatgrass Semi-natural Shrubland	ARTRW8/BRTE		70
Artemisia tridentata ssp. *wyomingensis / Festuca idahoensis* Shrubland	Wyoming Big Sagebrush / Idaho Fescue Shrubland	ARTRW8/FEID		11
Artemisia tridentata ssp. *wyomingensis / Hesperostipa comata* Shrubland	Wyoming Big Sagebrush / Needle and Thread Shrubland	ARTRW8/HECO26	CEGL001051	33
Artemisia tridentata ssp. *wyomingensis / Pascopyrum smithii* Shrub Herbaceous Vegetation	Wyoming Big Sagebrush / Western Wheatgrass Shrub Herbaceous Vegetation	ARTRW8/PASM	CEGL001047	9
Artemisia tridentata ssp. *wyomingensis / Poa secunda - Bromus tectorum* Semi-natural Shrubland	Wyoming Big Sagebrush / Sandberg Bluegrass - Cheatgrass Semi-natural Shrubland	ARTRW8/POSE-BRTE		76
Artemisia tridentata ssp. *wyomingensis / Poa secunda* Shrubland	Wyoming Big Sagebrush / Sandberg Bluegrass Shrubland	ARTRW8/POSE	CEGL001049	76
Artemisia tridentata ssp. *wyomingensis / Pseudoroegneria spicata* Shrubland	Wyoming Big Sagebrush / Bluebunch Wheatgrass Shrubland	ARTRW8/PSSP6	CEGL001009	15
Artemisia tripartita ssp. *tripartita / Achnatherum thurberianum* Shrubland	Threetip Sagebrush / Thurber's Needlegrass Shrubland	ARTRT2/ACTH7		30
Artemisia tripartita ssp. *tripartita / Bromus tectorum* Semi-natural Shrubland	Threetip Sagebrush / Cheatgrass Semi-natural Shrubland	ARTRT2/BRTE		40
Artemisia tripartita ssp. *tripartita / Festuca idahoensis* Shrub Herbaceous Vegetation	Threetip Sagebrush / Idaho Fescue Shrub Herbaceous Vegetation	ARTRT2/FEID	CEGL001536	14
Artemisia tripartita ssp. *tripartita / Hesperostipa comata* Shrub Herbaceous Vegetation	Threetip Sagebrush / Needle and Thread Shrub Herbaceous Vegetation	ARTRT2/HECO26	CEGL001539	8
Artemisia tripartita ssp. *tripartita / Koeleria macrantha* Shrubland	Threetip Sagebrush / Prairie Junegrass Shrubland	ARTRT2/KOMA		9
Artemisia tripartita ssp. *tripartita / Leymus cinereus* Shrub Herbaceous Vegetation	Threetip Sagebrush / Basin Wildrye Shrub Herbaceous Vegetation	ARTRT2/LECI4	CEGL002994	1
Artemisia tripartita ssp. *tripartita / Pascopyrum smithii - Bromus tectorum* Semi-natural Shrubland	Threetip Sagebrush / Western Wheatgrass - Cheatgrass Semi-natural Shrubland	ARTRT2/PASM-BRTE		11

Scientific Name	Common Name	Code	Elcode	N
Artemisia tripartita ssp. *tripartita / Pascopyrum smithii Shrubland*	Threetip Sagebrush / Western Wheatgrass Shrubland	ARTRT2/PASM		19
Artemisia tripartita ssp. *tripartita / Poa secunda - Bromus tectorum* Semi-natural Shrubland	Threetip Sagebrush / Sandberg Bluegrass - Cheatgrass Semi-natural Shrubland	ARTRT2/POSE-BRTE		59
Artemisia tripartita ssp. *tripartita / Poa secunda* Shrubland	Threetip Sagebrush / Sandberg Bluegrass Shrubland	ARTRT2/POSE		17
Artemisia tripartita ssp. *tripartita / Pseudoroegneria spicata* Shrub Herbaceous Vegetation	Threetip Sagebrush / Bluebunch Wheatgrass Shrub Herbaceous Vegetation	ARTRT2/PSSP6	CEGL001538	21
Cercocarpus ledifolius - Purshia tridentata / Poa secunda Shrubland	Curl-leaf Mountain Mahogany - Antelope Bitterbrush / Sandberg Bluegrass Shrubland	CELE3-PUTR2/POSE		2
Chrysothamnus viscidiflorus / Agropyron cristatum Shrubland	Yellow Rabbitbrush / Crested Wheatgrass Shrubland	CHVI8/AGCR		8
Chrysothamnus viscidiflorus / Bromus tectorum Semi-natural Shrubland	Yellow Rabbitbrush / Cheatgrass Semi-natural Shrubland	CHVI8/BRTE		39
Chrysothamnus viscidiflorus / Hesperostipa comata Shrubland	Yellow Rabbitbrush / Needle and Thread Shrubland	CHVI8/HECO26	CEGL002799	1
Chrysothamnus viscidiflorus / Pascopyrum smithii Shrubland	Yellow Rabbitbrush / Western Wheatgrass Shrubland	CHVI8/PASM		3
Chrysothamnus viscidiflorus / Poa secunda - Bromus tectorum Semi-natural Shrubland	Yellow Rabbitbrush / Sandberg Bluegrass - Cheatgrass Semi-natural Shrubland	CHVI8/POSE-BRTE		5
Chrysothamnus viscidiflorus / Pseudoroegneria spicata Shrubland	Yellow Rabbitbrush / Bluebunch Wheatgrass Shrubland	CHVI8/PSSP6		1
Ericameria nana - Holodiscus dumosus / Penstemon deustus Shrubland	Dwarf Goldenbush - Rockspirea / Scabland Penstemon Shrubland	ERNA7-HODU/PEDE4		11
Juniperus osteosperma / Artemisia tridentata ssp. *wyomingensis / Hesperostipa comata* Wooded Shrubland	Utah Juniper / Wyoming Big Sagebrush / Needle and Thread Wooded Shrubland	JUOS/ARTRW8/HECO26		6
Prunus virginiana / Leymus cinereus Shrubland	Chokecherry / Basin Wildrye Shrubland	PRVI/LECI4		8
Purshia tridentata - Ericameria nana / Penstemon deustus Shrubland	Antelope Bitterbrush - Dwarf Goldenbush / Scabland Penstemon Shrubland	PUTR2-ERNA7/PEDE4		15
Purshia tridentata - Philadelphus lewisii / Poa secunda Shrubland	Antelope Bitterbrush - Lewis' Mock Orange / Sandberg Bluegrass Shrubland	PUTR2-PHLE4/POSE		4
Purshia tridentata / Achnatherum thurberianum Shrubland	Antelope Bitterbrush / Thurber's Needlegrass Shrubland	PUTR2/ACTH7		3
Purshia tridentata / Leymus cinereus Shrub Herbaceous Vegetation	Antelope Bitterbrush / Basin Wildrye Shrub Herbaceous Vegetation	PUTR2/LECI4	CEGL001497	4

Scientific Name	Common Name	Code	Elcode	N
*Purshia tridentata / Pseudoroegneria spicat*a Shrub Herbaceous Vegetation	Antelope Bitterbrush / Bluebunch Wheatgrass Shrub Herbaceous Vegetation	PUTR2/PSSP6	CEGL001495	1
	Herbaceous Vegetation			
Achnatherum nelsonii / Lupinus argenteus Herbaceous Vegetation	Columbia Needlegrass / Silvery Lupine Herbaceous Vegetation	ACNE9/LUAR3		1
Achnatherum thurberianum - Bromus tectorum Semi-natural Herbaceous Vegetation	Thurber's Needlegrass - Cheatgrass Semi-natural Herbaceous Vegetation	ACTH7-BRTE		9
Agropyron cristatum - Bromus tectorum Semi-natural Herbaceous Vegetation	Crested Wheatgrass - Cheatgrass Semi-natural Herbaceous Vegetation	AGCR-BRTE		38
Bromus tectorum Semi-natural Herbaceous Vegetation	Cheatgrass Semi-natural Herbaceous Vegetation	BRTE	CEGL003019	52
Elymus lanceolatus / Lupinus argenteus Herbaceous Vegetation	Streambank Wheatgrass / Silvery Lupine Herbaceous Vegetation	ELLA3/LUAR3		4
Festuca idahoensis - Pseudoroegneria spicata Herbaceous Vegetation	Idaho Fescue - Bluebunch Wheatgrass Herbaceous Vegetation	FEID-PSSP6	CEGL001624	3
Hesperostipa comata - Poa secunda Herbaceous Vegetation	Needle and Thread - Sandberg Bluegrass Herbaceous Vegetation	HECO26-POSE	CEGL001704	3
Juncus balticus Herbaceous Vegetation	Baltic Rush Herbaceous Vegetation	JUBA	CEGL001838	1
Juniperus (scopulorum, osteosperma) / Ericameria nana Wooded Herbaceous Vegetation	Juniper (Rocky Mountain, Utah) / Dwarf Goldenbush Wooded Herbaceous Vegetation	JUSC2-JUOS/ERNA7		14
Leymus cinereus Herbaceous Vegetation	Basin Wildrye Herbaceous Vegetation	LECI4	CEGL001479	4
Pascopyrum smithii Herbaceous Vegetation	Western Wheatgrass Herbaceous Vegetation	PASM	CEGL001577	2
Poa secunda - Bromus tectorum Semi-natural Herbaceous Vegetation	Sandberg Bluegrass - Cheatgrass Semi-natural Herbaceous Vegetation	POSE-BRTE		99
Poa secunda Herbaceous Vegetation	Sandberg Bluegrass Herbaceous Vegetation	POSE		8
Pseudoroegneria spicata - Melica bulbosa Herbaceous Vegetation	Bluebunch Wheatgrass - Oniongrass Herbaceous Vegetation	PSSP6-MEBU/ARAC2		2
Pseudoroegneria spicata - Poa secunda / Balsamorhiza sagittata Herbaceous Vegetation	Bluebunch Wheatgrass - Sandberg Bluegrass / Arrowleaf Balsamroot Herbaceous Vegetation	PSSP6-POSE/BASA3	CEGL001662	3
Pseudoroegneria spicata - Poa secunda Herbaceous Vegetation	Bluebunch Wheatgrass - Sandberg Bluegrass Herbaceous Vegetation	PSSP6-POSE	CEGL001677	11
Pseudoroegneria spicata / Crepis acuminata Herbaceous Vegetation	Bluebunch Wheatgrass / Tapertip Hawksbeard Herbaceous Vegetation	PSSP6/CRAC2		6

Scientific Name	Common Name	Code	Elcode	N
Sisymbrium altissimum / Bromus tectorum Semi-natural Herbaceous Vegetation	Tall Tumblemustard / Cheatgrass Semi-natural Herbaceous Vegetation	SIAL2/BRTE		24
	Sparse Vegetation			
Chamaebatiaria millefolium / Penstemon deustus Sparse Vegetation	Fernbush / Scabland Penstemon Sparse Vegetation	CHMI2/PEDE4		5
Ericameria nana / Poa secunda / Penstemon deustus Sparse Vegetation	Dwarf Goldenbush / Sandberg Bluegrass / Scabland Penstemon Sparse Vegetation	ERNA7/POSE/PEDE4		11
Eriogonum ovalifolium var. depressum Sparse Vegetation	Cushion Buckwheat Sparse Vegetation	EROVD	CEGL001401	4
Philadelphus lewisii / Penstemon deustus Sparse Vegetation	Lewis' Mock Orange / Scabland Penstemon Sparse Vegetation	PHLE4/PEDE4		8
Pinus flexilis / Chamaebatiaria millefolium / Poa secunda Sparse Vegetation	Limber Pine / Fernbush / Sandberg Bluegrass Sparse Vegetation	PIFL2/CHMI2/POSE		4
Poa secunda / Leptodactylon pungens Sparse Vegetation	Sandberg Bluegrass / Granite Prickly Phlox Sparse Vegetation	POSE/LEPU		11

Dichotomous Key to the Classification

The field key to plant communities of the Monument and Preserve follows. The key is structured into physiognomic classes (or lifeform groups). These classes do not constraint the classification *per se*, rather they are employed to assist in applying the classification. In the field, different expressions of a given plant association may occur as different physiognomic classes. For example, *Ericameria nana - Holodiscus dumosus / Penstemon deustus* Shrubland occurs in stands that are classified as a range of different physiognomies: herbaceous, shrubland, and sparse vegetation (approximately 18%, 36%, and 45% of observations, respectively). Given this, several associations may be found through multiple pathways within the key.

Field Key to Plant Communities of Craters of the Moon National Monument and Preserve

Use of the Key

To use the field key most effectively, identify a representative, homogeneous stand of vegetation. Work through the entire hierarchy of the key, beginning with *Key to Lifeform Groups* to each sequential dichotomous lead. Estimate plant cover on an area of approximately 405m^2. If a satisfactory determination is not made in stands with low total cover consider adjusting diagnostic species cover break points downward. Assignment of individual species to lifeform follows USDA, NRCS (2007).

In the key the term *relative cover* is used. In this context relative cover refers to the proportional abundance of the given species (or group of species) with respect to the total abundance of the associated lifeform. The value is calculated by dividing the percent cover of the species (or group of species) under consideration by the total cover of the respective lifeform. For example, the relative cover of native grass species is calculated as follows: (sum of native grass species cover within the sample) / (total cover of all graminoids within the sample) = (relative native grass composition).

Key to Lifeform Groups

1a) Tree canopy cover (*Juniperus osteosperma, Juniperus scopulorum, Pinus flexilis, Populus balsamifera* ssp. *trichocarpa, Populus tremuloides,* or *Pseudotsuga menziesii* alone or combined) ≥10%, **Part A: Forest, Woodland, and Savannah**, lead 4a.
1b) Tree canopy cover <10%, lead 2a.
  2a) Shrub canopy cover ≥10%, **Part B: Shrublands and Shrub-Steppe**, lead 17a.
  2b) Shrub canopy cover <10%, lead 3a.
    3a) Vascular plant cover ≥10%, **Part C: Herbaceous Vegetation**, lead 81a.
    3b) Vascular plant cover <10%, **Part D: Sparse Vegetation**, lead 106a.

Part A: Forest, Woodland, and Savannah

4a) *Populus balsamifera* spp. *trichocarpa* ≥10% cover, **POBAT**.
4b) *Populus balsamifera* spp. *trichocarpa* <10% cover, lead 5a.
  5a) *Populus tremuloides* >10% cover, lead 6a.
    6a) *Pinus flexilis* ≥5% cover, **POTR5-PIFL2**.
    6b) *Pinus flexilis* <5% cover, lead 7a.
      7a) *Acer glabrum, Amelanchier alnifolia, Prunus virginiana,* or *Salix scouleriana* (alone or in combination) ≥10% cover (occasionally less abundant in sparse stands), **POTR5/PRVI**.
      7b) *Acer glabrum, Amelanchier alnifolia, Prunus virginiana,* or *Salix scouleriana* (alone or in combination) <10% cover, lead 8a.
        8a) *Artemisia tridentata* ssp. *vaseyana* ≥10% cover, **POTR5/ARTR**.

8b) *Artemisia tridentata* ssp. *vaseyana* <10% cover, lead 9a.
9a) *Ribes aureum, Ribes cereum, Rosa woodsii,* or *Symphoricarpos oreophilus* (alone or in combination) ≥10% cover (occasionally less abundant in sparse stands), **POTR5/SYOR2/CARU**.
9a) *Ribes aureum, Ribes cereum, Rosa woodsii,* or *Symphoricarpos oreophilus* (alone or in combination) <10% cover, lead 10a.
10a) *Agastache urticifolia, Delphinium occidentale, Hackelia floribunda, Heracleum maximum, Mertensia ciliata, Osmorhiza occidentalis, Senecio serra,* or *Valeriana occidentalis* (alone or in combination) ≥10% cover (occasionally less abundant in sparse stands), **POTR5/TALL FORBS**.
10b) *Calamagrostis rubescens* or *Carex geyeri* (alone or in combination) ≥10% cover (occasionally less abundant in sparse stands), **POTR5/CARU**.
5b) *Populus tremuloides* ≤10, lead 11a.
11a) *Pinus flexilis* ≥5% cover, **PIFL2/PUTR2**.
11b) *Pinus flexilis* <5% cover, lead 12a.
12a) *Pseudotsuga menziesii* ≥5% cover, lead 13a.
13a) *Carex geyeri* ≥5% cover, **PSME/CAGE2**.
13b) *Carex geyeri* <5% and *Prunus virginiana* or *Symphoricarpos oreophilus* (alone or in combination) ≥5% cover (occasionally less abundant in sparse stands), **PSME/SYOR2**.
12b) *Pseudotsuga menziesii* <5% cover and *Juniperus osteosperma* or *Juniperus scopulorum* is the principal tree species, lead 14a.
14a) *Juniperus scopulorum* ≥10% cover, **JUSC2/POSE/PEDE4**.
14b) *Juniperus scopulorum* <10% cover, lead 15a.
15a) *Chamaebatiaria millefolium* is present, **JUOS-JUSC2/ARTRW8/CHMI2**.
15b) *Chamaebatiaria millefolium* is absent, lead 16a.
16a) *Ericameria nana* is present, **JUSC2-JUOS/ERNA7**.
16b) *Ericameria nana* is not present, **JUOS/ARTRW8/HECO26**.

