

Grassland Series

Green Fescue Communities (FEVI-LULA3, FEVI-JUPA, FEVI-PENST)

Green fescue (*Festuca viridula*) is the dominant subalpine fescue in the Willowa Mountains of northeastern Oregon. It has been found in very few isolated locations in the northern Blue Mountains. The description of the plant associations and plant community types to which they pertain can be found in *Alpine and Subalpine Vegetation of the Willowa, Seven Devils and Blue Mountains* (Johnson 2004). The green fescue communities known to occur in the Blue Mountains are:

Green fescue-spurred lupine plant association

Festuca viridula/Lupinus laxiflorus

FEVI-LULA3 GS1112

Location—

Yellowjacket Point, northern Blue Mountains, Walla Walla RD, Umatilla NF.

Green fescue-Parry's rush plant association

Festuca viridula/Juncus parryi

FEVI-JUPA GS1113

Location—

South of Bone Spring Lookout, Walla Walla RD, Umatilla NF.

Green fescue-penstemon plant community type

Festuca viridula/Penstemon spp.

FEVI-PENST GS1115

Location—

Oregon Butte, Pomeroy RD, Umatilla NF.

Idaho Fescue Types

Idaho fescue (*Festuca idahoensis*) occurs at elevations exceeding 6,000 ft in the Blue and Ochoco Mountains. Two plant associations and four plant community types are described below for these subalpine Idaho fescue-dominated plant communities.

Idaho fescue-red avens plant community type

Festuca idahoensis-Geum triflorum

FEID-GETR GB5923 N = 4

The sampled sites represent ridgetop locations high in elevation (mean 7,633 ft) where bluebunch wheatgrass and prairie junegrass are unable to persist. Sites were in the

Willowa Mountains on basaltic substrates on gentle to moderate slopes (mean 18 percent), in the Elkhorn Mountains on argillites, and at Dixie Butte on andesites. No sedges occurred. Only forbs were associated with fescue. Lupines, penstemon, and yarrow represented species that tended to increase with ungulate disturbance. Red avens and western groundsel were prominent associates. On depressions and thinner soil microsites, pussytoes, scabland fleabane, and buckwheat were found. Mosses were abundant. Erosion pavement was always present at 5 to 10 percent. The FEID-GETR plant community type has not been previously described.

Environmental features—

	Mean	Range
Elevation (feet)	7,633	6,620–8,080
Slope (percent)	23	15–20
Aspect (number of plots)	NW (2), NE (0), SE (0), SW (2)	
Lithology	Basalt	
Position	Ridgetop	
Slope shape	Convex	

Ground surface features—

	Mean	Range
	Percent	
Bare ground	7	0–15
Rock	7	5–10
Gravel	2	0–5
Pavement	9	5–10
Moss	11	5–18
Lichen	1	0–1
Litter	5	0–15

Principal species—

Species	Code	Cover/constancy	Range of cover
		Percent	
Grasses:			
Idaho fescue	FEID	44/100	40–50
Forbs:			
lupine	LUPIN	11/75	0–30
western groundsel	SEIN2	5/50	0–10
red avens	GETR	18/100	10–30
common yarrow	ACMIL	8/100	5–20
penstemon	PENST	2/50	0–5
golden buckwheat	ERFL4	1/50	0–1
pussytoes	ANTEN	7/100	1–1
scabland fleabane	ERBL	2/75	0–4
woolly goldenweed	HALA3	1/50	0–1
phlox	PHLOX	4/25	0–15
creamy buckwheat	ERHE2	3/25	0–10

Idaho fescue-bluebunch wheatgrass-Cymopterus plant association

Festuca idahoensis-*Agropyron spicatum*-*Cymopterus terebinthinus foeniculaceus*

FEID-AGSP-CYTEF

GB5925

N = 7



Fields Peak, Blue Mountain RD, Malheur NF.

Distribution—

Sampled sites were in the Aldrich Mountains (southern Blue Mountains) and Wallowa Mountains (outside of the study area).

Environmental features—

The type was found from 6,040 to 8,100 ft elevation (mean 6,963 ft) on moderate to steep slopes (mean 36 percent). All sampled sites were on southwest-facing slopes where solar radiation and warmth were greatest. Sites were located on ridgetops and upper midslope positions on convex to flat surfaces. This type occurred on a broad range of substrates—basalts, dacite, sandstone, and serpentine. The two soils studied were droughty and formed in coarse-grained colluvium over bedrock. Very to extremely gravelly sandy loam was over bedrock at 21 and 39 in, in the two profiles. Available water capacity was very low (1.5 to 2 in), and pH was 6.5 to 7.5.

	Mean	Range
Elevation (feet)	6,963	6,040–8,100
Slope (percent)	36	15–58
Herbage (pounds/acre, n = 1)	3,330	
Aspect (number of plots)	NW (0), NE (0), SE (0), SW (7)	
Lithology	Basalt, sandstone, serpentine, dacite	
Position	Ridgetop; upper and mid slopes	
Slope shape	Convex, flat	

Ground surface features—

	Mean	Range
	Percent	
Bare ground	2	0–10
Rock	5	0–10
Gravel	20	0–55
Moss	8	0–25
Lichen	1	0–1
Litter	22	1–55

Vegetation composition—

Idaho fescue and bluebunch wheatgrass codominate subalpine gravelly sites with turpentine cymopterus. In addition to the two principal bunchgrasses, Sandberg's bluegrass was often present.

The perennial forbs associated with cymopterus were relatively few on these dry, warm sites. Only yarrow and sulfur penstemon were regular community members. Two dry, gravelly site plants (woolly eriophyllum and scabland fleabane) were also found in these communities. Rock and gravel averaged 25 percent of the surface cover.

Principal species—

Species	Code	Cover/constancy	Range of cover
Percent			
Grasses:			
Idaho fescue	FEID	15/100	3–35
bluebunch wheatgrass	AGSP	16/100	5–25
Sandberg's bluegrass	POSA12	3/57	0–15
Forbs:			
turpentine cymopterus	CYTEF	11/100	1–30
common yarrow	ACMIL	5/100	1–20
yellow salsify	TRDU	1/43	0–1
red avens	GETR	1/43	0–5
scabland fleabane	ERBL	1/43	0–1
sulfur penstemon	PEAT3	5/71	0–15
woolly eriophyllum	ERLA6	4/43	0–20
pussytoes	ANTEN	5/28	0–25

Management considerations—

On steep colluvial slopes, the cymopterus competes well with bunchgrasses by sending the taproot deep into the colluvium to reach available ground water.

Relationship to other studies—

The FED1-AGSP-CYTEF plant association was first described in Johnson (2004).

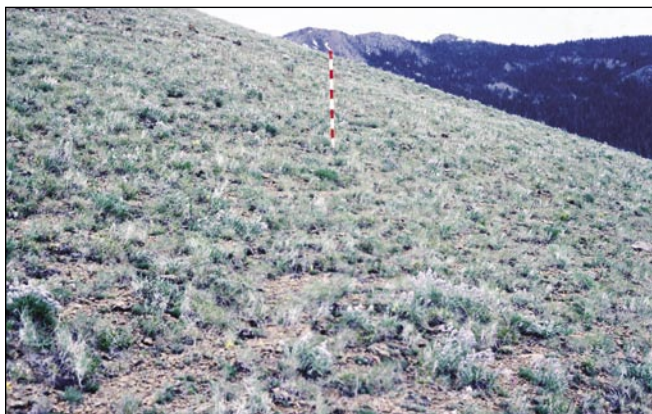
Idaho fescue-bluebunch wheatgrass-Cusick's frasera plant association

Festuca idahoensis-*Agropyron spicatum*-*Frasera albicaulis* var. *cusickii*

FEID-AGSP-FRALC2

GB5926

N = 5



Baldy Mountain, Prairie City RD, Malheur NF.

Distribution—

Strawberry Mountains on serpentine substrates.

Environmental features—

This plant association was found on peridotite, gabbro, and serpentine substrates on the north flank of the Strawberry Mountains. Elevational range was 6,360 to 7,420 ft (mean 7,004 ft). Slopes were gentle to moderately steep (mean 16 percent). Sampled sites were predominantly on northerly aspects. All surfaces were encountered (convex, concave, flat, and undulating). Sample sites were on ridgetops and at upper slope positions.

	Mean	Range
Elevation (feet)	7,004	6,360–7,420
Slope (percent)	16	10–28
Herbage (pounds/acre, n = 1)	2,140	
Aspect (number of plots)	NW (3), NE (1), SE (1), SW (0)	
Lithology	Peridotite, gabbro, serpentine	
Position	Ridgetop, upper third of slope	
Slope shape	Convex, flat, concave, undulating	

Ground surface features—

	Mean	Range
Percent		
Bare ground	3	1–10
Rock	6	0–30
Gravel	44	0–55
Moss	4	0–20
Lichen	5	0–5
Litter	8	0–20

Vegetation composition—

Bunchgrass cover was low owing to the low calcium and high metallic levels of the ultramafic rocks. Idaho fescue and bluebunch wheatgrass were the dominant species on these sites. Onespikes oatgrass was usually present as well. The forbs associated included plants often found on ultramafic sites (e.g., cockscomb cryptantha (*Cryptantha celosioides*) and Nuttall's draba (*Draba densifolia*)). Cusick's frasera was always present as the most abundant forb. Sulfur penstemon (*Penstemon attenuatus* var. *palustris*), serrate balsamroot, and scabland fleabane were other species usually occurring with the bunchgrasses.

Principal species—

Species	Code	Cover/constancy	Range of cover
Percent			
Grasses:			
Idaho fescue	FEID	15/100	5–25
bluebunch wheatgrass	AGSP	10/100	1–20
onespike oatgrass	DAUN	1/80	0–3
Forbs:			
common yarrow	ACMIL	1/100	1–3
scabland fleabane	ERBL	3/80	0–3
stonecrops	SEDUM	4/40	0–10
sulfur penstemon	PEAT3	3/100	1–5
spurred lupine	LULA3	4/40	0–5
Nuttall's draba	DRDE	2/80	0–3
Cusick's frasera	FRALC2	7/100	3–15
serrate balsamroot	BASE2	1/80	0–1
woolly goldenweed	HALA3	1/40	0–1
cockscomb cryptantha	CRCE	1/40	0–1
prairie lupine	LULEU2	2/40	0–3

Management considerations—

These subalpine sites were used intensively by domestic sheep in the early 1900s. Pedestalled fescue plants, erosion pavement in deflation depressions, and trailing terracettes are all indicative of past soil erosion resulting from overgrazing. On relatively pristine sites, Idaho fescue dominates over bluebunch wheatgrass at a 2:1 ratio. Stands that have been moderately affected by grazing contain the two principal bunchgrasses at a 1:1 ratio. Stands that have been more strongly affected by grazing are dominated by bluebunch wheatgrass.

Relationship to other studies—

The FEDI-AGSP-FRALC2 plant association was first described in Johnson (2004).

Oniongrass-western needlegrass plant community type

Melica bulbosa-Stipa occidentalis

MEBU-STOC2

GB5011

N = 1

A ridgetop community at 7,300 ft elevation in the Strawberry Mountains, which has a history as a sheep livestock driveway, now contains a grass-dominated herbaceous component with perennial and annual forbs capitalizing on secondary site disturbance factors (e.g., pocket gophers, *Thomomys thalpoides*). A very high composition of oniongrass (*Melica bulbosa*) at 20 percent cover and western

needlegrass at 5 percent composed the graminoid component. Perennial forbs present were thread-leaf fleabane and sulfur penstemon. The churning of the soil by pocket gophers left a gravel/bare ground surface of 70 percent. Populating this highly disturbed area were annual forbs (e.g., narrow-leaf collomia, spreading groundsmoke). The substrate was rhyolitic on Strawberry Mountain volcanics.

Western needlegrass-bottlebrush squirreltail plant community type

Stipa occidentalis-Sitanion hystrix

STOC2-SIHY (Alpine)

GS50

N = 3

Severe annual grazing by domestic livestock in subalpine environments has degenerated native plant communities, caused soils to erode extensively, and resulted in plant communities capable of inhabiting a drier, often warmer site, with nutrient-deficient soils. This community represents vegetation found extensively along the subalpine mountain slopes where overgrazing and subsequent erosion have taken the vegetation beyond the threshold where Idaho fescue and elk sedge were once prevalent on the site but can no longer persist. This community was found in the

Strawberry Mountains and the Elkhorn Mountains of the central and southern Blue Mountains. Here two grasses, western needlegrass and bottlebrush squirreltail, codominated with 40 percent cover. An erosion pavement dominated the ground surface averaging 67 percent. Capitalizing on the lithic, warm site were phlox (especially *P. pulvinata*), western hawkweed, and hawksbeard. Elevations averaged 7,700 ft. Sampled sites were on moderate westerly slopes (mean 13 percent). Substrates were basaltic in the Strawberry Mountains, granitic in the Elkhorn Mountains.

Idaho fescue/prairie junegrass-mounds plant association

Festuca idahoensis/*Koeleria cristata*

FEID-KOCR (Mound)

GB5912

N = 14



Abels Ridge, Pomeroy RD, Umatilla NF.

Distribution—

Northern Blue Mountains.

Benchmark site—

Pataha Bunchgrass Research Natural Area, Pomeroy RD, Umatilla NF.

Environmental features—

This plant association occupies deep soil mounds overlying Columbia River basalts. Sampled sites occurred from 3,650 to 5,120 ft elevation (mean 4,440 ft). Slopes were gentle (mean 4 percent) with surfaces flat to convex. Mounded topography occurred on ridgetops. All aspects were represented. Soils consisted of a surface layer of silt loam (loess) over stony clayey soil over bedrock. The silt loam cap was about 2 ft thick on the mound centers, thinning to zero at mound margins where other plant associations were present. The available water capacity of the mound soils was moderate. Herbage production was high, ranging from 627 to 4,120 lb/ac (mean 1,934 lb/ac).

	Mean	Range
Elevation (feet)	4,440	3,650–5,120
Slope (percent)	4	1–5
Soil pH (n = 2)		6.2–7.0
Soil available water capacity (inches, n = 2)		4–7.5 (moderate)
Depth to bedrock (inches, n = 12)		16–30
Herbage (pounds/acre, n = 6)	1,934	627–4,120
Aspect (number of plots)	NW (3), NE (5), SE (3), SW (4)	
Lithology	Basalt	
Position	Summit	
Slope shape	Flat, convex	

Ground surface features—

	Phase						A + B range
	A (n = 1)	B (n = 3)	C1 (n = 1)	C2 (n = 3)	D1 (n = 1)	D2 (n = 2)	
	Cover (%)						
Bare ground	3	5	10	27	24	40	1–15
Bedrock	0	1	0	0	0	0	0
Rock	1	0	0	10	1	8	0–1
Gravel	0	0	0	3	0	8	0
Pavement	2	0	0	0	0	0	0–2
Mosses and lichens	20	1	0	3	17	5	0–20
Litter	74	55	90	10	43	11	

Vegetation composition—

These mounds are dominated by bunchgrasses. Shrubs are virtually absent in these communities, although common snowberry may occur as an incidental species. The bunchgrasses are mainly Idaho fescue, with prairie junegrass always associated at low cover levels in undisturbed communities. Forbs that frequently occur are yarrow, red besseya, deerhorn, creamy buckwheat, lupines, and potentillas. With increased disturbance, annual grasses (soft brome, Japanese brome, hairy brome, ventenata) may become prominent. Perennial forbs that tend to increase with disturbance are creamy buckwheat, yarrow, and red avens. Tarweeds and deerhorn are annual forbs that increase with surface disturbance.

States and transitions—

Six phases were defined as follows:

- A Idaho fescue and bluebunch wheatgrass cover totals >50 percent, perennial forb cover <30 percent.
- B Idaho fescue, bluebunch wheatgrass, and prairie junegrass cover totals 30 to 50 percent; forb cover >30 percent.

Principal species—

Species	Code	Phase						A + B range
		A (n = 1)	B (n = 3)	C1 (n = 1)	C2 (n = 3)	D1 (n = 4)	D2 (n = 2)	
		<i>Cover (%) / constancy (%)</i>						<i>Cover (%)</i>
Grasses:								
bluebunch wheatgrass	AGSP	21/100	30/67	1/100	15/33	1/50	3/100	0–30
mountain brome	BRCA5	0	2/67	0	3/67	3/50	0	0–2
hairy brome	BRCO4	0	20/33	0	20/33	22/75	1/50	0–20
Japanese brome	BRJA	0	0	0	0	0	35/50	0
soft brome	BRMO2	0	0	20/100	0	0	0	0
cheatgrass	BRTE	0	0	1/100	0	2/50	1/100	0
Idaho fescue	FEID	33/100	25/100	20/100	14/100	0	1/100	15–40
prairie junegrass	KOCR	2/100	3/100	0	12/67	12/75	1/50	1–5
Kentucky bluegrass	POPR	0	9/100	0	0	3/50	0	0–20
Sandberg's bluegrass	POSA12	2/100	0	1/100	6/67	25/25	6/100	0–2
ventenata	VEDU	0	0	40/100	0	3/25	0	0
Forbs:								
common yarrow	ACMIL	0	8/100	3/100	10/100	4/75	15/100	0–10
red besseya	BERU	0	3/67	0	0	1/25	0	0–5
deerhorn	CLPU	0	15/87	0	5/100	10/25	0	0–15
creamy buckwheat	ERHE2	3/100	11/67	10/100	22/100	0	38/100	0–15
red avens	GETR	0	7/33	0	8/67	0	0	0–7
cluster tarweed	MAGL2	0	0	0	0	58/50	0	0
slender tarweed	MAGR3	0	0	0	0	5/25	20/50	0
hairy owl-clover	ORHI	0	0	0	3/67	0	1/100	0
potentillas	POTEN	0	7/100	0	0	20/25	0	0–10
yellow salsify	TRDU	0	1/33	0	1/67	1/75	0	0–1
lupines	LUPIN	10/100	13/67	0	15/100	5/25	15/50	0–25

- C1 Idaho fescue and bluebunch wheatgrass cover totals 5 to 30 percent; annual grasses dominant.
- C2 Idaho fescue and bluebunch wheatgrass cover totals 5 to 30 percent; perennial forbs high in cover (creamy buckwheat, yarrow, and red avens); bare ground percentage high (>10 percent).
- D1 Idaho fescue and bluebunch wheatgrass cover <5 percent; annual bromes and tarweeds abundant.
- D2 Idaho fescue and bluebunch wheatgrass cover <5 percent; perennial forbs (yarrow, creamy buckwheat) high in cover; bare ground high (>25 percent).

These phases are the result of disturbances from wild and domestic ungulates. The site depicted by phase A is inside the Pataha Bunchgrass Research Natural Area that has excluded domestic livestock since 1968. As ungulate use increases, the three deep-rooted bunchgrasses (Idaho fescue, bluebunch wheatgrass, and prairie junegrass) decline in vigor and foliar cover (phase B). With further degradation, either annual grasses (phase C1) or perennial forbs and bare ground (phase C2) become dominant. The D phases represent the perennial bunchgrass as either relict or absent, with annuals (especially cluster tarweed, phase D1) or perennial forbs (creamy buckwheat and yarrow, phase D2) dominant.

Management considerations—

To promote or enhance Idaho fescue and bluebunch wheatgrass in these communities, grazing should occur after seed set. Ungulates can promote germination by trampling the seed into the soil after midsummer. Bunchgrasses generally rebound quickly from fires, reaching levels similar to those before the fire in just 1 year. However, fescue is often suppressed by severe burns in late summer, when root crowns are readily damaged or consumed; it usually returns to preburn cover within 5 years after fire. If heavy grazing suppresses bunchgrasses, perennial forbs or annuals expand as discussed above. Observations in the Hell's Canyon region suggest that Kentucky bluegrass may also invade if severe fires reduce the fescue component.

Relationship to other studies—

The FEID-KOCR association was first described by Poulton (1955) on the Deschutes-Umatilla Plateau of north-central Oregon. Tisdale (1979, 1986) subsequently described this vegetation as a FEID-KOCR habitat type. Johnson and Simon (1987) classified FEID-KOCR with topoedaphic breaks. They encountered the FEID-KOCR-Mound plant association in the northern Wallowa Mountains and on ridgetops above the Snake, Imnaha, and Grande Ronde River canyons.

Idaho fescue/prairie junegrass-ridge plant association

Festuca idahoensis-Koeleria cristata

FEID-KOCR (Ridge)

GB5911

N = 12



Long Creek Mountain, Blue Mountain RD, Malheur NF.

Distribution—

Northern and Central Blue Mountains.

Environmental features—

This plant association occupies ridgetop sites overlying andesites and basalts. Sampled sites occurred from 3,900 to 6,550 ft elevation (mean 4,690 ft). Slopes were gentle (mean 12 percent) with surfaces flat to convex. Soils consisted of a silt loam layer up to 8 in thick (sometimes absent), over a clay loam layer that usually contained gravel and could be extremely gravelly; bedrock occurred within about 2 ft of the surface. This plant association occurs on nonmounded ridgetops and shoulders. Aspects were mostly westerly. Herbage production ranged from 338 to 1,444 lb/ac (mean 722 lb/ac).

	Mean	Range
Elevation (feet)	4,690	3,900–6,550
Slope (percent)	12	2–30
Soil pH (n = 5)		6.0–6.8
Soil available water capacity (inches, n = 5)		1.5–6 (very low to moderate)
Depth to bedrock (inches, n = 10)		10–26
Herbage (pounds/acre, n = 6)	722	338–1,444
Aspect (number of plots)	NW (6), NE (1), SE (0), SW (5)	
Lithology	Basalt, andesite	
Position	Summit, shoulder	
Slope shape	Flat, convex	

Ground surface features—

	Phase					A + B range
	A (n = 6)	B (n = 3)	C1 (n = 1)	C2 (n = 1)	D (n = 1)	
	Cover (%)					
Bare ground	9	31	5	18	1	3–45
Bedrock	1	2	0	4	0	0–4
Rock	5	2	1	17	1	1–15
Gravel	4	0	0	0	40	0–15
Pavement	2	0	0	0	0	0–10
Mosses and lichens	5	10	18	3	25	0–12
Litter	30	55	70	58	1	

Vegetation composition—

Shrubs are virtually nonexistent in these bunchgrass-dominated communities. Idaho fescue dominates, with prairie junegrass and Sandberg's bluegrass always associated at low cover levels in undisturbed communities. Forbs that frequently occur are pale agoseris, red avens, lupines, yarrow, twin arnica, and creamy buckwheat. The latter three forbs increase with disturbances.

States and transitions—

Five phases were defined as follows:

- A Fescue and wheatgrass cover total >30 percent; bare ground cover 15 percent or less.
- B Fescue and wheatgrass cover >30 percent but Sandberg's bluegrass cover is >15 percent and often greater than fescue.
- C1 Fescue and wheatgrass cover <30 percent; abundant annual grasses.
- C2 Fescue and wheatgrass cover <30 percent; perennial forbs (yarrow, twin arnica, and creamy buckwheat) or Sandberg's bluegrass cover high (over 20 percent).
- D Idaho fescue and bluebunch wheatgrass <5 percent cover or absent; perennial forbs (yarrow and creamy buckwheat) abundant.

Principal species—

Species	Code	Phase					A + B range
		A (n = 6)	B (n = 3)	C1 (n = 1)	C2 (n = 1)	D (n = 1)	
		Cover (%)/constancy (%)					Cover (%)
Grasses:							
bluebunch wheatgrass	AGSP	25/33	20/100	10/100	8/100	1/100	0–30
annual bromes	BROMU	0	3/33	26/100	0	0	0
onespike oatgrass	DAUN	2/33	2/67	0	1/100	5/100	0–3
Idaho fescue	FEID	40/100	18/100	15/100	15/100	0	9–55
prairie junegrass	KOCR	7/100	12/100	5/100	3/100	35/100	1–15
Sandberg's bluegrass	POSA12	6/100	25/100	1/100	25/100	3/100	1–30
Forbs:							
common yarrow	ACMIL	3/100	4/100	3/100	1/100	15/100	1–7
pale agoseris	AGGL	2/33	2/67	0	0	4/100	0–3
pussytoes	ANTEN	1/33	1/33	0	0	1/100	0–1
twin arnica	ARSO2	7/17	1/100	1/100	10/100	1/100	0–7
serrate balsamroot	BASE2	4/50	0	0	0	1/100	0–5
creamy buckwheat	ERHE2	4/33	4/67	1/100	20/100	0	0–6
red avens	GETR	2/50	1/33	0	3/100	0	0–3
lupines	LUPIN	17/50	1/67	0	15/100	0	0–15
pussy clover	TRPL2	4/33	2/33	0	0	7/100	0–7

These phases are the result of disturbances from wild and domestic ungulates. As ungulate use increases, the three deep-rooted bunchgrasses (fescue, wheatgrass, and junegrass) decline in vigor and foliar cover. Phase A represents the least disturbed site. In phase B, disturbance has suppressed fescue and allowed bluegrass to increase. Phase C results from further degradation with either perennial forbs (phase C1) or Sandberg's bluegrass (phase C2) now dominant. In phase D, fescue has been eliminated and replaced by perennial forbs and junegrass.

Management considerations—

Wild ungulates use these ridgetop and ridge shoulder sites heavily before grasses mature. If plant vigor is to be maintained, domestic livestock should not use these sites until after seed maturity. Ungulates can promote germination by trampling the seed into the soil after midsummer. Bunchgrasses generally rebound quickly from fires, reaching levels similar to those before the fire in just 1

year. However, fescue is often suppressed by severe burns in late summer, when root crowns are readily damaged or consumed; it usually returns to preburn cover within 5 years after fire.

Relationship to other studies—

The FEID-KOCR association was first described by Poulton (1955) on the Deschutes-Umatilla Plateau of north-central Oregon. Tisdale (1979, 1986) subsequently described this vegetation as a FEID-KOCR habitat type. Johnson and Simon (1987) classified FEID-KOCR with topoedaphic breaks. They encountered the FEID-KOCR-Ridge plant association in the northern Wallowa Mountains and on ridgetops above the Snake, Imnaha, and Grande Ronde River canyons.

This description confirms the type first described by Poulton and extends the range into the Blue Mountains. It was found as far south as Long Creek Mountain on the northern Malheur NF.

Idaho fescue-bluebunch wheatgrass-lupine plant association

Festuca idahoensis-*Agropyron spicatum*-*Lupinus* spp.

FEID-AGSP-LUPIN

GB5916

N = 8



Mud Spring Ridge, Pomeroy RD, Umatilla NF.

Distribution—

Blue Mountains and Ochoco Mountains.