Part B: Shrublands and Shrub-Steppe

17a) *Alnus incana* or *Prunus virginiana* (alone or in combination) ≥10% cover, lead 18a.
18a) *Alnus incana* ≥10% cover, **ALIN2/Mesic Forbs**.
18a) *Alnus incana* <10% cover, **PRVI/LECI4**.
17b) *Alnus incana* or *Prunus virginiana* (alone or in combination) <10% cover, lead 19a.
19a) *Artemisia tripartita* spp. *tripartita* ≥8 % cover, lead 20a.
20a) Native grass composition <45% relative cover, **ARTRT2/BRTE**.
20b) Native grass composition ≥45% relative cover, lead 21a.
21a) *Hesperostipa comata* ≥18% of total graminoid cover, **ARTRT2/HECO26**.
21b) *Hesperostipa comata* <18% relative graminoid cover, lead 22a.
22a) Native grass composition ≥74% relative cover, lead 23a.
23a) *Pseudoroegneria spicata* ≥30% relative graminoid cover, **ARTRT2/PSSP6**.
23b) *Pseudoroegneria spicata* <30% relative graminoid cover, lead 24a.
24a) *Poa secunda* ≥42% relative graminoid cover, **ARTRT2/POSE**.
24b) *Poa secunda* <42% relative graminoid cover, lead 25a.
25a) *Pascopyrum smithii* <28% relative graminoid cover, lead 26a.
26a) *Festuca idahoensis* ≥15% relative cover[1], **ARTRT2/FEID**.
26b) *Festuca idahoensis* <15% relative cover, lead 27a.
27a) *Koeleria macrantha* <20% relative cover, **ARTRT2/ACTH7**.
27b) *Koeleria macrantha* ≥20% relative cover, **ARTRT2/KOMA**.
25b) *Pascopyrum smithii* ≥28% relative graminoid cover, **ARTRT2/PASM**.
22b) Native grass composition <74% relative cover, lead 28a.
28a) *Poa secunda* ≥15% relative cover, **ARTRT2/POSE-BRTE**.

[1] *Relative cover* through lead 29 is in reference to relative graminoid cover.

28b) *Poa secunda* <15% relative cover, lead 29a.
29a) *Leymus cinereus* ≥30% relative cover, **ARTRT2/LECI4**.
29b) *Leymus cinereus* <30% relative cover, **ARTRT2/PASM-BRTE**.
19b) *Artemisia tripartita* spp. *tripartita* <8% cover, lead 30a.
30a) *Artemisia tridentata* spp. *wyomingensis* ≥3% cover, lead 31a.
31a) Native grass composition <31% relative cover, **ARTRW8/BRTE**.
31b) Native grass composition ≥31% relative cover, lead 32a.
32a) *Juniperus osteosperma* or *Juniperus scopulorum* (alone or in combination) ≥2% cover, lead 14a.
32) *Juniperus osteosperma* or *Juniperus scopulorum* (alone or in combination) <2% cover, lead 33a.
33a) Native grass composition >50% relative cover, lead 34a.
34a) *Bromus tectorum* ≥10% cover, lead 35a.
35a) *Achnatherum thurberianum* ≥4% cover, **ARTRW8/ACTH7-BRTE**.
35b) *Achnatherum thurberianum* <4, lead 36a.
36a) *Hesperostipa comata* ≥5% cover, **ARTRW8/HECO26**.
36b) *Hesperostipa comata* <5% cover, **ARTRW8/POSE-BRTE**.
34b) *Bromus tectorum* <10% cover, lead 37a.
37a) *Hesperostipa comata* ≥1% cover, **ARTRW8/HECO26**.
37b) *Hesperostipa comata* <1% cover, lead 38a.
38a) *Pseudoroegneria spicata* <3 lead 39a.
39a) *Festuca idahoensis* ≥1% cover, **ARTRW8/FEID**.
39b) *Festuca idahoensis* <1% cover, lead 40a.
40a) *Achnatherum thurberianum* ≥2% cover, **ARTRW8/ACTH7**.
40b) *Achnatherum thurberianum* <2% cover, lead 41a.
41a) *Achnatherum hymenoides* ≥1% cover, **ARTRW8/ACHY**.
41b) *Achnatherum hymenoides* <1% cover, lead 42a.
42a) *Pascopyrum smithii* ≥2% cover, **ARTRW8/PASM**.
42b) *Pascopyrum smithii* <2% cover, **ARTRW8/POSE**.
38b) *Pseudoroegneria spicata* ≥3% cover, **ARTRW8/PSSP6**.
33b) Native grass composition ≤50% relative cover, lead 43a.
43a) *Agropyron cristatum* or *Agropyron fragile* (alone or in combination) ≥5% cover, **ARTRW8/AGCR**.
43a) *Agropyron cristatum* or *Agropyron fragile* (alone or in combination) <5% cover, **ARTRW8/POSE-BRTE**.
30b) *Artemisia tridentata* spp. *wyomingensis* <3% cover, lead 44a.
44a) *Artemisia tridentata* ssp. *vaseyana* ≥3% cover, lead 45a.
45a) Native grass composition <43% relative cover, **ARTRV/BRTE**.
45b) Native grass composition ≥43% relative cover, lead 46a.
46a) *Pinus flexilis* ≥1% cover, **PIFL2/PUTR2**.
46b) *Pinus flexilis* <1% cover, lead 47a.
47a) *Chamaebatiaria millefolium* ≥2% cover, **ARTRV-CHMI2/PEDE4**.
47b) *Chamaebatiaria millefolium* <2% cover, lead 48a.
48a) *Symphoricarpos oreophilus* ≥10% cover, **ARTRV-SYOR2/PSSP6**.
48b) *Symphoricarpos oreophilus* <10% cover, lead 49a.
49a) *Purshia tridentata* ≥5% cover, lead 50a.
50a) *Pseudoroegneria spicata* ≥1, **ARTRV-PUTR2/PSSP6**.
50b) *Pseudoroegneria spicata* <1, **ARTRV-PUTR2/POSE**.
49b) *Purshia tridentata* <5% cover, lead 51a.
51a) *Leymus cinereus* ≥10% cover, **ARTRV/LECI4**.
51b) *Leymus cinereus* <10% cover, lead 52a.
52a) *Hesperostipa comata* ≥1% cover, **ARTRV/HECO26**.
52b) *Hesperostipa comata* <1% cover, lead 53a.
53a) *Pseudoroegneria spicata* <2% cover, lead 54a.

54a) *Festuca idahoensis* ≥1% cover, **ARTRV/FEID**.
54b) *Festuca idahoensis* <1% cover, **ARTRV/POSE**.
53b) *Pseudoroegneria spicata* ≥2% cover, **ARTRV/PSSP6**.
44b) *Artemisia tridentata* ssp*. vaseyana* <3, lead 55a.
55a) *Chrysothamnus viscidiflorus* <5% cover, lead 56a.
56a) *Artemisia arbuscula* ssp*. arbuscula* ≥3% cover, lead 57a.
57a) *Pseudoroegneria spicata* ≥2% cover, **ARARA/PSSP6**.
57b) *Pseudoroegneria spicata* <2% cover, lead 58a.
58a) *Hesperostipa comata* is present, **ARARA/HECO26**.
58b) *Hesperostipa comata* is not present, lead 59a.
59a) *Poa secunda* ≥2% cover, **ARARA/POSE.**
59b) *Poa secunda* <2% cover, **ARARA/BRTE**.
56b) *Artemisia arbuscula* ssp*. arbuscula* <3% cover, lead 60a.
60a) *Artemisia arbuscula* ssp*. longiloba* ≥10% cover, **ARARL/FEID**.
60b) *Artemisia arbuscula* ssp*. longiloba* <10% cover, lead 61a.
61a) *Artemisia tridentata* ssp*. tridentata* ≥5% cover, lead 62a.
62a) *Festuca idahoensis* ≥2% cover, **ARTRT/FEID**.
62b) *Festuca idahoensis* <2% cover, lead 63a.
63a) *Leymus cinereus* ≥2% cover, **ARTRT/LECI4**.
63b) *Leymus cinereus* ≤2% cover, lead 64a.
64a) *Pseudoroegneria spicata* ≥2% cover, **ARTRT/PSSP6**.
64b) *Pseudoroegneria spicata* <2% cover, **ARTRT/POSE**.
61b) *Artemisia tridentata* ssp*. tridentata* <5% cover, lead 65a.
65a) *Artemisia tripartita* spp*. tripartita* ≥2% cover, lead 20a (ARTRT2).
65b) *Artemisia tripartita* spp*. tripartita* <2% cover, lead 66a.
66a) *Ericameria nana* ≥3% cover, lead 67a.
67a) Tree cover ≥2%, lead 14a.
67b) Tree cover <2%, lead 107a.
66b) *Ericameria nana* <3% cover, lead 68a.
68a) *Philadelphus lewisii* >2% cover, **PHLE4/PEDE4**.
68b) *Philadelphus lewisii* ≤2% cover, lead 69a.
69a) *Cercocarpus ledifolius* ≥5% cover, **CELE3-PUTR2/POSE**.
69b) *Cercocarpus ledifolius* <5% cover, lead 70a.
70a) *Pinus flexilis* ≥1% cover, **PIFL2/PUTR2**.
70b) *Pinus flexilis* <1% cover, lead 71a.
71a) *Achnatherum thurberianum* ≥2% cover, **PUTR2/ACTH7**.
71b) *Achnatherum thurberianum* <2% cover, lead 72a.
72a) *Leymus cinereus* present, **PUTR2/LECI4**.
72b) *Leymus cinereus* is absent, lead 73a.
73a) *Pseudoroegneria spicata* ≥2% cover, **PUTR2/PSSP6**.
73b) *Pseudoroegneria spicata* <2% cover, lead 74a.
74a) *Philadelphus lewisii* ≥1% cover, **PUTR2-PHLE4/POSE**.
74b) *Philadelphus lewisii* <1% cover, **PUTR2-ERNA7/PEDE4**.
55b) *Chrysothamnus viscidiflorus* ≥5% cover, lead 75a.
75a) *Artemisia tripartita* spp*. tripartita* ≥3% cover, lead 20a (ARTRT2).
75b) *Artemisia tripartita* spp*. tripartita* <3% cover, lead 76a.
76a) Native grass composition <70% relative cover, lead 77a.

77a) *Agropyron cristatum* or *Agropyron fragile* (alone or in combination) ≥2% cover, **CHVI8/AGCR**.
77b) *Agropyron cristatum* or *Agropyron fragile* (alone or in combination) <2% cover, **CHVI8/BRTE**.
76b) Native grass composition ≥70% relative cover, lead 78a.
78a) *Hesperostipa comata* ≥5% cover, **CHVI8/HECO26**.
78b) *Hesperostipa comata* <5% cover, lead 79a.
79a) *Pseudoroegneria spicata* ≥5% cover, **CHVI8/PSSP6**.
79b) *Pseudoroegneria spicata* <5% cover, lead 80a.
80a) *Achnatherum thurberianum* or *Pascopyrum smithii* (alone or in combination) ≥5% cover, **CHVI8/PASM**.
80b) *Achnatherum thurberianum* or *Pascopyrum smithii* (alone or in combination) <5% cover, **CHVI8/POSE-BRTE**.

Part C: Herbaceous Vegetation

81a) Relative cover of trees, shrubs, and dwarf-shrubs (combined) ≥21%, lead 82a.
82a) *Artemisia tridentata* spp. *wyomingensis* <3% cover, lead 83a.
83a) *Artemisia tridentata* spp. *wyomingensis* and *Chrysothamnus viscidiflorus*, combined, <6% cover, lead 84a.
84a) *Artemisia tripartita* spp. *tripartita* ≥3% cover, lead 20a (ARTRT2).
84b) *Artemisia tripartita* spp. *tripartita* <3% cover, lead 85a.
85a) *Artemisia tridentata* ssp. *vaseyana* ≥3% cover, lead 44a (ARTRV).
85b) *Artemisia tridentata* ssp. *vaseyana* <3% cover, lead 86a.
86a) *Artemisia arbuscula* ssp. *arbuscula* ≥4% cover, lead 56a (ARARA).
86b) *Artemisia arbuscula* ssp. *arbuscula* <4% cover, lead 87a.
87a) *Ericameria nana* is present, lead 88a.
88a) Total vegetative cover ≥10%, lead 67a.
88b) Total vegetative cover <10%, lead 107a.
87b) *Ericameria nana* is absent, lead 90a.
83b) *Artemisia tridentata* spp. *wyomingensis* and *Chrysothamnus viscidiflorus*, combined, ≥6% cover, lead 75a (CHVI8).
82b) *Artemisia tridentata* spp. *wyomingensis* ≥3% cover, lead 89a.
89a) *Artemisia tridentata* spp. *wyomingensis* and *Chrysothamnus viscidiflorus*, combined, ≥6% cover, lead 31a (ARTRW8).
89b) *Artemisia tridentata* spp. *wyomingensis* and *Chrysothamnus viscidiflorus*, combined, <6% cover, lead 81b.
81b) Relative cover of trees, shrubs, and dwarf-shrubs (combined) <21%, lead 90a.
90a) *Agropyron cristatum* or *Agropyron fragile* (alone or in combination) ≥3% cover, **AGCR-BRTE**.
90b) *Agropyron cristatum* or *Agropyron fragile* (alone or in combination) <3% cover, lead 91a.
91a) Native grass composition <39% relative cover, lead 92a.
92a) *Sisymbrium altissimum* ≥3% cover, **SIAL2/BRTE**.
92b) *Sisymbrium altissimum* <3% cover, lead 93a.
93a) Combined cover of native perennial grass species (*Achnatherum hymenoides, Achnatherum thurberianum, Elymus elymoides, Elymus lanceolatus, Festuca idahoensis, Hesperostipa comata, Leymus cinereus, Pascopyrum smithii, Poa secunda,* or *Pseudoroegneria spicata*) ≥3% cover, **POSE-BRTE**.
93b) Combined cover of native perennial grass species <3% cover, **BRTE**.
91b) Native grass composition ≥39% relative cover, lead 94a.
94a) *Hesperostipa comata* ≥10% cover, **HECO26-POSE**.
94b) *Hesperostipa comata* <10% cover, lead 95a.
95a) *Bromus tectorum* ≥2% cover, lead 96a.
96a) *Achnatherum thurberianum* ≥5% cover, **ACTH7-BRTE**.
96b) *Achnatherum thurberianum* <5% cover, **POSE-BRTE**.
95b) *Bromus tectorum* <2% cover, lead 97a.

97a) *Elymus lanceolatus* ≥3% cover, **ELLA3/LUAR3**.
97b) *Elymus lanceolatus* <3% cover, lead 98a.
98a) *Festuca idahoensis* ≥2% cover, **FEID-PSSP6**.
98b) *Festuca idahoensis* <2% cover, lead 99a.
99a) *Leymus cinereus* ≥2% and *Pseudoroegneria spicata* <1% cover, **LECI4**.
99b) *Leymus cinereus* <2% cover, lead 100a.
100a) *Pascopyrum smithii* ≥3% cover, **PASM**.
100b) *Pascopyrum smithii* <3% cover, lead 101a.
101a) *Pseudoroegneria spicata* ≥3% cover, lead 102a.
102a) Melica bulbosa ≥3% cover, **PSSP6-MEBU/ARAC2**.
102b) Melica bulbosa <3% cover, lead 103a.
103a) *Balsamorhiza sagittata* ≥5% cover, **PSSP6-POSE/BASA3**.
103b) *Balsamorhiza sagittata* <5% cover, lead 104a.
104a) *Poa secunda* <2% cover, **PSSP6/CRAC2**.
104b) *Poa secunda* ≥2% cover, **PSSP6-POSE**.
101b) *Pseudoroegneria spicata* <3% cover, lead 105a.
105a) *Leptodactylon pungens* is present, **POSE/LEPU**.
105a) *Leptodactylon pungens* is not present, **POSE**.

Part D: Sparse Vegetation

106a) *Agropyron cristatum* ≥2% cover, **AGCR**.
106b) *Agropyron cristatum* <2% cover, lead 107a.
107a) *Ericameria nana* present, lead 108a.
108a) *Juniperus scopulorum* or *Juniperus osteosperma* (alone or in combination) ≥1% cover, **JUSC2-JUOS/ERNA7**.
108b) *Juniperus scopulorum* or *Juniperus osteosperma* (alone or in combination) <1% cover, lead 109a.
109a) *Holodiscus dumosus* ≥1% cover, **ERNA7-HODU/PEDE4**.
109b) *Holodiscus dumosus* <1% cover, lead 110a.
110a) *Purshia tridentata* ≥1% cover, **PUTR2-ERNA7/PEDE4**.
110b) *Purshia tridentata* <1% cover, **ERNA7/POSE/PEDE4**.
107b) *Ericameria nana* is not present, lead 111a.
111a) *Philadelphus lewisii* is not present, lead 112a.
112a) *Juniperus osteosperma* ≥1% cover, **JUOS/ARTRW8/HECO26**.
112b) *Juniperus osteosperma* <1% cover, lead 113a.
113a) *Purshia tridentata* is present, lead 114a.
114a) *Leymus cinereus* is present, **PUTR2/LECI4**.
114b) *Leymus cinereus* is not present, **PUTR2-ERNA7/PEDE4**.
113b) *Purshia tridentata* is not present, lead 115a.
115a) *Eriogonum ovalifolium* var*. depressum* is present, **EROVD**.
115b) *Eriogonum ovalifolium* var*. depressum* is not present, lead 116a.
116a) *Chamaebatiaria millefolium* is present, **CHMI2/PEDE4**.
116b) *Chamaebatiaria millefolium* is not present, lead 117a.
117a) *Ericameria nana* and *Holodiscus dumosus* each are present, **ERNA7/POSE/PEDE4**.
117b) *Ericameria nana* and *Holodiscus dumosus* each are not present, **POSE/LEPU**.
111b) *Philadelphus lewisii* is present, lead 118a.
118a) *Purshia tridentata* ≥1% cover, **PUTR2-PHLE3/POSE**.
118b) *Purshia tridentata* <1% cover, lead 119a.
119a) *Pinus flexilis* ≥1% cover, **PIFL2/CHMI2/POSE**.
119b) *Pinus flexilis* <1% cover, **PHLE4/PEDE4**.

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Appendix 1. Cross-walk to vegetation types. Vegetation types described by Day and Wright (1985) are cross-walked to plant associations identified in this classification. Vegetation types are listed in the order they appear in Day and Wright (1985) with the equivalent plant community common and scientific name.