Environmental features—

This plant association occupies upper ridge slopes on basalts. Sampled sites occurred from 4,110 to 5,540 ft elevation (mean 4,570 ft). Slopes were gentle to steep (mean 26 percent) on mostly convex surfaces. All aspects were represented. Brief soil investigations (n = 4) suggest gravelly soils with bedrock or extremely gravelly material at 1 to 3 ft depth. Herbage production ranged from 650 to 1,970 lb/ac (mean 993 lb/ac).

	Mean	Range
Elevation (feet)	4,570	4,110–5,540
Slope (percent)	26	5–64
Herbage (pounds/acre, n = 7)	993	650–1,970
Aspect (number of plots)	NW (1), NE (3), SE (2), SW (2)	
Lithology	Basalt	
Position	Backslope, shoulders	
Slope shape	Convex	

Ground surface features—

	Phase			A + B range
	A (n = 1)	B (n = 5)	C (n = 2)	
	Cover (%)			
Bare ground	5	15	30	5–30
Bedrock	0	0	2	0
Rock	15	5	8	0–15
Gravel	0	6	10	0–25
Pavement	0	0	0	0
Mosses and lichens	10	3	3	0–11
Litter	20	47	20	3–80

Vegetation composition—

Bunchgrasses dominate and shrubs are nearly absent. Idaho fescue dominates with bluebunch wheatgrass and Sandberg's bluegrass always associated at low cover levels in undisturbed communities. Forbs that frequently occur are yarrow, lupines, and lomatiums.

States and transitions—

Three phases were defined as follows:

- A Fescue and wheatgrass cover total >50 percent; bare ground ≤5 percent.
- B Fescue and wheatgrass cover ≤50 percent; bare ground percentage still low (5 to 20 percent).
- C Fescue and wheatgrass cover <50 percent; bare ground percentage high (over 20 percent).

These phases are the result of disturbances from wild and domestic ungulates. As ungulate use increases, the deep-rooted bunchgrasses (fescue and wheatgrass) decline in vigor and foliar cover. Phase A represents the least disturbed site. Phase B represents vegetation resulting from moderate ungulate disturbance; fescue tends to lose its dominance over bluebunch wheatgrass, and Sandberg's bluegrass increases. Phase C results from further degradation with bare ground becoming dominant. Fescue and wheatgrass may decline below 20 percent cover.

Management considerations—

Wild ungulates use these ridgetop and ridge shoulder sites heavily before grasses mature. If plant vigor is to be maintained, domestic ungulates should not use these sites until after seed maturity. Ungulates can promote germination by trampling the seed into the soil after midsummer. Bunchgrasses generally rebound quickly from fires, reaching levels similar to those before the fire in just 1 year. However, fescue is often suppressed by severe burns in late summer,

Principal species—

Species	Code	Phase			A + B range
		A (n = 1)	B (n = 1)	C (n = 2)	
		Cover (%)/constancy (%)			Cover (%)
Grasses:					
bluebunch wheatgrass	AGSP	10/100	22/100	6/100	1–35
Idaho fescue	FEID	55/100	26/100	22/100	20–35
bulbous bluegrass	POBU	0	0	15/50	0
Sandberg's bluegrass	POSA12	1/100	5/100	10/50	1–10
Forbs:					
common yarrow	ACMIL	3/100	4/100	2/100	1–5
pussytoes	ANTEN	0	3/20	3/50	0–3
deerhorn	CLPU	0	1/20	10/50	0–1
creamy buckwheat	ERHE2	0	1/80	0	0–3
cleavers	GAAP2	0	0	5/50	0
lomatiums	LOMAT	1/100	1/60	8/50	0–10
lupines	LUPIN	5/100	14/100	13/100	5–25
mules' ears	WYAM	0	0	40/50	0

when root crowns are readily damaged or consumed; it usually returns to preburn cover within 5 years after fire.

Relationship to other studies—

The FEID-AGSP habitat type of Daubenmire (1970) is similar. Hall's (1973) plant community type, "bunchgrass on deep soil, steep slopes," is similar to this plant association. Tisdale (1979, 1986) classified a FEID-AGSP habitat type in the Snake River canyon that is similar. Mueggler and Stewart (1980) identified FEID-AGSP vegetation as forming the most common grassland in southwestern Montana. The FEID-AGSP-LUSE4 plant association described by Johnson and Simon (1987) in the Wallowa Mountain-Snake River canyon is similar to this plant association.

Idaho fescue-bluebunch wheatgrass-arrowleaf balsamroot plant association

Festuca idahoensis-Agropyron spicatum-Balsamorhiza sagittata

FEID-AGSP-BASA3

GB5917

N = 3



Smoothing Iron Ridge, Pomeroy RD, Umatilla NF.

Distribution—

Northern Blue Mountains.

Environmental features—

This plant association occupies upper ridge shoulders and slopes on basalts. Sampled sites occurred from 3,930 to 4,280 ft elevation (mean 4,113 ft). Slopes were steep (mean 56 percent) on mostly convex surfaces. Aspects were southerly.

	Mean	Range
Elevation (feet)	4,113	3,930–4,280
Slope (percent)	56	50–64
Aspect (number of plots)	NW (0), NE (0), SE (1), SW (2)	
Lithology	Basalt	
Position	Shoulder, backslope	
Slope shape	Convex	

Ground surface features—

	Phase			A + B range
	A (n = 1)	B (n = 1)	C (n = 2)	
		Cover (%)		
Bare ground	1	20	5	1–20
Bedrock	0	1	0	0–1
Rock	10	25	1	10–25
Gravel	1	5	35	1–5
Pavement	0	0	0	0
Mosses and lichens	6	2	4	2–6
Litter	70	35	55	35–70

Principal species—

Species	Code	Phase			A + B range
		A (n = 1)	B (n = 1)	C (n = 1)	
		Cover (%)/constancy (%)			Cover (%)
Grasses:					
bluebunch wheatgrass	AGSP	20/100	25/100	20/100	20–25
Idaho fescue	FEID	30/100	15/100	10/100	15–30
Sandberg's bluegrass	POSA12	10/100	15/100	5/100	10–15
hairy brome	BRCO4	5/100	10/100	0	5–10
brome fescue	FEBR4	0	5/100	0	0–5
cheatgrass	BRTE	0	3/100	1/100	0–3
soft brome	BRMO2	0	0	20/100	0
rattlesnake brome	BRBR7	1/100	1/100	0	1–1
ventenata	VEDU	0	3/100	0	0–3
Forbs:					
arrowleaf balsamroot	BASA3	10/100	5/100	5/100	5–10
common yarrow	ACMIL	1/100	3/100	1/100	1–3
lupines	LUPIN	1/100	1/100	5/100	1–1
deer horn	CLPU	1/100	0	10/100	0–1
pink microsteris	MIGR	0	0	30/100	0
slender tarweed	MAGR3	0	0	15/100	0

Vegetation composition—

Idaho fescue is associated with bluebunch wheatgrass and Sandberg's bluegrass. The dominant forb is arrowleaf balsamroot. Yarrow and lupines are usually present at low cover. Closely associated to FEID-AGSP-LUPIN, this plant association is more xeric as indicated by rockier sites and higher cover by Sandberg's bluegrass and balsamroot (the latter is more indicative of warm, dry sites than are lupines).

States and transitions—

Three phases were defined as follows:

- A Fescue and wheatgrass total cover ≥ 50 percent.
- B Fescue and wheatgrass total cover 30 to 50 percent.
- C Fescue and wheatgrass total cover < 30 percent.

These phases are the result of disturbances from wild and domestic ungulates. As ungulate use increases, the

deep-rooted bunchgrasses (fescue and wheatgrass) decline in vigor and foliar cover. Phase A represents the least disturbed site. In phase B, wheatgrass assumes dominance over fescue, and bluegrass increases. Phase C results from further degradation with fescue, wheatgrass, and bluegrass all declining and annuals assuming dominance. Informal observations suggest that severe overgrazing by domestic sheep has produced dense stands of balsamroot and mule's ears (*Wyethia*), a potential phase D for this type.

Management considerations—

Wild ungulates use these ridgetop and ridge shoulder sites heavily before grasses mature. If plant vigor is to be maintained, domestic livestock should not use these sites until after seed maturity. Ungulates can promote germination by trampling the seed into the soil after midsummer. Bunchgrasses generally rebound quickly from fires, reaching levels similar to those before the fire

in just 1 year. However, fescue is often suppressed by severe burns in late summer when root crowns are readily damaged or consumed; it usually returns to preburn cover within 5 years after fire.

Relationship to other studies—

The FEID-AGSP habitat type of Daubenmire (1970) is similar. Hall's (1973) plant community type, "bunchgrass on deep soil, steep slopes," is also similar to this plant association. Tisdale (1979, 1986) classified a FEID-AGSP habitat type in the Snake River canyon that is similar. Mueggler and Stewart (1980) identified FEID-AGSP vegetation as forming the most common grassland in southwestern Montana. The FEID-AGSP-BASA3 plant association described by Johnson and Simon (1987) in the Wallowa Mountain-Snake River canyon is similar to this plant association.

Idaho fescue-bluebunch wheatgrass-phlox plant association

Festuca idahoensis-Agropyron spicatum-Phlox spp.

FEID-AGSP-PHLOX

GB5931

N = 6



Big Ridge, Blue Mountain RD, Malheur NF.

Distribution—

Throughout the Blue Mountains.

Environmental features—

This plant association occupies ridge summits, shoulders, and slopes on basalts. Sampled sites occurred from 4,390 to 5,640 ft elevation (mean 5,001 ft). Slopes were gentle to steep (mean 27 percent) on mostly convex surfaces. Aspects were westerly. Soils consisted of gravelly to very gravelly loamy or clay loamy material, with bedrock or extremely gravelly material within 1 ft of the surface.

	Mean	Range
Elevation (feet)	5,001	4,390–5,640
Slope (percent)	27	6–70
Soil pH (n = 4)		6.0–7.0
Soil available water capacity (inches, n = 3)		1–2 (very low)
Depth to bedrock or extremely gravelly material (inches, n = 5)		0–10
Herbage (pounds/acre, n = 6)	563	286–1,208
Aspect (number of plots)	NW (3), NE (0), SE (0), SW (3)	
Lithology	Basalt	
Position	Summit, shoulder, slopes	
Slope shape	Convex	

Ground surface features—

	Phase		
	A (n = 3)	B (n = 3)	A + B range
	Cover (%)		
Bare ground	7	15	7–15
Bedrock	3	2	2–3
Rock	23	20	20–23
Gravel	3	3	3–3
Pavement	5	3	3–5
Mosses and lichens	3	7	3–7
Litter	50	15	15–50

Vegetation composition—

Idaho fescue is associated with bluebunch wheatgrass and Sandberg’s bluegrass on dry, warm, rocky sites. Idaho fescue is the dominant bunchgrass where vegetation is undisturbed. The dominant forb is phlox. Yarrow and fleabanes are usually present at low cover. This plant association is more xeric than FEID-AGSP-BASA3, as indicated by rockier sites and higher cover by Sandberg’s bluegrass and phloxes.

States and transitions—

Two phases were defined as follows:

- A Fescue and wheatgrass total cover \geq 35 percent.
- B Fescue and wheatgrass total cover < 35 percent.

These phases are the result of disturbances from wild and domestic ungulates. As ungulate use increases, the deep-rooted bunchgrasses (fescue, wheatgrass) decline in vigor and foliar cover. Phase A represents the least disturbed site. Total foliar cover of fescue and wheatgrass has declined, and bare ground increased from ungulate disturbance in phase B.

Principal species—

Species	Code	Phase		A + B range
		A (n = 3)	B (n = 3)	
		Cover (%)/constancy (%)		Cover (%)
Grasses:				
bluebunch wheatgrass	AGSP	25/100	9/100	9–25
Idaho fescue	FEID	16/100	17/100	16–17
Sandberg's bluegrass	POSA12	9/100	11/100	9–11
Forbs:				
common yarrow	ACMIL	2/100	2/100	2–2
fleabanes	ERIGE2	1/67	3/67	1–3
creamy buckwheat	ERHE2	9/100	0	0–9
phloxes	PHLOX	11/100	7/100	7–11
stonecrops	SEDUM	5/33	1/33	1–5

Management considerations—

Wild ungulates use these ridgetop, shoulder, and slope sites heavily before grasses mature. If plant vigor is to be maintained, domestic livestock should not use these sites until after seed maturity. Ungulates can promote germination by trampling the seed into the soil after midsummer.

Bunchgrasses generally rebound quickly from fires, reaching levels similar to those before the fire in just 1 year. However, fescue is often suppressed by severe burns in late summer, when root crowns are readily damaged or consumed; it usually returns to preburn cover within 5 years after fire.

Relationship to other studies—

The FEID-AGSP habitat type of Daubenmire (1970) is similar. Hall's (1973) plant community type, "bunchgrass on deep soil, steep slopes," is also similar to this plant association. Tisdale (1979, 1986) classified a FEID-AGSP habitat type in the Snake River canyon that is similar. Mueggler and Stewart (1980) identified FEID-AGSP vegetation as forming the most common grassland in southwestern Montana. The FEID-AGSP-PHCO2 plant association described by Johnson and Simon (1987) on ridgetops and upper slopes in the canyon lands of the Snake and Imnaha Rivers is the ecological equivalent to this plant association of the Blue Mountains.

Idaho fescue-bluebunch wheatgrass plant association

Festuca idahoensis-*Agropyron spicatum*

FEID-AGSP

GB59

N = 32



Horse Heaven Ridge, Walla Walla RD, Umatilla NF.

Distribution—

Throughout the Blue Mountains; Ochoco Mountains.

Environmental features—

This plant association occupies ridge summits, shoulders, and slopes on basalts. Sampled sites occurred from 3,900 to 6,990 ft elevation (mean 4,784 ft). Slopes were gentle to steep (mean 29 percent) on mostly convex or flat surfaces. All aspects were represented (70 percent of the sites sampled were southwesterly).

	Mean	Range
Elevation (feet)	4,784	3,900–6,990
Slope (percent)	29	0–60
Soil pH (n = 11)		6.2–6.8
Soil available water capacity (inches, n = 12)		1–5 (very low to moderate)
Depth to bedrock (inches, n = 24)		8–26
Herbage (pounds/acre, n = 18)	549	154–1,770 (outlier: 3,630)
Aspect (number of plots)	NW (2), NE (5), SE (3), SW (22)	
Lithology	Basalt	
Position	Summit, shoulder, backslope	
Slope shape	Convex, flat	

Ground surface features—

	Phase					A + B range
	A (n = 10)	B (n = 10)	C1 (n = 5)	C2 (n = 5)	D (n = 2)	
	Cover (%)					
Bare ground	9	11	15	15	17	0–20
Bedrock	1	1	1	0	0	0–5
Rock	19	23	12	7	5	1–56
Gravel	3	8	6	21	10	0–35
Pavement	6	4	2	0	0	0–33
Mosses and lichens	13	8	4	15	10	0–45
Litter	35	35	63	42	58	

Vegetation composition—

Idaho fescue is codominant with bluebunch wheatgrass. Sandberg’s bluegrass is always present at lower cover levels. Prominent forbs are yarrow, creamy buckwheat, phloxes, and lomatiums. This plant association is more xeric than FEID-AGSP-BASA3 and FEID-AGSP-LUPIN as indicated by phloxes and hot rock penstemon. This is the most common bunchgrass plant association in the Blue Mountains. Herbage production ranges are wide owing primarily to the diversity in elevation and latitude. Herbage ranged from 154 to 1,770 lb/ac (mean 549 lb/ac).

States and transitions—

Five phases were defined as follows:

- A Fescue and wheatgrass total cover ≥ 30 percent; little bare soil or annuals.
- B Fescue and wheatgrass total cover minus cover by annuals and bare soil is 0 to 20 percent.
- C1 Bare ground and annuals (forbs, annual brome-grasses, ventenata) collectively have greater cover than bunchgrasses.
- C2 Fescue and wheatgrass total cover <35 percent; bare ground >10 percent; perennial forbs (such as yarrow, creamy buckwheat, milkvetch, and lomatiums) and Sandberg’s bluegrass collectively have cover similar to or greater than bunchgrasses.
- D Fescue relict or absent (<5 percent cover); annual grasses (ventenata) dominant.

These phases are the result of disturbances from wild and domestic ungulates. As ungulate use increases, the deep-rooted bunchgrasses (fescue and wheatgrass) decline in vigor and foliar cover. Phase A represents the least disturbed site. In phase B, total foliar cover of fescue and wheatgrass has declined while annuals and bare ground have increased. Phase C occurs when either annuals (phase

Principal species—

Species	Code	Phase					A + B range
		A (n = 10)	B (n = 10)	C1 (n = 5)	C2 (n = 5)	D (n = 2)	
		Cover (%)/constancy (%)					Cover (%)
Grasses:							
bluebunch wheatgrass	AGSP	18/100	14/100	11/100	12/100	15/50	5–25
rattlesnake brome	BRBR7	0	2/30	10/49	10/20	1/50	0–3
Idaho fescue	FEID	22/100	16/100	19/100	15/100	3/50	5–35
Sandberg's bluegrass	POSA12	6/100	9/100	7/80	13/60	5/50	3–20
ventenata	VEDU	0	0	35/40	1/20	45/100	0
Forbs:							
common yarrow	ACMIL	2/90	2/90	4/80	5/100	24/100	0–5
Blue Mountain milkvetch	ASRE5	1/20	1/30	1/20	8/40	0	0–1
balsamroot	BALSA	3/20	5/80	3/80	15/40	0	0–25
tall annual willowherb	EPPA2	0	5/30	12/60	6/40	0	0–10
creamy buckwheat	ERHE2	12/30	5/80	12/60	18/60	0	0–18
lomatiums	LOMAT	1/60	4/70	3/40	18/50	12/60	0–7
slender tarweed	MAGR3	0	4/20	1/40	3/80	0	0–5
hot rock penstemon	PEDE4	1/10	2/60	0	2/40	0	0–3
phloxes	PHLOX	2/50	2/30	3/40	9/40	0	0–3

C1) or perennial forbs (phase C2) dominate over the bunchgrasses. Phase D results after degradation of the site results in the loss of fescue, the most mesic bunchgrass member.

Management considerations—

Wild ungulates (deer and elk) use these ridgetop, shoulder, and slope sites heavily before grasses mature. Use in late winter to early spring can displace saturated soils on slope sites with detrimental impacts to the bunchgrass plants. If bunchgrass vigor is to be maintained, domestic livestock should not use these sites until after seed maturity. Ungulates can promote germination by trampling the seed into the soil after midsummer. Bunchgrasses generally rebound quickly from fires, reaching levels similar to those before the fire in just 1 year. However, fescue is often suppressed by severe burns in late summer when root crowns are readily damaged or consumed; it usually returns to preburn cover within 5 years after fire. Pocket gophers can cause considerable soil displacement in degenerated FEID-AGSP communities.

Relationship to other studies—

The FEID-AGSP habitat type of Daubenmire (1970) is similar. Hall's (1973) classification of AGSP-FEID differentiated by soil depths and slope steepness included AGSP-POSA12 and FEID-AGSP vegetation as differentiated in this classification. Tisdale (1979, 1986) classified a FEID-AGSP habitat type in the Snake River canyon that is similar. Mueggler and Stewart (1980) identified FEID-AGSP vegetation as forming the most common grassland in southwestern Montana. In the Wallowa Mountains and Snake-Imnaha ridges, Johnson and Simon (1987) differentiated FEID-AGSP potential vegetation into three associations (FEID-AGSP/LUSE4, FEID-AGSP/BASA3, and FEID-AGSP/PHCO2). Several FEID-KOCR plant associations were also differentiated by using prairie junegrass as an indicator of a moister site. The present study generally parallels Johnson and Simon (1987) but retains a FEID-AGSP association that lacks other indicator species and thus is more narrowly defined than the FEID-AGSP in Johnson and Clausnitzer (1992).

Idaho fescue-onespike oatgrass plant community type

Festuca idahoensis-Danthonia unispicata

FEID-DAUN

GB5932

N = 2

This community occurs on scablands where soils are shallow over impervious bedrock of basalt. Onespike oatgrass, serrated balsamroot, pussytoes, bighead clover, and phloxes are all indicative of these site conditions. Idaho fescue, bluebunch wheatgrass, prairie junegrass, and Sandberg's bluegrass are commonly present. The presence of deeper soil bunchgrasses (fescue, wheatgrass, and junegrass) along

with soil erosion indicators suggests that these sites were once able to sustain Idaho-fescue-dominated communities. Bunchgrass plants on soil pedestals attest to past overuse by livestock with accelerated frost heaving and soil erosion. Ventenata can easily invade on these sites. These sites occur throughout the Blue and Ochoco Mountains.

Bluebunch wheatgrass-Sandberg's bluegrass-lupine plant association

Agropyron spicatum-Poa sandbergii-Lupinus spp.

AGSP-POSA12-LUPIN

GB4119

N = 9



Low Ridge, Wehaha-Tucannon Wilderness, Pomeroy RD, Umatilla NF.

Distribution—

Northern Blue Mountains and Ochoco Mountains.

Environmental features—

This plant association occupies shoulders and upper ridge slopes on basalts. Sampled sites occurred from 3,150 ft to 4,720 ft (mean 4,042 ft). Slopes were steep (mean 55 percent) on flat to convex surfaces. Aspects of sampled plots were all southwesterly. Brief soil investigations (n = 5) suggests that soils are rich in coarse fragments, and that bedrock or extremely stoney material occurs between 6 and 20 in of the surface. Herbage production ranged from 430 to 1,450 lb/ac (mean 931 lb/ac).

	Mean	Range
Elevation (feet)	4,042	3,150–4,720
Slope (percent, n = 3)	55	42–65
Herbage (pounds/acre, n = 8)	931	430–1,450
Aspect (number of plots)	NW (0), NE (0), SE (0), SW (9)	
Lithology	Basalt	
Position	Shoulder, backslope	
Slope shape	Flat, convex	

Ground surface features—

	Phase		
	B (n = 8)	C (n = 1)	A + B range
	Cover (%)		
Bare ground	22	50	3–35
Bedrock	0	0	0–1
Rock	23	5	1–60
Gravel	7	15	0–20
Pavement	0	0	0
Mosses and lichens	6	0	0–21
Litter	38	25	20–90

Vegetation composition—

Bluebunch wheatgrass and Sandberg's bluegrass occupy steep colluvial slopes with lupines (mostly *Lupinus sulphureus*). Rattlesnake brome is the most common annual grass. Perennial forbs commonly found are yarrow, brodiaea, hot rock penstemon, and creamy buckwheat. Annuals are common on the shifting colluvium (e.g., deerhorn, slender tarweed, and yellow salsify).

States and transitions—

Two phases were defined as follows:

- B Combined cover of bluebunch wheatgrass and Sandberg's bluegrass >20 percent; bare ground and gravel total <40 percent.
- C Combined cover of wheatgrass and bluegrass >20 percent; bare ground and gravel percentages are high (>40 percent).

These states are the result of disturbances from wild and domestic ungulates. As ungulate use increases, bare ground and gravels increase. No sites were assigned to phase A (hypothetically where bare ground and gravel would total ≤10 percent, and the bunchgrasses would account for a foliar cover of ≥30 percent). Phase B results from ungulate movement on the steep, unstable slopes resulting in increased bare ground and exposed gravels. Phase C results from further degradation where bare ground and gravels become dominant.

Management considerations—

Wild ungulates use these steep, southerly slopes heavily before grasses mature in late winter to early spring. The most degraded sites are a result of combined use by elk and cattle in late spring to early summer. If plant vigor is to be maintained, domestic livestock should not use these sites until after seed maturity. Ungulates can promote germination by trampling the seed into the soil after midsummer.

Principal species—

Species	Code	Phase		A + B range
		B (n = 8)	C (n = 1)	
		Cover (%)/constancy (%)		Cover (%)
Grasses:				
bluebunch wheatgrass	AGSP	25/100	25/100	20–40
rattlesnake brome	BRBR7	4/62	1/100	0–15
soft brome	BRMO2	8/38	0	0–20
cheatgrass	BRTE	5/25	0	0–10
Sandberg's bluegrass	POSA12	3/100	1/100	1–10
Forbs:				
common yarrow	ACMIL	3/88	1/100	0–5
arrowleaf balsamroot	BASA3	6/50	0	0–20
Douglas' brodiaea	BRDO	1/62	0	0–3
harsh paintbrush	CAHI9	4/38	0	0–5
deerhorn	CLPU	8/62	3/100	0–25
creamy buckwheat	ERHE2	1/62	0	0–1
cleavers	GAAP2	9/38	0	0–20
swale desert-parsley	LOAM	12/38	0	0–10
lupines	LUPIN	11/100	6/100	5–20
slender tarweed	MAGR3	2/38	0	0–5
pink microsteris	MIGR	12/38	0	0–20
hot rock penstemon	PEDE4	6/25	1/100	0–10
yellow salsify	TRDU	1/50	0	0–1

Relationship to other studies—

Daubenmire (1970) was the first to define AGSP-POSA12 vegetation as a habitat type in eastern Washington; Hall (1973) included AGSP-POSA12-LUPIN vegetation in the “bunchgrass on deep soil, steep slopes” plant community type for the Blue Mountains. Tisdale (1986) classified an AGSP-POSA12 habitat type in the Snake River canyon in Idaho. Mueggler and Stewart (1980) identified AGSP-POSA12 vegetation in Montana. Johnson and Simon (1987) differentiated AGSP-POSA12 into eight plant associations in the Wallowa Mountains and canyon lands of northeastern Oregon. The AGSP-POSA12-LUPIN plant association has not been previously described.

Bluebunch wheatgrass-Sandberg's bluegrass-arrowleaf balsamroot plant association

Agropyron spicatum-Poa sandbergii-Balsamorhiza sagittata

AGSP-POSA12-BASA3

GB4123

N = 11



Near Crite Spring, Pomeroy RD, Umatilla NF.

Distribution—

Blue Mountains and Ochoco Mountains.

Environmental features—

This plant association occupies upper ridge slopes on basalts. Sampled sites occurred from 2,140 ft elevation in the Crooked River National Grasslands to 4,680 ft elevation in the northern Blue Mountains (mean 3,869 ft). Slopes were moderate to steep (mean 48 percent) on mostly convex surfaces. All aspects were represented (the majority were southerly). Brief soil investigations (n = 6) suggest that soils are rich in coarse fragments and that bedrock or extremely stoney material occurs between 5 and 20 in of the surface. Herbage production ranged from 650 to 1,580 lb/ac (mean 1,202 lb/ac).