Vegetation Type (Day and Wright 1985)	Equivalent Common Name	Equivalent Scientific Name
Cinder Gardens	Cushion Buckwheat Sparse Vegetation	*Eriogonum ovalifolium var. depressum* Sparse Vegetation
Low Density Lava Flows and Medium Density Lava Flows	Mountain Big Sagebrush - Fernbush / Scabland Penstemon Shrubland	*Artemisia tridentata* ssp. *vaseyana - Chamaebatiaria millefolium / Penstemon deustus* Shrubland
	Fernbush / Scabland Penstemon Sparse Vegetation	*Chamaebatiaria millefolium / Penstemon deustus* Sparse Vegetation
	Dwarf Goldenbush - Rockspirea / Scabland Penstemon Shrubland	*Ericameria nana - Holodiscus dumosus / Penstemon deustus* Shrubland
	Dwarf Goldenbush / Sandberg Bluegrass / Scabland Penstemon Sparse Vegetation	*Ericameria nana / Poa secunda / Penstemon deustus* Sparse Vegetation
	Juniper (Rocky Mountain, Utah) / Dwarf Goldenbush Herbaceous Vegetation	*Juniperus (scopulorum, osteosperma) / Ericameria nana* Herbaceous Vegetation
	Antelope Bitterbrush - Dwarf Goldenbush / Scabland Penstemon Shrubland	*Purshia tridentata - Ericameria nana / Penstemon deustus* Shrubland
	Antelope Bitterbrush - Lewis' Mock Orange / Sandberg Bluegrass Shrubland	*Purshia tridentata - Philadelphus lewisii / Poa secunda* Shrubland
Mountain Big Sagebrush / Bluebunch Wheatgrass	Mountain Big Sagebrush / Bluebunch Wheatgrass Shrubland	*Artemisia tridentata* ssp. *vaseyana / Pseudoroegneria spicata* Shrubland
Mountain Big Sagebrush / Sandberg Bluegrass	Mountain Big Sagebrush / Sandberg Bluegrass Shrubland	*Artemisia tridentata* ssp. *vaseyana / Poa secunda* Shrubland
Mountain Big Sagebrush / Needle Grass	Mountain Big Sagebrush / Needle and Thread Shrubland	*Artemisia tridentata* ssp. *vaseyana / Hesperostipa comata* Shrubland
Mountain Big Sagebrush / Idaho Fescue	Mountain Big Sagebrush / Idaho Fescue Shrub Herbaceous Vegetation	*Artemisia tridentata* ssp. *vaseyana / Festuca idahoensis* Shrub Herbaceous Vegetation
Big Sagebrush / Cheatgrass	not sampled	
Three-tip Sagebrush / Idaho Fescue	Threetip Sagebrush / Idaho Fescue Shrub Herbaceous Vegetation	*Artemisia tripartita* ssp. *tripartita / Festuca idahoensis* Shrub Herbaceous Vegetation

Vegetation Type (Day and Wright 1985)	Equivalent Common Name	Equivalent Scientific Name
Early Low Sagebrush / Idaho Fescue	Early Low Sagebrush / Idaho Fescue Shrub Herbaceous Vegetation	*Artemisia arbuscula* ssp. *longiloba / Festuca idahoensis* Shrub Herbaceous Vegetation
Low Sagebrush / Sandberg Bluegrass	Low Sagebrush / Sandberg Bluegrass Shrub Herbaceous Vegetation	*Artemisia arbuscula* ssp. *arbuscula / Poa secunda* Shrub Herbaceous Vegetation
Low Sagebrush / Idaho Fescue	Low Sagebrush / Idaho Fescue Shrub Herbaceous Vegetation	*Artemisia arbuscula* ssp. *arbuscula / Festuca idahoensis* Shrub Herbaceous Vegetation
Antelope Bitterbrush	Antelope Bitterbrush / Bluebunch Wheatgrass Shrub Herbaceous Vegetation	*Purshia tridentata / Pseudoroegneria spicata* Shrub Herbaceous Vegetation
Antelope Bitterbrush / Great Basin Wildrye	Antelope Bitterbrush / Basin Wildrye Shrub Herbaceous Vegetation	*Purshia tridentata / Leymus cinereus* Shrub Herbaceous Vegetation
Bluebunch Wheatgrass / Idaho Fescue	Idaho Fescue - Bluebunch Wheatgrass Herbaceous Vegetation	*Festuca idahoensis - Pseudoroegneria spicata* Herbaceous Vegetation
Bluebunch Wheatgrass / Sandberg Bluegrass	Bluebunch Wheatgrass - Sandberg Bluegrass / Arrowleaf Balsamroot Herbaceous Vegetation	*Pseudoroegneria spicata - Poa secunda / Balsamorhiza sagittata* Herbaceous Vegetation
	Bluebunch Wheatgrass - Sandberg Bluegrass Herbaceous Vegetation	*Pseudoroegneria spicata - Poa secunda* Herbaceous Vegetation
	Bluebunch Wheatgrass / Tapertip Hawksbeard Herbaceous Vegetation	*Pseudoroegneria spicata / Crepis acuminata* Herbaceous Vegetation
Great Basin Wildrye	Basin Wildrye Herbaceous Vegetation	*Leymus cinereus* Herbaceous Vegetation
Limber Pine / Antelope Bitterbrush (Low Total Cover)	Limber Pine / Fernbush / Sandberg Bluegrass Sparse Vegetation	*Pinus flexilis / Chamaebatiaria millefolium / Poa secunda* Sparse Vegetation
Limber Pine / Antelope Bitterbrush (High Total Cover)	Limber Pine / Antelope Bitterbrush Woodland	*Pinus flexilis / Purshia tridentata* Woodland
Limber Pine / Antelope Bitterbrush (High Density Limber Pine)	Limber Pine / Antelope Bitterbrush Woodland	*Pinus flexilis / Purshia tridentata* Woodland
Douglas-fir / Mountain Snowberry	Douglas-fir / Mountain Snowberry Forest	*Pseudotsuga menziesii / Symphoricarpos oreophilus* Forest
Upland Quaking Aspen	Quaking Aspen - Limber Pine Forest	*Populus tremuloides - Pinus flexilis* Forest
	Quaking Aspen / Big Sagebrush Forest	*Populus tremuloides / Artemisia tridentata* Forest
	Quaking Aspen / Pinegrass Forest	*Populus tremuloides / Calamagrostis rubescens* Forest

Vegetation Type (Day and Wright 1985)	Equivalent Common Name	Equivalent Scientific Name
	Quaking Aspen / Chokecherry Forest	*Populus tremuloides / Prunus virginiana* Forest
	Quaking Aspen / Mountain Snowberry / California Brome Forest	*Populus tremuloides / Symphoricarpos oreophilus / Bromus carinatus* Forest
	Quaking Aspen / Mountain Snowberry / Pinegrass Forest	*Populus tremuloides / Symphoricarpos oreophilus / Calamagrostis rubescens* Forest
	Quaking Aspen / Mountain Snowberry Forest	*Populus tremuloides / Symphoricarpos oreophilus* Forest
	Quaking Aspen / Tall Forbs Forest	*Populus tremuloides* / Tall Forbs Forest
Riparian	Gray Alder / Mesic Forbs Shrubland	*Alnus incana* / Mesic Forbs Shrubland
	Black Cottonwood Temporarily Flooded Woodland Alliance	*Populus balsamifera ssp. trichocarpa* Temporarily Flooded Woodland Alliance

Appendix 2. Summary of pertinent classification literature. Local and regional literature regarding the classification of vegetation found within Craters of the Moon National Monument and Preserve is listed alphabetically by plant association within physiognomic class. The work of Day and Wright (1985) is treated in detail in Appendix 1 and is not listed here.

Scientific Name	Reference
Forest and Woodland	
Juniperus osteosperma / Artemisia tridentata ssp. wyomingensis / Hesperostipa comata	Forman et al. 2003
Populus tremuloides - Pinus flexilis Forest	Mueggler 1988
Populus tremuloides / Artemisia tridentata Forest	Mueggler 1988
Populus tremuloides / Calamagrostis rubescens Forest	Mueggler 1988
Populus tremuloides / Symphoricarpos oreophilus / Calamagrostis rubescens Forest	Mueggler 1988
Populus tremuloides / Tall Forbs Forest	Bowerman et al. 1996, Mueggler 1988
Pseudotsuga menziesii / Carex geyeri Forest	Cooper et al. 1991, Steele et al. 1981
Pseudotsuga menziesii / Symphoricarpos oreophilus Forest	Bowerman et al. 1996, Johnson and Simon 1987, Steele et al. 1981, Steele et al. 1983
Shrubland	
Alnus incana / Mesic Forbs Shrubland	Crowe and Clausnitzer 1995, Manning and Padgett 1995, Padgett et al. 1989
Artemisia arbuscula ssp. arbuscula / Poa secunda Shrub Herbaceous Vegetation	Hironaka et al. 1983
Artemisia arbuscula ssp. arbuscula / Pseudoroegneria spicata Shrub Herbaceous Vegetation	Bowerman et al. 1996, Hironaka et al. 1983, Nelson and Jensen 1987
Artemisia arbuscula ssp. longiloba / Festuca idahoensis Shrub Herbaceous Vegetation	Hironaka et al. 1983, Nelson and Jensen 1987
Artemisia tridentata ssp. tridentata / Festuca idahoensis Shrubland	Hironaka et al. 1983, Nelson and Jensen 1987
Artemisia tridentata ssp. tridentata / Leymus cinereus Shrubland	Hironaka et al. 1983
Artemisia tridentata ssp. *tridentata / Poa secunda* Shrubland	Daubenmire 1970
Artemisia tridentata ssp. tridentata / Pseudoroegneria spicata Shrub Herbaceous Vegetation	Bowerman et al. 1996, Daubenmire 1970, Hironaka et al. 1983, Nelson and Jensen 1987
Artemisia tridentata ssp. vaseyana - Symphoricarpos oreophilus / Pseudoroegneria spicata Shrubland	Bowerman et al. 1996, Hironaka et al. 1983, Nelson and Jensen 1987
Artemisia tridentata ssp. vaseyana / Festuca idahoensis Shrub Herbaceous Vegetation	Bowerman et al. 1996, Hironaka et al. 1983, Johnson and Simon 1987, Winward 1970

Scientific Name	Reference
Artemisia tridentata ssp. vaseyana / Hesperostipa comata Shrubland	Hironaka et al. 1983, Winward 1970
Artemisia tridentata ssp. vaseyana / Leymus cinereus Shrubland	Hironaka et al. 1983, Nelson and Jensen 1987
Artemisia tridentata ssp. vaseyana / Pseudoroegneria spicata Shrubland	Bowerman et al. 1996, Hironaka et al. 1983, Lauer and Peek 1976, Nelson and Jensen 1987, Winward 1970
Artemisia tridentata ssp. wyomingensis / Achnatherum hymenoides	McBride et al. 1978
Artemisia tridentata ssp. wyomingensis / Achnatherum thurberianum Shrubland	Hironaka et al. 1983
Artemisia tridentata ssp. wyomingensis / Hesperostipa comata Shrubland	Hironaka et al. 1983, Winward 1970, McBride et al. 1978
Artemisia tridentata ssp. wyomingensis / Poa secunda Shrubland	Hironaka et al. 1983
Artemisia tridentata ssp. *wyomingensis / Pseudoroegneria spicata* Shrubland	Hironaka et al. 1983, McBride et al. 1978
Artemisia tripartita ssp. tripartita / Festuca idahoensis Shrub Herbaceous Vegetation	Daubenmire 1970, Hironaka et al. 1983
Artemisia tripartita ssp. tripartita / Hesperostipa comata Shrub Herbaceous Vegetation	Daubenmire 1970, Hironaka et al. 1983
Artemisia tripartita ssp. tripartita / Pseudoroegneria spicata Shrub Herbaceous Vegetation	Daubenmire 1970, Hironaka et al. 1983
Purshia tridentata / Pseudoroegneria spicata Shrub Herbaceous Vegetation	Hironaka et al. 1983, Johnson and Simon 1987
Herbaceous Vegetation	
Festuca idahoensis - Pseudoroegneria spicata Herbaceous Vegetation	Johnson and Simon 1987, Mueggler and Harris 1969, Tisdale 1986
Hesperostipa comata - Poa secunda Herbaceous Vegetation	Daubenmire 1970
Juncus balticus Herbaceous Vegetation	Crowe and Clausnitzer 1995, Manning and Padgett 1995, Padgett et al. 1989, Tuhy and Jensen 1982, Youngblood et al. 1985
Leymus cinereus Herbaceous Vegetation	Johnson and Simon 1987
Pascopyrum smithii Herbaceous Vegetation	French and Mitchell 1983
Pseudoroegneria spicata - Melica bulbosa Herbaceous Vegetation	Mueggler and Harris 1969, Schlatterer 1972
Pseudoroegneria spicata - Poa secunda Herbaceous Vegetation	Johnson and Simon 1987
Pseudoroegneria spicata - Poa secunda / Balsamorhiza sagittata Herbaceous Vegetation	Mueggler and Harris 1969, Tisdale 1986

Appendix 3. Stand tables. The species compositions of plant associations that were sampled on 4 or more plots are summarized. The stand tables are organized alphabetically by physiognomic class: Part A: Forest, Woodland and Savanna; Part B: Shrublands and Shrub-Steppe; Part C: Herbaceous Vegetation; Part D: Sparse Vegetation. Species composition data is summarized as percent frequency followed by characteristic cover (the later shown in parentheses). For the purpose of comparison, species lists are selected by physiognomic class. One exception here are the deciduous shrublands, which have a unique species list and appear at the end of Part B. In some instances blank rows will appear as the summary for a given physiognomic class may span over several pages. Please refer to Table 1 for association sample sizes.

Part A: Forest, Woodland, and Savanna

Species	JUOS-JUSC2/ ARTRW8/ CHMI2	JUSC2/ POSE/ PEDE4	PIFL2/ PUTR2	POTR5/ CARU	POTR5/ PRVI	POTR5/ SYOR2/ CARU	PSME/ SYOR2
TREES							
Juniperus osteosperma	100 (11.3)	50 (4.2)	13 (0.6)	-	-	-	-
Juniperus scopulorum	86 (3.7)	100 (20.4)	-	-	-	13 (0.1)	-
Pinus flexilis	-	-	100 (9.7)	50 (0.4)	-	38 (0.1)	25 (0.2)
Populus tremuloides	-	-	6 (10)	100 (19.5)	100 (18.8)	100 (25.3)	-
Pseudotsuga menziesii	-	-	6 (10)	-	-	-	100 (24.1)
DWART-SHRUBS							
Ericameria nana	86 (2.2)	71 (0.5)	-	-	-	-	-
Eriogonum microthecum	-	14 (0.1)	19 (0.1)	-	-	-	-
SHRUBS							
Amelanchier alnifolia	-	-	25 (0.1)	17 (0.1)	25 (0.1)	25 (0.1)	-
Artemisia tridentata ssp. vaseyana	-	-	63 (9.5)	50 (0.4)	25 (0.1)	63 (0.3)	38 (6.4)
Artemisia tridentata var. wyomingensis	100 (6.3)	43 (3.7)	6 (2)	-	-	-	-
Chamaebatiaria millefolium	100 (2.3)	21 (1.4)	19 (0.1)	-	-	-	-
Chrysothamnus viscidiflorus	14 (5)	7 (0.1)	6 (1)	-	-	25 (0.1)	-
Ericameria nauseosa ssp. consimilis var. oreophila	71 (1)	93 (1.1)	88 (3)	33 (0.1)	25 (0.1)	25 (0.1)	-
Holodiscus dumosus	43 (1)	29 (0.1)	-	-	-	-	-
Prunus virginiana	-	-	-	67 (0.8)	100 (19)	63 (0.7)	50 (12.8)
Purshia tridentata	86 (0.7)	79 (1.7)	100 (8.9)	17 (0.1)	-	13 (0.1)	13 (0.1)
Ribes aureum	-	36 (0.6)	25 (0.1)	-	25 (0.1)	13 (0.1)	50 (0.1)
Ribes cereum var. pedicellare	-	-	63 (1)	-	-	-	-
Salix boothii	-	-	-	33 (0.1)	25 (2)	13 (2)	13 (0.1)
Salix scouleriana	-	-	-	33 (2.6)	-	-	25 (1)
Symphoricarpos oreophilus	-	-	6 (0.1)	100 (2.4)	75 (3.7)	100 (11)	50 (4.8)
GRAMINOIDS							
Achnatherum hymenoides	29 (0.6)	36 (0.5)	50 (0.3)	-	-	-	-
Achnatherum nelsonii ssp. dorei	-	-	-	50 (0.1)	50 (0.1)	50 (1.6)	25 (0.1)
Bromus tectorum	86 (1.5)	100 (1.3)	19 (0.1)	-	25 (0.1)	-	13 (3)
Calamagrostis rubescens	-	-	-	100 (18.5)	25 (1)	75 (10.3)	-
Elymus elymoides	14 (0.1)	43 (0.3)	56 (0.2)	-	-	-	-
Festuca idahoensis	-	-	19 (0.7)	-	25 (0.1)	13 (0.1)	-
Hesperostipa comata ssp. comata	14 (0.1)	50 (0.9)	-	-	-	-	-
Koeleria macrantha	-	-	-	17 (0.1)	25 (0.1)	63 (0.1)	-
Leymus cinereus	-	7 (0.1)	13 (0.6)	17 (0.1)	50 (0.6)	38 (0.7)	-
Poa secunda	86 (5)	100 (1.3)	88 (0.8)	-	-	25 (0.1)	38 (1.7)
Pseudoroegneria spicata	-	14 (1)	13 (1.1)	17 (0.1)	50 (1.5)	13 (0.1)	63 (1.4)
FORBS							
Achillea millefolium	-	-	-	50 (0.1)	25 (0.1)	88 (0.4)	-
Agastache urticifolia	-	-	-	17 (0.1)	50 (0.1)	25 (0.1)	25 (0.1)
Agoseris glauca	-	-	19 (0.1)	-	25 (0.1)	-	-
Angelica pinnata	-	-	-	33 (0.1)	50 (0.1)	13 (0.1)	25 (0.1)
Antennaria microphylla	-	-	-	17 (0.1)	-	38 (0.1)	-
Asteraceae	-	-	-	67 (0.2)	50 (0.2)	63 (0.1)	25 (0.1)
Balsamorhiza sagittata	-	-	-	17 (0.1)	25 (0.1)	50 (0.1)	50 (5)
Chaenactis douglasii	71 (0.5)	36 (0.5)	6 (0.1)	-	-	-	-
Cirsium canovirens	57 (0.3)	14 (0.1)	-	-	-	-	-
Collinsia parviflora	-	-	13 (0.1)	-	25 (0.1)	13 (0.1)	25 (0.1)
Crepis acuminata	-	-	31 (0.1)	17 (0.1)	25 (0.1)	50 (0.1)	25 (0.1)
Delphinium andersonii	-	-	81 (0.2)	-	-	-	-
Descurainia pinnata ssp. filipes	57 (0.8)	7 (0.1)	-	-	-	-	-
Eriogonum ovalifolium	-	-	56 (0.1)	-	-	-	-
Eriogonum ovalifolium var. depressum	-	-	31 (0.1)	-	-	-	-
Eriogonum umbellatum	-	7 (0.1)	81 (0.1)	-	-	-	-
Galium bifolium	-	-	-	-	50 (0.1)	13 (0.1)	25 (0.6)
Gutierrezia sarothrae	-	36 (0.8)	-	-	-	-	-
Hackelia floribunda	-	-	-	33 (0.1)	25 (0.1)	38 (0.1)	25 (0.1)
Lactuca serriola	71 (0.8)	57 (0.2)	-	17 (0.1)	-	13 (1)	-
Leptodactylon pungens	86 (1.5)	79 (0.5)	56 (0.2)	-	-	-	-
Lithospermum ruderale	-	-	13 (0.1)	-	25 (0.1)	25 (0.1)	-
Lupinus arbustus	-	-	-	-	25 (0.1)	25 (0.1)	-
Lupinus argenteus	-	-	-	33 (0.1)	-	25 (0.1)	-
Maianthemum racemosum ssp. amplexicaule	-	-	-	17 (0.1)	25 (0.1)	25 (0.1)	25 (0.1)
Maianthemum stellatum	-	-	-	33 (0.1)	50 (0.1)	25 (0.1)	-
Opuntia polyacantha	43 (0.4)	43 (0.3)	-	-	-	-	-
Penstemon deustus	86 (2.7)	100 (0.7)	38 (0.1)	-	-	-	13 (0.1)
Phacelia hastata	-	7 (0.1)	81 (0.2)	-	25 (1)	13 (0.1)	-
Potentilla glandulosa	43 (0.1)	64 (0.2)	19 (1)	50 (0.1)	25 (0.1)	50 (0.1)	25 (0.1)
Pteryxia terebinthina var. foeniculacea	-	-	44 (0.4)	-	-	-	13 (0.1)
Senecio integerrimus var. exaltatus	-	-	31 (0.1)	17 (0.1)	-	13 (0.1)	-
Stephanomeria minor var. myrioclada	100 (1)	79 (0.3)	6 (0.1)	-	-	-	-
Taraxacum officinale	-	-	-	67 (0.1)	50 (0.1)	38 (0.1)	25 (0.1)
Tragopogon dubius	29 (0.1)	14 (0.1)	-	17 (0.1)	25 (0.1)	13 (0.1)	-
Unknown species	-	-	-	33 (0.1)	25 (0.2)	13 (0.1)	25 (0.1)
Viola nuttallii	-	-	6 (0.1)	-	25 (0.1)	50 (0.1)	-

Part B: Shrublands and Shrub-Steppe

Species	ARARA/ POSE	ARARA/ PSSP6	ARTRT/ LECI4	ARTRT/ POSE	ARTRT2/ ACTH7	ARTRT2/ BRTE	ARTRT2/ FEID
TREES							
Juniperus osteosperma	-	-	-	-	-	-	-
Pinus flexilis	-	-	-	-	-	-	-
DWARF-SHRUBS	-	-	-	-	-	-	-
Artemisia arbuscula	100 (12)	100 (7.6)	-	-	-	3 (0.1)	-
Ericameria nana	-	-	-	-	-	-	-
Eriogonum microthecum	25 (0.1)	-	-	17 (0.1)	-	-	-
Artemisia tridentata ssp. tridentata	-	-	100 (12.4)	100 (13.2)	-	3 (0.1)	-
Artemisia tridentata ssp. vaseyana	-	29 (2)	-	17 (1)	-	-	21 (0.1)
Artemisia tridentata var. wyomingensis	-	-	-	-	50 (5.9)	58 (2)	43 (0.7)
Artemisia tripartita	-	-	40 (2)	33 (1.5)	100 (21.5)	100 (10.2)	100 (25.1)
SHRUBS							
Chamaebatiaria millefolium	-	-	-	-	-	-	-
Chrysothamnus viscidiflorus	-	29 (1)	60 (2.7)	33 (0.2)	90 (4.8)	80 (3.3)	86 (1.5)
Ericameria nauseosa ssp. consimilis var. oreophila	13 (0.1)	-	20 (4)	67 (0.8)	37 (2.9)	-	7 (2)
Holodiscus dumosus	-	-	-	-	-	-	-
Philadelphus lewisii	-	-	-	-	-	-	-
Purshia tridentata	-	43 (1)	-	67 (6.5)	13 (2.3)	8 (3)	36 (0.6)
Ribes aureum	-	-	-	-	-	-	-
Symphoricarpos oreophilus	-	-	-	-	-	-	-
Tetradymia canescens	-	-	20 (2)	-	20 (1.5)	5 (1)	7 (4)
GRAMINOIDS							
Achnatherum hymenoides	-	-	-	17 (0.1)	13 (1.8)	10 (1)	14 (0.6)
Achnatherum thurberianum	-	-	20 (1)	-	100 (10.9)	43 (1.5)	43 (12.2)
Agropyron cristatum	-	-	-	-	-	8 (5.7)	-
Agropyron fragile	-	-	-	-	-	-	-
Bromus japonicus	38 (2.3)	-	-	-	-	3 (0.1)	7 (0.1)
Bromus tectorum	50 (2.5)	57 (2.5)	80 (7)	83 (7)	87 (8)	95 (7.3)	57 (7.9)
Carex	-	-	-	-	33 (4.9)	-	7 (2)
Elymus elymoides	38 (0.4)	14 (1)	20 (7)	83 (0.1)	67 (5.8)	30 (1.3)	29 (0.6)
Elymus lanceolatus	-	-	40 (2.1)	33 (0.2)	23 (3.3)	-	7 (2)
Festuca idahoensis	-	-	-	17 (0.1)	27 (3.6)	-	100 (15.4)
Hesperostipa comata ssp. comata	-	-	20 (0.1)	17 (0.1)	23 (2.9)	13 (1.4)	7 (1)
Koeleria macrantha	-	-	20 (0.1)	17 (0.1)	40 (2.8)	-	57 (1)
Leymus cinereus	-	-	100 (7.2)	67 (0.1)	43 (1.8)	8 (1.3)	57 (0.4)
Melica bulbosa	-	14 (1)	-	-	-	-	-
Pascopyrum smithii	-	-	20 (29)	-	63 (3.3)	20 (2.1)	50 (2.6)
Poa	-	14 (1)	20 (12)	-	7 (2.5)	43 (2.7)	7 (0.1)
Poa ampla	-	-	-	-	23 (2.6)	-	-
Poa nevadensis	-	-	-	-	40 (2.3)	-	7 (3)
Poa secunda	100 (4.3)	71 (2.4)	80 (5.3)	100 (1.4)	100 (8.5)	65 (2.3)	79 (9.9)
Pseudoroegneria spicata	38 (1)	100 (2.6)	60 (1)	33 (0.2)	77 (5)	18 (1)	71 (1.9)
FORBS							
Agoseris glauca	-	-	-	33 (0.1)	30 (2.2)	-	21 (0.1)
Allium	-	-	40 (0.6)	17 (0.1)	33 (1.6)	5 (1)	7 (0.1)
Allium acuminatum	-	-	20 (0.1)	50 (0.1)	-	3 (0.1)	-
Alyssum desertorum	-	-	20 (0.1)	17 (0.2)	-	-	-
Amsinckia	-	-	-	-	-	13 (1.6)	-
Arabis	-	-	-	-	3 (1)	-	-
Arabis holboellii	25 (0.1)	-	-	33 (0.1)	-	-	-
Arenaria aculeata	25 (1.6)	14 (2)	-	-	-	5 (1.5)	-
Aster	-	-	-	-	10 (1.3)	3 (1)	-
Astragalus	13 (0.1)	-	20 (1)	-	33 (1.6)	-	7 (0.1)
Astragalus purshii var. glareosus	13 (0.1)	-	-	-	-	-	7 (0.1)
Balsamorhiza sagittata	-	43 (1)	20 (10)	17 (0.2)	3 (1)	-	-
Calochortus	-	-	-	-	3 (1)	-	-
Castilleja	-	-	-	-	7 (1)	-	7 (0.1)
Castilleja pallescens var. inverta	25 (0.6)	-	-	17 (0.2)	-	-	-
Ceratocephala testiculata	-	-	-	17 (0.1)	-	-	-
Chaenactis douglasii	-	-	-	33 (0.1)	-	-	-
Cirsium	-	-	-	-	-	-	-
Cirsium canovirens	-	-	-	-	-	-	-
Collinsia parviflora	25 (0.6)	-	40 (0.1)	50 (0.1)	-	-	14 (0.1)
Crepis acuminata	25 (0.6)	-	60 (0.7)	83 (0.3)	-	5 (1)	21 (0.1)
Cryptantha	13 (2)	29 (1)	-	-	-	5 (1.5)	-
Cryptantha spiculifera	-	-	-	17 (0.1)	-	-	-
Delphinium andersonii	-	-	-	83 (0.1)	-	3 (0.1)	21 (0.1)
Descurainia pinnata ssp. filipes	-	-	-	-	-	3 (1)	-
Epilobium	-	-	-	-	7 (2)	15 (1)	-
Erigeron	-	-	20 (1)	-	3 (2)	-	-
Erigeron peregrinus	-	-	-	-	-	5 (2)	-
Erigeron pumilus	-	-	20 (0.1)	17 (0.1)	-	-	7 (0.1)
Eriogonum	-	43 (2.3)	-	-	13 (2.5)	3 (1)	-
Eriogonum caespitosum	38 (0.2)	-	-	-	-	-	7 (0.1)
Eriogonum heracleoides	13 (0.1)	-	-	-	-	-	-
Eriogonum ovalifolium	13 (0.1)	-	20 (0.1)	33 (0.1)	-	-	-
Eriogonum umbellatum	-	-	-	17 (0.1)	-	-	7 (0.1)
Fabaceae	-	-	-	-	-	13 (1.6)	-
Gayophytum	-	-	20 (1)	-	27 (2.4)	55 (2.5)	7 (0.1)
Gutierrezia sarothrae	-	-	-	-	-	-	-

Gymnosteris nudicaulis	-	-	-	33 (0.1)	-	-	-
Gymnosteris parvula	-	-	-	50 (0.1)	-	-	-
Lactuca serriola	-	-	-	-	-	3 (0.1)	-
Lappula occidentalis var. occidentalis	-	-	-	-	-	-	-
Leptodactylon pungens	-	-	20 (0.1)	33 (0.1)	3 (9)	-	-
Lithophragma glabrum	-	-	20 (0.1)	-	-	-	7 (0.1)
Lithophragma tenellum	-	-	-	17 (0.1)	-	-	14 (0.1)
Lithospermum ruderale	-	-	-	33 (0.1)	3 (2)	5 (1)	7 (0.1)
Lomatium	-	-	20 (1)	-	53 (2.3)	-	-
Lomatium dissectum	-	-	-	17 (0.1)	-	-	-
Lomatium foeniculaceum ssp. macdougalii	13 (0.1)	-	20 (0.1)	33 (0.1)	-	-	7 (0.1)
Lomatium nudicaule	-	-	-	-	-	15 (1.7)	-
Lomatium triternatum	-	-	40 (0.1)	67 (0.1)	-	-	43 (0.3)
Lupinus	-	14 (2)	-	-	10 (1.3)	-	21 (0.1)
Machaeranthera canescens	-	-	-	-	-	-	-
Nothocalais troximoides	-	-	-	33 (0.2)	-	-	-
Opuntia polyacantha	13 (0.1)	-	20 (0.1)	17 (0.1)	13 (1.5)	-	7 (0.1)
Orthocarpus	-	-	20 (3)	-	27 (2.5)	18 (1.1)	-
Packera cana	-	-	20 (0.1)	33 (0.1)	-	-	-
Penstemon	-	-	-	17 (0.1)	3 (1)	-	-
Penstemon cyaneus	-	-	40 (0.1)	-	-	3 (0.1)	7 (0.1)
Penstemon deustus	-	14 (1)	-	-	-	5 (0.6)	-
Phacelia hastata	-	-	20 (0.1)	33 (0.1)	-	-	-
Phlox	-	29 (1)	-	-	3 (1)	10 (1)	-
Phlox hoodii	63 (1.4)	29 (1.5)	20 (0.1)	33 (0.1)	73 (4)	23 (1.2)	86 (2.6)
Phlox longifolia	38 (2)	43 (3)	40 (5.1)	17 (0.4)	60 (4.2)	23 (1.1)	7 (1)
Potentilla glandulosa	-	-	-	-	-	-	-
Pteryxia terebinthina var. foeniculacea	13 (0.1)	-	-	17 (0.2)	-	-	-
Senecio integerrimus var. exaltatus	-	-	20 (0.1)	50 (0.1)	-	-	21 (0.1)
Sisymbrium altissimum	-	-	20 (0.1)	-	-	15 (1.4)	-
Stephanomeria minor var. myrioclada	-	-	-	-	-	-	-
Tragopogon dubius	-	-	20 (0.1)	17 (0.1)	13 (1.3)	8 (0.7)	7 (0.1)
Unknown forb	13 (1)	-	20 (1)	-	17 (1)	8 (0.7)	7 (1)
Unknown species	-	-	-	17 (0.1)	-	-	14 (0.6)
Viola nuttallii	-	-	20 (0.1)	-	-	-	-

Part B: Shrublands and Shrub-Steppe (continued)