	Mean	Range
Elevation (feet)	3,869	2,140–4,680
Slope (percent)	48	15–68
Herbage (pounds/acre, n = 5)	1,202	650–1,580
Aspect (number of plots)	NW (1), NE (1), SE (2), SW (7)	
Lithology	Basalt	
Position	Backslope	
Slope shape	Flat, convex	

Ground surface features—

	Phase				A + B range
	A (n = 1)	B (n = 7)	C (n = 1)	D (n = 2)	
	Cover (%)				
Bare ground	7	15	45	42	1–30
Bedrock	3	1	0	0	0–5
Rock	3	18	15	15	1–70
Gravel	0	18	10	6	0–40
Pavement	0	0	0	0	0
Mosses and lichens	0	0	0	0	0
Litter	70	46	10	28	

Vegetation composition—

Bluebunch wheatgrass and Sandberg's bluegrass occupy steep colluvial slopes with arrowleaf balsamroot. Other forbs commonly found are yarrow and annuals that occupy the shifting colluvium (e.g., deerhorn, slender tarweed, and yellow salsify).

States and transitions—

Four phases were defined as follows:

- A Bluebunch wheatgrass cover >50 percent, arrowleaf balsamroot <10 percent; bare ground is 10 percent or less.
- B Bluebunch wheatgrass cover is 20 to 50 percent; balsamroot cover is 10 to 25 percent; bare ground 10 to 40 percent.
- C Bluebunch wheatgrass cover 5 to 25 percent; cover by annuals is greater than that of wheatgrass; bare ground percentage is high (>40 percent).
- D Bluebunch wheatgrass <5 percent cover or absent; cover by annuals >40 percent.

These phases are the result of disturbances from wild and domestic ungulates. As ungulate use increases, bluebunch wheatgrass declines in vigor and foliar cover. Sandberg's bluegrass also declines from increased ungulate use resulting from soil surface movement. Phase A represents

Principal species—

Species	Code	Phase				A + B range
		A (n = 1)	B (n = 7)	C (n = 1)	D (n = 2)	
		Cover (%) / constancy (%)				Cover (%)
Grasses:						
bluebunch wheatgrass	AGSP	65/100	29/100	20/100	1/50	20–65
rattlesnake brome	BRBR7	0	2/43	1/100	4/100	0–1
hairy brome	BRCO4	0	20/14	0	35/50	0–20
Japanese brome	BRJA	0	5/14	0	3/50	0–5
cheatgrass	BRTE	0	14/71	20/100	1/50	0–40
Sandberg's bluegrass	POSA12	20/100	6/71	3/100	8/100	0–20
Forbs:						
common yarrow	ACMIL	1/100	7/100	0	1/100	1–10
large-flowered agoseris	AGGR	0	1/29	1/100	1/100	0–1
arrowleaf balsamroot	BASA3	7/100	12/100	30/100	25/100	5–20
blepharipappus	BLSC	0	2/29	15/100	25/100	0–3
deerhorn	CLPU	0	10/43	3/100	0	0–15
common cryptantha	CRIN8	0	5/14	15/100	4/100	0–5
tall annual willowherb	EPPA2	0	2/29	3/100	3/100	0–2
slender tarweed	MAGR3	0	2/43	1/100	10/50	0
hairy owl-clover	ORHI	0	0	0	10/50	0
narrowleaf skullcap	SCAN3	0	0	0	15/50	0
yellow salsify	TRDU	0	2/57	3/100	0	0–2

the least disturbed site. Phase B represents AGSP-POSA12-BASA3 vegetation resulting from ungulate disturbance where the bunchgrasses decline. Phase C results from further degradation where bare ground and annuals become codominant with the bunchgrasses. Phase D results from sustained severe ungulate disturbance resulting in loss of bluebunch wheatgrass. Annual vegetation increases with soil displacement in phases C and D. Cryptanthas and blepharipappus are common annual forbs in the AGSP-POSA12-BASA3 plant association.

Management considerations—

Wild ungulates use these steep, southerly slopes heavily before grasses mature in late winter to early spring. The most degraded sites are a result of combined use by elk and cattle in late spring to early summer. If plant vigor is to be maintained, domestic ungulates should not use these sites until after seed maturity. Ungulates can promote germination by trampling the seed into the soil after midsummer.

Relationship to other studies—

Daubenmire (1970) was the first to define AGSP-POSA12 vegetation as a habitat type in eastern Washington; Hall (1973) included AGSP-POSA12-BASA3 vegetation in the “bunchgrass on deep soil, steep slopes” plant community type for the Blue Mountains.

Tisdale (1986) classified an AGSP-POSA12 habitat type in the Snake River canyon in Idaho. Mueggler and Stewart (1980) identified AGSP-POSA12 vegetation in Montana. Johnson and Simon (1987) differentiated AGSP-POSA12 into eight plant associations in the Wallowa Mountains and canyon lands of northeastern Oregon. The AGSP-POSA12-BASA3 plant association has not been previously described. It is similar to the AGSP-POSA12 (basalt) plant association found in the Wallowa Mountains.

Bluebunch wheatgrass-Sandberg's bluegrass-creamy buckwheat plant association

Agropyron spicatum-Poa sandbergii-Eriogonum heracleoides

AGSP-POSA12-ERHE2

GB4124

N = 14



Moore Flat, Wehaha-Tucannon Wilderness, Pomeroy RD, Umatilla NF.

Distribution—

Northern Blue Mountains.

Environmental features—

This plant association occupies ridgetops, shoulders, and upper ridge slopes on basalts. Sampled sites occurred from 2,960 to 6,280 ft (mean 4,673 ft). Slopes were gentle to steep (mean 32 percent) on flat to convex surfaces. Aspects of sampled plots were mostly southerly. Brief soil investigations (n = 5) suggest that soils are rich in coarse fragments, and that bedrock or extremely stoney material occurs between 6 and 20 in of the surface. Herbage production ranged from 310 to 1,630 lb/ac (mean 842 lb/ac).

	Mean	Range
Elevation (feet)	4,673	2,960–6,280
Slope (percent)	32	4–72
Herbage (pounds/acre, n = 10)	842	310–1,630
Aspect (number of plots)	NW (0), NE (1), SE (6), SW (7)	
Lithology	Basalt	
Position	Shoulder, backslope	
Slope shape	Flat, convex	

Ground surface features—

	Phase			A + B range
	B (n = 10)	C (n = 3)	D (n = 1)	
	Cover (%)			
Bare ground	14	28	30	1–25
Bedrock	1	1	1	0–5
Rock	19	20	15	1–45
Gravel	8	0	25	5–15
Pavement	0	1	0	0
Mosses and lichens	7	10	11	0–45
Litter	49	38	20	

Vegetation composition—

Bluebunch wheatgrass and Sandberg's bluegrass occupy steep colluvial slopes and gentle ridgetops with creamy buckwheat. Perennial forbs commonly found are yarrow and western groundsel. Prominent annuals are deerhorn and yellow salsify. Species richness is relatively low in this type.

States and transitions—

Three phases were defined as follows:

- B Combined cover of bluebunch wheatgrass and Sandberg's bluegrass >25 percent; bare ground <25 percent.
- C Combined cover of wheatgrass and Sandberg's bluegrass <25 percent; either bare ground percentage is high (>25 percent) or annual bromes (cheatgrass, hairy brome, Japanese brome) cover is high.
- D Combined cover of bluebunch wheatgrass and Sandberg's bluegrass <5 percent; bare ground >25 percent; high coverage of annual plants (e.g., annuals bromes, tarweed).

These phases are the result of disturbances from wild and domestic ungulates. As ungulate use increases, bare ground increases. No sites were assigned to phase A (hypothetically where bare ground and gravel would total ≤10 percent, and bunchgrasses would have a foliar cover ≥30 percent). Phase B has increased bare ground resulting from ungulate grazing and trampling on the steep, unstable slopes. Phase C results from further degradation where bare ground and annuals become dominant. Phase D results from sustained severe ungulate disturbance resulting in loss of the bunchgrasses, increased bare ground, and a high cover by annuals.

Management considerations—

Wild ungulates use these steep, southerly slopes heavily before grasses mature in late winter to early spring. The most degraded sites are a result of combined use by elk and

Principal species—

Species	Code	Phase			A + B range
		B (n = 10)	C (n = 3)	D (n = 1)	
		Cover (%)/constancy (%)			Cover (%)
Grasses:					
bluebunch wheatgrass	AGSP	28/100	18/100	3/100	20–35
hairy brome	BRCO4	0	20/33	0	0
Japanese brome	BRJA	1/10	10/33	0	0–1
soft brome	BRMO2	0	0	15/100	
cheatgrass	BRTE	2/20	40/33	1/100	0–3
Sandberg's bluegrass	POSA12	8/90	6/100	1/100	0–15
Forbs:					
common yarrow	ACMIL	2/100	4/100	3/100	1–10
deerhorn	CLPU	2/20	3/67	3/100	0–3
creamy buckwheat	ERHE2	14/100	27/100	15/100	5–30
slender tarweed	MAGR3	1/10	5/33	20/100	
western groundsel	SEIN2	5/50	0	0	0–15
yellow salsify	TRDU	1/40	5/67	1/100	0–1

cattle in late spring to early summer. If plant vigor is to be maintained, domestic ungulates should not use these sites until after seed maturity. Northern pocket gophers are prominent inhabitants beneath the soil surface in these communities and contribute to the bare ground in degraded communities.

Relationship to other studies—

Daubenmire (1970) was the first to define AGSP-POSA12 vegetation as a habitat type in eastern Washington. Tisdale (1986) classified an AGSP-POSA12 habitat type in the Snake River canyon in Idaho. Mueggler and Stewart (1980) identified AGSP-POSA12 vegetation in Montana. Johnson and Simon (1987) differentiated AGSP-POSA12 into eight plant associations in the Wallowa Mountains and canyon lands of northeastern Oregon. The AGSP-POSA12-ERHE2 plant association has not been previously described.

Bluebunch wheatgrass-Sandberg's bluegrass-blue mountain milkvetch plant association

Agropyron spicatum-Poa sandbergii-Astragalus reventus

AGSP-POSA12-ASRE5

GB4125

N = 5



Alder Gulch, Pomeroy RD, Umatilla NF.

Distribution—

Northern and central Blue Mountains.

Environmental features—

This plant association occupies shoulders and backslopes on basaltic ridges. Sampled sites occurred from 4,500 to 5,960 ft (mean 5,066 ft). Slopes were moderate (mean 20 percent) with convex shape. Aspects were mostly southerly. Brief soil investigations (n = 5) suggests that soils are rich in coarse fragments and that bedrock or extremely stoney material occurs between 6 and 20 in of the surface. Herbage production ranged from 736 to 1,186 lb/ac (mean 961 lb/ac).

	Mean	Range
Elevation (feet)	5,066	4,500–5,960
Slope (percent)	20	15–25
Herbage (pounds/acre, n = 2)	961	736–1,186
Aspect (number of plots)	NW (0), NE (1), SE (0), SW (4)	
Lithology	Basalt	
Position	Shoulder, backslope	
Slope shape	Convex	

Principal species—

Species	Code	Phase				A + B range
		A (n = 2)	B (n = 1)	C (n = 1)	D (n = 1)	
		Cover (%)/constancy (%)				Cover (%)
Grasses:						
bluebunch wheatgrass	AGSP	32/100	10/100	25/100	3/100	10–35
rattlesnake brome	BRBR7	1/50	0	1/100	0	0–1
hairy brome	BRCO4	10/50	0	3/100	0	0–10
cheatgrass	BRTE	3/50	0	0	0	0–3
Sandberg's bluegrass	POSA12	5/100	0	3/100	10/100	0–5
western needlegrass	STOC2	10/50	0	0	0	0–10
ventenata	VEDU	0	0	0	55/100	0
Forbs:						
common yarrow	ACMIL	2/100	1/100	3/100	5/100	1–10
Blue Mountain milkvetch	ASRE5	12/100	10/100	15/100	10/100	10–15
serrate balsamroot	BASE2	5/50	0	1/100	0	0–5
creamy buckwheat	ERHE2	8/100	3/100	0	0	1–15
western hawkweed	HAL	3/50	0	0	0	0–3
lomatiums	LOMAT	3/50	15/100	3/100	0	0–15
tailcup lupine	LUCA	10/50	1/100	0	0	0–10
narrowleaf skullcap	SCAN3	5/50	0	0	0	0–5
yellow salsify	TRDU	2/100	0	1/100	1/100	0–3

Ground surface features—

	Phase				A + B range
	A (n = 2)	B (n = 1)	C (n = 1)	D (n = 1)	
		Cover (%)			
Bare ground	8	3	30	10	3–10
Bedrock	0	0	0	0	0
Rock	6	20	10	10	3–20
Gravel	0	10	15	3	0–10
Pavement	25	30	0	0	10–40
Mosses and lichens	2	35	16	6	0–30
Litter	33	1	30	70	1–35

Vegetation composition—

Bluebunch wheatgrass and Sandberg's bluegrass are the prominent perennial bunchgrasses. Annual bromes and needlegrass occupy disturbed areas. The type indicator, Blue Mountain milkvetch, is the most prominent perennial forb. Other forbs commonly found are yarrow, creamy buckwheat, lomatiums, tailcup lupine, and yellow salsify.

States and transitions—

Four phases were defined as follows:

- A Combined cover of bluebunch wheatgrass and Sandberg's bluegrass >35 percent.
- B Combined cover of bluebunch wheatgrass and Sandberg's bluegrass <35 percent; bare ground percentage is low (<10 percent).
- C Combined cover of bluebunch wheatgrass and Sandberg's bluegrass <35 percent; bare ground percentage is high (>25 percent).
- D Bluebunch wheatgrass is absent or relict (<5 percent); bare ground >25 percent; cover by annuals is high.

These phases are the result of disturbances from wild and domestic ungulates. As ungulate use increases, bare ground increases. Phase A is the least disturbed with high cover by bunchgrasses. Phase B results from increased ungulate use of the bunchgrasses. Phase C results from further degradation where bare ground becomes dominant. Phase D results from sustained severe ungulate disturbance resulting in loss of bluebunch wheatgrass, increased bare ground, and a high cover by annuals.

Management considerations—

Wild ungulates (especially elk) use these steep, southerly slopes heavily before grasses mature in late winter to early spring. The most degraded sites are a result of combined use by elk and cattle in late spring to early summer. If plant vigor is to be maintained, domestic ungulates should not use these sites until after seed maturity. Ungulates can promote germination by trampling the seed into the soil after mid-summer.

Relationship to other studies—

Daubenmire (1970) was the first to define AGSP-POSA12 vegetation as a habitat type in eastern Washington. Tisdale (1986) classified an AGSP-POSA12 habitat type in the Snake River canyon in Idaho. Mueggler and Stewart (1980) identified AGSP-POSA12 vegetation in Montana. Johnson and Simon (1987) differentiated AGSP-POSA12 into eight plant associations in the Wallowa Mountains and canyon lands of northeastern Oregon. The AGSP-POSA12-ASRE5 plant association has not been previously described.

Bluebunch wheatgrass-Sandberg's bluegrass-bighead clover plant association

Agropyron spicatum-Poa sandbergii-Trifolium macrocephalum

AGSP-POSA12-TRMA3

GB4126

N = 4



Near Rager Spring, Paulina RD, Ochoco NF.

Distribution—

Blue and Ochoco Mountains.

Environmental features—

This plant association occupies ridgetop shoulders and backslopes. Sampled sites occurred from 3,460 to 4,000 ft (mean 3,980 ft). This type was found on basalts and andesites. Slopes varied from gentle to steep (mean 27 percent) on convex, undulating, and flat surfaces. Aspects were mostly southwesterly. Soils consisted of about 5 in of gravelly to very gravelly loamy soil over very to extremely gravelly clay loam, with bedrock at a depth of 10 to 20 in. Herbage production ranged from 203 to 620 lb/ac (mean 428 lb/ac).

	Mean	Range
Elevation (feet)	3,980	3,460–4,000
Slope (percent)	27	5–80
Soil pH (n = 3)		6.2–7.0
Soil available water capacity (inches, n = 3)		1–3 (very low to low)
Depth to bedrock or extremely gravelly material (inches, n = 5)		10–20
Herbage (pounds/acre, n = 4)	428	203–620
Aspect (number of plots)	NW (0), NE (1), SE (0), SW (4)	
Lithology	Basalt, andesite	
Position	Shoulder, backslope	
Slope shape	Convex, flat, undulating	

Ground surface features—

	Phase		
	A (n = 2)	B (n = 2)	A + B range
	Cover (%)		
Bare ground	8	11	7–15
Bedrock	4	2	0–5
Rock	36	40	29–50
Gravel	0	8	0–15
Pavement	6	4	0–12
Mosses and lichens	13	23	10–31
Litter	33	1	

Vegetation composition—

Bluebunch wheatgrass and Sandberg's bluegrass are the prominent perennial bunchgrasses. Idaho fescue may occur as an incidental species at low cover. Bottlebrush squirreltail frequently occurs and increases on disturbed areas. Bighead clover is the dominant perennial forb. Other forbs commonly found are yarrow, low pussytoes, creamy buckwheat, phloxes, and lomatiums.

States and transitions—

Three phases were defined as follows:

- A Combined cover of bluebunch wheatgrass and Sandberg's bluegrass >40 percent.
- B Combined cover of bluebunch wheatgrass and Sandberg's bluegrass 20 to 40 percent.

These phases are the result of disturbances from wild and domestic ungulates. As ungulate use increases, the bluebunch wheatgrass declines and bare ground increases. Phase A is the least disturbed with high cover by bunchgrasses. Phase B results from increased ungulate use of the bunchgrasses.

Principal species—

Species	Code	Phase		A + B range
		A (n = 2)	B (n = 2)	
		Cover (%)/constancy (%)		Cover (%)
Grasses:				
bluebunch wheatgrass	AGSP	30/100	16/100	13–30
Idaho fescue	FEID	2/50	1/50	0–2
Sandberg's bluegrass	POSA12	16/100	12/100	3–20
bottlebrush squirreltail	SIHY	1/50	0	0–1
ventenata	VEDU	0	3/50	0–3
Forbs:				
common yarrow	ACMIL	2/100	0	0–3
pale agoseris	AGGL	1/50	1/50	0–1
tapertip onion	ALAC4	1/50	3/50	0–3
low pussytoes	ANDI2	2/100	0	0–2
serrate balsamroot	BASE2	2/50	3/50	0–3
blepharipappus	BLSC	0	10/50	0–10
hawksbeards	CREPI	1/50	0	0–1
creamy buckwheat	ERHE2	10/50	0	0–10
lomatiums	LOMAT	2/100	6/100	1–10
lupines	LUPIN	5/50	1/50	0–5
phlox	PHLOX	8/50	1/50	0–8
bighead clover	TRMA3	8/100	16/100	6–20

Management considerations—

The most degraded sites are a result of combined use by elk and cattle in late spring to early summer. If plant vigor is to be maintained, domestic ungulates should not use these sites until after seed maturity. Ungulates can promote germination by trampling the seed into the soil after mid-summer. Fire is a stimulant to the bunchgrasses. Highly degraded AGSP-POSA12 sites are prime locations for invasive colonization by medusahead (*Elymus caput-medusae*).

Relationship to other studies—

Daubenmire (1970) was the first to define AGSP-POSA12 vegetation as a habitat type in eastern Washington. Hall (1973) included AGSP-POSA12 vegetation in his “bunchgrasses on steep, gentle, deep and shallow” plant community types of the Blue Mountains. Tisdale (1986) classified an AGSP-POSA12 habitat type in the Snake River canyon in Idaho. Mueggler and Stewart (1980) identified AGSP-POSA12 vegetation in Montana. Johnson and Simon (1987) differentiated AGSP-POSA12 into eight plant associations in the Wallowa Mountains and canyon lands of northeastern Oregon. Johnson and Clausnitzer (1992) described the AGSP-POSA12 plant association in the Blue and Ochoco Mountains. The AGSP-POSA12-TRMA3 plant association has not been previously described.

Bluebunch wheatgrass-Sandberg's bluegrass-narrowleaf skullcap plant association

Agropyron spicatum-Poa sandbergii-Scutellaria angustifolia

AGSP-POSA12-SCAN3

GB4112

N = 3



Wenaha River Canyon, Wenaha-Tucannon Wilderness, Pomeroy RD, Umatilla NF.

Distribution—

Northern Blue Mountains.

Environmental features—

This plant association occurs on steep basaltic slopes where shifting gravels make plant occupancy difficult. Sampled sites occurred from 2,000 ft to 4,920 ft (mean 3,070 ft). Slopes were steep (mean 54 percent) on flat surfaces. Aspects were mostly southwesterly. Herbage production ranged from 1,000 to 1,270 lb/ac (mean 1,100 lb/ac). Herbage was among the highest of the bluebunch wheatgrass plant associations owing to the rank growth afforded by low-elevation, warm sites in the Wenaha River canyon.

	Mean	Range
Elevation (feet)	3,070	2,000–4,920
Slope (percent)	54	50–58
Herbage (pounds/acre, n = 3)	1,100	1,000–1,270
Aspect (number of plots)	NW (0), NE (0), SE (1), SW (2)	
Lithology	Basalt	
Position	Steep slopes	
Slope shape	Flat	

Vegetation composition—

Bluebunch wheatgrass is the prominent perennial bunchgrass. Sandberg's bluegrass is usually present at low cover owing to the instability of the site. Skullcap is the indicative forb owing to its ability to anchor in the talus with long rhizomes that extend deep to

Ground surface features—

	Phase A (n = 3)	A + B range
	Cover (%)	
Bare ground	5	1–10
Bedrock	1	0–3
Rock	15	10–20
Gravel	33	10–50
Pavement	0	0
Mosses and lichens	1	0–1
Litter	42	25–70

tap subsurface moisture. Other perennial forbs commonly found are yarrow, arrowleaf balsamroot, swale desert-parsley, and large-flowered agoseris. Annuals that thrive on the disturbance are tall annual willowherb and deerhorn.

States and transitions—

Only one phase was identified (phase A). Our sample plots probably approximate the PN of the plot with light grazing impacts.

As these communities degenerate from natural or animal-induced surface movements, bluebunch wheatgrass will decline. Skullcap and deerhorn typically increase as bare ground increases.

Principal species—

Species	Code	Phase A (n = 3)	A + B range
		Cover (%)/ constancy (%)	Cover (%)
Grasses:			
bluebunch wheatgrass	AGSP	37/100	20–65
Sandberg's bluegrass	POSA12	4/67	0–5
Forbs:			
common yarrow	ACMIL	2/67	0–3
large-flowered agoseris	AGGR	2/67	0–3
spreading dogbane	APAN2	3/33	0–3
arrowleaf balsamroot	BASA3	4/67	0–5
deerhorn	CLPU	10/33	0–10
tall annual willowherb	EPPA2	4/100	1–10
swale desert-parsley	LOAM	14/100	1–25
narrowleaf skullcap	SCAN3	5/100	5–5
bighead clover	TRMA3	10/33	0–10

Management considerations—

The most degraded sites are a result of combined use by elk and cattle in late spring to early summer. If plant vigor is to be maintained, domestic ungulates should not use these sites until after seed maturity. Fires do not carry well in these communities owing to lack of fuel. Burns tend to be light in severity.

Relationship to other studies—

Daubenmire (1970) was the first to define AGSP-POSA12 vegetation as a habitat type in eastern Washington. Tisdale (1986) classified an AGSP-POSA12 habitat type in the Snake River canyon in Idaho. Mueggler and Stewart (1980) identified AGSP-POSA12 vegetation in Montana. Johnson and Simon (1987) differentiated AGSP-POSA12 into eight plant associations in the Wallowa Mountains and canyon lands of northeastern Oregon. One of these was the AGSP-POSA12-SCAN3 plant association. The AGSP-POSA12-SCAN3 plant association has not been previously described in the Blue Mountains.

Bluebunch wheatgrass-Sandberg's bluegrass-spreading dogbane plant association

Agropyron spicatum-Poa sandbergii-Apocynum androsaemifolium

AGSP-POSA12-APAN2

GB4127

N = 4



Low Ridge, Wenaha-Tucannon Wilderness, Pomeroy RD, Umatilla NF.

Distribution—

Northern Blue Mountains.

Environmental features—

This plant association occurs on steep basaltic slopes where shifting gravels make plant occupancy difficult. Sampled sites occurred from 3,200 to 3,870 ft (mean 3,493 ft). Slopes varied from moderate to steep (mean 53 percent) on convex and flat surfaces. Aspects were mostly southwesterly. Soil data were not available, but we can infer that soils are high in coarse fragments and have very low to low available water capacity. Herbage production ranged from 700 to 1,250 lb/ac (mean 975 lb/ac).

	Mean	Range
Elevation (feet)	3,493	3,200–3,870
Slope (percent)	53	35–65
Herbage (pounds/acre, n = 2)	975	700–1,250
Aspect (number of plots)	NW (0), NE (0), SE (1), SW (3)	
Lithology	Basalt	
Position	Steep slopes	
Slope shape	Convex, flat	

Vegetation composition—

Bluebunch wheatgrass is the prominent perennial bunchgrass. Sandberg's bluegrass is usually present at low cover owing to the instability of the site. Spreading dogbane is the dominant forb owing to its ability to anchor in the talus with long rhizomes. Other perennial forbs commonly found are yarrow, arrowleaf balsamroot, harsh paintbrush, and silverleaf phacelia. Annuals that thrive on the disturbance are pale allysum, thymeleaf sandwort, cluster tarweed, and cryptanthas.

Ground surface features—

	Phase		A + B range
	B (n = 3)	D (n = 1)	
	Cover (%)		
Bare ground	8	30	5–15
Bedrock	1	0	0–1
Rock	17	10	15–20
Gravel	18	45	10–30
Pavement	0	0	0
Mosses and lichens	0	0	0–1
Litter	52	15	40–65

Principal species—

Species	Code	Phase		A + B range
		B (n = 3)	D (n = 1)	
Cover (%) / constancy (%) Cover (%)				
Grasses:				
bluebunch wheatgrass	AGSP	33/100	3/100	30–40
rattlesnake brome	BRBR7	3/33	15/100	0–3
Japanese brome	BRJA	5/33	0	0–5
cheatgrass	BRTE	1/33	25/100	0–1
Sandberg's bluegrass	POSA12	2/100	0	1–3
Forbs:				
common yarrow	ACMIL	2/100	3/100	1–3
pale allysum	ALAL3	0	35/100	0
spreading dogbane	APAN2	18/100	15/100	10–25
thymeleaf sandwort	ARSE2	30/33	0	0–30
arrowleaf balsamroot	BASA3	1/100	1/100	1–3
harsh paintbrush	CAHI9	8/100	1/100	1–20
deerhorn	CLPU	1/67	1/100	0–1
Torrey's cryptantha	CRT04	1/67	3/100	0–1
cluster tarweed	MAGL2	1/33	25/100	0–1
nodding microseris	MINU	1/67	1/100	0–1
silverleaf phacelia	PHHA	1/33	5/100	0–1

States and transitions—

Two phases were defined as follows:

- B Bluebunch wheatgrass cover >30 percent.
- D Bluebunch wheatgrass absent or relict (<5 percent).