Species	ARTRT2/ HECO26	ARTRT2/ KOMA	ARTRT2/ PASM	ARTRT2/ PASM-BRTE	ARTRT2/ POSE	ARTRT2/ POSE-BRTE	ARTRT2/ PSSP6
TREES							
Juniperus osteosperma	-	-	-	-	-	-	-
Pinus flexilis	-	-	-	-	-	-	-
DWARF-SHRUBS							
Artemisia arbuscula	-	-	-	-	-	-	-
Ericameria nana	-	-	-	-	-	-	5 (0.1)
Eriogonum microthecum	25 (0.1)	-	-	-	6 (0.1)	-	29 (0.4)
Artemisia tridentata ssp. tridentata	13 (0.1)	-	-	-	-	2 (3)	10 (1.1)
Artemisia tridentata ssp. vaseyana	13 (0.1)	-	-	-	6 (5)	-	19 (0.3)
Artemisia tridentata var. wyomingensis	25 (1.5)	22 (0.6)	5 (1)	18 (2.5)	47 (3.9)	49 (3.4)	29 (2)
Artemisia tripartita	100 (13.1)	100 (29)	100 (14.2)	100 (11.1)	100 (19.1)	100 (17.4)	100 (16.9)
SHRUBS							
Chamaebatiaria millefolium	-	-	-	-	-	-	5 (5)
Chrysothamnus viscidiflorus	88 (1.6)	89 (4.1)	84 (3.9)	73 (4.5)	82 (2.3)	71 (3.9)	62 (3.5)
Ericameria nauseosa ssp. consimilis var. oreophila	13 (0.1)	22 (0.6)	-	-	24 (1.3)	14 (1.8)	29 (1.4)
Holodiscus dumosus	-	-	-	-	-	-	-
Philadelphus lewisii	-	-	-	-	-	-	-
Purshia tridentata	25 (1.1)	11 (0.1)	-	9 (2)	12 (0.6)	12 (3.3)	33 (1.3)
Ribes aureum	-	-	-	-	-	-	10 (0.1)
Symphoricarpos oreophilus	-	-	-	-	-	-	5 (3)
Tetradymia canescens	25 (1.5)	22 (2)	21 (1)	9 (1)	-	10 (1.8)	24 (2.4)
GRAMINOIDS							
Achnatherum hymenoides	13 (2)	-	-	-	18 (1.7)	7 (1.3)	24 (0.3)
Achnatherum thurberianum	38 (2.7)	44 (2.5)	58 (3)	82 (2.9)	53 (3.2)	59 (3.6)	14 (5)
Agropyron cristatum	-	-	-	9 (2)	6 (1)	2 (2)	-
Agropyron fragile	-	-	-	-	-	5 (6)	-
Bromus japonicus	-	11 (2)	-	-	-	-	-
Bromus tectorum	63 (1.8)	100 (4.5)	32 (2)	100 (2.7)	71 (4.2)	98 (8.8)	33 (4.5)
Carex	25 (3.5)	33 (6.3)	11 (2.5)	-	-	5 (4.7)	19 (2)
Elymus elymoides	50 (1)	33 (1)	5 (1)	27 (1.3)	18 (3.7)	32 (2.8)	24 (2.2)
Elymus lanceolatus	-	-	-	-	12 (3.1)	3 (3)	10 (1.1)
Festuca idahoensis	13 (2)	44 (2.5)	5 (1)	-	24 (10)	19 (2.9)	52 (3.5)
Hesperostipa comata ssp. comata	100 (4.3)	44 (2)	16 (4)	-	12 (2)	12 (1.1)	24 (3)
Koeleria macrantha	25 (4.6)	100 (12.8)	21 (12.5)	-	12 (2)	5 (2.3)	29 (6.2)
Leymus cinereus	13 (0.1)	44 (5)	5 (1)	18 (1)	6 (2)	8 (1.4)	57 (1.5)
Melica bulbosa	-	-	-	-	-	-	-
Pascopyrum smithii	25 (1.5)	56 (6.6)	100 (7.8)	100 (2.5)	29 (1.6)	58 (4.5)	19 (4.5)
Poa	25 (3)	-	32 (1.3)	73 (2.6)	12 (2.5)	24 (2)	5 (1)
Poa ampla	-	-	-	-	6 (1)	3 (1)	-
Poa nevadensis	13 (2)	44 (2)	5 (3)	-	12 (1)	5 (1.7)	5 (1)
Poa secunda	75 (3.9)	100 (2.9)	74 (1.9)	55 (1.2)	100 (14.2)	100 (9.8)	86 (4.6)
Pseudoroegneria spicata	63 (1.4)	78 (3.3)	63 (2.8)	64 (2)	59 (2.2)	41 (1.6)	100 (13.4)
FORBS							
Agoseris glauca	13 (0.1)	-	-	-	-	8 (2.2)	5 (2)
Allium	13 (1)	56 (4.4)	16 (3.7)	-	12 (1.5)	14 (1.4)	24 (2.4)
Allium acuminatum	-	-	-	-	-	-	5 (0.1)
Alyssum desertorum	-	11 (0.1)	-	-	-	-	-
Amsinckia	13 (1)	-	11 (1)	-	6 (1)	3 (1.5)	-
Arabis	-	11 (0.1)	-	-	6 (1)	-	5 (1)
Arabis holboellii	13 (0.1)	-	-	-	-	-	-
Arenaria aculeata	13 (0.1)	-	-	-	6 (1)	3 (1)	-
Aster	-	-	-	-	-	2 (1)	-
Astragalus	-	33 (2)	16 (3.3)	-	24 (0.6)	10 (1.7)	14 (0.7)
Astragalus purshii var. glareosus	-	-	-	-	6 (0.1)	-	-
Balsamorhiza sagittata	13 (0.1)	11 (1)	-	-	6 (0.1)	-	19 (3.3)
Calochortus	-	-	-	-	-	2 (1)	-
Castilleja	-	11 (0.1)	-	-	-	2 (1)	5 (1)
Castilleja pallescens var. inverta	13 (0.1)	-	-	-	-	-	-
Ceratocephala testiculata	-	-	-	-	-	-	-
Chaenactis douglasii	13 (0.1)	-	-	-	-	-	5 (0.1)
Cirsium	-	-	-	-	-	-	-
Cirsium canovirens	-	-	-	-	-	-	-
Collinsia parviflora	13 (0.1)	11 (0.1)	-	-	6 (0.1)	-	5 (0.1)
Crepis acuminata	50 (0.6)	11 (0.1)	-	-	12 (0.6)	5 (1.3)	33 (0.2)
Cryptantha	-	-	-	-	6 (0.1)	-	-
Cryptantha spiculifera	-	-	-	-	-	-	-
Delphinium andersonii	13 (0.1)	11 (0.1)	-	-	-	-	19 (0.1)
Descurainia pinnata ssp. filipes	-	-	-	-	-	-	5 (0.1)
Epilobium	-	-	5 (1)	-	6 (1)	2 (1)	-
Erigeron	-	-	-	-	6 (2)	2 (1)	-
Erigeron peregrinus	13 (1)	-	5 (1)	-	-	3 (1.5)	-
Erigeron pumilus	-	-	-	-	-	-	10 (0.6)
Eriogonum	13 (1)	33 (1.3)	16 (2)	-	12 (1.5)	5 (1)	10 (1.5)
Eriogonum caespitosum	-	-	-	-	-	-	-
Eriogonum heracleoides	-	-	-	-	-	-	-
Eriogonum ovalifolium	13 (0.1)	11 (0.1)	-	-	6 (0.1)	-	33 (0.1)
Eriogonum umbellatum	13 (0.1)	-	-	-	6 (0.1)	-	19 (0.1)
Fabaceae	-	-	5 (1)	-	-	3 (1)	5 (0.1)
Gayophytum	38 (2.3)	-	58 (2.8)	55 (1.8)	47 (2.5)	36 (2.7)	10 (2)

Gutierrezia sarothrae	-	-	-	-	-	-	-
Gymnosteris nudicaulis	13 (0.1)	11 (0.1)	-	-	6 (0.1)	-	-
Gymnosteris parvula	13 (0.1)	11 (0.1)	-	-	6 (0.1)	-	-
Lactuca serriola	-	-	-	-	-	-	5 (0.1)
Lappula occidentalis var. occidentalis	-	-	-	-	-	-	-
Leptodactylon pungens	25 (0.6)	33 (2)	5 (3)	-	6 (1)	2 (3)	52 (1.9)
Lithophragma glabrum	-	-	-	-	-	-	-
Lithophragma tenellum	-	11 (0.1)	-	-	-	-	-
Lithospermum ruderale	13 (1)	22 (0.1)	-	-	-	2 (1)	5 (0.1)
Lomatium	-	67 (1.5)	11 (2)	-	18 (2.7)	14 (2)	19 (3.8)
Lomatium dissectum	-	-	-	-	6 (0.1)	-	-
Lomatium foeniculaceum ssp. macdougalii	-	-	-	-	6 (0.1)	-	24 (0.1)
Lomatium nudicaule	13 (1)	-	-	-	6 (1)	-	-
Lomatium triternatum	13 (0.1)	11 (0.1)	-	-	6 (0.1)	-	5 (0.1)
Lupinus	13 (0.1)	22 (1)	-	-	6 (0.1)	3 (1)	14 (0.7)
Machaeranthera canescens	-	-	-	-	-	2 (1)	-
Nothocalais troximoides	13 (0.1)	-	-	-	-	-	-
Opuntia polyacantha	-	-	-	-	6 (0.1)	-	19 (0.1)
Orthocarpus	13 (2)	-	47 (3.2)	55 (2)	29 (1.6)	22 (1.8)	10 (5.5)
Packera cana	-	-	-	-	-	-	10 (0.6)
Penstemon	-	-	-	-	6 (1)	3 (1)	14 (0.1)
Penstemon cyaneus	13 (0.1)	22 (0.6)	-	-	6 (0.1)	-	10 (0.1)
Penstemon deustus	-	-	-	-	-	-	5 (0.1)
Phacelia hastata	13 (0.1)	-	-	-	6 (0.1)	-	14 (0.1)
Phlox	13 (3)	11 (2)	26 (2.4)	-	-	5 (1)	5 (3)
Phlox hoodii	63 (0.8)	78 (5.1)	47 (2.7)	45 (1.8)	59 (2.9)	54 (2.5)	52 (1.9)
Phlox longifolia	25 (0.6)	56 (3.6)	26 (3.6)	9 (3)	47 (2.1)	39 (2.9)	33 (3.3)
Potentilla glandulosa	-	-	-	-	-	-	5 (1)
Pteryxia terebinthina var. foeniculacea	13 (0.1)	-	-	-	6 (0.1)	-	5 (1)
Senecio integerrimus var. exaltatus	13 (0.1)	-	-	-	-	-	14 (0.1)
Sisymbrium altissimum	13 (2)	-	26 (1)	27 (1)	-	8 (2.4)	5 (1)
Stephanomeria minor var. myrioclada	-	-	-	-	-	-	-
Tragopogon dubius	13 (0.1)	-	5 (1)	-	-	5 (1)	10 (0.6)
Unknown forb	13 (1)	11 (1)	-	-	6 (2)	14 (1.1)	5 (2)
Unknown species	13 (0.1)	-	-	-	6 (0.1)	-	10 (0.1)
Viola nuttallii	-	-	-	-	-	-	14 (0.1)

Part B: Shrublands and Shrub-Steppe (continued)

Species	ARTRV-CHMI2/ PEDE4	ARTRV-PUTR2/ POSE	ARTRV-PUTR2/ PSSP6	ARTRV/ BRTE	ARTRV/ FEID	ARTRV/ HECO26	ARTRV/ POSE	ARTRV/ PSSP6
TREES								
Juniperus osteosperma	-	-	-	-	-	-	-	-
Pinus flexilis	40 (2.5)	-	-	4 (0.1)	-	-	7 (0.1)	-
DWARF-SHRUBS								
Artemisia arbuscula	-	-	-	17 (4.3)	-	-	20 (4)	9 (2.7)
Ericameria nana	60 (1)	20 (2)	20 (0.1)	8 (0.1)	-	25 (0.1)	33 (0.7)	3 (0.1)
Eriogonum microthecum	-	40 (0.6)	40 (0.6)	13 (0.1)	-	50 (0.1)	47 (0.1)	3 (0.1)
Artemisia tridentata ssp. tridentata	20 (1)	-	-	-	-	-	-	-
Artemisia tridentata ssp. vaseyana	100 (10)	100 (20)	100 (18)	100 (12.1)	100 (11.8)	100 (13.8)	100 (12.6)	100 (11.3)
Artemisia tridentata var. wyomingensis	-	-	-	-	11 (2)	-	-	-
Artemisia tripartita	20 (1)	-	-	4 (6)	11 (5)	-	-	3 (5)
SHRUBS								
Chamaebatiaria millefolium	100 (4.8)	20 (0.1)	20 (0.1)	17 (0.1)	11 (0.1)	75 (0.1)	20 (0.1)	6 (3)
Chrysothamnus viscidiflorus	-	40 (1.1)	-	25 (1.7)	33 (2.3)	-	13 (1.5)	38 (1.1)
Ericameria nauseosa ssp. consimilis var. oreophila	40 (1)	40 (0.6)	60 (0.4)	21 (0.1)	-	50 (0.6)	53 (0.2)	13 (0.3)
Holodiscus dumosus	-	-	-	-	-	-	-	-
Philadelphus lewisii	20 (0.1)	-	-	-	-	-	-	-
Purshia tridentata	100 (1.2)	100 (8)	100 (12)	50 (3.2)	22 (2.1)	100 (1.3)	60 (1.6)	38 (0.8)
Ribes aureum	-	20 (1)	20 (0.1)	-	-	25 (0.1)	-	-
Symphoricarpos oreophilus	-	20 (0.1)	20 (1)	4 (2)	22 (1)	-	-	19 (1.2)
Tetradymia canescens	-	-	-	-	-	-	-	3 (0.1)
GRAMINOIDS								
Achnatherum hymenoides	40 (0.6)	-	-	-	-	-	13 (0.1)	3 (1)
Achnatherum thurberianum	-	-	-	-	-	-	-	-
Agropyron cristatum	20 (0.1)	-	-	-	-	-	-	3 (1)
Agropyron fragile	-	-	-	-	-	-	-	-
Bromus japonicus	-	-	-	25 (2.2)	-	-	13 (0.6)	9 (1.3)
Bromus tectorum	40 (0.1)	40 (0.6)	40 (0.6)	96 (7.8)	11 (2)	100 (0.3)	33 (1.4)	41 (3.4)
Carex	40 (0.1)	-	-	-	-	-	-	3 (0.1)
Elymus elymoides	80 (0.1)	40 (0.1)	20 (0.1)	25 (0.1)	11 (0.1)	75 (0.1)	33 (0.1)	16 (1.2)
Elymus lanceolatus	-	40 (1.5)	20 (0.1)	-	-	-	-	3 (0.1)
Festuca idahoensis	40 (1.1)	20 (0.1)	20 (1)	4 (1)	100 (2)	-	7 (0.1)	22 (1.7)
Hesperostipa comata ssp. comata	-	20 (1)	60 (0.4)	21 (0.5)	-	100 (1.3)	7 (0.1)	-
Koeleria macrantha	-	20 (0.1)	-	-	11 (1)	-	-	3 (1)
Leymus cinereus	20 (0.1)	-	20 (0.1)	8 (0.6)	22 (1.5)	-	13 (0.6)	22 (1)
Melica bulbosa	-	-	-	17 (1.5)	22 (1)	-	13 (2)	16 (2)
Pascopyrum smithii	-	-	-	-	-	-	-	-
Poa	-	-	20 (2)	8 (3)	22 (1)	-	-	6 (1)
Poa ampla	-	-	-	-	-	-	-	-
Poa nevadensis	-	-	-	-	-	-	-	-
Poa secunda	100 (0.6)	100 (2.8)	60 (1.8)	58 (2)	56 (1.6)	100 (2)	93 (3.7)	47 (3.2)
Pseudoroegneria spicata	40 (0.6)	40 (0.1)	100 (2)	33 (2.4)	78 (1.6)	-	27 (1.3)	100 (5.8)
FORBS								
Agoseris glauca	20 (0.1)	-	-	8 (0.1)	11 (0.1)	-	7 (0.1)	3 (1)
Allium	-	-	-	13 (0.1)	-	25 (0.1)	7 (0.1)	-
Allium acuminatum	-	20 (0.1)	-	-	11 (0.1)	-	7 (0.1)	3 (0.1)
Alyssum desertorum	-	-	-	-	-	-	-	-
Amsinckia	-	-	-	-	-	-	-	-
Arabis	-	-	-	-	-	-	-	6 (1)
Arabis holboellii	-	-	-	4 (0.1)	11 (0.1)	25 (0.1)	7 (0.1)	6 (0.1)
Arenaria aculeata	-	-	-	4 (1)	11 (1)	-	7 (1)	6 (1)
Aster	-	-	-	-	-	-	-	-
Astragalus	-	-	-	8 (0.6)	-	-	-	3 (0.1)
Astragalus purshii var. glareosus	-	-	-	-	-	-	-	3 (0.1)
Balsamorhiza sagittata	-	-	-	25 (2.7)	33 (0.7)	-	13 (2.5)	44 (2.2)
Calochortus	-	-	-	8 (0.6)	-	-	-	3 (1)
Castilleja	-	-	-	-	-	-	-	-
Castilleja pallescens var. inverta	20 (0.1)	-	-	-	-	25 (0.1)	-	-
Ceratocephala testiculata	-	-	-	4 (3)	-	-	-	3 (1)
Chaenactis douglasii	40 (0.1)	20 (0.1)	40 (0.1)	4 (0.1)	-	-	-	-
Cirsium	20 (0.1)	20 (0.1)	20 (0.1)	13 (0.1)	11 (0.1)	50 (1.6)	-	-
Cirsium canovirens	60 (0.1)	-	-	8 (0.1)	-	-	27 (0.1)	3 (0.1)
Collinsia parviflora	-	20 (0.1)	-	13 (0.7)	22 (1)	-	13 (0.6)	19 (1.2)
Crepis acuminata	-	40 (0.1)	60 (0.1)	-	22 (1.5)	25 (0.1)	20 (0.1)	25 (0.8)
Cryptantha	-	20 (0.1)	20 (0.1)	8 (1)	-	-	-	9 (0.4)
Cryptantha spiculifera	-	-	-	-	-	-	-	-
Delphinium andersonii	40 (0.1)	40 (0.1)	40 (0.1)	4 (0.1)	-	-	27 (0.1)	6 (0.1)
Descurainia pinnata ssp. filipes	-	-	-	-	11 (1)	-	-	-
Epilobium	-	-	-	13 (1.3)	-	-	-	-
Erigeron	-	-	-	4 (0.1)	-	-	13 (0.1)	-
Erigeron peregrinus	-	-	-	4 (1)	-	-	-	-
Erigeron pumilus	-	-	-	4 (0.1)	-	25 (0.1)	13 (0.1)	-
Eriogonum	-	20 (0.1)	-	25 (1)	44 (6.3)	-	33 (2.4)	34 (1.8)
Eriogonum caespitosum	20 (2)	-	20 (1)	-	-	25 (0.1)	-	3 (0.1)
Eriogonum heracleoides	-	40 (0.1)	80 (1.3)	-	-	-	7 (0.1)	6 (1.1)
Eriogonum ovalifolium	40 (0.1)	60 (0.1)	20 (0.1)	8 (0.1)	-	50 (0.1)	40 (0.3)	3 (0.2)
Eriogonum umbellatum	40 (0.1)	80 (0.1)	-	4 (0.1)	-	-	27 (0.1)	9 (0.1)
Fabaceae	-	-	-	-	-	-	7 (0.1)	-
Gayophytum	-	-	-	-	-	-	-	-

Gutierrezia sarothrae	-	-	-	-	-	-	-	-
Gymnosteris nudicaulis	-	20 (0.1)	-	-	-	-	-	3 (0.1)
Gymnosteris parvula	-	20 (0.1)	-	-	-	-	-	3 (0.1)
Lactuca serriola	-	-	-	-	-	25 (0.1)	7 (0.1)	3 (1)
Lappula occidentalis var. occidentalis	-	-	-	4 (0.1)	-	-	7 (0.1)	3 (0.1)
Leptodactylon pungens	40 (0.1)	60 (0.1)	40 (2.1)	17 (0.3)	11 (1)	75 (1)	53 (0.5)	6 (0.1)
Lithophragma glabrum	-	20 (0.1)	20 (0.1)	-	-	-	13 (0.1)	-
Lithophragma tenellum	60 (0.1)	20 (0.1)	20 (0.1)	8 (0.1)	11 (0.1)	25 (0.1)	13 (0.1)	-
Lithospermum ruderale	-	-	-	8 (1)	-	-	13 (0.6)	9 (0.1)
Lomatium	-	-	-	4 (0.1)	-	-	-	-
Lomatium dissectum	-	-	20 (0.1)	4 (0.1)	-	25 (2)	7 (0.1)	-
Lomatium foeniculaceum ssp. macdougalii	20 (0.1)	-	-	4 (0.1)	-	-	13 (0.1)	3 (0.1)
Lomatium nudicaule	-	-	-	4 (1)	-	-	-	3 (3)
Lomatium triternatum	-	20 (0.1)	40 (0.1)	8 (0.1)	11 (0.1)	-	13 (0.1)	-
Lupinus	-	-	-	21 (1.8)	67 (4.9)	-	20 (3.3)	50 (3.1)
Machaeranthera canescens	-	-	-	-	-	-	-	-
Nothocalais troximoides	-	20 (0.1)	-	13 (0.1)	-	50 (0.1)	-	3 (0.1)
Opuntia polyacantha	40 (0.1)	20 (0.1)	20 (0.1)	-	-	-	27 (0.1)	-
Orthocarpus	-	-	-	-	-	-	-	-
Packera cana	-	20 (0.1)	20 (0.1)	-	11 (0.1)	-	13 (0.1)	-
Penstemon	-	-	40 (0.1)	-	-	-	-	3 (0.1)
Penstemon cyaneus	20 (0.1)	-	40 (0.1)	8 (0.1)	-	-	7 (0.1)	3 (0.1)
Penstemon deustus	100 (0.1)	60 (0.4)	80 (0.1)	13 (0.1)	44 (0.8)	75 (0.1)	47 (0.2)	6 (1)
Phacelia hastata	20 (0.1)	20 (0.1)	60 (0.1)	4 (1)	-	25 (0.1)	20 (0.1)	13 (0.1)
Phlox	-	-	-	8 (1)	11 (3)	-	-	3 (1)
Phlox hoodii	-	20 (0.1)	-	8 (0.6)	11 (3)	-	27 (1.8)	22 (2.4)
Phlox longifolia	-	20 (0.1)	-	13 (1)	22 (5)	-	7 (3)	28 (1.8)
Potentilla glandulosa	60 (0.1)	20 (0.1)	20 (0.1)	-	11 (0.1)	-	27 (0.1)	3 (0.1)
Pteryxia terebinthina var. foeniculacea	60 (0.7)	20 (5)	-	4 (0.1)	11 (0.1)	-	13 (0.1)	-
Senecio integerrimus var. exaltatus	20 (0.1)	20 (0.1)	20 (0.1)	-	11 (0.1)	-	13 (0.1)	9 (0.1)
Sisymbrium altissimum	-	-	20 (0.1)	4 (0.1)	11 (0.1)	-	-	-
Stephanomeria minor var. myrioclada	-	-	-	-	-	-	7 (0.1)	-
Tragopogon dubius	-	-	-	8 (0.1)	11 (0.1)	-	-	3 (1)
Unknown forb	20 (0.1)	-	-	4 (0.1)	-	-	7 (1)	6 (1)
Unknown species	20 (0.1)	-	-	-	-	-	13 (0.6)	9 (0.2)
Viola nuttallii	40 (0.1)	40 (0.1)	-	-	-	-	7 (0.1)	3 (0.1)

Part B: Shrublands and Shrub-Steppe (continued)

Species	ARTRW8/ ACHY	ARTRW8/ ACTH7	ARTRW8/ ACTH7-BRTE	ARTRW8/ AGCR	ARTRW8/ BRTE	ARTRW8/ FEID	ARTRW8/ HECO26
TREES							
Juniperus osteosperma	-	-	-	-	1 (0.1)	9 (2)	-
Pinus flexilis	-	-	-	-	-	-	-
DWARF-SHRUBS							
Artemisia arbuscula	-	-	-	-	1 (0.1)	-	-
Ericameria nana	-	-	-	-	9 (0.1)	18 (0.6)	12 (1)
Eriogonum microthecum	20 (0.1)	-	-	-	4 (0.1)	36 (0.1)	12 (0.6)
Artemisia tridentata ssp. tridentata	-	-	-	-	1 (0.1)	-	-
Artemisia tridentata ssp. vaseyana	-	-	-	-	6 (4.8)	9 (5)	-
Artemisia tridentata var. wyomingensis	100 (12.2)	100 (8.4)	100 (18.5)	100 (14.4)	99 (9.8)	100 (14.5)	100 (14.2)
Artemisia tripartita	60 (3.3)	31 (1.3)	61 (5.5)	40 (10)	19 (3.2)	18 (3.5)	27 (3.9)
SHRUBS							
Chamaebatiaria millefolium	-	-	-	-	4 (0.1)	18 (0.1)	3 (0.1)
Chrysothamnus viscidiflorus	60 (0.7)	77 (3.4)	89 (5.9)	60 (2.7)	59 (2.4)	27 (1.7)	61 (3.8)
Ericameria nauseosa ssp. consimilis var. oreophila	-	-	89 (4.2)	80 (5.8)	14 (0.6)	27 (0.1)	48 (1.7)
Holodiscus dumosus	-	-	-	-	-	-	3 (1)
Philadelphus lewisii	-	-	-	-	-	-	-
Purshia tridentata	40 (0.6)	38 (2.2)	25 (6.6)	-	26 (0.7)	55 (0.6)	36 (1)
Ribes aureum	-	-	-	-	-	-	-
Symphoricarpos oreophilus	20 (4)	-	-	-	-	-	-
Tetradymia canescens	-	23 (2.3)	14 (1.3)	-	-	-	9 (1)
GRAMINOIDS							
Achnatherum hymenoides	100 (1)	8 (1)	32 (1.4)	-	10 (0.6)	9 (0.1)	15 (1.2)
Achnatherum thurberianum	20 (2)	100 (5.4)	100 (9.2)	60 (3.7)	16 (1.5)	9 (1)	21 (3.4)
Agropyron cristatum	-	-	-	100 (8.6)	3 (5.5)	-	3 (3)
Agropyron fragile	-	-	4 (1)	80 (16.5)	-	-	6 (2)
Bromus japonicus	-	8 (1)	-	-	4 (2.7)	-	3 (0.1)
Bromus tectorum	60 (4)	92 (4)	100 (17.2)	100 (10.2)	99 (9.4)	36 (2.8)	91 (9.7)
Carex	-	8 (1)	11 (1.7)	-	1 (1)	9 (0.1)	-
Elymus elymoides	40 (0.1)	23 (1.3)	96 (7.2)	80 (3.3)	41 (0.4)	45 (2.1)	64 (1.9)
Elymus lanceolatus	-	-	36 (4)	80 (2.8)	1 (0.1)	-	9 (8.7)
Festuca idahoensis	-	8 (1)	4 (1)	-	6 (0.6)	100 (5.6)	9 (1.3)
Hesperostipa comata ssp. comata	20 (0.1)	-	29 (2.4)	60 (6.7)	19 (0.4)	-	100 (5.2)
Koeleria macrantha	-	-	7 (1.5)	-	1 (0.1)	-	-
Leymus cinereus	-	31 (1)	57 (2.3)	-	6 (0.3)	-	12 (1.5)
Melica bulbosa	-	-	-	-	-	-	-
Pascopyrum smithii	-	31 (1.5)	71 (6.7)	20 (2)	10 (2.1)	-	33 (3.8)
Poa	20 (4)	23 (1.3)	-	-	13 (1.9)	18 (0.6)	-
Poa ampla	-	-	25 (1.1)	20 (1)	-	-	-
Poa nevadensis	-	-	29 (1.6)	20 (1)	-	-	12 (1.8)
Poa secunda	80 (4.3)	92 (4.1)	100 (18.1)	100 (10.4)	81 (1.6)	73 (5.9)	94 (8.6)
Pseudoroegneria spicata	20 (0.1)	15 (1.5)	61 (2.4)	20 (1)	14 (0.9)	45 (1.8)	39 (4)
FORBS							
Agoseris glauca	20 (0.1)	-	50 (1.6)	20 (1)	1 (0.1)	9 (0.1)	3 (1)
Allium	60 (0.7)	8 (2)	54 (1.9)	40 (1)	9 (0.7)	18 (2.1)	15 (0.6)
Allium acuminatum	-	-	-	-	11 (0.1)	9 (0.1)	9 (0.7)
Alyssum desertorum	-	-	-	-	10 (1.5)	-	3 (5)
Amsinckia	-	-	-	-	3 (1)	-	-
Arabis	-	-	14 (1)	-	-	-	6 (1)
Arabis holboellii	-	-	-	-	3 (0.1)	-	-
Arenaria aculeata	-	-	-	-	1 (1)	9 (2)	6 (1)
Aster	-	-	11 (1)	-	1 (1)	9 (0.1)	-
Astragalus	-	-	54 (2.1)	40 (2.5)	-	27 (0.7)	9 (1.7)
Astragalus purshii var. glareosus	20 (0.1)	-	-	-	3 (0.1)	27 (0.1)	-
Balsamorhiza sagittata	20 (2)	-	14 (1.5)	-	9 (1.2)	18 (0.6)	12 (5)
Calochortus	-	-	4 (1)	-	3 (0.1)	-	3 (0.1)
Castilleja	-	-	14 (1)	-	-	18 (0.1)	3 (0.1)
Castilleja pallescens var. inverta	40 (0.1)	-	-	-	1 (0.1)	9 (0.1)	3 (0.1)
Ceratocephala testiculata	-	-	-	-	10 (0.7)	9 (0.1)	-
Chaenactis douglasii	-	-	-	-	10 (0.1)	-	9 (0.1)
Cirsium	-	-	-	-	1 (0.1)	-	3 (0.1)
Cirsium canovirens	-	-	-	-	-	-	-
Collinsia parviflora	-	8 (1)	-	-	10 (0.9)	27 (0.1)	12 (1.3)
Crepis acuminata	40 (0.1)	-	11 (1.3)	-	30 (0.6)	45 (1.7)	30 (0.8)
Cryptantha	-	-	-	-	-	-	-
Cryptantha spiculifera	-	-	-	-	1 (0.1)	-	-
Delphinium andersonii	-	-	-	-	10 (0.1)	55 (0.3)	9 (0.1)
Descurainia pinnata ssp. filipes	-	-	-	-	3 (0.1)	-	-
Epilobium	-	-	-	-	7 (1.4)	-	-
Erigeron	-	-	25 (1.4)	20 (1)	-	-	-
Erigeron peregrinus	20 (1)	-	-	-	4 (1)	-	3 (1)
Erigeron pumilus	20 (0.1)	-	-	-	6 (0.1)	-	6 (0.1)
Eriogonum	20 (1)	8 (1)	18 (1.6)	20 (1)	1 (2)	27 (3)	9 (2)
Eriogonum caespitosum	-	-	-	-	-	18 (0.1)	-
Eriogonum heracleoides	-	-	-	-	-	-	-
Eriogonum ovalifolium	20 (0.1)	-	-	-	4 (0.1)	27 (0.1)	6 (0.1)
Eriogonum umbellatum	-	-	-	-	1 (0.1)	-	9 (0.1)
Fabaceae	-	-	-	-	-	-	-
Gayophytum	20 (6)	31 (1.8)	-	-	30 (1.8)	-	12 (2.8)

Gutierrezia sarothrae	-	-	-	-	1 (0.1)	-	-
Gymnosteris nudicaulis	-	-	-	-	4 (0.1)	9 (0.1)	3 (0.1)
Gymnosteris parvula	-	-	-	-	4 (0.1)	9 (0.1)	3 (0.1)
Lactuca serriola	-	8 (1)	-	-	10 (0.4)	-	3 (0.1)
Lappula occidentalis var. occidentalis	20 (0.1)	-	-	-	3 (0.1)	-	-
Leptodactylon pungens	40 (2)	-	14 (1.5)	-	17 (0.8)	45 (0.3)	45 (0.8)
Lithophragma glabrum	20 (0.1)	-	-	-	6 (0.1)	-	-
Lithophragma tenellum	20 (0.1)	-	-	-	4 (0.1)	9 (0.1)	3 (0.1)
Lithospermum ruderale	-	-	4 (2)	-	9 (0.3)	-	-
Lomatium	-	-	79 (3.5)	80 (3.8)	-	9 (15)	12 (4)
Lomatium dissectum	-	-	-	-	6 (2.8)	9 (2)	9 (3)
Lomatium foeniculaceum ssp. macdougalii	-	-	-	-	3 (0.1)	36 (0.1)	9 (0.1)
Lomatium nudicaule	20 (1)	23 (1.3)	-	20 (4)	3 (1)	-	3 (1)
Lomatium triternatum	20 (0.1)	-	-	-	10 (0.4)	27 (0.1)	9 (0.1)
Lupinus	-	-	4 (1)	-	1 (2)	18 (4)	3 (2)
Machaeranthera canescens	-	-	-	-	6 (1)	-	6 (1.5)
Nothocalais troximoides	-	-	-	-	4 (0.1)	-	12 (0.1)
Opuntia polyacantha	-	8 (1)	14 (1.5)	20 (1)	9 (0.1)	18 (0.1)	27 (0.4)
Orthocarpus	-	38 (2.8)	-	-	3 (1)	-	-
Packera cana	20 (0.1)	-	-	-	3 (0.1)	9 (0.1)	3 (0.1)
Penstemon	-	-	7 (1)	-	-	27 (0.4)	-
Penstemon cyaneus	-	-	-	-	10 (0.1)	9 (0.1)	9 (0.4)
Penstemon deustus	-	8 (1)	-	-	6 (0.1)	18 (0.1)	15 (0.6)
Phacelia hastata	-	-	-	-	3 (0.1)	9 (0.1)	3 (0.1)
Phlox	20 (8)	-	-	-	-	18 (1.5)	-
Phlox hoodii	40 (0.6)	15 (2)	64 (3.9)	-	26 (1)	64 (0.8)	30 (1.1)
Phlox longifolia	-	23 (1)	96 (4.9)	80 (5.8)	26 (0.9)	18 (5.6)	48 (4.1)
Potentilla glandulosa	-	-	-	-	1 (0.1)	9 (0.1)	3 (1)
Pteryxia terebinthina var. foeniculacea	-	-	-	-	4 (0.1)	9 (0.1)	3 (0.1)
Senecio integerrimus var. exaltatus	-	-	-	-	4 (0.1)	45 (0.3)	-
Sisymbrium altissimum	-	8 (1)	-	-	14 (0.5)	-	3 (1)
Stephanomeria minor var. myrioclada	-	-	-	-	-	-	12 (0.1)
Tragopogon dubius	20 (0.1)	-	50 (1.3)	20 (1)	13 (0.2)	18 (0.1)	18 (0.4)
Unknown forb	-	8 (1)	54 (1.7)	20 (2)	14 (0.7)	9 (7)	21 (1.4)
Unknown species	-	-	-	-	7 (1.2)	27 (0.1)	-
Viola nuttallii	-	-	-	-	-	9 (0.1)	-

Part B: Shrublands and Shrub-Steppe (continued)