These phases are the result of disturbances from wild and domestic ungulates as well as natural slope movement. As disturbances increase, the bunchgrasses decline with an increase in gravels and bare ground. Phase B is the least disturbed with high cover by bluebunch wheatgrass. Phase D results from increased ungulate use of the bunchgrasses and movement of the ground surface owing to animal trampling on the steep, unstable slopes.

Management considerations—

The most degraded sites are a result of use by elk and cattle in late spring to early summer. If plant vigor is to be

maintained, domestic ungulates should not use these sites until after seed maturity. Fires do not carry well in these communities owing to lack of fuel. Burns tend to be light in severity.

Relationship to other studies—

Daubenmire (1970) was the first to define AGSP-POSA12 vegetation as a habitat type in eastern Washington. Tisdale (1986) classified an AGSP-POSA12 habitat type in the Snake

River canyon in Idaho. Mueggler and Stewart (1980) identified AGSP-POSA12 vegetation in Montana. Johnson and Simon (1987) differentiated AGSP-POSA12 into eight plant associations in the Wallowa Mountains and canyon lands of northeastern Oregon. Johnson and Clausnitzer (1992) described the AGSP-POSA12 plant association in the Blue and Ochoco Mountains. The AGSP-POSA12-APAN2 plant association has not been previously described.

Bluebunch wheatgrass-Sandberg's bluegrass-onespike oatgrass plant association

Agropyron spicatum-Poa sandbergii-Danthonia unispicata

AGSP-POSA12-DAUN

GB4911

N = 4



Near Huckleberry Mountain, Walla Walla RD, Umatilla NF.

Distribution—

Blue and Ochoco Mountains.

Environmental features—

This plant association occupies ridgetop summits and plateau flats. Sampled sites occurred from 3,500 to 5,150 ft (mean 4,297 ft). This type was found on basalts and volcanic tuffs. Slopes varied from gentle to moderate (mean 10 percent) on convex and flat surfaces. Aspects were southerly. Soils consisted of about 5 in of gravelly loamy soil over very to extremely gravelly clay loam, with bedrock at a depth of 6 to 20 in. Herbage production ranged from 250 to 548 lb/ac (mean 408 lb/ac).

	Mean	Range
Elevation (feet)	4,297	3,500–5,150
Slope (percent)	10	3–15
Soil pH (n = 2)		6.2–7.0
Soil available water capacity (inches, n = 2)		1–3 (very low to low)
Depth to bedrock or extremely gravelly material (inches, n = 4)		6–20
Herbage (pounds/acre, n = 3)	408	250–548
Aspect (number of plots)	NW (0), NE (0), SE (3), SW (1)	
Lithology	Basalt, tuff	
Position	Summit	
Slope shape	Convex	

Ground surface features—

	Phases B + C (n = 4)
	Cover (%)
Bare ground	14
Bedrock	1
Rock	24
Gravel	8
Pavement	2
Mosses and lichens	9
Litter	28

Vegetation composition—

Bluebunch wheatgrass, Sandberg’s bluegrass, and one-spike oatgrass are the prominent perennial bunchgrasses. The bluegrass and oatgrass occupy shallow soils (scabland) with bluebunch wheatgrass penetrating deeper soils through fractures in the underlying bedrock. Perennial forbs commonly found are yarrow, tapertip onion, serrate balsamroot, scabland fleabane, bighead clover, phloxes, and lomatiums.

Principal species—

Species	Code	Phases B + C (n = 4)
		Cover (%)/constancy (%)
Grasses:		
bluebunch wheatgrass	AGSP	22/100
onespike oatgrass	DAUN	8/100
prairie junegrass	KOCR	5/25
Sandberg’s bluegrass	POSA12	15/100
Forbs:		
common yarrow	ACMIL	2/75
tapertip onion	ALAC4	3/50
fringed onion	ALFI	5/25
basalt milkvetch	ASFI	10/25
serrate balsamroot	BASE2	2/50
western hawksbeard	CROC	5/25
scabland fleabane	ERBL	1/50
dwarf yellow fleabane	ERCH4	1/25
golden buckwheat	ERFL4	3/25
lomatiums	LOMAT	2/100
false agoseris	MITR5	6/25
phloxes	PHLOX	5/50
lanceleaf stonecrop	SELA	7/25
wormleaf stonecrop	SEST2	3/25
bighead clover	TRMA3	8/50

States and transitions—

No phases were defined because of the small sample size and our lack of knowledge of the potential for these sites. All four plots sampled were judged to have some grazing-related degradation. The AGSP-POSA12-DAUN plant association occupies sites with shallow soils overlying fractured bedrock permitting bluebunch wheatgrass to exist. Some of the communities with this composition have resulted from degradation of FEID-AGSP and AGSP-POSA12 sites by severe overgrazing and trampling. Soil loss and compaction make the effects of drought more severe; Idaho fescue can no longer be sustained and bluebunch wheatgrass is reduced, allowing establishment of onespike oatgrass.

Management considerations—

Trampling is the principal cause of degradation in these communities. It reduces the grass-forb-moss/lichen cover and promotes compaction, soil loss, and erosion pavement. Use by livestock has less of an impact after soils have lost moisture saturation from the late winter snowmelt and spring precipitation. Ideally flowering and seed set by the bunchgrasses should have culminated prior to domestic grazing.

Relationship to other studies—

Daubenmire (1970) was the first to define AGSP-POSA12 vegetation as a habitat type in eastern Washington. Hall (1973) included AGSP-POSA12-DAUN vegetation in his “bunchgrasses on gentle slopes and shallow soils” plant community type of the Blue Mountains. Johnson and Clausnitzer (1992) described an AGSP-POSA12-DAUN plant community type in the Blue and Ochoco Mountains. This work now elevates the type to plant association status.

Bluebunch wheatgrass-Sandberg's bluegrass plant association

Agropyron spicatum-Poa sandbergii

AGSP-POSA12

GB4121

N = 29



South Fork of Spring Creek, La Grande RD, Wallowa-Whitman NF.

Distribution—

Blue and Ochoco Mountains.

Environmental features—

This plant association occupies ridgetop shoulders, backslopes, and footslopes. Sampled sites occurred from 2,540 to 5,850 ft (mean 4,153 ft). This type was found on basalts, andesites, and rhyolites. Slopes varied from gentle, moderate, to steep (mean 44 percent) on convex and flat surfaces. Soils consisted of 5 to 10 in of silt loam or loam (usually gravelly), over gravelly to very gravelly clay loam or silty clay loam. Bedrock or extremely gravelly material occurred at a depth of 6 to 30 in, and available water capacity was low or very low. Aspects were mostly southerly. Herbage production ranged from 100 to 1,460 lb/ac (mean 592 lb/ac).

	Mean	Range
Elevation (feet)	4,153	2,540–5,850
Slope (percent)	44	1–80
Soil pH (n = 16)		6.2–7.2
Soil available water capacity (inches, n = 15)		1–4 (very low to low)
Depth to bedrock or extremely gravelly material (inches, n = 22)		6–30
Herbage (pounds/acre, n = 24)	592	100–1,460
Aspect (number of plots)	NW (0), NE (2), SE (11), SW (16)	
Lithology	Basalt, andesite, rhyolite	
Position	Backslope, footslopes, shoulders	
Slope shape	Convex, flat	

Ground surface features—

	Phase				A + B range
	A (n = 8)	B (n = 9)	C (n = 9)	D (n = 3)	
	Cover (%)				
Bare ground	12	11	26	10	1–30
Bedrock	3	1	2	0	0–5
Rock	13	38	18	10	0–60
Gravel	3	8	18	2	1–50
Pavement	7	6	7	3	0–29
Mosses and lichens	7	3	12	5	0–26
Litter	30	32	22	60	20–60

Vegetation composition—

Bluebunch wheatgrass and Sandberg's bluegrass are the prominent perennial bunchgrasses. Annual bromes (especially soft brome and cheatgrass) occupy disturbed areas. Perennial forbs commonly found are yarrow, creamy buckwheat, lomatiums, and yellow salsify. Forbs are scattered or sparse in this plant association.

States and transitions—

Four phases were defined as follows:

- A Combined cover of bluebunch wheatgrass and Sandberg's bluegrass >40 percent.
- B Combined cover of bluebunch wheatgrass and Sandberg's bluegrass 20 to 40 percent.
- C Cover by bare ground or annuals is high (>25 percent).
- D Bluebunch wheatgrass is absent or relict (<5 percent cover); annuals dominate.

Principal species—

Species	Code	Phase				A + B range
		A (n = 8)	B (n = 9)	C (n = 9)	D (n = 3)	
		Cover (%)/constancy (%)				Cover (%)
Shrubs:						
gray rabbitbrush	CHNA2	0	1/22	2/11	2/67	0–1
Grasses:						
bluebunch wheatgrass	AGSP	39/100	21/100	20/100	2/100	15–65
rattlesnake brome	BRBR7	0	2/33	1/11	5/33	0–3
soft brome	BRMO2	0	0	0	25/33	0
cheatgrass	BRTE	0	3/33	3/22	30/67	0–5
medusahead	ELCA13	0	0	0	2/67	0
prairie junegrass	KOCR	8/50	3/11	2/22	0	0–20
Sandberg's bluegrass	POSA12	11/100	6/100	5/100	1/67	1–20
bottlebrush squirreltail	SIHY	1/12	1/11	1/22	10/33	0–1
Forbs:						
common yarrow	ACMIL	2/75	2/78	1/22	1/33	0–5
low pussytoes	ANDI2	1/38	1/11	3/11	0	0–1
serrate balsamroot	BASE2	3/12	2/33	0	1/33	0–3
creamy buckwheat	ERHE2	2/75	2/22	3/11	0	0–3
lomatiums	LOMAT	4/38	5/44	3/56	4/33	0–5
lanceleaf stonecrop	SELA	2/25	2/22	1/11	1/33	0–3
yellow salsify	TRDU	0	1/11	1/22	1/67	0–1

These phases are the result of disturbances from wild and domestic ungulates. As ungulate use increases, the bunchgrasses decline and bare ground increases. Phase A is the least disturbed with high cover by bunchgrasses. Phase B results from increased ungulate use. Phase C results from further degradation where bare ground and annuals become prominent. Phase D results from sustained severe ungulate disturbance resulting in the loss of bluebunch wheatgrass and complete takeover of the site by annual weeds.

Management considerations—

Wild ungulates (especially elk) use these steep, southerly slopes heavily before grasses mature in late winter to early

spring. The most degraded sites are a result of combined use by elk and cattle in late spring to early summer. The southerly slopes, commonly frequented by elk concentrations in early spring when soils are saturated with moisture, are prone to increase of bare ground from trampling. Plant loss from uprooting owing to use by animals and slope movement is especially high at this time. If plant vigor is to be maintained, domestic ungulates should not use these sites until after seed maturity. Ungulates can promote germination by trampling the seed into the soil after midsummer. Highly degraded AGSP-POSA12 sites are prime locations for invasive colonization by yellow starthistle (*Centaurea solstitialis*).

Relationship to other studies—

Daubenmire (1970) was the first to define AGSP-POSA12 vegetation as a habitat type in eastern Washington. Hall (1973) included AGSP-POSA12 vegetation in his “bunchgrasses on steep, gentle, deep and shallow” plant community types of the Blue Mountains. Tisdale (1986) classified an AGSP-POSA12 habitat type in the Snake River canyon in Idaho. Mueggler and Stewart (1980) identified AGSP-POSA12 vegetation in Montana. Johnson and Simon (1987) differentiated AGSP-POSA12 into eight plant associations in the Wallowa Mountains and canyon lands of northeastern Oregon. Johnson and Clausnitzer (1992) described the AGSP-POSA12 plant association in the Blue and Ochoco Mountains.

Bluebunch wheatgrass-mountain brome plant community type

Agropyron spicatum-Bromus carinatus

AGSP-BRCA5

GB4131

N = 2

These plant communities occur in the Blue Mountains on Columbia River basalts at elevations above 4,000 ft. Brief soil investigations suggest a higher moisture-holding capacity than on most sites in the bluebunch wheatgrass series. Bluebunch wheatgrass is the dominant bunchgrass with Sandberg's bluegrass and mountain brome usually associated at lower cover levels. Annual bromes also are

found on disturbed sites within the community. The most prominent are rattlesnake brome and hairy brome. Forbs that are often associated are yarrow, large-flowered agoseris, arrowleaf balsamroot, creamy buckwheat, and Cusick's peavine. The common annual forb that increases with disturbances is blepharipappus.

Bluebunch wheatgrass-sulfur-flower buckwheat plant community type

Agropyron spicatum-Eriogonum umbellatum

AGSP-ERUM

GB4132

N = 3

These plant communities occur in the northern Blue Mountains on Columbia River basalts at elevations above 5,000 ft. The sites are on moderate to steep slopes. Herbage production is low (350 to 600 lb/ac) owing to the rocky-gravelly nature of the sites. Rock-gravel cover ranged from 45 to 75 percent. Because of the instability of these steep slopes, Sandberg's bluegrass is unable to establish. Blue-

bunch wheatgrass is the sole bunchgrass. Plants adapted for hot, dry sites are found with the sulfur-flower buckwheat. These perennials are yarrow, scarlet gilia, mountain monardella, Blue Mountain penstemon, and silverleaf phacelia. The annual plant increasing on disturbed sites in these communities is common cryptantha.

Bluebunch wheatgrass-turpentine cymopterus plant community type

Agropyron spicatum-Cymopterus terebinthinus var. foeniculaceus

AGSP-CYTEF

GB4133

N = 2

These plant communities occur in the northern Blue Mountains on Columbia River basalts at elevations ranging from 3,000 to 5,000 ft. The sites are on steep to moderately steep slopes (mean 55 percent) where rock and gravels dominate. Rock-gravel averaged 60 percent. Owing to the instability of these gravelly slopes, Sandberg's bluegrass was only able

to persist on stable patches behind large rocks. The dominant bunchgrass was bluebunch wheatgrass. Forbs were few. Cymopterus dominated with penstemons, lomatiums, and Douglas' knotweed also associated.

Douglas' buckwheat-Sandberg's bluegrass plant community type

Eriogonum douglasii-Poa sandbergii

ERDO-POSA12

FM9111

N = 1

This plant community type occurs on the ridgetops north of the Wallowa Mountains on Columbia River basalts between 4,400 and 5,400 ft elevation. The type was also found in the northern Blue Mountains (near Oregon Butte) on the Wenaha Basalt Formation at 5,300 ft elevation. Erosion pavement dominated (60 percent) over a shallow

soil. The dominant plant was Douglas' buckwheat. Other dry, scabland perennial plants associated were bighead clover, ballhead sandwort, lanceleaf stonecrop, and serrate balsamroot. Bluebunch wheatgrass and Sandberg's bluegrass were low in cover (<5 percent each).

Bulbous bluegrass-cluster tarweed plant community type

Poa bulbosa-Madia glomerata

POBU-MAGL2

GB4411

N = 1

This highly disturbed site was found in the northern Blue Mountains on Columbia River basalts. In 1962, bluebunch wheatgrass and Sandberg's bluegrass were present on the site. By 2003, all vestiges of the bunchgrasses were gone. Now dominating were bulbous

bluegrass (60 percent cover), cluster tarweed (40 percent cover), yarrow (25 percent cover), and mountain brome (10 percent cover). These highly degraded sites occur in the northern Blue Mountains on old domestic sheep driveways and bedding areas.

Onespike oatgrass-slenderfruit lomatium plant association

Danthonia unispicata-Lomatium leptocarpum

DAUN-LOLE2

GB9114

N = 9



Near Heister Creek, Paulina RD, Ochoco NF.

	Mean	Range
Elevation (feet)	4,853	4,440–5,670
Slope (percent)	5	0–12
Soil pH (n = 3)		6.0–7.2
Soil available water capacity (inches, n = 3)		0.5–2 (very low)
Depth to bedrock or extremely gravelly material (inches, n = 7)		5–12
Herbage (pounds/acre, n = 2)	325	200–450
Aspect (number of plots)	NW (2), NE (2), SE (2), SW (3)	
Lithology	Basalt, andesite	
Position	Summit	
Slope shape	Flat, convex	

Vegetation composition—

Onespike oatgrass and Sandberg’s bluegrass are the prominent perennial bunchgrasses. The bluegrass and oatgrass occupy shallow soils (scabland) with rushes (primarily slender rush, *Juncus tenuis*) occupying seepage areas of greater moisture abundance. Hummocks are often abundant from frost heaving. Along with the rushes, common camas is frequently found owing to the perched water table in early spring. Other scabland forbs of prominence are serrate balsamroot, lanceleaf stonecrop, bighead clover, and slenderfruit lomatium. Rushes and slenderfruit lomatium are key indicators of this mesic scabland type.

Distribution—

Central Blue and Ochoco Mountains.

Environmental features—

This plant association occupies ridgetop summits and plateau flats. Sampled sites occurred from 4,440 ft to 5,670 ft (mean 4,853 ft). This type was found on basalts and andesites. Slopes were gentle (mean 5 percent) on convex and flat surfaces. All aspects were represented. Soils consisted of cobbly to very cobbly loamy or clay loamy material just 5 to 12 in thick, over bedrock. These soils are often saturated in spring owing to perching of water over bedrock and clay, but their capacity to store water is very low. Herbage production ranged from 200 to 450 lb/ac (mean 325 lb/ac).

Ground surface features—

	Phase						A + B range
	A (n = 2)	B (n = 2)	C1 (n = 1)	C2 (n = 1)	D1 (n = 2)	D2 (n = 1)	
	Cover (%)						
Bare ground	15	22	1	—	0	50	5–39
Bedrock	0	1	0	—	0	0	0–2
Rock	12	28	5	—	22	3	5–50
Gravel	10	2	0	—	0	5	0–20
Pavement	2	0	0	—	0	5	0–5
Mosses and lichens	19	12	36	—	30	25	2–35
Litter	38	1	1	—	42	1	

— = no data.

Principal species—

Species	Code	Phase						A + B range
		A (n = 2)	B (n = 2)	C1 (n = 1)	C2 (n = 1)	D1 (n = 2)	D2 (n = 1)	
		<i>Cover (%) / constancy (%)</i>						<i>Cover (%)</i>
<i>Grasses:</i>								
onespike oatgrass	DAUN	68/100	22/100	45/100	5/100	35/100	0	20–70
bulbous bluegrass	POBU	0	0	0	0	0	30/100	0
Sandberg's bluegrass	POSA12	3/100	15/100	5/100	15/100	2/100	10/100	1–20
bottlebrush squirreltail	SIHYH	2/100	0	0	0	0	0	0–3
western needlegrass	STOC2	0	0	0	5/100	0	15/100	0
ventenata	VEDU	0	1/50	20/100	0	30/100	0	0–1
<i>Grasslikes:</i>								
rushes	JUNCU	1/50	1/100	1/100	0	1/100	0	0–1
<i>Forbs:</i>								
agoseric	AGOSE	1/50	1/50	1/100	1/100	1/50	1/100	0–1
serrate balsamroot	BASE2	9/100	1/50	0	0	1/50	1/100	0–15
common camas	CAQU2	15/50	2/100	3/100	1/100	0	3/100	0–15
slenderfruit lomatium	LOLE2	6/100	5/50	3/100	10/100	1/50	1/100	0–10
lomatiums	LOMAT	0	8/50	0	0	1/50	0	0–7
slender tarweed	MAGR3	0	0	0	0	5/50	0	0
western burnet	SAOC2	0	1/50	1/100	1/100	0	10/100	0–1
lanceleaf stonecrop	SELA	1/100	3/50	0	3/100	0	0	0–3
bighead clover	TRMA3	5/50	20/50	0	5/100	1/100	1/100	0–20

States and transitions—

Six phases were defined:

- A Onespike oatgrass cover >50 percent; Sandberg's bluegrass subordinate to oatgrass.
- B Oatgrass and bluegrass cover total 30 to 50 percent; bluegrass and oatgrass codominant.
- C1 Oatgrass dominant; ventenata invasive.
- C2 Oatgrass and bluegrass cover total <30 percent; perennial forbs dominant.
- D1 Oatgrass dominant; bluegrass relict to absent; ventenata invasive.
- D2 Oatgrass relict to absent; bulbous bluegrass and western needlegrass invasive.

The phases are based on the dominance of onespike oatgrass when moisture is abundant and retained during the summer months to support it (phase A), the emergence of Sandberg's bluegrass as the site loses its ability to retain adequate moisture for oatgrass (phase B), the decrease of both bunchgrasses as site deterioration continues (phase C), and the loss of the bunchgrasses as the site loses its ability to sustain them (phase D). Transition from phase A to B and so forth is due primarily to grazing ungulates when soils are saturated and the community is most vulnerable.

Management considerations—

Trampling and use of the early greening bluegrass in late winter to early spring are the primary causes of site degradation in this plant association. Elk and deer use can reduce the grass-rock-moss/lichen cover and promote compaction, soil loss, erosion pavement, and increased bare ground. Use by livestock has less of an impact after soils have lost moisture saturation from the late winter snowmelt and spring precipitation. Ideally flowering and seed set by the bunchgrasses should have culminated prior to the onset of domestic grazing. When the cover by grass, mosses, and lichens is reduced and bare ground is exposed, ventenata, bulbous bluegrass, and western needlegrass readily colonize.

Relationship to other studies—

Hall (1973) described this vegetation as part of his "bluegrass scabland plant community type" in the Blue Mountains. Volland (1976) also described "bluegrass scabland plant community type" on the pumice of central Oregon with similar characteristics. Johnson and Simon (1987) incorporated this more mesic vegetation type into their POSA12-DAUN plant association in the Wallowa Mountains of northeast Oregon. Johnson and Clausnitzer (1992) retained the DAUN-LOLE2 vegetation as part of POSA12-DAUN for the Blue and Ochoco Mountains. This work differentiates the more mesic DAUN-LOLE2 as a plant association for the Blue and Ochoco Mountains.

Sandberg's bluegrass-onespike oatgrass plant association

Poa sandbergii-*Danthonia unispicata*

POSA12-DAUN

GB9111

N = 13



Fred Hall



Fred Hall

Above Cougar Canyon, La Grande RD, Wallowa-Whitman NF.

Distribution—

Blue and Ochoco Mountains.

Environmental features—

This plant association occupies scabland ridgetops and shoulders as well as plateau flats. Sampled sites occurred from 3,800 to 6,950 ft (mean 5,157 ft). This type was found on basalts and andesites. Slopes were gentle (mean 6 percent) on convex and flat surfaces. All aspects were represented. Soils consisted of cobbly to very cobbly loamy or clay loamy material just 4 to 10 in thick, over bedrock. These soils are often saturated in spring owing to perching of water over bedrock and clay, but their capacity to store water is very low. Herbage production ranged from 45 to 486 lb/ac (mean 184 lb/ac).

	Mean	Range
Elevation (feet)	5,157	3,800–6,950
Slope (percent)	6	1–15
Soil pH (n = 9)		6.0–7.0
Soil available water capacity (inches, n = 7)		0.5–1.5 (very low)
Depth to bedrock or extremely gravelly material (inches, n = 7)		4–10
Herbage (pounds/acre, n = 11)	184	45–486
Aspect (number of plots)	NW (1), NE (2), SE (6), SW (4)	
Lithology	Basalt, andesite	
Position	Summit, shoulder	
Slope shape	Convex, flat	

Ground surface features—

	Phase			A + B range
	A (n = 2)	B (n = 3)	D (n = 8)	
	Cover (%)			
Bare ground	14	23	35	7–38
Bedrock	2	1	1	0–3
Rock	20	22	16	5–35
Gravel	0	3	6	0–10
Pavement	0	2	11	0–5
Mosses and lichens	40	20	10	20–60
Litter	24	5	21	

Vegetation composition—

Onespike oatgrass and Sandberg's bluegrass occupy shallow soils over impervious, nonfractured bedrock. Bottlebrush squirreltail is the other bunchgrass that frequently occurs at low coverage. Scabland forbs of prominence are yellow, low pussytoes, serrate balsamroot, stonecrops, and lomatiums.

States and transitions—

Four phases were defined:

- A—Sandberg's bluegrass, onespike oatgrass, and moss cover total >75 percent.
- B—Sandberg's bluegrass, onespike oatgrass, and moss cover total 50 to 75 percent.
- D—Sandberg's bluegrass, onespike oatgrass, and moss cover total <50 percent; DAUN relict to absent.

Phase A is based on the dominance of Sandberg's bluegrass and onespike oatgrass with high moss cover retarding soil desiccation during the summer months. As surface disturbance increases from ungulate trampling, bare ground

Principal species—

Species	Code	Phase			A + B range
		A (n = 2)	B (n = 3)	D (n = 8)	
		Cover (%)/constancy (%)			Cover (%)
Grasses:					
onespike oatgrass	DAUN	32/100	15/67	1/50	0–60
Sandberg's bluegrass	POSA12	19/100	22/100	11/100	3–35
bottlebrush squirreltail	SIHYH	0	1/67	2/50	0–1
western needlegrass	STOC2	0	7/33	3/12	0–7
Forbs:					
common yarrow	ACMIL	2/100	2/100	3/50	1–3
low pussytoes	ANDI2	0	3/67	6/50	0–3
serrate balsamroot	BASE2	0	10/67	13/38	0–20
lomatiums	LOMAT	1/100	4/67	8/60	0–5
stonecrops	SEDUM	2/50	4/100	2/50	0–10
bighead clover	TRMA3	0	0	16/25	0

increases, soil loss occurs, and bunchgrasses become “pedestalled” with a resultant decline in the bunchgrass and moss cover (phase B). In phase D, the bunchgrasses can no longer survive the drought of the hot, dry summer months. They are relict as the plant-moss-rock matrix is lost to bare ground dominance from ungulate trampling in the saturated soil period of the year.

Management considerations—

Trampling and use of the early greening bluegrass in late winter to early spring are the primary causes of site degradation in this plant association. Elk and deer use can reduce the grass-rock-moss/lichen cover and promote compaction, soil loss, erosion pavement, and increased bare ground. Use by livestock has less of an impact after soils have lost moisture saturation from the late winter snow-melt and spring precipitation. Ideally flowering and seed set by the bunchgrasses should have culminated prior to domestic grazing. When the cover by grass, mosses, and lichens is reduced and bare ground is exposed, these sites may be irreparably damaged.

Relationship to other studies—

Hall (1973) described this vegetation as part of his “bluegrass scabland plant community type” in the Blue Mountains. Volland (1976) also described “bluegrass scabland plant community type” on the pumice of central Oregon with similar characteristics. Johnson and Simon (1987) described a POSA12-DAUN plant association in the Wallowa Mountains of northeast Oregon. Johnson and Clausnitzer (1992) also classified a POSA12-DAUN plant association for the Blue and Ochoco Mountains.