Species	ARTRW8/ PASM	ARTRW8/ POSE	ARTRW8/ POSE-BRTE	ARTRW8/ PSSP6	CHVI8/ AGCR	CHVI8/ BRTE	CHVI8/ POSE-BRTE
TREES							
Juniperus osteosperma	-	5 (2.8)	-	7 (0.1)	-	-	-
Pinus flexilis	-	5 (1.8)	-	7 (0.1)	-	-	-
DWARF-SHRUBS							
Artemisia arbuscula	-	-	1 (1)	-	-	-	-
Ericameria nana	-	16 (0.5)	-	-	-	-	-
Eriogonum microthecum	-	11 (0.2)	1 (0.1)	13 (0.1)	-	-	-
Artemisia tridentata ssp. tridentata	-	-	-	-	-	-	-
Artemisia tridentata ssp. vaseyana	-	5 (0.6)	1 (2)	-	13 (0.1)	-	-
Artemisia tridentata var. wyomingensis	100 (8.4)	100 (10.8)	100 (11.2)	100 (15.7)	63 (1.2)	79 (2.1)	40 (1.1)
Artemisia tripartita	44 (2)	17 (2.1)	41 (3)	20 (1.7)	25 (2.5)	18 (1.3)	40 (1.5)
SHRUBS							
Chamaebatiaria millefolium	-	13 (0.2)	1 (1)	-	-	-	-
Chrysothamnus viscidiflorus	78 (2.1)	43 (1.8)	87 (4)	53 (3.3)	100 (9.8)	100 (8.3)	100 (8.8)
Ericameria nauseosa ssp. consimilis var. oreophila	22 (4.1)	24 (0.9)	30 (4.7)	20 (0.7)	50 (2.3)	8 (3.7)	20 (1)
Holodiscus dumosus	-	-	-	-	-	-	-
Philadelphus lewisii	-	-	-	-	-	-	-
Purshia tridentata	11 (0.1)	38 (1.4)	16 (2.3)	33 (1)	13 (1)	13 (2.2)	20 (1)
Ribes aureum	-	4 (0.1)	-	7 (0.1)	-	-	-
Symphoricarpos oreophilus	-	-	-	7 (1)	-	-	20 (1)
Tetradymia canescens	-	-	7 (2.8)	-	-	5 (2.5)	-
GRAMINOIDS							
Achnatherum hymenoides	-	1 (0.1)	9 (2.6)	7 (2)	-	13 (2.4)	20 (2)
Achnatherum thurberianum	33 (1.7)	14 (1.5)	41 (2)	20 (4)	-	23 (2.7)	80 (1.8)
Agropyron cristatum	-	3 (2)	4 (3.7)	-	100 (5.6)	-	20 (0.1)
Agropyron fragile	-	-	4 (2.7)	13 (3)	38 (29.3)	5 (8.5)	-
Bromus japonicus	-	3 (1)	4 (1)	-	-	3 (4)	-
Bromus tectorum	89 (3.6)	87 (2.8)	100 (13.3)	60 (2.5)	100 (7.6)	100 (11.9)	100 (2.8)
Carex	-	-	4 (3)	-	13 (4)	-	-
Elymus elymoides	33 (1)	51 (0.5)	50 (4.6)	47 (3.6)	25 (0.6)	36 (1.6)	20 (1)
Elymus lanceolatus	-	1 (0.1)	11 (3.1)	27 (1.1)	-	-	-
Festuca idahoensis	11 (1)	12 (0.1)	-	27 (1.3)	13 (0.1)	5 (3)	20 (4)
Hesperostipa comata ssp. comata	11 (0.1)	13 (0.1)	7 (4.2)	20 (0.1)	13 (1)	15 (1)	40 (0.6)
Koeleria macrantha	-	-	1 (1)	7 (9)	-	3 (10)	-
Leymus cinereus	11 (1)	4 (0.7)	28 (2)	33 (0.6)	13 (1)	18 (1.6)	40 (3)
Melica bulbosa	-	1 (1)	-	-	-	-	20 (1)
Pascopyrum smithii	100 (3.8)	8 (1)	45 (3.5)	27 (2.3)	25 (5)	26 (4.5)	40 (2)
Poa	11 (2)	7 (2.8)	5 (2.3)	-	-	21 (1.3)	-
Poa ampla	-	-	4 (1)	13 (4.5)	-	-	-
Poa nevadensis	11 (1)	-	11 (1.5)	7 (2)	-	5 (4)	-
Poa secunda	89 (5.3)	99 (4.5)	96 (10.2)	73 (3.9)	100 (9.9)	95 (4.2)	100 (6.6)
Pseudoroegneria spicata	11 (1)	11 (1)	29 (2.8)	100 (8.3)	-	21 (2.6)	40 (3)
FORBS							
Agoseris glauca	11 (2)	9 (0.1)	16 (1.7)	20 (0.1)	13 (0.1)	3 (24)	-
Allium	-	11 (0.8)	8 (1)	13 (1.5)	13 (1)	3 (1)	20 (2)
Allium acuminatum	-	17 (0.2)	-	27 (0.1)	-	3 (0.1)	-
Alyssum desertorum	-	4 (3)	1 (3)	13 (0.1)	-	5 (1.5)	20 (2)
Amsinckia	-	1 (1)	-	-	13 (1)	10 (1)	-
Arabis	-	8 (0.1)	3 (1)	13 (0.6)	-	-	-
Arabis holboellii	-	5 (0.1)	-	-	-	-	-
Arenaria aculeata	-	7 (1.2)	4 (1.3)	-	13 (3)	10 (1.3)	-
Aster	-	-	3 (1)	7 (0.1)	-	-	-
Astragalus	11 (2)	-	12 (1.1)	20 (1)	25 (1)	-	-
Astragalus purshii var. glareosus	-	-	-	7 (0.1)	13 (0.1)	3 (0.1)	-
Balsamorhiza sagittata	11 (2)	7 (1.1)	8 (0.9)	33 (1.4)	-	-	20 (0.1)
Calochortus	-	-	1 (1)	-	-	-	-
Castilleja	-	-	1 (1)	-	-	-	-
Castilleja pallescens var. inverta	-	3 (0.1)	-	13 (0.1)	-	-	-
Ceratocephala testiculata	-	1 (2)	-	-	-	-	-
Chaenactis douglasii	-	9 (0.1)	1 (0.1)	13 (0.1)	13 (0.1)	3 (0.1)	-
Cirsium	-	3 (0.1)	-	7 (0.1)	-	-	-
Cirsium canovirens	-	-	-	-	-	-	-
Collinsia parviflora	-	11 (1.5)	4 (1.7)	7 (0.1)	25 (2)	8 (2.3)	-
Crepis acuminata	11 (0.1)	28 (0.2)	9 (1.2)	53 (0.2)	13 (0.1)	3 (0.1)	-
Cryptantha	-	3 (0.1)	-	-	-	-	-
Cryptantha spiculifera	-	3 (0.1)	-	-	-	-	-
Delphinium andersonii	-	18 (0.1)	1 (0.1)	13 (0.1)	13 (0.1)	-	-
Descurainia pinnata ssp. filipes	11 (0.1)	1 (0.1)	-	7 (0.1)	-	-	20 (0.1)
Epilobium	-	-	5 (1.8)	7 (1)	13 (2)	15 (1.7)	20 (3)
Erigeron	-	-	3 (1)	-	-	-	-
Erigeron peregrinus	11 (1)	5 (1.3)	7 (1.2)	-	-	10 (1)	-
Erigeron pumilus	-	8 (0.1)	3 (0.2)	27 (0.1)	-	3 (0.1)	-
Eriogonum	11 (1)	4 (0.4)	7 (1.4)	13 (1)	13 (1)	5 (1)	-
Eriogonum caespitosum	-	5 (0.1)	-	-	-	-	-
Eriogonum heracleoides	-	-	-	-	-	-	-
Eriogonum ovalifolium	-	12 (0.1)	1 (0.2)	13 (0.1)	-	-	-
Eriogonum umbellatum	-	7 (0.1)	1 (4)	7 (0.1)	-	-	-
Fabaceae	11 (1)	3 (0.6)	5 (1)	-	-	3 (1)	-
Gayophytum	67 (3.3)	14 (2.2)	26 (1.8)	-	13 (2)	51 (1.7)	60 (1)

Gutierrezia sarothrae	-	-	-	-	-	-	-
Gymnosteris nudicaulis	-	4 (0.1)	1 (0.1)	7 (0.1)	-	-	-
Gymnosteris parvula	-	4 (0.1)	1 (0.1)	7 (0.1)	-	-	-
Lactuca serriola	11 (1)	4 (0.7)	1 (0.2)	20 (0.1)	13 (2)	3 (0.1)	-
Lappula occidentalis var. occidentalis	-	1 (0.1)	-	7 (0.1)	-	-	20 (0.1)
Leptodactylon pungens	-	36 (0.4)	5 (0.6)	27 (0.1)	-	3 (1)	-
Lithophragma glabrum	-	8 (0.1)	1 (0.1)	-	-	-	-
Lithophragma tenellum	-	4 (0.7)	1 (0.1)	7 (0.1)	-	-	-
Lithospermum ruderale	-	1 (0.1)	4 (0.7)	7 (1)	13 (0.1)	3 (0.1)	-
Lomatium	11 (2)	-	16 (3.5)	20 (3.7)	-	-	-
Lomatium dissectum	11 (0.1)	3 (0.1)	1 (0.1)	13 (0.1)	-	-	-
Lomatium foeniculaceum ssp. macdougalii	-	8 (0.1)	-	7 (0.1)	-	-	-
Lomatium nudicaule	-	11 (2)	5 (1.5)	-	13 (1)	5 (1)	-
Lomatium triternatum	-	16 (0.3)	1 (0.1)	27 (0.1)	13 (1)	-	-
Lupinus	-	1 (1)	-	13 (1.5)	-	3 (1)	-
Machaeranthera canescens	-	1 (2)	4 (1)	-	13 (1)	8 (1)	20 (1)
Nothocalais troximoides	-	8 (0.1)	1 (0.1)	-	-	-	-
Opuntia polyacantha	11 (1)	14 (0.3)	4 (1)	20 (0.1)	-	8 (0.7)	20 (0.1)
Orthocarpus	22 (1.5)	3 (1)	8 (2.3)	-	-	10 (1.3)	20 (1)
Packera cana	-	16 (0.1)	-	-	-	-	-
Penstemon	-	-	1 (1)	7 (0.1)	-	3 (0.1)	-
Penstemon cyaneus	-	5 (0.1)	1 (0.2)	27 (0.1)	-	-	-
Penstemon deustus	-	21 (0.2)	1 (0.1)	-	-	-	20 (1)
Phacelia hastata	-	4 (0.1)	1 (0.1)	7 (0.1)	13 (0.1)	-	20 (2)
Phlox	-	3 (1.5)	4 (1.3)	-	13 (1)	5 (1)	-
Phlox hoodii	33 (2.3)	33 (1.1)	43 (1.9)	47 (1.8)	13 (1)	21 (1.5)	-
Phlox longifolia	44 (2)	17 (1)	53 (2.7)	60 (2.8)	50 (2)	18 (1.2)	-
Potentilla glandulosa	-	12 (0.1)	-	-	-	-	-
Pteryxia terebinthina var. foeniculacea	-	16 (0.5)	-	7 (0.1)	-	3 (0.1)	-
Senecio integerrimus var. exaltatus	-	3 (0.1)	-	13 (0.1)	-	-	-
Sisymbrium altissimum	11 (0.1)	5 (1.3)	3 (1)	13 (1.1)	13 (7)	10 (1.3)	60 (1.7)
Stephanomeria minor var. myrioclada	-	8 (0.1)	-	-	-	-	-
Tragopogon dubius	22 (1.1)	8 (0.3)	20 (1.2)	13 (0.1)	13 (0.1)	3 (0.1)	20 (0.1)
Unknown forb	22 (2.5)	5 (0.8)	25 (1.4)	-	38 (1.4)	13 (2)	-
Unknown species	11 (0.1)	5 (0.8)	4 (2.7)	27 (0.1)	13 (8)	3 (0.3)	-
Viola nuttallii	-	1 (0.1)	1 (0.1)	-	-	-	-

Part B: Shrublands and Shrub-Steppe (continued)

Species	ERNA7-HODU/PEDE4	JUOS/ARTRW8/HECO26	PUTR2-ERNA7/PEDE4	PUTR2-PHLE4/POSE	PUTR2/LECI4
TREES					
Juniperus osteosperma	18 (1.1)	100 (6.5)	13 (0.1)	-	-
Pinus flexilis	-	-	7 (0.1)	50 (1.5)	-
DWARF-SHRUBS					
Artemisia arbuscula	-	-	-	-	-
Ericameria nana	100 (8)	50 (0.1)	100 (0.8)	50 (0.1)	25 (0.1)
Eriogonum microthecum	36 (0.6)	17 (0.1)	80 (0.9)	50 (0.1)	-
Artemisia tridentata ssp. tridentata	-	-	-	-	-
Artemisia tridentata ssp. vaseyana	-	-	-	25 (0.1)	50 (0.1)
Artemisia tridentata var. wyomingensis	-	100 (5.5)	47 (2.6)	25 (0.1)	-
Artemisia tripartita	-	-	-	-	-
SHRUBS					
Chamaebatiaria millefolium	9 (0.1)	-	13 (0.1)	75 (2)	-
Chrysothamnus viscidiflorus	-	50 (10.3)	-	-	-
Ericameria nauseosa ssp. consimilis var. oreophila	36 (0.4)	100 (1.8)	60 (0.7)	50 (1.1)	25 (1)
Holodiscus dumosus	100 (2)	33 (0.1)	40 (0.2)	-	-
Philadelphus lewisii	27 (1.4)	-	27 (1)	100 (4.5)	-
Purshia tridentata	27 (0.4)	83 (0.6)	100 (4.5)	100 (1.3)	100 (9.3)
Ribes aureum	18 (0.1)	-	13 (0.6)	50 (0.1)	-
Symphoricarpos oreophilus	-	-	-	-	-
Tetradymia canescens	-	-	-	-	-
GRAMINOIDS					
Achnatherum hymenoides	55 (0.7)	50 (0.1)	20 (0.4)	25 (0.1)	25 (0.1)
Achnatherum thurberianum	27 (0.1)	17 (1)	13 (1.3)	-	-
Agropyron cristatum	-	-	-	-	-
Agropyron fragile	-	-	-	-	-
Bromus japonicus	-	-	-	-	-
Bromus tectorum	27 (0.1)	100 (21.9)	93 (1.1)	50 (0.1)	50 (2)
Carex	-	-	-	-	-
Elymus elymoides	82 (0.2)	33 (0.6)	80 (0.1)	75 (0.1)	25 (0.1)
Elymus lanceolatus	-	17 (0.1)	-	-	-
Festuca idahoensis	-	-	-	-	-
Hesperostipa comata ssp. comata	18 (0.1)	67 (2.3)	47 (0.8)	-	25 (0.1)
Koeleria macrantha	-	-	-	-	-
Leymus cinereus	-	-	-	-	100 (3.3)
Melica bulbosa	-	-	-	-	-
Pascopyrum smithii	-	-	-	-	-
Poa	-	-	-	-	-
Poa ampla	-	-	-	-	-
Poa nevadensis	-	-	-	-	-
Poa secunda	91 (1.4)	83 (0.7)	100 (1.8)	100 (0.6)	50 (1.1)
Pseudoroegneria spicata	-	33 (21)	-	-	-
FORBS					
Agoseris glauca	-	17 (1)	-	-	25 (0.1)
Allium	-	-	-	-	25 (0.1)
Allium acuminatum	-	50 (1)	-	-	-
Alyssum desertorum	-	50 (0.1)	7 (0.1)	-	-
Amsinckia	-	-	-	-	-
Arabis	-	-	-	50 (0.1)	-
Arabis holboellii	-	-	13 (0.1)	25 (0.1)	-
Arenaria aculeata	-	-	-	-	-
Aster	-	-	-	-	-
Astragalus	-	-	-	-	-
Astragalus purshii var. glareosus	-	-	-	-	-
Balsamorhiza sagittata	-	33 (5)	-	-	-
Calochortus	-	-	-	-	-
Castilleja	18 (0.1)	-	-	-	-
Castilleja pallescens var. inverta	-	-	-	-	-
Ceratocephala testiculata	-	-	-	-	-
Chaenactis douglasii	55 (0.3)	33 (0.1)	40 (0.1)	-	25 (0.1)
Cirsium	9 (0.1)	17 (0.1)	7 (0.1)	25 (0.1)	-
Cirsium canovirens	45 (0.2)	-	13 (0.6)	-	-
Collinsia parviflora	-	-	-	-	50 (0.1)
Crepis acuminata	-	33 (0.6)	-	-	50 (1.1)
Cryptantha	-	-	-	-	-
Cryptantha spiculifera	45 (0.4)	-	33 (0.1)	25 (0.1)	-
Delphinium andersonii	-	-	-	-	50 (0.1)
Descurainia pinnata ssp. filipes	9 (0.1)	50 (0.1)	33 (0.1)	25 (0.1)	-
Epilobium	-	-	-	-	-
Erigeron	-	-	-	-	-
Erigeron peregrinus	-	-	-	-	-
Erigeron pumilus	73 (0.1)	-	-	-	-
Eriogonum	36 (0.7)	-	20 (0.1)	-	-
Eriogonum caespitosum	55 (0.7)	-	33 (0.1)	25 (0.1)	-
Eriogonum heracleoides	9 (0.1)	-	7 (0.1)	-	25 (0.1)
Eriogonum ovalifolium	9 (0.1)	-	13 (0.1)	25 (0.1)	25 (0.1)
Eriogonum umbellatum	-	-	40 (0.1)	50 (0.1)	50 (0.1)
Fabaceae	-	-	-	-	-
Gayophytum	-	-	-	-	25 (0.1)

Gutierrezia sarothrae	27 (0.1)	50 (0.1)	20 (0.1)	-	-
Gymnosteris nudicaulis	-	-	-	-	-
Gymnosteris parvula	-	-	-	-	-
Lactuca serriola	45 (0.3)	83 (0.3)	47 (0.1)	-	-
Lappula occidentalis var. occidentalis	-	33 (0.1)	13 (0.1)	-	-
Leptodactylon pungens	91 (0.5)	33 (0.1)	87 (0.5)	50 (0.1)	-
Lithophragma glabrum	-	-	-	-	-
Lithophragma tenellum	-	-	-	-	-
Lithospermum ruderale	-	17 (2)	-	-	-
Lomatium	9 (0.1)	-	-	-	-
Lomatium dissectum	-	50 (2.3)	-	-	50 (0.6)
Lomatium foeniculaceum ssp. macdougalii	-	-	-	-	-
Lomatium nudicaule	-	-	-	-	-
Lomatium triternatum	-	17 (0.1)	7 (0.1)	-	-
Lupinus	-	-	-	-	25 (0.1)
Machaeranthera canescens	-	-	-	-	-
Nothocalais troximoides	-	-	-	-	-
Opuntia polyacantha	9 (0.1)	67 (1.3)	13 (0.1)	50 (0.1)	-
Orthocarpus	-	-	-	-	-
Packera cana	36 (0.5)	17 (0.1)	27 (0.6)	75 (0.1)	-
Penstemon	-	-	-	-	25 (0.1)
Penstemon cyaneus	-	33 (0.1)	-	-	25 (0.1)
Penstemon deustus	100 (0.7)	50 (2.4)	100 (0.6)	100 (0.1)	-
Phacelia hastata	36 (0.1)	-	80 (0.1)	25 (0.2)	75 (0.1)
Phlox	-	-	-	-	-
Phlox hoodii	9 (0.1)	17 (0.1)	-	-	-
Phlox longifolia	-	17 (2)	-	-	-
Potentilla glandulosa	82 (0.5)	50 (0.1)	73 (0.1)	100 (0.1)	-
Pteryxia terebinthina var. foeniculacea	-	-	13 (0.1)	75 (0.7)	-
Senecio integerrimus var. exaltatus	-	-	-	-	25 (0.1)
Sisymbrium altissimum	9 (0.1)	67 (0.3)	13 (0.1)	-	-
Stephanomeria minor var. myrioclada	64 (0.1)	17 (0.1)	67 (0.1)	-	-
Tragopogon dubius	18 (0.6)	50 (0.1)	40 (0.1)	-	-
Unknown forb	-	-	7 (0.1)	-	-
Unknown species	-	50 (0.1)	7 (0.1)	25 (0.1)	25 (0.1)
Viola nuttallii	-	-	-	-	-

Part B: Shrublands and Shrub-Steppe (continued)

Species	ALIN2/ MesicForbs	PRVI/ LECI4
TREES		
Populus tremuloides	100 (1.8)	25 (0.6)
SHRUBS		
Alnus incana	100 (27.5)	13 (2)
Artemisia tridentata ssp. vaseyana	25 (0.1)	25 (0.1)
Prunus virginiana	75 (0.7)	100 (55.6)
Rosa woodsii var. ultramontana	50 (0.6)	25 (0.1)
Salix boothii	75 (0.7)	-
Symphoricarpos oreophilus	50 (0.1)	75 (3.1)
GRAMINOIDS		
Bromus tectorum	-	38 (3.4)
Leymus cinereus	75 (1.7)	88 (3.3)
Poa pratensis	100 (0.1)	13 (0.1)
FORBS		
Agastache urticifolia	-	38 (0.1)
Angelica pinnata	100 (0.1)	63 (1.6)
Aquilegia formosa	50 (0.1)	13 (0.1)
Chamerion angustifolium ssp. angustifolium	75 (0.1)	13 (0.1)
Crepis acuminata	-	38 (0.1)
Galium bifolium	100 (0.8)	63 (1)
Hackelia floribunda	50 (0.1)	38 (0.1)
Heracleum maximum	100 (12.5)	38 (5)
Hydrophyllum capitatum var. capitatum	100 (0.1)	50 (0.1)
Lactuca serriola	25 (0.1)	38 (0.1)
Maianthemum racemosum ssp. amplexicaule	75 (0.1)	38 (0.1)
Maianthemum stellatum	100 (0.1)	38 (0.1)
Osmorhiza berteroi	75 (0.1)	-
Solidago canadensis var. salebrosa	100 (0.1)	63 (0.3)
Taraxacum officinale	50 (0.1)	25 (0.1)
Unknown species	75 (0.3)	13 (0.2)
Urtica dioica ssp. gracilis	100 (5.5)	50 (3)
Verbascum thapsus	25 (0.1)	38 (0.1)
Viola	25 (0.1)	25 (0.1)