Glossary

andesite—A fine-grained igneous rock of intermediate composition between rhyolite and basalt.

argillite—A sedimentary rock resembling shale but hardened by heat, pressure, or chemical cementing agents.

ash (volcanic)—Fine-grained material deposited from volcanic eruption by airfall.

aspect (slope)—The horizontal direction that a slope faces, usually expressed in a compass azimuth or cardinal direction.

basalt—A dark-colored, fine-grained igneous rock rich in magnesium and iron.

batholith—A large body of intruded igneous rock.

bunchgrass—A grass (member of the family Poaceae) with tufted growth form, as opposed to a sod-forming grass.

climax (community)—The stable community, in an ecological succession, that is able to reproduce itself indefinitely under existing environmental conditions in the absence of disturbance. The final stage of succession.

climax (species)—Species that are self-perpetuating in the absence of disturbance.

colluvium—Unconsolidated earth material deposited on or at the base of slopes by mass wasting (direct gravitational action) or local unconcentrated runoff.

constancy—The percentage of plots on which the species occurred in the sampled population.

cover—The percentage of ground area included in a vertical projection of individual plant canopies by a given species.

disclimax—A stable community that differs from the theoretical climax for the site as a result of ongoing disturbance or severe disturbance in the past followed by invasion of exotic species.

dominant—A plant or group of plants which by their collective size, mass, or number exert the most influence on other components of the ecosystem.

forb—A herbaceous plant other than a sedge, grass, or other plant with similar grasslike foliage.

graminoid—An herbaceous grass or grasslike plant.

granite—A coarse-grained igneous rock rich in quartz, feldspar, and mica.

grass—A plant of the family Poaceae (formerly Gramineae), characterized by jointed stems, sheathing leaves, flower spikelets, and fruit consisting of a seedlike grain or caryopsis.

grassland—vegetation dominated by grasses (Poaceae) and lacking either a tree or shrub cover of 10 percent or more.

graywacke—A sandstone rich in feldspar or rock fragments.

habitat type—An aggregation of all land areas capable of supporting similar plant associations at climax.

herb—A plant that dies back to the ground surface each year.

igneous rock—A rock formed by the eruption or subsurface intrusion of molten rock.

indicator species—A plant species that is sensitive to environmental features of a site and has a high fidelity and constancy to a type.

layer (vegetation)—A plant physiognomic level such as overstory tree or shrub.

lithology—Rock type.

loess—Fine-grained, wind-deposited material predominantly of silt-sized particles.

metasedimentary—Sedimentary rock that has been altered by heat and pressure.

noncalcareous—Soil or sediment that lacks measurable quantities of calcium carbonate.

perching—Water pooling over impenetrable rock or soil layer.

phase (plant community)—A plant community, often one of several, that is an identifiable component of a state. Transitions between phases within a state are readily reversible.

plant association—A unit of vegetation classification based on the projected late-seral community. Plant associations have a characteristic range in species composition, specific diagnostic species, and a defined range in habitat conditions, physiognomy, and structure.

plant community—An assemblage of plants living together and interacting among themselves in a common spatial arrangement.

plant community type—An aggregation of all plant communities with similar structure and floristic composition placed in a classification unit.

rhyolite—A fine-grained igneous rock rich in silica.

savanna—A type of vegetation in which widely spaced trees are scattered over a landscape otherwise covered by low-growing plants.

sedimentary rock—A rock formed by deposition of particles in the air or water or by precipitation from solution in surface bodies of water.

seral—A stage of temporary communities in a successional sequence.

series—An aggregation of taxonomically related plant communities that takes the name of the climax species that dominates the uppermost layer.

shale—A sedimentary rock composed of small (silt- and clay-sized) particles.

shrubland—vegetation where total canopy cover of shrubs is 10 percent or more and tree cover is less than 10 percent.

state—A recognizable, resilient complex of soil and vegetation. One or more vegetation communities (phases), connected by reversible transitions, may occur within a state. Transitions between states involve crossing ecologic thresholds and are typically difficult to reverse.

succession—The change in species composition resulting from the replacement of one community with another, driven by internal processes in the ecosystem such as plant competition and soil development.

transition—Change in ecosystems between states or phases, driven by natural events such as succession or by management actions such as grazing or seeding.

tuff—An igneous rock composed of volcanic ash and other volcanic material deposited by airfall.

ultramafic—Refers to rock that is very high in magnesium and iron; examples are serpentinite and peridotite.

ungulate—Cloven-hoofed animal.

zone—A geographic area of uniform macroclimate where the plant associations share the same dominant species.

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Metric and English Equivalents

When you know:	Multiply by:	To find:
Inches (in)	2.54	Centimeters (cm)
Inches (in)	.254	Decimeters (dm)
Feet (ft)	.3048	Meters (m)
Miles (mi)	1.609	Kilometers (km)
Square feet (ft ²)	.093	Square meters (m ²)
Acres (ac)	.405	Hectares (ha)
Pounds (lb)	.454	Kilograms (kg)
Pounds per acre (lb/ac)	1.12	Kilograms per hectare (kg/ha)

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Appendix A: Plants Listed by Life Form and Scientific Name

Scientific name ¹	PLANTS code ²	R6 code ³	Common name
Trees:			
<i>Abies lasiocarpa</i>	ABLA	ABLA2	Subalpine fir
<i>Juniperus occidentalis</i>	JUOC	JUOC	Western juniper
<i>Pinus albicaulis</i>	PIAL	PIAL	Whitebark pine
<i>Pinus contorta</i>	PICO	PICO	Lodgepole pine
<i>Pinus ponderosa</i>	PIPO	PIPO	Ponderosa pine
<i>Pseudotsuga menziesii</i>	PSME	PSME	Douglas-fir
Shrubs:			
<i>Amelanchier alnifolia</i>	AMAL2	AMAL	Western serviceberry
<i>Artemisia arbuscula</i>	ARAR8	ARAR	Low sagebrush
<i>Artemisia rigida</i>	ARRI2	ARRI	Stiff sagebrush
<i>Artemisia tridentata</i> var. <i>vaseyana</i>	ARTRV	ARTRV	Mountain big sagebrush
<i>Artemisia tripartita</i>	ARTR4	ARTR2	Threetip sagebrush
<i>Berberis repens</i>	BERE	BERE	Creeping Oregon grape
<i>Ceanothus velutinus</i>	CEVE	CEVE	Snowbrush ceanothus
<i>Cercocarpus ledifolius</i>	CELE3	CELE	Curleaf mountain mahogany
<i>Chrysothamnus nauseosus</i>	CHNA2	CHNA	Gray rabbitbrush
<i>Chrysothamnus nauseosus</i> var. <i>nanus</i>	CHNAN2	CHNAN	Gray rabbitbrush
<i>Chrysothamnus viscidiflorus</i>	CHVI8	CHVI	Green rabbitbush
<i>Holodiscus discolor</i>	HODI	HODI	Creambush ocean-spray
<i>Leptodactylon pungens</i>	LEPU	LEPU2	Leptodactylon
<i>Peraphyllum ramosissimum</i>	PERA4	PERA3	Squaw apple
<i>Philadelphus lewisii</i>	PHLE4	PHLE2	Lewis' mock-orange
<i>Physocarpus malvaceus</i>	PHMA5	PHMA	Mallow ninebark
<i>Prunus</i>	PRUNU	PRUNU	Cherry
<i>Prunus virginiana</i>	PRVI	PRVI	Common chokecherry
<i>Purshia tridentata</i>	PUTR2	PUTR	Bitterbrush
<i>Rhamnus purshiana</i>	RHPU	RHPU	Cascara
<i>Ribes</i>	RIBES	RIBES	Currant or gooseberry
<i>Ribes aureum</i>	RIAU	RIAU	Golden currant
<i>Ribes cereum</i>	RICE	RICE	Wax currant
<i>Ribes montigenum</i>	RIMO2	RIMO	Mountain gooseberry
<i>Ribes viscosissimum</i>	RIVI3	RIVI	Sticky currant
<i>Rosa</i>	ROSA5	ROSA	Rose
<i>Rosa gymnocarpa</i>	ROGY	ROGY	Baldhip rose
<i>Rosa nutkana</i>	RONU	RONU	Nootka rose
<i>Sambucus cerulea</i>	SACE3	SACE	Blue elderberry
<i>Spiraea betulifolia</i>	SPBE2	SPBE	Birchleaf spiraea
<i>Symphoricarpos albus</i>	SYAL	SYAL	Common snowberry
<i>Symphoricarpos oreophilus</i>	SYOR2	SYOR	Mountain snowberry
<i>Tetradymia canescens</i>	TECA2	TECA	Gray horsebrush
<i>Tetradymia glabrata</i>	TEGL	TEGL	Littleleaf horsebrush
Grasses:			
<i>Agropyron cristatum</i>	AGCR	AGCR	Crested wheatgrass
<i>Agropyron intermedium</i>	AGIN2	AGIN2	Intermediate wheatgrass
<i>Agropyron spicatum</i>	AGSP	AGSP	Bluebunch wheatgrass
<i>Agropyron trichophorum</i>	AGTR6	AGTR2	Pubescent wheatgrass
<i>Agrostis</i>	AGROS2	AGROS	Bentgrass
<i>Agrostis exarata</i>	AGEX	AGEX	Spike bentgrass
<i>Agrostis interrupta</i>	AGIN4	AGIN3	Interrupted bentgrass
<i>Alopecurus pratensis</i>	ALPR3	ALPR	Meadow foxtail
<i>Bromus</i>	BROMU	BROMU	Brome

Scientific name ¹	PLANTS code ²	R6 code ³	Common name
<i>Bromus brizaeformis</i>	BRBR7	BRBR	Rattlesnake brome
<i>Bromus carinatus</i>	BRCA5	BRCA	Mountain brome
<i>Bromus commutatus</i>	BRCO4	BRCO	Hairy brome
<i>Bromus inermis</i>	BRIN2	BRIN	Smooth brome
<i>Bromus japonicus</i>	BRJA	BRJA	Japanese brome
<i>Bromus mollis</i>	BRMO2	BRMO	Soft brome
<i>Bromus secalinus</i>	BRSE	BRSE	Ryebrome
<i>Bromus tectorum</i>	BRTE	BRTE	Cheatgrass
<i>Calamagrostis</i>	CALAM	CALAM	Reedgrass or pinegrass
<i>Calamagrostis rubescens</i>	CARU	CARU	Pinegrass
<i>Dactylis glomerata</i>	DAGL	DAGL	Orchardgrass
<i>Danthonia</i>	DANTH	DANTH	Oatgrass
<i>Danthonia californica</i>	DACA3	DACA	California oatgrass
<i>Danthonia unispicata</i>	DAUN	DAUN	Onespike oatgrass
<i>Deschampsia danthonioides</i>	DEDA	DEDA	Annual hairgrass
<i>Elymus caput-medusae</i>	ELCA13	ELCA2	Medusahead
<i>Elymus cinereus</i>	ELCI2	ELCI	Basin wildrye
<i>Elymus glaucus</i>	ELGL	ELGL	Blue wildrye
<i>Festuca bromoides</i>	FEBR4	FEBR	Brome fescue
<i>Festuca idahoensis</i>	FEID	FEID	Idaho fescue
<i>Festuca megalura</i>	FEME	FEME	Foxtail fescue
<i>Festuca microstachys</i>	FEMI2	FEMI	Small fescue
<i>Festuca myuros</i>	FEMY2	FEMY	Rat-tail fescue
<i>Festuca ovina</i>	FEOV	FEOV	Sheep fescue
<i>Festuca ovina</i> var. <i>rydbergii</i>	FEOVR	FEOVR	Sheep fescue
<i>Festuca viridula</i>	FEVI	FEVI	Green fescue
<i>Hordeum jubatum</i>	HOJU	HOJU	Foxtail barley
<i>Koeleria cristata</i>	KOCR	KOCR	Prairie junegrass
<i>Melica</i>	MELIC	MELIC	Oniongrass
<i>Melica bulbosa</i>	MEBU	MEBU	Oniongrass
<i>Melica fugax</i>	MEFU	MEFU	Little oniongrass
<i>Melica spectabilis</i>	MESP	MESP	Showy oniongrass
<i>Muhlenbergia mexicana</i>	MUME2	MUME	Wirestem muhly
<i>Oryzopsis webberi</i>	ORWE	ORWE	Webber's ricegrass
<i>Phleum pratense</i>	PHPR3	PHPR	Common timothy
<i>Poa</i>	POA	POA	Bluegrass
<i>Poa bulbosa</i>	POBU	POBU	Bulbous bluegrass
<i>Poa cusickii</i>	POCU3	POCU	Cusick's bluegrass
<i>Poa cusickii</i> var. <i>cusickii</i>	POCUC4	POCUC	Cusick's bluegrass
<i>Poa nervosa</i>	PONE2	PONE	Wheeler's bluegrass
<i>Poa nervosa</i> var. <i>wheeleri</i>	PONEW	PONEW	Wheeler's bluegrass
<i>Poa pratensis</i>	POPR	POPR	Kentucky bluegrass
<i>Poa sandbergii</i>	POSA12	POSA3	Sandberg's bluegrass
<i>Poa scabrella</i>	POSC	POSC	Pine bluegrass
<i>Poa secunda</i>	POSE	POSE	Sandberg's bluegrass
<i>Poa secunda</i> var. <i>juncifolia</i>	POSEJ	POSEJ	Alkali bluegrass
<i>Poa vaseyochloa</i>	POVA	POVA	Leiberg's bluegrass
<i>Sitanion hystrix</i>	SIHY	SIHY	Bottlebrush squirreltail
<i>Sitanion hystrix</i> var. <i>hordeoides</i>	SIHYH	SIHYH	Bottlebrush squirreltail
<i>Sitanion jubatum</i>	SIJU	SIJU	Big squirreltail
<i>Stipa</i>	STIPA	STIPA	Needlegrass
<i>Stipa lemmonii</i>	STLE2	STLE2	Lemmon's needlegrass
<i>Stipa lettermanii</i>	STLE4	STLE	Letterman's needlegrass
<i>Stipa occidentalis</i>	STOC2	STOC	Western needlegrass
<i>Stipa occidentalis</i> var. <i>occidentalis</i>	STOC2	STOCO	Western needlegrass

Scientific name ¹	PLANTS code ²	R6 code ³	Common name
<i>Stipa thurberiana</i>	STTH2	STTH	Thurber's needlegrass
<i>Ventenata dubia</i>	VEDU	VEDU	Ventenata
Sedges and rushes:			
<i>Carex</i>	CAREX	CAREX	Sedge
<i>Carex eurycarpa</i>	CAEU2	CAEU	Widefruit sedge
<i>Carex filifolia</i>	CAFI	CAFI	Threadleaf sedge
<i>Carex geyeri</i>	CAGE2	CAGE	Elk sedge
<i>Carex hoodii</i>	CAHO5	CAHO	Hood's sedge
<i>Carex multicosata</i>	CAMU6	CAMU	Many-ribbed sedge
<i>Carex phaeocephala</i>	CAPH2	CAPH	Dunhead sedge
<i>Carex praegracilis</i>	CAPR5	CAPR5	Clustered field sedge
<i>Carex pyrenaica</i>	CAPY3	CAPY	Pyrenaean sedge
<i>Carex raynoldsii</i>	CARA6	CARA	Raynolds' sedge
<i>Carex rossii</i>	CARO5	CARO	Ross' sedge
<i>Juncus</i>	JUNCU	JUNCU	Rush
<i>Juncus balticus</i>	JUBA	JUBA	Baltic rush
<i>Juncus confusus</i>	JUCO2	JUCO	Colorado rush
<i>Juncus drummondii</i>	JUDR	JUDR	Drummond's rush
<i>Juncus parryi</i>	JUPA	JUPA	Parry's rush
<i>Juncus tenuis</i>	JUTE	JUTE	Slender rush
<i>Juncus tenuis</i> var. <i>tenuis</i>	JUTE	JUTET	Slender rush
Forbs:			
<i>Achillea millefolium</i> var. <i>lanulosa</i>	ACMIL	ACMIL	Common yarrow
<i>Agastache urticifolia</i>	AGUR	AGUR	Nettleleaf horsemint
<i>Agoseris</i>	AGOSE	AGOSE	Agoseris
<i>Agoseris glauca</i>	AGGL	AGGL	Pale agoseris
<i>Agoseris glauca</i> var. <i>laciniata</i>	AGGLL	AGGLL	Pale agoseris
<i>Agoseris grandiflora</i>	AGGR	AGGR	Large-flowered agoseris
<i>Agoseris heterophylla</i>	AGHE2	AGHE	Annual agoseris
<i>Allium</i>	ALLIU	ALLIU	Wild onion
<i>Allium acuminatum</i>	ALAC4	ALAC	Tapertip onion
<i>Allium brandegei</i>	ALBR	ALBR	Brandegee's onion
<i>Allium fibrillum</i>	ALFI	ALFI	Fringed onion
<i>Allium tolmiei</i>	ALTO	ALTO	Tolm's onion
<i>Alyssum alyssoides</i>	ALAL3	ALAL	Pale alyssum
<i>Amsinckia</i>	AMSIN	AMSIN	Fiddleneck
<i>Amsinckia retrorsa</i>	AMRE2	AMRE2	Rigid fiddleneck
<i>Amsinckia tessellata</i>	AMTE3	AMTE	Bristly fiddleneck
<i>Angelica arguta</i>	ANAR3	ANAR2	Sharptooth angelica
<i>Antennaria</i>	ANTEN	ANTEN	Pussytoes
<i>Antennaria alpina</i>	ANAL4	ANAL	Alpine pussytoes
<i>Antennaria anaphaloides</i>	ANAN2	ANAN	Tall pussytoes
<i>Antennaria dimorpha</i>	ANDI2	ANDI	Low pussytoes
<i>Antennaria luzuloides</i>	ANLU2	ANLU	Woodrush pussytoes
<i>Antennaria microphylla</i>	ANMI3	ANMI2	Rosy pussytoes
<i>Antennaria rosea</i>	ANRO2	ANRO	Rosy pussytoes
<i>Antennaria stenophylla</i>	ANST2	ANST	Narrowleaf pussytoes
<i>Antennaria umbrinella</i>	ANUM	ANUM	Brown pussytoes
<i>Anthriscus scandicina</i>	ANSC8	ANSC2	Chervil
<i>Apocynum androsaemifolium</i>	APAN2	APAN	Spreading dogbane
<i>Apocynum androsaemifolium</i> var. <i>pumilum</i>	APANP	APANP	Spreading dogbane
<i>Arabis</i>	ARABI2	ARABI	Rockcross
<i>Arabis aculeolata</i>	ARAC4	ARAC	Wall rockcross
<i>Arabis hirsuta</i>	ARHI	ARHI	Hairy rockcross

Scientific name ¹	PLANTS code ²	R6 code ³	Common name
<i>Arabis holboellii</i>	ARHO2	ARHO	Holboell's rockcress
<i>Arabis holboellii</i> var. <i>retrofracta</i>	ARHOR	ARHOR	Holboell's rockcress
<i>Arabis perelegans</i>	ARPE11	ARPE	Hairystem rockcress
<i>Arabis sparsiflora</i>	ARSP	ARSP2	Elegant rockcress
<i>Arenaria</i>	ARENA	ARENA	Sandwort
<i>Arenaria aculeata</i>	ARAC2	ARAC2	Prickly sandwort
<i>Arenaria capillaris</i>	ARCA7	ARCA2	Threadleaf sandwort
<i>Arenaria congesta</i>	ARCO5	ARCO2	Ballhead sandwort
<i>Arenaria macrophylla</i>	ARMA18	ARMA3	Bigleaf sandwort
<i>Arenaria nuttallii</i> var. <i>fragilis</i>	ARNUF	ARNUF	Nuttall's sandwort
<i>Arenaria serpyllifolia</i>	ARSE2	ARSE	Thymeleaf sandwort
<i>Arnica cordifolia</i>	ARCO9	ARCO	Heartleaf arnica
<i>Arnica fulgens</i>	ARFU3	ARFU	Orange arnica
<i>Arnica sororia</i>	ARSO2	ARSO	Twin arnica
<i>Artemisia ludoviciana</i>	ARLU	ARLU	Western mugwort
<i>Asclepias fascicularis</i>	ASFA	ASFA2	Mexican milkweed
<i>Aspidotis densa</i>	ASDE6	ASDE	Podfern
<i>Aster</i>	ASTER	ASTER	Aster
<i>Aster alpigenus</i> var. <i>haydenii</i>	ASALH2	ASALH	Alpine aster
<i>Aster conspicuus</i>	ASCO3	ASCO	Showy aster
<i>Aster integrifolius</i>	ASIN3	ASIN	Thickstem aster
<i>Astragalus</i>	ASTRA	ASTRA	Locoweed or milkvetch
<i>Astragalus conjunctus</i>	ASCO11	ASCO3	Stiff milkvetch
<i>Astragalus filipes</i>	ASFI	ASFI	Basalt milkvetch
<i>Astragalus purshii</i>	ASPU9	ASPU	Woollypod milkvetch
<i>Astragalus purshii</i> var. <i>lagopinus</i>	ASPUL	ASPUL	Woollypod milkvetch
<i>Astragalus reventus</i>	ASRE5	ASRE	Blue Mountain milkvetch
<i>Astragalus reventus</i> var. <i>reventus</i>	ASRE5	ASRER	Longleaf milkvetch
<i>Astragalus reventus</i> var. <i>sheldonii</i>	ASRES	ASRES	Sheldon's milkvetch
<i>Astragalus whitneyi</i>	ASWH	ASWH	Balloon milkvetch
<i>Astragalus whitneyi</i> var. <i>sonneanus</i>	ASWHS2	ASWHS	Balloon milkvetch
<i>Balsamorhiza</i>	BALSA	BALSA	Balsamroot
<i>Balsamorhiza hirsuta</i>	BAHI	BAHI	Hairy balsamroot
<i>Balsamorhiza incana</i>	BAIN	BAIN	Hoary balsamroot
<i>Balsamorhiza sagittata</i>	BASA3	BASA	Arrowleaf balsamroot
<i>Balsamorhiza serrata</i>	BASE2	BASE	Serrate balsamroot
<i>Besseyia rubra</i>	BERU	BERU	Red besseyia
<i>Blepharipappus scaber</i>	BLSC	BLSC	Blepharipappus
<i>Brassica hirta</i>	BRHI2	BRHI	White mustard
<i>Brodiaea</i>	BRODI	BRODI	Brodiaea
<i>Brodiaea douglasii</i>	BRDO	BRDO	Douglas' brodiaea
<i>Calochortus</i>	CALOC	CALOC	Sego lily
<i>Calochortus eurycarpus</i>	CAEU	CAEU2	Wide fruit mariposa
<i>Calochortus macrocarpus</i>	CAMA5	CAMA	Sagebrush mariposa
<i>Camassia</i>	CAMAS	CAMAS	Camas
<i>Camassia cusickii</i>	CACU2	CACU	Cusick's camas
<i>Camassia quamash</i>	CAQU2	CAQU	Common camas
<i>Cardamine pulcherrima</i>	CAPU4	CAPU2	Slender toothwort
<i>Castilleja</i>	CASTI2	CASTI	Paintbrush
<i>Castilleja applegatei</i>	CAAP4	CAAP2	Wavy-leaved paintbrush
<i>Castilleja cusickii</i>	CACU7	CACU3	Cusick's paintbrush
<i>Castilleja hispida</i>	CAHI9	CAHI2	Harsh paintbrush
<i>Castilleja hispida</i> var. <i>acuta</i>	CAHIA2	CAHIA	Harsh paintbrush
<i>Castilleja linariaefolia</i>	CALI4	CALI2	Wyoming Indian paintbrush
<i>Castilleja miniata</i>	CAMI12	CAMI2	Scarlet paintbrush

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<i>Castilleja oresbia</i>	CAOR4	CAOR3	Pale Wallowa paintbrush
<i>Castilleja pilosa</i>	CAPI3	CAPI2	Hairy penstemon
<i>Castilleja pruinosa</i>	CAPR14	CAPR4	Frosted Indian paintbrush
<i>Centaurea solstitialis</i>	CESO3	CESO	Yellow star-thistle
<i>Cerastium arvense</i>	CEAR4	CEAR	Field chickweed
<i>Chaenactis douglasii</i>	CHDO	CHDO	Hoary chaenactis
<i>Chaenactis douglasii</i> var. <i>achilleaeifolia</i>	CHDOA	CHDOA	Hoary chaenactis
<i>Cirsium</i>	CIRSI	CIRSI	Thistle
<i>Cirsium brevifolium</i>	CIBR	CIBR	Palouse thistle
<i>Cirsium canovirens</i>	CICA6	CICA2	Gray-green thistle
<i>Cirsium utahense</i>	CIUT	CIUT	Utah thistle
<i>Cirsium vulgare</i>	CIVU	CIVU	Bull thistle
<i>Clarkia pulchella</i>	CLPU	CLPU	Deerhorn
<i>Clematis hirsutissima</i>	CLHI	CLHI	Sugar bowls
<i>Collinsia parviflora</i>	COPA3	COPA	Small flowered blue-eyed Mary
<i>Collomia grandiflora</i>	COGR4	COGR2	Large-flowered collomia
<i>Collomia linearis</i>	COLI2	COLI2	Narrow-leaved collomia
<i>Collomia tenella</i>	COTE	COTE	Diffuse collomia
<i>Cordylanthus ramosus</i>	CORA5	CORA	Bushy birdbeak
<i>Crepis</i>	CREPI	CREPI	Hawksbeard
<i>Crepis acuminata</i>	CRAC2	CRAC	Tapertip hawksbeard
<i>Crepis atrabarba</i>	CRAT	CRAT	Slender hawksbeard
<i>Crepis atrabarba</i> var. <i>originalis</i>	CRATO	CRATO	Slender hawksbeard
<i>Crepis bakeri</i>	CRBA2	CRBA	Baker's hawksbeard
<i>Crepis intermedia</i>	CRIN4	CRIN	Gray hawksbeard
<i>Crepis modocensis</i>	CRMO4	CRMO3	Siskiyou hawksbeard
<i>Crepis occidentalis</i>	CROC	CROC	Western hawksbeard
<i>Crepis occidentalis</i> var. <i>costata</i>	CROCC2	CROCC	Western hawksbeard
<i>Cryptantha</i>	CRYPT	CRYPT2	Cryptantha
<i>Cryptantha affinis</i>	CRAF	CRAF	Slender cryptantha
<i>Cryptantha ambigua</i>	CRAM3	CRAM	Obscure cryptantha
<i>Cryptantha celosioides</i>	CRCE	CRCE	Cockscomb cryptantha
<i>Cryptantha intermedia</i>	CRIN8	CRIN2	Common cryptantha
<i>Cryptantha torreyana</i>	CRTO4	CRTO	Torrey's cryptantha
<i>Cryptogramma crispa</i>	CRCRA2	CRCR	Rockbrake
<i>Cymopterus nivalis</i>	CYNI3	CYNI	Snowline cymopterus
<i>Cymopterus terebinthinus</i>	CYTE9	CYTE	Turpentine cymopterus
<i>Cymopterus terebinthinus</i> var. <i>foeniculaceus</i>	CYTEF	CYTEF	Turpentine cymopterus
<i>Cynoglossum officinale</i>	CYOF	CYOF	Common houndstongue
<i>Cystopteris fragilis</i>	CYFR2	CYFR	Brittle bladderfern
<i>Delphinium</i>	DELPH	DELPH	Larkspur
<i>Delphinium depauperatum</i>	DEDE2	DEDE	Slim larkspur
<i>Delphinium menziesii</i>	DEME	DEME	Menzies larkspur
<i>Delphinium nuttallianum</i>	DENU2	DENU3	Upland larkspur
<i>Descurainia</i>	DESCU	DESCU	Tansymustard
<i>Dodecatheon</i>	DODEC	DODEC	Shootingstar
<i>Dodecatheon conjugens</i>	DOCO	DOCO	Slimpod shootingstar
<i>Dodecatheon cusickii</i>	DOCU2	DOCU	Cusick's shootingstar
<i>Draba densifolia</i>	DRDE	DRDE	Nuttall's draba
<i>Epilobium</i>	EPILO	EPILO	Willowherb
<i>Epilobium angustifolium</i>	EPAN2	EPAN	Fireweed
<i>Epilobium glandulosum</i>	EPGL4	EPGL2	Common willowherb
<i>Epilobium minutum</i>	EPMI	EPMI	Small-flowered willowherb
<i>Epilobium paniculatum</i>	EPPA2	EPPA	Tall annual willowherb
<i>Erigeron</i>	ERIGE2	ERIGE	Fleabane