Part C: Herbaceous Vegetation

Species	ACTH7-BRTE	BRTE	JUSC2-JUOS/ERNA7	LECI4	POSE	POSE-BRTE	PSSP6-POSE	PSSP6/CRAC2	SIAL2/BRTE
TREES									
Juniperus osteosperma	-	-	86 (3.8)	-	-	-	-	-	4 (0.1)
Juniperus scopulorum	-	-	93 (3.3)	-	-	-	-	-	-
DWARF-SHRUBS									
Artemisia arbuscula	-	2 (2)	-	-	13 (3)	2 (1)	9 (2)	-	-
Ericameria nana	-	2 (0.1)	100 (4.7)	-	-	-	-	-	-
Eriogonum microthecum	-	6 (0.1)	29 (1)	-	-	-	27 (0.1)	50 (0.1)	-
Monardella odoratissima	-	-	29 (1.9)	-	-	-	-	-	-
SHRUBS									
Artemisia tridentata ssp. vaseyana	-	2 (0.1)	-	25 (0.1)	-	4 (3.5)	18 (2.6)	33 (3)	-
Artemisia tridentata var. wyomingensis	56 (2.8)	38 (2.6)	21 (3.7)	-	75 (3.5)	54 (2.6)	45 (2.4)	17 (0.1)	25 (1.4)
Artemisia tripartita	-	10 (1.8)	-	-	25 (2)	13 (1.7)	27 (0.1)	33 (0.1)	4 (2)
Chrysothamnus viscidiflorus	33 (2.7)	42 (2.1)	-	-	38 (1.7)	62 (2.3)	55 (1.5)	17 (5)	33 (1.5)
Ericameria nauseosa ssp. consimilis var. oreophila	-	6 (0.7)	71 (1)	-	-	2 (1.5)	36 (0.3)	50 (0.4)	4 (1)
Holodiscus dumosus	-	-	57 (0.6)	-	-	-	-	-	-
Purshia tridentata	11 (4)	10 (0.9)	57 (2.3)	-	13 (2)	4 (2.8)	27 (0.1)	17 (0.1)	4 (0.1)
Ribes aureum	-	-	29 (1.6)	-	-	-	-	17 (0.1)	-
Tetradymia canescens	-	2 (0.1)	-	-	-	1 (2)	27 (0.1)	33 (3)	-
GRAMINOIDS									
Achnatherum hymenoides	-	10 (0.7)	50 (1.3)	-	-	6 (1.4)	18 (1.1)	33 (0.1)	-
Achnatherum nelsonii ssp. dorei	-	6 (1.3)	-	-	-	1 (2)	-	-	4 (1)
Achnatherum thurberianum	100 (9.6)	-	43 (0.7)	-	25 (2.5)	26 (2)	-	-	-
Agropyron cristatum	-	17 (1.6)	-	-	-	6 (1.3)	9 (1)	-	29 (1.7)
Aristida purpurea	-	-	43 (1.8)	-	-	-	-	-	-
Bromus japonicus	11 (2)	2 (1)	-	-	25 (3.5)	6 (1.8)	-	-	-
Bromus tectorum	100 (6.9)	100 (17.5)	57 (3.2)	50 (1.1)	50 (1.5)	100 (10.8)	55 (1.4)	50 (0.7)	100 (17.7)
Elymus elymoides	11 (2)	19 (0.5)	57 (0.6)	-	38 (1.3)	27 (1.2)	9 (0.1)	17 (0.1)	13 (1)
Elymus lanceolatus	-	6 (0.4)	-	-	-	1 (1)	-	-	8 (0.1)
Festuca idahoensis	-	2 (1)	-	-	-	-	18 (0.1)	17 (1)	-
Hesperostipa comata ssp. comata	-	8 (0.6)	43 (1)	-	-	14 (2.2)	18 (1.6)	17 (0.1)	4 (1)
Leymus cinereus	11 (3)	15 (0.8)	-	100 (27.5)	13 (1)	17 (2)	36 (2.6)	33 (0.1)	13 (1)
Pascopyrum smithii	67 (1.7)	4 (1)	-	-	25 (1)	17 (2.8)	9 (2)	-	4 (2)
Poa	22 (1)	6 (2)	-	-	25 (1.5)	14 (2)	-	17 (1)	8 (1.5)
Poa bulbosa	-	2 (0.1)	-	25 (0.1)	-	5 (1.8)	-	-	4 (10)
Poa secunda	67 (3)	73 (1.5)	93 (2.7)	25 (0.1)	100 (11)	94 (6.1)	100 (2.4)	83 (0.5)	75 (6.3)
Pseudoroegneria spicata	22 (1.5)	19 (1)	14 (1.1)	-	50 (1.8)	19 (4)	100 (12.9)	100 (9.5)	-
Thinopyrum intermedium	-	10 (1.4)	-	-	-	4 (5)	-	-	-
FORBS									
Agoseris glauca	-	2 (0.1)	-	25 (0.1)	-	3 (0.7)	18 (1.1)	-	4 (0.1)
Allium	-	2 (1)	-	-	25 (1)	6 (0.9)	-	-	4 (1)
Allium acuminatum	-	6 (0.1)	-	-	-	4 (0.1)	18 (0.6)	17 (0.1)	-
Alyssum desertorum	33 (1.3)	15 (0.7)	-	-	-	14 (1.8)	9 (0.1)	-	21 (2.8)
Amsinckia	-	2 (1)	-	-	-	5 (1.2)	-	-	8 (1)
Arenaria aculeata	-	-	-	-	-	5 (1.4)	-	-	4 (1)
Aster	-	4 (0.6)	-	-	-	6 (1.2)	9 (0.1)	-	4 (2)
Astragalus	-	-	-	25 (0.1)	-	1 (0.1)	9 (0.1)	17 (0.1)	4 (1)
Astragalus purshii var. glareosus	-	2 (0.1)	-	-	-	1 (0.1)	9 (0.1)	33 (0.1)	-
Balsamorhiza sagittata	-	2 (9)	-	-	25 (1.5)	5 (3)	18 (1.1)	33 (0.1)	-
Ceratocephala testiculata	-	8 (2.5)	-	-	13 (1)	5 (1)	-	-	8 (1.5)
Chaenactis	-	-	-	-	-	9 (1.3)	-	-	17 (1.3)
Chaenactis douglasii	-	4 (0.1)	29 (0.1)	-	-	1 (0.1)	-	17 (0.1)	-
Cirsium canovirens	-	-	50 (0.4)	-	-	-	-	-	-
Collinsia parviflora	67 (3.3)	12 (2.7)	-	-	-	13 (2.3)	9 (0.1)	-	13 (1.7)
Crepis acuminata	-	13 (0.2)	-	-	13 (2)	9 (0.9)	73 (0.7)	83 (0.5)	-
Cryptantha	-	4 (0.6)	-	-	-	4 (1)	-	17 (0.1)	13 (1.7)
Cryptantha spiculifera	-	-	43 (0.2)	-	-	-	9 (0.1)	-	-
Delphinium andersonii	-	4 (0.1)	-	-	-	-	55 (0.1)	67 (0.1)	-
Descurainia pinnata ssp. filipes	-	-	7 (0.1)	50 (0.1)	-	1 (0.1)	-	17 (0.1)	13 (1.7)
Epilobium	11 (3)	2 (3)	-	-	-	16 (1.8)	-	17 (1)	4 (2)
Erigeron peregrinus	-	4 (1)	-	-	-	4 (1)	-	-	4 (1)
Erigeron pumilus	-	8 (0.1)	14 (0.1)	-	-	1 (0.1)	9 (0.1)	33 (0.1)	-
Eriogonum	-	-	36 (0.9)	-	25 (3)	3 (1)	9 (2)	-	-
Eriogonum caespitosum	-	-	36 (0.6)	-	-	-	-	-	-
Eriogonum ovalifolium	-	4 (0.1)	-	-	-	-	27 (0.1)	33 (0.1)	-
Fabaceae	-	-	-	-	-	2 (1)	-	17 (0.1)	4 (0.1)
Fritillaria pudica	-	8 (0.1)	-	-	-	2 (1.5)	-	-	-
Gayophytum	44 (2)	10 (1.8)	-	-	25 (3)	26 (1.9)	9 (5)	-	17 (2.3)
Kochia scoparia	-	-	-	25 (1)	-	3 (0.7)	-	-	17 (1.3)
Lactuca serriola	-	19 (1)	29 (0.1)	25 (1)	-	12 (1.7)	9 (0.1)	-	58 (2.3)
Leptodactylon pungens	-	4 (0.1)	86 (2)	-	-	2 (0.1)	36 (0.6)	50 (1)	-
Lithospermum ruderale	-	8 (0.6)	-	-	-	4 (0.8)	9 (1)	-	-
Lomatium dissectum	-	2 (0.1)	-	-	-	1 (10)	18 (0.6)	-	-
Lomatium foeniculaceum ssp. macdougalii	-	4 (0.1)	-	-	-	-	36 (0.1)	67 (0.1)	-
Lomatium nudicaule	-	-	-	-	13 (4)	10 (1.1)	18 (1)	-	8 (2)
Lomatium triternatum	-	6 (0.4)	-	-	-	1 (0.2)	36 (0.1)	67 (0.3)	-
Lupinus	-	2 (1)	-	25 (0.1)	13 (1)	3 (1)	9 (9)	50 (0.7)	-
Lupinus argenteus	-	-	-	-	-	1 (1)	36 (0.6)	-	-
Machaeranthera canescens	11 (1)	4 (1)	-	-	-	9 (1.1)	-	-	8 (1)
Mentzelia albicaulis	-	2 (0.1)	-	25 (0.1)	-	1 (0.1)	-	-	4 (0.1)
Nothocalais troximoides	-	6 (0.1)	-	50 (0.1)	-	-	-	-	-

Opuntia polyacantha	11 (2)	6 (0.1)	29 (0.6)	-	-	3 (0.7)	9 (2)	33 (0.1)	4 (0.1)
Orthocarpus	-	-	-	-	-	7 (1.1)	-	-	-
Packera cana	-	-	36 (1.1)	-	-	1 (0.1)	9 (0.1)	-	-
Penstemon	-	6 (0.1)	-	-	-	1 (0.2)	-	33 (0.1)	-
Penstemon cyaneus	-	-	-	-	-	1 (0.1)	36 (0.1)	33 (1.1)	-
Penstemon deustus	-	2 (0.1)	93 (2.6)	25 (0.1)	-	2 (1)	-	17 (0.1)	-
Phacelia hastata	-	8 (0.8)	43 (0.1)	-	-	2 (0.6)	36 (0.1)	33 (0.6)	-
Phlox	-	-	7 (0.1)	-	-	4 (1)	-	-	-
Phlox hoodii	33 (1.3)	10 (0.1)	-	-	25 (1.5)	26 (1.6)	36 (0.8)	33 (0.1)	8 (1)
Phlox longifolia	44 (2)	15 (0.8)	-	-	13 (5)	22 (1.7)	18 (0.1)	17 (3)	17 (0.8)
Potentilla glandulosa	-	-	93 (0.8)	-	-	-	-	-	-
Pteryxia terebinthina var. foeniculacea	-	4 (0.1)	-	-	-	1 (0.1)	9 (0.1)	-	-
Salsola tragus	-	-	-	-	-	5 (1.8)	-	-	21 (2)
Sisymbrium altissimum	22 (1.5)	37 (1.3)	7 (0.1)	25 (0.1)	-	24 (3.2)	36 (0.3)	-	100 (14)
Sisymbrium loeselii	-	2 (0.1)	-	25 (0.1)	-	1 (0.1)	-	-	4 (0.1)
Stephanomeria minor var. myrioclada	-	-	79 (0.5)	-	-	-	-	-	-
Thlaspi	-	4 (1.5)	-	-	-	4 (2.8)	-	-	4 (2)
Tragopogon dubius	11 (1)	31 (2.9)	43 (0.1)	-	13 (1)	27 (2.7)	18 (0.1)	17 (0.1)	71 (2.4)
Unknown forb	22 (1)	6 (0.7)	21 (1)	-	-	12 (1.4)	27 (0.4)	-	17 (1.5)
Unknown species	-	17 (1.7)	-	25 (0.2)	-	7 (0.5)	27 (0.1)	17 (0.1)	13 (1.7)
Viola nuttallii	-	2 (0.1)	-	75 (0.1)	-	-	18 (0.1)	-	4 (0.1)

Part D: Sparse Vegetation

Species	CHMI2/ PEDE4	ERNA7/ POSE/ PEDE4	EROVD	PHLE4/ PEDE4	PIFL2/ CHMI2/ POSE	POSE/ LEPU
TREES						
Pinus flexilis	-	-	25 (7)	-	100 (1.5)	-
Dwarf-Shrubs						
Ericameria nana	-	100 (1.5)	-	25 (0.1)	-	45 (0.3)
Eriogonum microthecum	-	73 (1)	-	25 (0.1)	-	36 (1.6)
SHRUBS						
Artemisia tridentata ssp. tridentata	40 (0.1)	-	-	-	25 (0.1)	9 (2)
Artemisia tridentata ssp. vaseyana	20 (0.1)	-	-	-	75 (1)	18 (3)
Artemisia tridentata var. wyomingensis	20 (0.1)	27 (1)	-	-	-	36 (3.8)
Chamaebatiaria millefolium	100 (0.7)	-	-	63 (0.3)	100 (0.8)	9 (0.1)
Ericameria nauseosa ssp. consimilis var. oreophila	-	27 (0.7)	-	-	25 (0.1)	55 (0.1)
Holodiscus dumosus	-	64 (0.1)	-	13 (0.1)	50 (0.1)	9 (0.1)
Philadelphus lewisii	-	27 (1.7)	-	100 (0.6)	100 (1.5)	9 (0.1)
Purshia tridentata	-	64 (0.7)	-	13 (0.1)	25 (0.1)	18 (0.6)
Ribes aureum	-	9 (0.1)	-	-	75 (0.1)	-
GRAMINOIDS						
Achnatherum hymenoides	-	27 (0.1)	-	-	-	18 (0.6)
Bromus tectorum	-	45 (0.5)	-	-	-	45 (1)
Elymus elymoides	20 (0.1)	91 (0.3)	-	100 (0.1)	25 (0.1)	73 (0.8)
Hesperostipa comata ssp. comata	40 (0.1)	82 (0.8)	-	13 (0.1)	-	27 (0.4)
Poa secunda	60 (0.1)	100 (0.6)	-	38 (0.1)	100 (0.1)	100 (4.8)
Pseudoroegneria spicata	-	-	-	13 (0.1)	75 (1.7)	18 (2)
FORBS						
Arabis holboellii	-	-	-	25 (0.1)	-	27 (0.1)
Castilleja angustifolia var. angustifolia	-	27 (0.1)	-	13 (0.1)	-	18 (0.1)
Chaenactis douglasii	-	27 (0.1)	75 (0.1)	-	-	27 (0.1)
Cirsium	-	27 (0.1)	25 (0.1)	13 (0.1)	-	18 (0.1)
Cirsium canovirens	-	9 (0.1)	-	-	25 (0.1)	18 (0.1)
Crepis acuminata	-	-	-	-	50 (0.1)	9 (0.1)
Dryopteris filix-mas	-	9 (0.1)	-	-	75 (0.1)	-
Eriogonum ovalifolium	-	-	-	-	25 (0.1)	27 (0.1)
Eriogonum ovalifolium var. depressum	-	-	100 (0.8)	-	-	-
Eriogonum umbellatum	-	64 (0.1)	25 (0.1)	13 (0.1)	-	27 (0.1)
Gilia leptomeria	20 (0.1)	9 (0.1)	-	50 (0.1)	100 (0.1)	18 (0.1)
Leptodactylon pungens	-	91 (0.8)	-	25 (0.1)	75 (0.1)	82 (0.8)
Lewisia rediviva	-	-	75 (0.1)	-	-	-
Lithophragma tenellum	-	-	-	-	100 (0.1)	-
Lomatium triternatum	-	27 (0.1)	-	-	-	9 (0.1)
Opuntia polyacantha	-	36 (0.1)	-	-	-	55 (0.1)
Packera cana	20 (0.1)	27 (0.1)	-	25 (0.1)	-	36 (0.1)
Penstemon deustus	60 (0.1)	100 (0.3)	-	100 (0.2)	25 (0.1)	64 (0.2)
Phacelia hastata	-	91 (0.2)	100 (0.3)	-	-	36 (0.1)
Phlox hoodii	-	9 (0.1)	-	25 (0.2)	-	18 (0.6)
Potentilla glandulosa	20 (0.1)	91 (0.6)	-	88 (0.6)	25 (0.1)	27 (0.4)
Pteryxia terebinthina var. foeniculacea	-	9 (0.1)	-	75 (0.1)	75 (0.1)	36 (0.3)
Stephanomeria minor var. myrioclada	20 (0.1)	73 (0.1)	-	13 (0.1)	-	36 (0.1)
Tragopogon dubius	-	18 (0.1)	-	-	-	27 (0.1)
Viola nuttallii	-	-	-	-	75 (0.1)	-

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