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<i>Erigeron acris</i>	ERAC13	ERAC	Bitter fleabane
<i>Erigeron aphanactis</i>	ERAP	ERAP	Rayless fleabane
<i>Erigeron bloomeri</i>	ERBL	ERBL	Scabland fleabane
<i>Erigeron chrysopsidis</i>	ERCH4	ERCH	Dwarf yellow fleabane
<i>Erigeron chrysopsidis</i> var. <i>brevifolius</i>	ERCHB	ERCHB	Alpine dwarf yellow fleabane
<i>Erigeron compositus</i>	ERCO4	ERCO	Cutleaf daisy
<i>Erigeron corymbosus</i>	ERCO5	ERCO3	Foothill daisy
<i>Erigeron divergens</i>	ERDI4	ERDI	Spreading fleabane
<i>Erigeron eatonii</i>	EREA	EREA	Eaton's daisy
<i>Erigeron filifolius</i>	ERFI2	ERFI	Threadleaf fleabane
<i>Erigeron linearis</i>	ERLI	ERLI	Desert yellow daisy
<i>Erigeron poliospermus</i>	ERPO2	ERPO	Cushion fleabane
<i>Erigeron pumilus</i>	ERPU2	ERPU	Shaggy fleabane
<i>Erigeron pumilus</i> var. <i>intermedius</i>	ERPUI	ERPUI	Shaggy fleabane
<i>Erigeron pumilus</i> ssp. <i>intermedius</i> var. <i>gracilior</i>	ERPUG	ERPUG	Shaggy fleabane
<i>Erigeron speciosus</i>	ERSP4	ERSP	Showy fleabane
<i>Eriogonum</i>	ERIOG	ERIOG	Eriogonum
<i>Eriogonum caespitosum</i>	ERCA8	ERCA	Cushion buckwheat
<i>Eriogonum compositum</i>	ERCO12	ERCO5	Heart-leaved buckwheat
<i>Eriogonum douglasii</i>	ERDO	ERDO	Douglas' buckwheat
<i>Eriogonum flavum</i>	ERFL4	ERFL	Golden buckwheat
<i>Eriogonum flavum</i> var. <i>piperi</i>	ERFLP	ERFLP	Golden buckwheat
<i>Eriogonum heracleoides</i>	ERHE2	ERHE	Creamy buckwheat
<i>Eriogonum heracleoides</i> var. <i>angustifolium</i>	ERHEA2	ERHEA	Creamy buckwheat
<i>Eriogonum microthecum</i> var. <i>laxiflorum</i>	ERMIL5	ERMIL	Slender buckwheat
<i>Eriogonum ovalifolium</i>	EROV	EROV	Oval-leaved eriogonum
<i>Eriogonum sphaerocephalum</i>	ERSP7	ERSP3	Rock buckwheat
<i>Eriogonum strictum</i>	ERST4	ERST2	Strict buckwheat
<i>Eriogonum strictum</i> var. <i>proliferum</i>	ERSTP	ERSTP	Strict buckwheat
<i>Eriogonum strictum</i> ssp. <i>proliferum</i> var. <i>anserinum</i>	ERSTA3	ERSTA3	Strict buckwheat
<i>Eriogonum umbellatum</i>	ERUM	ERUM	Sulfur-flower buckwheat
<i>Eriogonum umbellatum</i> var. <i>polyanthum</i>	ERUMP3	ERUMP	Sulfur-flower buckwheat
<i>Eriogonum umbellatum</i> var. <i>stellatum</i>	ERUMS5	ERUMS	Sulfur-flower buckwheat
<i>Eriogonum umbellatum</i> var. <i>umbellatum</i>	ERUMU2	ERUMU	Sulfur-flower buckwheat
<i>Eriogonum vimineum</i>	ERV15	ERVI	Broom buckwheat
<i>Eriophyllum lanatum</i>	ERLA6	ERLA	Woolly eriophyllum
<i>Erodium cicutarium</i>	ERCI6	ERCI	Crane's-bill
<i>Erysimum asperum</i>	ERAS2	ERAS	Rough wallflower
<i>Erythronium grandiflorum</i>	ERGR9	ERGR	Dogtooth violet
<i>Fragaria virginiana</i>	FRVI	FRVI	Virginia strawberry
<i>Fragaria virginiana</i> var. <i>platypetala</i>	FRVIP2	FRVIP	Virginia strawberry
<i>Frasera albicaulis</i>	FRAL2	FRAL2	Whitestem frasera
<i>Frasera albicaulis</i> var. <i>cusickii</i>	FRALC2	FRALC	Cusick's frasera
<i>Frasera albicaulis</i> var. <i>nitida</i>	FRALN2	FRALN	Shiny frasera
<i>Gaillardia aristata</i>	GAAR	GAAR	Blanket flower
<i>Galium aparine</i>	GAAP2	GAAP	Cleavers
<i>Galium multiflorum</i>	GAMU2	GAMU	Shrubby bedstraw
<i>Gayophytum</i>	GAYOP	GAYOP	Groundsmoke
<i>Gayophytum diffusum</i>	GADI2	GADI	Spreading groundsmoke
<i>Gayophytum ramosissimum</i>	GARA2	GARA	Hairstem groundsmoke
<i>Geranium viscosissimum</i>	GEVI2	GEVI	Sticky geranium
<i>Geum triflorum</i>	GETR	GETR	Red avens
<i>Geum triflorum</i> var. <i>ciliatum</i>	GETRC2	GETRC2	Red avens
<i>Gilia aggregata</i>	GIAG	GIAG	Scarlet gilia
<i>Gilia congesta</i>	GICO2	GICO	Ballhead gilia

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<i>Gnaphalium microcephalum</i>	GNMI	GNMI	Slender cudweed
<i>Grindelia nana</i>	GRNA	GRNA	Low gumweed
<i>Grindelia squarrosa</i>	GRSQ	GRSQ	Curlycup gumweed
<i>Hackelia floribunda</i>	HAFL2	HAFL	Manyflower stickseed
<i>Hackelia jessicae</i>	HAJE	HAJE	Blue stickseed
<i>Haplopappus acaulis</i>	HAAC	HAAC	Stemless goldenweed
<i>Haplopappus carthamoides</i>	HACA5	HACA	Largeflower goldenweed
<i>Haplopappus greenei</i>	HAGR6	HAGR	Green's goldenweed
<i>Haplopappus lanuginosus</i>	HALA3	HALA	Woolly goldenweed
<i>Haplopappus stenophyllus</i>	HAST	HAST2	Narrowleaf goldenweed
<i>Helianthella uniflora</i>	HEUN	HEUN	Little sunflower
<i>Hesperochiron pumilis</i>	HEPU6	HEPU	Dwarf hesperochiron
<i>Heuchera cylindrica</i>	HECY2	HECY	Roundleaf alumroot
<i>Heuchera cylindrica alpina</i>	HECYA	HECYA	Alpine roundleaved alumroot
<i>Heuchera grossulariifolia</i>	HEGR8	HEGR	Gooseberryleaf alumroot
<i>Heuchera grossulariifolia</i> var. <i>grossulariifolia</i>	HEGRG	HEGRG	Gooseberryleaf alumroot
<i>Hieracium</i>	HIERA	HIERA	Hawkweed
<i>Hieracium albertinum</i>	HIAL	HIAL2	Western hawkweed
<i>Hieracium albiflorum</i>	HIAL2	HIAL	White hawkweed
<i>Hieracium scouleri</i>	HISC2	HISC	Woolly-weed
<i>Hydrophyllum capitatum</i>	HYCA4	HYCA	Waterleaf
<i>Hymenoxys grandiflora</i>	HYGR5	HYGR	Old man of the mountains
<i>Hypericum perforatum</i>	HYPE	HYPE	Common St. John's wort
<i>Iris missouriensis</i>	IRMI	IRMI	Rocky Mountain iris
<i>Lactuca serriola</i>	LASE	LASE	Prickly lettuce
<i>Lagophylla ramosissima</i>	LARA	LARA	Hareleaf
<i>Lathyrus</i>	LATHY	LATHY	Peavine
<i>Lathyrus lanszwertii</i>	LALA3	LALA2	Thick-leaved peavine
<i>Lathyrus nevadensis</i>	LANE3	LANE	Sierran peavine
<i>Lathyrus nevadensis</i> ssp. <i>cusickii</i>	LANEC	LANEC	Cusick's peavine
<i>Lathyrus pauciflorus</i>	LAPA5	LAPA2	Fewflower peavine
<i>Lathyrus rigidus</i>	LARI	LARI	Rigid peavine
<i>Leucocrinum montanum</i>	LEMO4	LEMO	Sand lily
<i>Lewisia rediviva</i>	LERE7	LERE	Bitterroot
<i>Ligusticum</i>	LIGUS	LIGUS	Lovage
<i>Ligusticum canbyi</i>	LICA2	LICA2	Canby's lovage
<i>Ligusticum filicinum</i>	LIFI	LIFI	Fernleaf lovage
<i>Linanthastrum nuttallii</i>	LINU4	LINU	Nuttall's linanthastrum
<i>Linanthus harknessii</i>	LIHA	LIHA	Harkness' linanthus
<i>Linanthus septentrionalis</i>	LISE	LISE	Northern linanthus
<i>Linum perenne</i> var. <i>lewisii</i>	LIPEL3	LIPEL	Wild blue flax
<i>Lithophragma bulbifera</i>	LIBU2	LIBU	Bulbiferous fringecup
<i>Lithophragma parviflora</i>	LIPAP3	LIPA	Smallflower fringecup
<i>Lithospermum ruderales</i>	LIRU4	LIRU	Wayside gromwell
<i>Lomatium</i>	LOMAT	LOMAT	Biscuitroot
<i>Lomatium ambiguum</i>	LOAM	LOAM	Swale desert-parsley
<i>Lomatium cous</i>	LOCO4	LOCO2	Cous biscuitroot
<i>Lomatium dissectum</i>	LODI	LODI2	Fern-leaved lomatium
<i>Lomatium dissectum</i> var. <i>eatonii</i>	LODIE	LODIE	Fern-leaved lomatium
<i>Lomatium dissectum</i> var. <i>multifidum</i>	LODIM	LODIM	Fern-leaved lomatium
<i>Lomatium donnellii</i>	LODO2	LODO	Donnell's lomatium
<i>Lomatium gormanii</i>	LOGO	LOGO	Gorman's biscuitroot
<i>Lomatium grayi</i>	LOGR	LOGR	Gray's lomatium
<i>Lomatium hendersonii</i>	LOHE2	LOHE	Henderson's lomatium
<i>Lomatium leptocarpum</i>	LOLE2	LOLE	Slenderfruit lomatium

Scientific name ¹	PLANTS code ²	R6 code ³	Common name
<i>Lomatium macrocarpum</i>	LOMA3	LOMA	Large-fruited lomatium
<i>Lomatium nudicaule</i>	LONU2	LONU	Barestem lomatium
<i>Lomatium triternatum</i>	LOTR2	LOTR	Nineleaf lomatium
<i>Lomatium triternatum</i> var. <i>platycarpum</i>	LOTRP	LOTRP	Nineleaf lomatium
<i>Lomatium triternatum</i> var. <i>triternatum</i>	LOTRT	LOTRT	Nineleaf lomatium
<i>Lomatium vaginatum</i>	LOVA	LOVA	Broadsheath lomatium
<i>Lupinus</i>	LUPIN	LUPIN	Lupine
<i>Lupinus caudatus</i>	LUCA	LUCA	Tailcup lupine
<i>Lupinus holosericeus</i>	LUHO2	LUHO	Little-flowered lupine
<i>Lupinus laxiflorus</i>	LULA3	LULA2	Spurred lupine
<i>Lupinus laxiflorus</i> var. <i>laxiflorus</i>	LULAA	LULAL3	Spurred lupine
<i>Lupinus laxiflorus</i> var. <i>pseudoparviflorus</i>	LULAP5	LULAP	Spurred lupine
<i>Lupinus lepidus</i>	LULE2	LULE2	Prairie lupine
<i>Lupinus lepidus</i> var. <i>utahensis</i>	LULEU2	LULEU	Prairie lupine
<i>Lupinus leucophyllus</i>	LULE3	LULE	Velvet lupine
<i>Lupinus leucophyllus</i> var. <i>leucophyllus</i>	LULEL4	LULEL	Velvet lupine
<i>Lupinus leucophyllus</i> var. <i>tenuispicus</i>	LULET	LULET	Velvet lupine
<i>Lupinus saxosus</i>	LUSA2	LUSA	Rock lupine
<i>Lupinus sericeus</i>	LUSE4	LUSE	Silky lupine
<i>Lupinus sericeus</i> var. <i>sericeus</i>	LUSES2	LUSES	Silky lupine
<i>Lupinus sulphureus</i>	LUSU5	LUSU	Sulphur lupine
<i>Lupinus wyethii</i>	LUWY	LUWY	Wyeth's lupine
<i>Madia</i>	MADIA	MADIA	Tarweed
<i>Madia citriodora</i>	MACI2	MACI	Lemon-scented tarweed
<i>Madia glomerata</i>	MAGL2	MAGL	Cluster tarweed
<i>Madia gracilis</i>	MAGR3	MAGR	Slender tarweed
<i>Madia minima</i>	MAMI	MAMI	Small-head tarweed
<i>Medicago sativa</i>	MESA	MESA	Alfalfa
<i>Mentzelia albicaulis</i>	MEAL6	MEAL2	Whitestem mentzelia
<i>Mentzelia dispersa</i>	MEDI	MEDI	Bush mentzelia
<i>Microseris</i>	MICRO6	MICRO3	Microseris
<i>Microseris linearifolia</i>	MILI	MILI	Lindley's microseris
<i>Microseris nutans</i>	MINU	MINU	Nodding microseris
<i>Microseris troximoides</i>	MITR5	MITR	False agoseris
<i>Microsteris gracilis</i>	MIGR	MIGR	Pink microsteris
<i>Mimulus guttatus</i>	MIGU	MIGU	Yellow monkeyflower
<i>Mimulus nanus</i>	MINA	MINA	Dwarf purple monkeyflower
<i>Mitella stauropetala</i>	MIST3	MIST2	Side-flowered mitrewort
<i>Monardella odoratissima</i>	MOOD	MOOD	Mountain monardella
<i>Montia linearis</i>	MOLI4	MOLI	Narrowleaf miner's lettuce
<i>Montia perfoliata</i>	MOPE3	MOPE	Miner's lettuce
<i>Myosotis micrantha</i>	MYMI	MYMI	Blue scorpion grass
<i>Navarretia intertexta</i>	NAIN2	NAIN	Needleleaf navarretia
<i>Navarretia intertexta</i> var. <i>propinqua</i>	NAINP3	NAINP	Pin cushion plant
<i>Nemophila breviflora</i>	NEBR	NEBR	Great Basin nemophila
<i>Nemophila parviflora</i>	NEPA	NEPA	Smallflower nemophila
<i>Oenothera heterantha</i>	OEHE	OEHE	Longleaf evening-primrose
<i>Orobanche uniflora</i>	ORUN	ORUN	Naked broomrape
<i>Orobanche uniflora purpurea</i>	ORUNP	ORUNP	Naked broomrape
<i>Orthocarpus hispidus</i>	ORHI	ORHI	Hairy owl-clover
<i>Orthocarpus tenuifolius</i>	ORTE2	ORTE	Thinleaf owl-clover
<i>Osmorhiza</i>	OSMOR	OSMOR	Sweet-cicely
<i>Osmorhiza chilensis</i>	OSCH	OSCH	Mountain sweet-cicely
<i>Osmorhiza occidentalis</i>	OSOC	OSOC	Western sweetroot
<i>Paeonia brownii</i>	PABR	PABR	Brown's peony

Scientific name ¹	PLANTS code ²	R6 code ³	Common name
<i>Pedicularis contorta</i>	PECO	PECO2	Coiled lousewort
<i>Penstemon</i>	PENST	PENST	Penstemon
<i>Penstemon attenuatus</i>	PEAT3	PEAT	Sulfur penstemon
<i>Penstemon attenuatus</i> var. <i>militaris</i>	PEATM	PEATM	Sulfur penstemon
<i>Penstemon attenuatus</i> var. <i>pseudoprocerus</i>	PEATP2	PEATP	Sulfur penstemon
<i>Penstemon davidsonii</i> var. <i>menziesii</i>	PEDAM	PEDAM	Davidson's penstemon
<i>Penstemon deustus</i>	PEDE4	PEDE	Hot rock penstemon
<i>Penstemon deustus</i> var. <i>variabilis</i>	PEDEV	PEDEV	Hot rock penstemon
<i>Penstemon gairdneri</i>	PEGA	PEGA	Gairdner's penstemon
<i>Penstemon gairdneri</i> var. <i>oreganus</i>	PEGAO2	PEGAO	Gairdner's penstemon
<i>Penstemon humilis</i>	PEHU	PEHU	Low penstemon
<i>Penstemon pennellianus</i>	PEPE11	PEPE3	Blue Mountain penstemon
<i>Penstemon rydbergii</i>	PERY	PERY	Rydberg's penstemon
<i>Penstemon speciosus</i>	PESP	PESP	Showy penstemon
<i>Penstemon venustus</i>	PEVE2	PEVE	Blue Mountain penstemon
<i>Perideridia</i>	PERID	PERID	Yampah
<i>Perideridia bolanderi</i>	PEBO2	PEBO	Bolander's yampah
<i>Perideridia gairdneri</i>	PEGA3	PEGA2	Gairdner's yampah
<i>Phacelia</i>	PHACE	PHACE	Phacelia
<i>Phacelia hastata</i>	PHHA	PHHA	Silverleaf phacelia
<i>Phacelia hastata</i> var. <i>alpina</i>	PHHAA	PHHAA	Silverleaf phacelia
<i>Phacelia hastata</i> var. <i>leucophylla</i>	PHHAL	PHHAL	Silverleaf phacelia
<i>Phacelia heterophylla</i>	PHHE2	PHHE	Varileaf phacelia
<i>Phacelia linearis</i>	PHLI	PHLI	Threadleaf phacelia
<i>Phacelia sericea</i>	PHSE	PHSE	Silky phacelia
<i>Phlox</i>	PHLOX	PHLOX	Phlox
<i>Phlox austromontana</i>	PHAU3	PHAU	Mountain phlox
<i>Phlox caespitosa</i>	PHCA7	PHCA2	Tufted phlox
<i>Phlox diffusa</i>	PHDI3	PHDI	Spreading phlox
<i>Phlox hoodii</i>	PHHO	PHHO	Hood's phlox
<i>Phlox longifolia</i>	PHLO2	PHLO	Longleaf phlox
<i>Phlox multiflora</i>	PHMU3	PHMU	Many-flowered phlox
<i>Phlox pulvinata</i>	PHPU5	PHPU	Cushion phlox
<i>Phoenicaulis cheiranthoides</i>	PHCH	PHCH	Daggerpod
<i>Physaria oregana</i>	PHOR2	PHOR	Oregon twinpod
<i>Plectritis macrocera</i>	PLMA4	PLMA3	White plectritis
<i>Polygonum</i>	POLYG4	POLYG	Knotweed
<i>Polygonum bistortoides</i>	POBI6	POBI	American bistort
<i>Polygonum douglasii</i>	PODO4	PODO	Douglas' knotweed
<i>Polygonum majus</i>	POMA9	POMA2	Wiry knotweed
<i>Polygonum phytolaccaefolium</i>	POPH	POPH	Alpine fleeceflower
<i>Polygonum polygaloides</i>	POPO4	POPO	White-margined knotweed
<i>Potentilla</i>	POTEN	POTEN	Cinquefoil
<i>Potentilla glandulosa</i>	POGL9	POGL	Sticky cinquefoil
<i>Potentilla gracilis</i>	POGR9	POGR	Slender cinquefoil
<i>Potentilla gracilis</i> var. <i>glabrata</i>	POGRG	POGRG	Slender cinquefoil
<i>Ranunculus populago</i>	RAPO	RAPO	Blue Mountain buttercup
<i>Rigiopappus leptocladus</i>	RILE2	RILE	Rigiopappus
<i>Rumex acetosella</i>	RUAC3	RUAC	Sheep sorrel
<i>Sanguisorba occidentalis</i>	SAOC2	SAOC	Annual burnet
<i>Sanicula graveolens</i>	SAGR5	SAGR	Sierra sanicle
<i>Saxifraga fragosa</i>	SAFR7	SAFR	Swamp saxifrage
<i>Saxifraga integrifolia</i>	SAIN4	SAIN	Swamp saxifrage
<i>Saxifraga integrifolia</i> var. <i>columbiana</i>	SAINC2	SAINC	Swamp saxifrage
<i>Saxifraga rhomboidea</i>	SARH2	SARH	Diamondleaf saxifrage

Scientific name ¹	PLANTS code ²	R6 code ³	Common name
<i>Scutellaria angustifolia</i>	SCAN3	SCAN	Narrowleaf skullcap
<i>Sedum</i>	SEDUM	SEDUM	Stonecrop
<i>Sedum douglasii</i>	SEDO3	SEDO	Wormleaf stonecrop
<i>Sedum lanceolatum</i>	SELA	SELA2	Lanceleaf stonecrop
<i>Sedum stenopetalum</i>	SEST2	SEST	Wormleaf stonecrop
<i>Senecio</i>	SENEC	SENEC	Groundsel
<i>Senecio canus</i>	SECA2	SECA	Woolly groundsel
<i>Senecio integerrimus</i>	SEIN2	SEIN	Western groundsel
<i>Senecio integerrimus</i> var. <i>exaltatus</i>	SEINE	SEINE	Western groundsel
<i>Senecio streptanthifolius</i>	SEST3	SEST2	Rocky Mountain butterweed
<i>Sidalcea oregana</i>	SIOR	SIOR	Oregon checker-mallow
<i>Silene</i>	SILEN	SILEN	Campion
<i>Silene douglasii</i>	SIDO	SIDO2	Douglas' campion
<i>Silene oregana</i>	SIOR3	SIOR2	Oregon catchfly
<i>Silene scaposa</i>	SISC	SISC2	Scapose silene
<i>Sisyrinchium inflatum</i>	SIIN15	SIIN2	Grasswidow
<i>Smilacina racemosa</i>	SMRA	SMRA	Western false solomon's seal
<i>Solidago canadensis</i>	SOCA6	SOCA	Canada goldenrod
<i>Solidago missouriensis</i>	SOMI2	SOMI	Missouri goldenrod
<i>Spraguea umbellata</i>	SPUM	SPUM	Pussypaws
<i>Taraxacum officinale</i>	TAOF	TAOF	Common dandelion
<i>Thalictrum occidentale</i>	THOC	THOC	Western meadowrue
<i>Thysanocarpus curvipes</i>	THCU	THCU	Lacepod
<i>Tragopogon</i>	TRAGO	TRAGO	Salsify
<i>Tragopogon dubius</i>	TRDU	TRDU	Yellow salsify
<i>Trifolium</i>	TRIFO	TRIFO	Clover
<i>Trifolium eriocephalum</i> var. <i>piperi</i>	TRERP2	TRERP	Woollyhead clover
<i>Trifolium longipes</i>	TRLO	TRLO	Longstalk clover
<i>Trifolium macrocephalum</i>	TRMA3	TRMA	Bighead clover
<i>Trifolium plumosum</i>	TRPL2	TRPL	Pussy clover
<i>Valerianella locusta</i>	VALO	VALO	Valerianella
<i>Veratrum californicum</i>	VECA2	VECA	California false hellebore
<i>Veronica arvensis</i>	VEAR	VEAR	Common speedwell
<i>Vicia americana</i>	VIAM	VIAM	American vetch
<i>Vicia cracca</i>	VICR	VICR	Cracca's vetch
<i>Viola</i>	VIOLA	VIOLA	Violet
<i>Viola purpurea</i>	VIPU4	VIPU	Goosefoot violet
<i>Woodsia oregana</i>	WOOR	WOOR	Oregon cliff fern
<i>Wyethia amplexicaulis</i>	WYAM	WYAM	Northern mule's ears
<i>Zigadenus</i>	ZIGAD	ZIGAD	Deathcamas
<i>Zigadenus paniculatus</i>	ZIPA2	ZIPA	Panicled deathcamas
<i>Zigadenus venenosus</i>	ZIVE	ZIVE	Meadow deathcamus
<i>Zigadenus venenosus</i> var. <i>gramineus</i>	ZIVEG	ZIVEG	Meadow deathcamus

¹Hitchcock and Cronquist 1973.²USDA, NRCS 2004b.³Garrison and Skovlin 1976.

Appendix B: Plants Listed by Common Name

Common name	Scientific name ¹	PLANTS code ²	R6 code ³
Agoseris	<i>Agoseris</i>	AGOSE	AGOSE
Alfalfa	<i>Medicago sativa</i>	MESA	MESA
Alkali bluegrass	<i>Poa secunda</i> var. <i>juncifolia</i>	POSEJ	POSEJ
Alpine aster	<i>Aster alpigenus</i> var. <i>haydenii</i>	ASALH2	ASALH
Alpine dwarf yellow fleabane	<i>Erigeron chrysopsidis</i> var. <i>brevifolius</i>	ERCHB	ERCHB
Alpine fleecflower	<i>Polygonum phytolaccaefolium</i>	POPH	POPH
Alpine pussytoes	<i>Antennaria alpina</i>	ANAL4	ANAL
Alpine roundleaved alumroot	<i>Heuchera cylindrica</i> var. <i>alpina</i>	HECYA	HECYA
American bistort	<i>Polygonum bistortoides</i>	POBI6	POBI
American vetch	<i>Vicia americana</i>	VIAM	VIAM
Annual agoseris	<i>Agoseris heterophylla</i>	AGHE2	AGHE
Annual burnet	<i>Sanguisorba occidentalis</i>	SAOC2	SAOC
Annual hairgrass	<i>Deschampsia danthonioides</i>	DEDA	DEDA
Arrowleaf balsamroot	<i>Balsamorhiza sagittata</i>	BASA3	BASA
Aster	<i>Aster</i>	ASTER	ASTER
Baker's hawkbeard	<i>Crepis bakeri</i>	CRBA2	CRBA
Baldhip rose	<i>Rosa gymnocarpa</i>	ROGY	ROGY
Ballhead gilia	<i>Gilia congesta</i>	GICO2	GICO
Ballhead sandwort	<i>Arenaria congesta</i>	ARCO5	ARCO2
Balloon milkvetch	<i>Astragalus whitneyi</i>	ASWH	ASWH
Balloon milkvetch	<i>Astragalus whitneyi</i> var. <i>sonneanus</i>	ASWHS2	ASWHS
Balsamroot	<i>Balsamorhiza</i>	BALSA	BALSA
Baltic rush	<i>Juncus balticus</i>	JUBA	JUBA
Barestem lomatium	<i>Lomatium nudicaule</i>	LONU2	LONU
Basalt milkvetch	<i>Astragalus filipes</i>	ASFI	ASFI
Basin wildrye	<i>Elymus cinereus</i>	ELCI2	ELCI
Bentgrass	<i>Agrostis</i>	AGROS2	AGROS
Big squirreltail	<i>Sitanion jubatum</i>	SIJU	SIJU
Bighead clover	<i>Trifolium macrocephalum</i>	TRMA3	TRMA
Bigleaf sandwort	<i>Arenaria macrophylla</i>	ARMA18	ARMA3
Birchleaf spiraea	<i>Spiraea betulifolia</i>	SPBE2	SPBE
Biscuitroot	<i>Lomatium</i>	LOMAT	LOMAT
Bitter fleabane	<i>Erigeron acris</i>	ERAC13	ERAC
Bitterbrush	<i>Purshia tridentata</i>	PUTR2	PUTR
Bitterroot	<i>Lewisia rediviva</i>	LERE7	LERE
Blanket flower	<i>Gaillardia aristata</i>	GAAR	GAAR
Blepharipappus	<i>Blepharipappus scaber</i>	BLSC	BLSC
Blue elderberry	<i>Sambucus cerulea</i>	SACE3	SACE
Blue Mountain buttercup	<i>Ranunculus populago</i>	RAPO	RAPO
Blue Mountain milkvetch	<i>Astragalus reventus</i>	ASRE5	ASRE
Blue Mountain penstemon	<i>Penstemon venustus</i>	PEVE2	PEVE
Blue Mountain penstemon	<i>Penstemon pennellianus</i>	PEPE11	PEPE3
Blue scorpion grass	<i>Myosotis micrantha</i>	MYMI	MYMI
Blue stickseed	<i>Hackelia jessicae</i>	HAJE	HAJE
Blue wildrye	<i>Elymus glaucus</i>	ELGL	ELGL
Bluebunch wheatgrass	<i>Agropyron spicatum</i>	AGSP	AGSP
Bluegrass	<i>Poa</i>	POA	POA
Bolander's yampah	<i>Perideridia bolanderi</i>	PEBO2	PEBO
Bottlebrush squirreltail	<i>Sitanion hystrix</i>	SIHY	SIHY
Bottlebrush squirreltail	<i>Sitanion hystrix</i> var. <i>hordeoides</i>	SIHYH	SIHYH
Brandegge's onion	<i>Allium brandegei</i>	ALBR	ALBR
Bristly fiddleneck	<i>Amsinckia tessellata</i>	AMTE3	AMTE
Brittle bladderfern	<i>Cystopteris fragilis</i>	CYFR2	CYFR

Common name	Scientific name ¹	PLANTS code ²	R6 code ³
Broadsheath lomatium	<i>Lomatium vaginatum</i>	LOVA	LOVA
Brodiaea	<i>Brodiaea</i>	BRODI	BRODI
Brome	<i>Bromus</i>	BROMU	BROMU
Brome fescue	<i>Festuca bromoides</i>	FEBR4	FEBR
Broom buckwheat	<i>Eriogonum vimineum</i>	ERV15	ERVI
Brown pussytoes	<i>Antennaria umbrinella</i>	ANUM	ANUM
Brown's peony	<i>Paeonia brownii</i>	PABR	PABR
Bulbiferous fringecup	<i>Lithophragma bulbifera</i>	LIBU2	LIBU
Bulbous bluegrass	<i>Poa bulbosa</i>	POBU	POBU
Bull thistle	<i>Cirsium vulgare</i>	CIVU	CIVU
Bush mentzelia	<i>Mentzelia dispersa</i>	MEDI	MEDI
Bushy birdbeak	<i>Cordylanthus ramosus</i>	CORA5	CORA
California false hellebore	<i>Veratrum californicum</i>	VECA2	VECA
California oatgrass	<i>Danthonia californica</i>	DACA3	DACA
Camas	<i>Camassia</i>	CAMAS	CAMAS
Campion	<i>Silene</i>	SILEN	SILEN
Canada goldenrod	<i>Solidago canadensis</i>	SOCA6	SOCA
Canby's lovage	<i>Ligusticum canbyi</i>	LICA2	LICA2
Cascara	<i>Rhamnus purshiana</i>	RHPU	RHPU
Cheatgrass	<i>Bromus tectorum</i>	BRTE	BRTE
Cherry	<i>Prunus</i>	PRUNU	PRUNU
Chervil	<i>Anthriscus scandicina</i>	ANSC8	ANSC2
Cinquefoil	<i>Potentilla</i>	POTEN	POTEN
Cleavers	<i>Galium aparine</i>	GAAP2	GAAP
Clover	<i>Trifolium</i>	TRIFO	TRIFO
Cluster tarweed	<i>Madia glomerata</i>	MAGL2	MAGL
Clustered field sedge	<i>Carex praegracilis</i>	CAPR5	CAPR5
Cockscomb cryptantha	<i>Cryptantha celosioides</i>	CRCE	CRCE
Coiled lousewort	<i>Pedicularis contorta</i>	PECO	PECO2
Colorado rush	<i>Juncus confusus</i>	JUCO2	JUCO
Common camas	<i>Camassia quamash</i>	CAQU2	CAQU
Common chokecherry	<i>Prunus virginiana</i>	PRVI	PRVI
Common cryptantha	<i>Cryptantha intermedia</i>	CRIN8	CRIN2
Common dandelion	<i>Taraxacum officinale</i>	TAOF	TAOF
Common houndstongue	<i>Cynoglossum officinale</i>	CYOF	CYOF
Common snowberry	<i>Symphoricarpos albus</i>	SYAL	SYAL
Common speedwell	<i>Veronica arvensis</i>	VEAR	VEAR
Common St. John's wort	<i>Hypericum perforatum</i>	HYPE	HYPE
Common timothy	<i>Phleum pratense</i>	PHPR3	PHPR
Common willowherb	<i>Epilobium glandulosum</i>	EPGL4	EPGL2
Common yarrow	<i>Achillea millefolium</i> var. <i>lanulosa</i>	ACMIL	ACMIL
Cous biscuitroot	<i>Lomatium cous</i>	LOCO4	LOCO2
Cracca's vetch	<i>Vicia cracca</i>	VICR	VICR
Crane's-bill	<i>Erodium cicutarium</i>	ERCI6	ERCI
Creambush ocean-spray	<i>Holodiscus discolor</i>	HODI	HODI
Creamy buckwheat	<i>Eriogonum heracleoides</i>	ERHE2	ERHE
Creamy buckwheat	<i>Eriogonum heracleoides</i> var. <i>angustifolium</i>	ERHEA2	ERHEA
Creeping Oregon grape	<i>Berberis repens</i>	BERE	BERE
Crested wheatgrass	<i>Agropyron cristatum</i>	AGCR	AGCR
Cryptantha	<i>Cryptantha</i>	CRYPT	CRYPT2
Curlleaf mountain mahogany	<i>Cercocarpus ledifolius</i>	CELE3	CELE
Curlycup gumweed	<i>Grindelia squarrosa</i>	GRSQ	GRSQ
Currant or gooseberry	<i>Ribes</i>	RIBES	RIBES
Cushion buckwheat	<i>Eriogonum caespitosum</i>	ERCA8	ERCA
Cushion fleabane	<i>Erigeron poliospermus</i>	ERPO2	ERPO

Common name	Scientific name ¹	PLANTS code ²	R6 code ³
Cushion phlox	<i>Phlox pulvinata</i>	PHPU5	PHPU
Cusick's bluegrass	<i>Poa cusickii</i>	POCU3	POCU
Cusick's bluegrass	<i>Poa cusickii</i> var. <i>cusickii</i>	POCUC4	POCUC
Cusick's camas	<i>Camassia cusickii</i>	CACU2	CACU
Cusick's frasera	<i>Frasera albicaulis</i> var. <i>cusickii</i>	FRALC2	FRALC
Cusick's paintbrush	<i>Castilleja cusickii</i>	CACU7	CACU3
Cusick's peavine	<i>Lathyrus nevadensis</i> spp. <i>cusickii</i>	LANEC	LANEC
Cusick's shootingstar	<i>Dodecatheon cusickii</i>	DOCU2	DOCU
Cutleaf daisy	<i>Erigeron compositus</i>	ERCO4	ERCO
Daggerpod	<i>Phoenicaulis cheiranthoides</i>	PHCH	PHCH
Davidson's penstemon	<i>Penstemon davidsonii</i> var. <i>menziesii</i>	PEDAM	PEDAM
Deathcamas	<i>Zigadenus</i>	ZIGAD	ZIGAD
Deerhorn	<i>Clarkia pulchella</i>	CLPU	CLPU
Desert yellow daisy	<i>Erigeron linearis</i>	ERLI	ERLI
Diamondleaf saxifrage	<i>Saxifraga rhomboidea</i>	SARH2	SARH
Diffuse collomia	<i>Collomia tenella</i>	COTE	COTE
Dogtooth violet	<i>Erythronium grandiflorum</i>	ERGR9	ERGR
Donnell's lomatium	<i>Lomatium donnellii</i>	LODO2	LODO
Douglas' brodiaea	<i>Brodiaea douglasii</i>	BRDO	BRDO
Douglas' buckwheat	<i>Eriogonum douglasii</i>	ERDO	ERDO
Douglas' campion	<i>Silene douglasii</i>	SIDO	SIDO2
Douglas' knotweed	<i>Polygonum douglasii</i>	PODO4	PODO
Douglas-fir	<i>Pseudotsuga menziesii</i>	PSME	PSME
Drummond's rush	<i>Juncus drummondii</i>	JUDR	JUDR
Dunhead sedge	<i>Carex phaeocephala</i>	CAPH2	CAPH
Dwarf hesperochiron	<i>Hesperochiron pumilis</i>	HEPU6	HEPU
Dwarf purple monkeyflower	<i>Mimulus nanus</i>	MINA	MINA
Dwarf yellow fleabane	<i>Erigeron chrysopsidis</i>	ERCH4	ERCH
Eaton's daisy	<i>Erigeron eatonii</i>	EREA	EREA
Elegant rockcress	<i>Arabis sparsiflora</i>	ARSP	ARSP2
Elk sedge	<i>Carex geyeri</i>	CAGE2	CAGE
Eriogonum	<i>Eriogonum</i>	ERIOG	ERIOG
False agoseris	<i>Microseris troximoides</i>	MITR5	MITR
Fernleaf lovage	<i>Ligusticum filicinum</i>	LIFI	LIFI
Fern-leaved lomatium	<i>Lomatium dissectum</i>	LODI	LODI2
Fern-leaved lomatium	<i>Lomatium dissectum</i> var. <i>eatonii</i>	LODIE	LODIE
Fern-leaved lomatium	<i>Lomatium dissectum</i> var. <i>multifidum</i>	LODIM	LODIM
Fewflower peavine	<i>Lathyrus pauciflorus</i>	LAPA5	LAPA2
Fiddleneck	<i>Amsinckia</i>	AMSIN	AMSIN
Field chickweed	<i>Cerastium arvense</i>	CEAR4	CEAR
Fireweed	<i>Epilobium angustifolium</i>	EPAN2	EPAN
Fleabane	<i>Erigeron</i>	ERIGE2	ERIGE
Foothill daisy	<i>Erigeron corymbosus</i>	ERCO5	ERCO3
Foxtail barley	<i>Hordeum jubatum</i>	HOJU	HOJU
Foxtail fescue	<i>Festuca megalura</i>	FEME	FEME
Fringed onion	<i>Allium fibrillum</i>	ALFI	ALFI
Frosted Indian paintbrush	<i>Castilleja pruinosa</i>	CAPR14	CAPR4
Gairdner's penstemon	<i>Penstemon gairdneri</i>	PEGA	PEGA
Gairdner's penstemon	<i>Penstemon gairdneri</i> var. <i>oreganus</i>	PEGAO2	PEGAO
Gairdner's yampah	<i>Perideridia gairdneri</i>	PEGA3	PEGA2
Golden buckwheat	<i>Eriogonum flavum</i>	ERFL4	ERFL
Golden buckwheat	<i>Eriogonum flavum</i> var. <i>piperi</i>	ERFLP	ERFLP
Golden currant	<i>Ribes aureum</i>	RIAU	RIAU
Gooseberryleaf alumroot	<i>Heuchera grossulariifolia</i>	HEGR8	HEGR
Gooseberryleaf alumroot	<i>Heuchera grossulariifolia</i> var. <i>grossulariifolia</i>	HEGRG	HEGRG

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Goosefoot violet	<i>Viola purpurea</i>	VIPU4	VIPU
Gorman's biscuitroot	<i>Lomatium gormanii</i>	LOGO	LOGO
Grasswidow	<i>Sisyrinchium inflatum</i>	SIIN15	SIIN2
Gray hawkbeard	<i>Crepis intermedia</i>	CRIN4	CRIN
Gray horsebrush	<i>Tetradymia canescens</i>	TECA2	TECA
Gray rabbitbrush	<i>Chrysothamnus nauseosus</i>	CHNA2	CHNA
Gray rabbitbrush	<i>Chrysothamnus nauseosus var. nanus</i>	CHNAN2	CHNAN
Gray-green thistle	<i>Cirsium canovirens</i>	CICA6	CICA2
Gray's lomatium	<i>Lomatium grayi</i>	LOGR	LOGR
Great Basin nemophila	<i>Nemophila breviflora</i>	NEBR	NEBR
Green fescue	<i>Festuca viridula</i>	FEVI	FEVI
Green rabbitbush	<i>Chrysothamnus viscidiflorus</i>	CHVI8	CHVI
Green's goldenweed	<i>Haplopappus greenei</i>	HAGR6	HAGR
Groundsel	<i>Senecio</i>	SENEC	SENEC
Groundsmoke	<i>Gayophytum</i>	GAYOP	GAYOP
Hairstem groundsmoke	<i>Gayophytum ramosissimum</i>	GARA2	GARA
Hairy balsamroot	<i>Balsamorhiza hirsuta</i>	BAHI	BAHI
Hairy brome	<i>Bromus commutatus</i>	BRCO4	BRCO
Hairy owl-clover	<i>Orthocarpus hispidus</i>	ORHI	ORHI
Hairy penstemon	<i>Castilleja pilosa</i>	CAPI3	CAPI2
Hairy rockcress	<i>Arabis hirsuta</i>	ARHI	ARHI
Hairystem rockcress	<i>Arabis perelegans</i>	ARPE11	ARPE
Hareleaf	<i>Lagophylla ramosissima</i>	LARA	LARA
Harkness' linanthus	<i>Linanthus harknessii</i>	LIHA	LIHA
Harsh paintbrush	<i>Castilleja hispida</i>	CAHI9	CAHI2
Harsh paintbrush	<i>Castilleja hispida var. acuta</i>	CAHIA2	CAHIA
Hawksbeard	<i>Crepis</i>	CREPI	CREPI
Hawkweed	<i>Hieracium</i>	HIERA	HIERA
Heartleaf arnica	<i>Arnica cordifolia</i>	ARCO9	ARCO
Heart-leaved buckwheat	<i>Eriogonum compositum</i>	ERCO12	ERCO5
Henderson's lomatium	<i>Lomatium hendersonii</i>	LOHE2	LOHE
Hoary balsamroot	<i>Balsamorhiza incana</i>	BAIN	BAIN
Hoary chaenactis	<i>Chaenactis douglasii</i>	CHDO	CHDO
Hoary chaenactis	<i>Chaenactis douglasii var. achilleaefolia</i>	CHDOA	CHDOA
Holboell's rockcress	<i>Arabis holboellii</i>	ARHO2	ARHO
Holboell's rockcress	<i>Arabis holboellii var. retrofracta</i>	ARHOR	ARHOR
Hood's phlox	<i>Phlox hoodii</i>	PHHO	PHHO
Hood's sedge	<i>Carex hoodii</i>	CAHO5	CAHO
Hot rock penstemon	<i>Penstemon deustus</i>	PEDE4	PEDE
Hot rock penstemon	<i>Penstemon deustus var. variabilis</i>	PEDEV	PEDEV
Idaho fescue	<i>Festuca idahoensis</i>	FEID	FEID
Intermediate wheatgrass	<i>Agropyron intermedium</i>	AGIN2	AGIN2
Interrupted bentgrass	<i>Agrostis interrupta</i>	AGIN4	AGIN3
Japanese brome	<i>Bromus japonicus</i>	BRJA	BRJA
Kentucky bluegrass	<i>Poa pratensis</i>	POPR	POPR
Knotweed	<i>Polygonum</i>	POLYG4	POLYG
Lacepod	<i>Thysanocarpus curvipes</i>	THCU	THCU
Lanceleaf stonecrop	<i>Sedum lanceolatum</i>	SELA	SELA2
Largeflower goldenweed	<i>Haplopappus carthamoides</i>	HACA5	HACA
Large-flowered agoseris	<i>Agoseris grandiflora</i>	AGGR	AGGR
Large-flowered collomia	<i>Collomia grandiflora</i>	COGR4	COGR2
Large-fruited lomatium	<i>Lomatium macrocarpum</i>	LOMA3	LOMA
Larkspur	<i>Delphinium</i>	DELPH	DELPH
Leiberg's bluegrass	<i>Poa vaseyochloa</i>	POVA	POVA
Lemmon's needlegrass	<i>Stipa lemmonii</i>	STLE2	STLE2

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Lemon-scented tarweed	<i>Madia citriodora</i>	MACI2	MACI
Leptodactylon	<i>Leptodactylon pungens</i>	LEPU	LEPU2
Letterman's needlegrass	<i>Stipa lettermanii</i>	STLE4	STLE
Lewis' mock-orange	<i>Philadelphus lewisii</i>	PHLE4	PHLE2
Lindley's microseris	<i>Microseris linearifolia</i>	MILI	MILI
Little oniongrass	<i>Melica fugax</i>	MEFU	MEFU
Little sunflower	<i>Helianthella uniflora</i>	HEUN	HEUN
Little-flowered lupine	<i>Lupinus holosericeus</i>	LUHO2	LUHO
Littleleaf horsebrush	<i>Tetradymia glabrata</i>	TEGL	TEGL
Locoweed or milkvetch	<i>Astragalus</i>	ASTRA	ASTRA
Lodgepole pine	<i>Pinus contorta</i>	PICO	PICO
Longleaf evening-primrose	<i>Oenothera heterantha</i>	OEHE	OEHE
Longleaf milkvetch	<i>Astragalus reventus</i> var. <i>reventus</i>	ASRE5	ASRER
Longleaf phlox	<i>Phlox longifolia</i>	PHLO2	PHLO
Longstalk clover	<i>Trifolium longipes</i>	TRLO	TRLO
Lovage	<i>Ligusticum</i>	LIGUS	LIGUS
Low gumweed	<i>Grindelia nana</i>	GRNA	GRNA
Low penstemon	<i>Penstemon humilis</i>	PEHU	PEHU
Low pussytoes	<i>Antennaria dimorpha</i>	ANDI2	ANDI
Low sagebrush	<i>Artemisia arbuscula</i>	ARAR8	ARAR
Lupine	<i>Lupinus</i>	LUPIN	LUPIN
Mallow ninebark	<i>Physocarpus malvaceus</i>	PHMA5	PHMA
Manyflower stickseed	<i>Hackelia floribunda</i>	HAFL2	HAFL
Many-flowered phlox	<i>Phlox multiflora</i>	PHMU3	PHMU
Many-ribbed sedge	<i>Carex multicosata</i>	CAMU6	CAMU
Meadow deathcamus	<i>Zigadenus venenosus</i>	ZIVE	ZIVE
Meadow deathcamus	<i>Zigadenus venenosus</i> var. <i>gramineus</i>	ZIVEG	ZIVEG
Meadow foxtail	<i>Alopecurus pratensis</i>	ALPR3	ALPR
Medusahead	<i>Elymus caput-medusae</i>	ELCA13	ELCA2
Menzies larkspur	<i>Delphinium menziesii</i>	DEME	DEME
Mexican milkweed	<i>Asclepias fascicularis</i>	ASFA	ASFA2
Microseris	<i>Microseris</i>	MICRO6	MICRO3
Miner's lettuce	<i>Montia perfoliata</i>	MOPE3	MOPE
Missouri goldenrod	<i>Solidago missouriensis</i>	SOMI2	SOMI
Mountain big sagebrush	<i>Artemisia tridentata</i> var. <i>vaseyana</i>	ARTRV	ARTRV
Mountain brome	<i>Bromus carinatus</i>	BRCA5	BRCA
Mountain gooseberry	<i>Ribes montigenum</i>	RIMO2	RIMO
Mountain monardella	<i>Monardella odoratissima</i>	MOOD	MOOD
Mountain phlox	<i>Phlox austromontana</i>	PHAU3	PHAU
Mountain snowberry	<i>Symphoricarpos oreophilus</i>	SYOR2	SYOR
Mountain sweet-cicely	<i>Osmorhiza chilensis</i>	OSCH	OSCH
Naked broomrape	<i>Orobanche uniflora</i>	ORUN	ORUN
Naked broomrape	<i>Orobanche uniflora</i> var. <i>purpurea</i>	ORUNP	ORUNP
Narrowleaf goldenweed	<i>Haplopappus stenophyllus</i>	HAST	HAST2
Narrowleaf miner's lettuce	<i>Montia linearis</i>	MOLI4	MOLI
Narrowleaf pussytoes	<i>Antennaria stenophylla</i>	ANST2	ANST
Narrowleaf skullcap	<i>Scutellaria angustifolia</i>	SCAN3	SCAN
Narrow-leaved collomia	<i>Collomia linearis</i>	COLI2	COLI2
Needlegrass	<i>Stipa</i>	STIPA	STIPA
Needleleaf navarretia	<i>Navarretia intertexta</i>	NAIN2	NAIN
Nettleleaf horsemint	<i>Agastache urticifolia</i>	AGUR	AGUR
Nineleaf lomatium	<i>Lomatium triternatum</i>	LOTR2	LOTR
Nineleaf lomatium	<i>Lomatium triternatum</i> var. <i>platycarpum</i>	LOTRP	LOTRP
Nineleaf lomatium	<i>Lomatium triternatum</i> var. <i>triternatum</i>	LOTRT	LOTRT
Nodding microseris	<i>Microseris nutans</i>	MINU	MINU

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Nootka rose	<i>Rosa nutkana</i>	RONU	RONU
Northern linanthus	<i>Linanthus septentrionalis</i>	LISE	LISE
Northern mule's ears	<i>Wyethia amplexicaulis</i>	WYAM	WYAM
Nuttall's draba	<i>Draba densifolia</i>	DRDE	DRDE
Nuttall's linanthastrum	<i>Linanthastrum nuttallii</i>	LINU4	LINU
Nuttall's sandwort	<i>Arenaria nuttallii</i> var. <i>fragilis</i>	ARNUF	ARNUF
Oatgrass	<i>Danthonia</i>	DANTH	DANTH
Obscure cryptantha	<i>Cryptantha ambigua</i>	CRAM3	CRAM
Old man of the mountains	<i>Hymenoxys grandiflora</i>	HYGR5	HYGR
Onespike oatgrass	<i>Danthonia unispicata</i>	DAUN	DAUN
Oniongrass	<i>Melica</i>	MELIC	MELIC
Oniongrass	<i>Melica bulbosa</i>	MEBU	MEBU
Orange arnica	<i>Arnica fulgens</i>	ARFU3	ARFU
Orchardgrass	<i>Dactylis glomerata</i>	DAGL	DAGL
Oregon catchfly	<i>Silene oregana</i>	SIOR3	SIOR2
Oregon checker-mallow	<i>Sidalcea oregana</i>	SIOR	SIOR
Oregon cliff fern	<i>Woodsia oregana</i>	WOOR	WOOR
Oregon twinpod	<i>Physaria oregana</i>	PHOR2	PHOR
Oval-leaved eriogonum	<i>Eriogonum ovalifolium</i>	EROV	EROV
Paintbrush	<i>Castilleja</i>	CASTI2	CASTI
Pale agoseris	<i>Agoseris glauca</i>	AGGL	AGGL
Pale agoseris	<i>Agoseris glauca</i> var. <i>laciniata</i>	AGGLL	AGGLL
Pale alyssum	<i>Alyssum alyssoides</i>	ALAL3	ALAL
Pale Wallowa paintbrush	<i>Castilleja oresbia</i>	CAOR4	CAOR3
Palouse thistle	<i>Cirsium brevifolium</i>	CIBR	CIBR
Panicled deathcamas	<i>Zigadenus paniculatus</i>	ZIPA2	ZIPA
Parry's rush	<i>Juncus parryi</i>	JUPA	JUPA
Peavine	<i>Lathyrus</i>	LATHY	LATHY
Penstemon	<i>Penstemon</i>	PENST	PENST
Phacelia	<i>Phacelia</i>	PHACE	PHACE
Phlox	<i>Phlox</i>	PHLOX	PHLOX
Pin cushion plant	<i>Navarretia intertexta</i> var. <i>propinqua</i>	NAINP3	NAINP
Pine bluegrass	<i>Poa scabrella</i>	POSC	POSC
Pinegrass	<i>Calamagrostis rubescens</i>	CARU	CARU
Pink microsteris	<i>Microsteris gracilis</i>	MIGR	MIGR
Podfern	<i>Aspidotis densa</i>	ASDE6	ASDE
Ponderosa pine	<i>Pinus ponderosa</i>	PIPO	PIPO
Prairie junegrass	<i>Koeleria cristata</i>	KOCR	KOCR
Prairie lupine	<i>Lupinus lepidus</i>	LULE2	LULE2
Prairie lupine	<i>Lupinus lepidus</i> var. <i>utahensis</i>	LULEU2	LULEU
Prickly lettuce	<i>Lactuca serriola</i>	LASE	LASE
Prickly sandwort	<i>Arenaria aculeata</i>	ARAC2	ARAC2
Pubescent wheatgrass	<i>Agropyron trichophorum</i>	AGTR6	AGTR2
Pussy clover	<i>Trifolium plumosum</i>	TRPL2	TRPL
Pussypaws	<i>Spraguea umbellata</i>	SPUM	SPUM
Pussytoes	<i>Antennaria</i>	ANTEN	ANTEN
Pyrenaean sedge	<i>Carex pyrenaica</i>	CAPY3	CAPY
Rat-tail fescue	<i>Festuca myuros</i>	FEMY2	FEMY
Rattlesnake brome	<i>Bromus brizaeformis</i>	BRBR7	BRBR
Rayless fleabane	<i>Erigeron aphanactis</i>	ERAP	ERAP
Raynolds' sedge	<i>Carex raynoldsii</i>	CARA6	CARA
Red avens	<i>Geum triflorum</i>	GETR	GETR
Red avens	<i>Geum triflorum</i> var. <i>ciliatum</i>	GETRC2	GETRC2
Red besseyia	<i>Besseyia rubra</i>	BERU	BERU
Reedgrass or pinegrass	<i>Calamagrostis</i>	CALAM	CALAM

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Rigid fiddleneck	<i>Amsinckia retrorsa</i>	AMRE2	AMRE2
Rigid peavine	<i>Lathyrus rigidus</i>	LARI	LARI
Rigiopappus	<i>Rigiopappus leptocladus</i>	RILE2	RILE
Rock buckwheat	<i>Eriogonum sphaerocephalum</i>	ERSP7	ERSP3
Rock lupine	<i>Lupinus saxosus</i>	LUSA2	LUSA
Rockbrake	<i>Cryptogramma crista</i>	CRCRA2	CRCR
Rockcress	<i>Arabis</i>	ARABI2	ARABI
Rocky Mountain butterweed	<i>Senecio streptanthifolius</i>	SEST3	SEST2
Rocky Mountain iris	<i>Iris missouriensis</i>	IRMI	IRMI
Rose	<i>Rosa</i>	ROSA5	ROSA
Ross' sedge	<i>Carex rossii</i>	CARO5	CARO
Rosy pussytoes	<i>Antennaria microphylla</i>	ANMI3	ANMI2
Rosy pussytoes	<i>Antennaria rosea</i>	ANRO2	ANRO
Rough wallflower	<i>Erysimum asperum</i>	ERAS2	ERAS
Roundleaf alumroot	<i>Heuchera cylindrica</i>	HECY2	HECY
Rush	<i>Juncus</i>	JUNCU	JUNCU
Rydberg's penstemon	<i>Penstemon rydbergii</i>	PERY	PERY
Ryebrome	<i>Bromus secalinus</i>	BRSE	BRSE
Sagebrush mariposa	<i>Calochortus macrocarpus</i>	CAMA5	CAMA
Salsify	<i>Tragopogon</i>	TRAGO	TRAGO
Sand lily	<i>Leucocrinum montanum</i>	LEMO4	LEMO
Sandberg's bluegrass	<i>Poa sandbergii</i>	POSA12	POSA3
Sandberg's bluegrass	<i>Poa secunda</i>	POSE	POSE
Sandwort	<i>Arenaria</i>	ARENA	ARENA
Scabland fleabane	<i>Erigeron bloomeri</i>	ERBL	ERBL
Scapose silene	<i>Silene scaposa</i>	SISC	SISC2
Scarlet gilia	<i>Gilia aggregata</i>	GIAG	GIAG
Scarlet paintbrush	<i>Castilleja miniata</i>	CAMI12	CAMI2
Sedge	<i>Carex</i>	CAREX	CAREX
Sego lily	<i>Calochortus</i>	CALOC	CALOC
Serrate balsamroot	<i>Balsamorhiza serrata</i>	BASE2	BASE
Shaggy fleabane	<i>Erigeron pumilus</i>	ERPU2	ERPU
Shaggy fleabane	<i>Erigeron pumilus</i> var. <i>intermedius</i>	ERPUI	ERPUI
Shaggy fleabane	<i>Erigeron pumilus</i> ssp. <i>intermedius</i> var. <i>gracilior</i>	ERPUG	ERPUG
Sharptooth angelica	<i>Angelica arguta</i>	ANAR3	ANAR2
Sheep fescue	<i>Festuca ovina</i>	FEOV	FEOV
Sheep fescue	<i>Festuca ovina</i> var. <i>rydbergii</i>	FEOVR	FEOVR
Sheep sorrel	<i>Rumex acetosella</i>	RUAC3	RUAC
Sheldon's milkvetch	<i>Astragalus reventus</i> var. <i>sheldonii</i>	ASRES	ASRES
Shiny fraseria	<i>Frasera albicaulis</i> var. <i>nitida</i>	FRALN2	FRALN
Shootingstar	<i>Dodecatheon</i>	DODEC	DODEC
Showy aster	<i>Aster conspicuus</i>	ASCO3	ASCO
Showy fleabane	<i>Erigeron speciosus</i>	ERSP4	ERSP
Showy oniongrass	<i>Melica spectabilis</i>	MESP	MESP
Showy penstemon	<i>Penstemon speciosus</i>	PESP	PESP
Shrubby bedstraw	<i>Galium multiflorum</i>	GAMU2	GAMU
Side-flowered mitrewort	<i>Mitella stauropetala</i>	MIST3	MIST2
Sierra sanicle	<i>Sanicula graveolens</i>	SAGR5	SAGR
Sierran peavine	<i>Lathyrus nevadensis</i>	LANE3	LANE
Silky lupine	<i>Lupinus sericeus</i>	LUSE4	LUSE
Silky lupine	<i>Lupinus sericeus</i> var. <i>sericeus</i>	LUSES2	LUSES
Silky phacelia	<i>Phacelia sericea</i>	PHSE	PHSE
Silverleaf phacelia	<i>Phacelia hastata</i>	PHHA	PHHA
Silverleaf phacelia	<i>Phacelia hastata</i> var. <i>alpina</i>	PHHAA	PHHAA
Silverleaf phacelia	<i>Phacelia hastata</i> var. <i>leucophylla</i>	PHHAL	PHHAL

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Siskiyou hawksbeard	<i>Crepis modocensis</i>	CRMO4	CRMO3
Slender buckwheat	<i>Eriogonum microthecum</i> var. <i>laxiflorum</i>	ERMIL5	ERMIL
Slender cinquefoil	<i>Potentilla gracilis</i>	POGR9	POGR
Slender cinquefoil	<i>Potentilla gracilis</i> var. <i>glabrata</i>	POGRG	POGRG
Slender cryptantha	<i>Cryptantha affinis</i>	CRAF	CRAF
Slender cudweed	<i>Gnaphalium microcephalum</i>	GNMI	GNMI
Slender hawksbeard	<i>Crepis atrabarba</i>	CRAT	CRAT
Slender hawksbeard	<i>Crepis atrabarba</i> var. <i>originalis</i>	CRATO	CRATO
Slender rush	<i>Juncus tenuis</i>	JUTE	JUTE
Slender rush	<i>Juncus tenuis</i> var. <i>tenuis</i>	JUTE	JUTET
Slender tarweed	<i>Madia gracilis</i>	MAGR3	MAGR
Slender toothwort	<i>Cardamine pulcherrima</i>	CAPU4	CAPU2
Slenderfruit lomatium	<i>Lomatium leptocarpum</i>	LOLE2	LOLE
Slim larkspur	<i>Delphinium depauperatum</i>	DEDE2	DEDE
Slimpod shootingstar	<i>Dodecatheon conjugens</i>	DOCO	DOCO
Small fescue	<i>Festuca microstachys</i>	FEMI2	FEMI
Small flowered blue-eyed Mary	<i>Collinsia parviflora</i>	COPA3	COPA
Smallflower fringecup	<i>Lithophragma parviflora</i>	LIPAP3	LIPA
Smallflower nemophila	<i>Nemophila parviflora</i>	NEPA	NEPA
Small-flowered willowherb	<i>Epilobium minutum</i>	EPMI	EPMI
Small-head tarweed	<i>Madia minima</i>	MAMI	MAMI
Smooth brome	<i>Bromus inermis</i>	BRIN2	BRIN
Snowbrush ceanothus	<i>Ceanothus velutinus</i>	CEVE	CEVE
Snowline cymopterus	<i>Cymopterus nivalis</i>	CYN13	CYNI
Soft brome	<i>Bromus mollis</i>	BRMO2	BRMO
Spike bentgrass	<i>Agrostis exarata</i>	AGEX	AGEX
Spreading dogbane	<i>Apocynum androsaemifolium</i>	APAN2	APAN
Spreading dogbane	<i>Apocynum androsaemifolium</i> var. <i>pumilum</i>	APANP	APANP
Spreading fleabane	<i>Erigeron divergens</i>	ERDI4	ERDI
Spreading groundsmoke	<i>Gayophytum diffusum</i>	GADI2	GADI
Spreading phlox	<i>Phlox diffusa</i>	PHDI3	PHDI
Spurred lupine	<i>Lupinus laxiflorus</i>	LULA3	LULA2
Spurred lupine	<i>Lupinus laxiflorus</i> var. <i>laxiflorus</i>	LULAA	LULAL3
Spurred lupine	<i>Lupinus laxiflorus</i> var. <i>pseudoparviflorus</i>	LULAP5	LULAP
Squaw apple	<i>Peraphyllum ramosissimum</i>	PERA4	PERA3
Stemless goldenweed	<i>Haplopappus acaulis</i>	HAAC	HAAC
Sticky cinquefoil	<i>Potentilla glandulosa</i>	POGL9	POGL
Sticky currant	<i>Ribes viscosissimum</i>	RIVI3	RIVI
Sticky geranium	<i>Geranium viscosissimum</i>	GEVI2	GEVI
Stiff milkvetch	<i>Astragalus conjunctus</i>	ASCO11	ASCO3
Stiff sagebrush	<i>Artemisia rigida</i>	ARRI2	ARRI
Stoncrop	<i>Sedum</i>	SEDUM	SEDUM
Strict buckwheat	<i>Eriogonum strictum</i>	ERST4	ERST2
Strict buckwheat	<i>Eriogonum strictum</i> var. <i>proliferum</i>	ERSTP	ERSTP
Strict buckwheat	<i>Eriogonum strictum</i> ssp. <i>proliferum</i> var. <i>anserinum</i>	ERSTA3	ERSTA3
Subalpine fir	<i>Abies lasiocarpa</i>	ABLA	ABLA2
Sugar bowls	<i>Clematis hirsutissima</i>	CLHI	CLHI
Sulfur penstemon	<i>Penstemon attenuatus</i>	PEAT3	PEAT
Sulfur penstemon	<i>Penstemon attenuatus</i> var. <i>militaris</i>	PEATM	PEATM
Sulfur penstemon	<i>Penstemon attenuatus</i> var. <i>pseudoprocerus</i>	PEATP2	PEATP
Sulfur-flower buckwheat	<i>Eriogonum umbellatum</i>	ERUM	ERUM
Sulfur-flower buckwheat	<i>Eriogonum umbellatum</i> var. <i>polyanthum</i>	ERUMP3	ERUMP
Sulfur-flower buckwheat	<i>Eriogonum umbellatum</i> var. <i>stellatum</i>	ERUMS5	ERUMS
Sulfur-flower buckwheat	<i>Eriogonum umbellatum</i> var. <i>umbellatum</i>	ERUMU2	ERUMU
Sulphur lupine	<i>Lupinus sulphureus</i>	LUSU5	LUSU

Common name	Scientific name ¹	PLANTS code ²	R6 code ³
Swale desert-parsley	<i>Lomatium ambiguum</i>	LOAM	LOAM
Swamp saxifrage	<i>Saxifraga fragosa</i>	SAFR7	SAFR
Swamp saxifrage	<i>Saxifraga integrifolia</i>	SAIN4	SAIN
Swamp saxifrage	<i>Saxifraga integrifolia</i> var. <i>columbiana</i>	SAINC2	SAINC
Sweet-cicely	<i>Osmorhiza</i>	OSMOR	OSMOR
Tailcup lupine	<i>Lupinus caudatus</i>	LUCA	LUCA
Tall annual willowherb	<i>Epilobium paniculatum</i>	EPPA2	EPPA
Tall pussytoes	<i>Antennaria anaphaloides</i>	ANAN2	ANAN
Tansymustard	<i>Descurainia</i>	DESCU	DESCU
Tapertip hawksbeard	<i>Crepis acuminata</i>	CRAC2	CRAC
Tapertip onion	<i>Allium acuminatum</i>	ALAC4	ALAC
Tarweed	<i>Madia</i>	MADIA	MADIA
Thick-leaved peavine	<i>Lathyrus lanszwertii</i>	LALA3	LALA2
Thickstem aster	<i>Aster integrifolius</i>	ASIN3	ASIN
Thinleaf owl-clover	<i>Orthocarpus tenuifolius</i>	ORTE2	ORTE
Thistle	<i>Cirsium</i>	CIRSI	CIRSI
Threadleaf fleabane	<i>Erigeron filifolius</i>	ERFI2	ERFI
Threadleaf phacelia	<i>Phacelia linearis</i>	PHLI	PHLI
Threadleaf sandwort	<i>Arenaria capillaris</i>	ARCA7	ARCA2
Threadleaf sedge	<i>Carex filifolia</i>	CAFI	CAFI
Threetip sagebrush	<i>Artemisia tripartita</i>	ARTR4	ARTR2
Thurber's needlegrass	<i>Stipa thurberiana</i>	STTH2	STTH
Thymeleaf sandwort	<i>Arenaria serpyllifolia</i>	ARSE2	ARSE
Tolm's onion	<i>Allium tolmiei</i>	ALTO	ALTO
Torrey's cryptantha	<i>Cryptantha torreyana</i>	CRT04	CRT0
Tufted phlox	<i>Phlox caespitosa</i>	PHCA7	PHCA2
Turpentine cymopterus	<i>Cymopterus terebinthinus</i>	CYTE9	CYTE
Turpentine cymopterus	<i>Cymopterus terebinthinus</i> var. <i>foeniculaceus</i>	CYTEF	CYTEF
Twin arnica	<i>Arnica sororia</i>	ARSO2	ARSO
Upland larkspur	<i>Delphinium nuttallianum</i>	DENU2	DENU3
Utah thistle	<i>Cirsium utahense</i>	CIUT	CIUT
Valerianella	<i>Valerianella locusta</i>	VALO	VALO
Varileaf phacelia	<i>Phacelia heterophylla</i>	PHHE2	PHHE
Velvet lupine	<i>Lupinus leucophyllus</i>	LULE3	LULE
Velvet lupine	<i>Lupinus leucophyllus</i> var. <i>leucophyllus</i>	LULEL4	LULEL
Velvet lupine	<i>Lupinus leucophyllus</i> var. <i>tenuispicus</i>	LULET	LULET
Ventenata	<i>Ventenata dubia</i>	VEDU	VEDU
Violet	<i>Viola</i>	VIOLA	VIOLA
Virginia strawberry	<i>Fragaria virginiana</i>	FRVI	FRVI
Virginia strawberry	<i>Fragaria virginiana</i> var. <i>platypetala</i>	FRVIP2	FRVIP
Wall rockcress	<i>Arabis aculeolata</i>	ARAC4	ARAC
Waterleaf	<i>Hydrophyllum capitatum</i>	HYCA4	HYCA
Wavy-leaved paintbrush	<i>Castilleja applegatei</i>	CAAP4	CAAP2
Wax currant	<i>Ribes cereum</i>	RICE	RICE
Wayside gromwell	<i>Lithospermum ruderales</i>	LIRU4	LIRU
Webber's ricegrass	<i>Oryzopsis webberi</i>	ORWE	ORWE
Western false solomon's seal	<i>Smilacina racemosa</i>	SMRA	SMRA
Western groundsel	<i>Senecio integerrimus</i>	SEIN2	SEIN
Western groundsel	<i>Senecio integerrimus</i> var. <i>exaltatus</i>	SEINE	SEINE
Western hawksbeard	<i>Crepis occidentalis</i>	CROC	CROC
Western hawksbeard	<i>Crepis occidentalis</i> var. <i>costata</i>	CROCC2	CROCC
Western hawkweed	<i>Hieracium albertinum</i>	HIAL	HIAL2
Western juniper	<i>Juniperus occidentalis</i>	JUOC	JUOC
Western meadowrue	<i>Thalictrum occidentale</i>	THOC	THOC
Western mugwort	<i>Artemisia ludoviciana</i>	ARLU	ARLU

Common name	Scientific name ¹	PLANTS code ²	R6 code ³
Western needlegrass	<i>Stipa occidentalis</i>	STOC2	STOC
Western needlegrass	<i>Stipa occidentalis</i> var. <i>occidentalis</i>	STOC2	STOCO
Western serviceberry	<i>Amelanchier alnifolia</i>	AMAL2	AMAL
Western sweetroot	<i>Osmorhiza occidentalis</i>	OSOC	OSOC
Wheeler's bluegrass	<i>Poa nervosa</i>	PONE2	PONE
Wheeler's bluegrass	<i>Poa nervosa</i> var. <i>wheeleri</i>	PONEW	PONEW
White hawkweed	<i>Hieracium albiflorum</i>	HIAL2	HIAL
White mustard	<i>Brassica hirta</i>	BRHI2	BRHI
White plectritis	<i>Plectritis macrocera</i>	PLMA4	PLMA3
Whitebark pine	<i>Pinus albicaulis</i>	PIAL	PIAL
White-margined knotweed	<i>Polygonum polygaloides</i>	POPO4	POPO
Whitestem frasera	<i>Frasera albicaulis</i>	FRAL2	FRAL2
Whitestem mentzelia	<i>Mentzelia albicaulis</i>	MEAL6	MEAL2
Wide fruit mariposa	<i>Calochortus eurycarpus</i>	CAEU	CAEU2
Widefruit sedge	<i>Carex eurycarpa</i>	CAEU2	CAEU
Wild blue flax	<i>Linum perenne</i> var. <i>lewisii</i>	LIPEL3	LIPEL
Wild onion	<i>Allium</i>	ALLIU	ALLIU
Willowherb	<i>Epilobium</i>	EPILO	EPILO
Wirestem muhly	<i>Muhlenbergia mexicana</i>	MUME2	MUME
Wiry knotweed	<i>Polygonum majus</i>	POMA9	POMA2
Woodrush pussytoes	<i>Antennaria luzuloides</i>	ANLU2	ANLU
Woolly eriophyllum	<i>Eriophyllum lanatum</i>	ERLA6	ERLA
Woolly goldenweed	<i>Haplopappus lanuginosus</i>	HALA3	HALA
Woolly groundsel	<i>Senecio canus</i>	SECA2	SECA
Woollyhead clover	<i>Trifolium eriocephalum</i> var. <i>piperi</i>	TRERP2	TRERP
Woollypod milkvetch	<i>Astragalus purshii</i>	ASPU9	ASPU
Woollypod milkvetch	<i>Astragalus purshii</i> var. <i>lagopinus</i>	ASPUL	ASPUL
Woolly-weed	<i>Hieracium scouleri</i>	HISC2	HISC
Wormleaf stonecrop	<i>Sedum douglasii</i>	SEDO3	SEDO
Wormleaf stonecrop	<i>Sedum stenopetalum</i>	SEST2	SEST
Wyeth's lupine	<i>Lupinus wyethii</i>	LUWY	LUWY
Wyoming Indian paintbrush	<i>Castilleja linariaefolia</i>	CALI4	CALI2
Yampah	<i>Perideridia</i>	PERID	PERID
Yellow monkeyflower	<i>Mimulus guttatus</i>	MIGU	MIGU
Yellow salsify	<i>Tragopogon dubius</i>	TRDU	TRDU
Yellow star-thistle	<i>Centaurea solstitialis</i>	CESO3	CESO

¹Hitchcock and Cronquist 1973.²USDA, NRCS 2004b.³Garrison and Skovlin 1976.

Appendix C: Vegetation Types by Ecoclass Code

Ecoclass code	Short name	Long name	Level ¹	PAG ²
CJG111	JUOC/FEID-AGSP	Western juniper/Idaho fescue-bluebunch wheatgrass	PA	Hot moist UW
CJG113	JUOC/AGSP	Western juniper/bluebunch wheatgrass	PCT	Hot dry UW
CJS112	JUOC/ARAR8/FEID	Western juniper/low sagebrush/Idaho fescue	PA	Hot dry UW
CJS321	JUOC/PUTR2/FEID-AGSP	Western juniper/bitterbrush/Idaho fescue-bluebunch wheatgrass	PA	Hot moist UW
CJS41	JUOC/CELE3/FEID-AGSP	Western juniper/mountain mahogany/Idaho fescue-bluebunch wheatgrass	PA	Hot moist UW
CJS811	JUOC/ARRI2-Scab	Western juniper/stiff sagebrush	PCT	Hot dry UW
CPC212	PIPO-JUOC/CELE3-SYOR2	Ponderosa pine-western juniper/mountain mahogany-mountain snowberry	PCT	Hot dry UF
CPG111	PIPO/AGSP	Ponderosa pine/bluebunch wheatgrass	PA	Hot dry UF
CPG112	PIPO/FEID	Ponderosa pine/Idaho fescue	PA	Hot dry UF
CPS131	PIPO/ARTRV/FEID-AGSP	Ponderosa pine/mountain big sagebrush/Idaho fescue-bluebunch wheatgrass	PA	Hot dry UF
CPS226	PIPO/PUTR2/FEID-AGSP	Ponderosa pine/bitterbrush/Idaho fescue-bluebunch wheatgrass	PA	Hot dry UF
CPS229	PIPO/PUTR2/AGSP-POSA12	Ponderosa pine/bitterbrush/bluebunch wheatgrass-Sandberg's bluegrass	PA	Hot dry UF
CPS233	PIPO/CELE3/PONEW	Ponderosa pine/mountain mahogany/Wheeler's bluegrass	PA	Hot dry UF
CPS234	PIPO/CELE3/FEID-AGSP	Ponderosa pine/mountain mahogany/Idaho fescue-bluebunch wheatgrass	PA	Hot dry UF
CPS8	PIPO/PERA4	Ponderosa pine/squaw apple	PCT	Hot dry UF
FM9111	ERDO-POSA12	Douglas' buckwheat-Sandberg's bluegrass	PCT	Hot dry UH
GB4112	AGSP-POSA12-SCAN3	Bluebunch wheatgrass-Sandberg's bluegrass-narrowleaf skullcap	PA	Hot dry UH
GB4119	AGSP-POSA12-LUPIN	Bluebunch wheatgrass-Sandberg's bluegrass-lupine	PA	Hot dry UH
GB4121	AGSP-POSA12	Bluebunch wheatgrass-Sandberg's bluegrass	PA	Hot dry UH
GB4123	AGSP-POSA12-BASA3	Bluebunch wheatgrass-Sandberg's bluegrass-arrowleaf balsamroot	PA	Hot dry UH
GB4124	AGSP-POSA12-ERHE2	Bluebunch wheatgrass-Sandberg's bluegrass-creamy buckwheat	PA	Hot dry UH
GB4125	AGSP-POSA12-ASRE5	Bluebunch wheatgrass-Sandberg's bluegrass-Blue Mountain milkvetch	PA	Hot dry UH
GB4126	AGSP-POSA12-TRMA3	Bluebunch wheatgrass-Sandberg's bluegrass-bighead clover	PA	Hot dry UH
GB4127	AGSP-POSA12-APAN2	Bluebunch wheatgrass-Sandberg's bluegrass-spreading dogbane	PA	Hot dry UH
GB4131	AGSP-BRCA5	Bluebunch wheatgrass-mountain brome	PCT	Warm moist UH
GB4132	AGSP-ERUM	Bluebunch wheatgrass-sulfur-flower buckwheat	PCT	Hot dry UH
GB4133	AGSP-CYTEF	Bluebunch wheatgrass-turpentine cymopterus	PCT	Hot dry UH
GB4411	POBU-MAGL2	Bulbous bluegrass-cluster tarweed	PCT	Hot dry UH
GB4911	AGSP-POSA12-DAUN	Bluebunch wheatgrass-Sandberg's bluegrass-onespike oatgrass	PA	Hot dry UH
GB4915	BERE/AGSP-APAN2	Creeping Oregon grape/bluebunch wheatgrass-spreading dogbane	PCT	Warm dry US
GB5011	MEBU-STOC2	Oniongrass-western needlegrass	PCT	Warm dry UH
GB59	FEID-AGSP	Idaho fescue-bluebunch wheatgrass	PA	Warm moist UH
GB5911	FEID-KOCR (Ridge)	Idaho fescue-prairie junegrass (ridge)	PA	Cool moist UH
GB5912	FEID-KOCR (Mound)	Idaho fescue-prairie junegrass (mound)	PA	Cool moist UH
GB5916	FEID-AGSP-LUPIN	Idaho fescue-bluebunch wheatgrass-lupine	PA	Warm moist UH
GB5917	FEID-AGSP-BASA3	Idaho fescue-bluebunch wheatgrass-arrowleaf balsamroot	PA	Warm moist UH
GB5923	FEID-GETR	Idaho fescue-red avens	PCT	Cool moist UH

Ecoclass code	Short name	Long name	Level ¹	PAG ²
GB5925	FEID-AGSP-CYTEF	Idaho fescue-bluebunch wheatgrass-cymopterus	PA	Warm dry UH
GB5926	FEID-AGSP-FRALC2	Idaho fescue-bluebunch wheatgrass-Cusick's frasera	PA	Cool moist UH
GB5931	FEID-AGSP-PHLOX	Idaho fescue-bluebunch wheatgrass-phlox	PA	Warm moist UH
GB5932	FEID-DAUN	Idaho fescue-onespike oatgrass	PCT	Warm dry UH
GB9111	POSA12-DAUN	Sandberg's bluegrass-onespike oatgrass	PA	Hot dry UH
GB9114	DAUN-LOLE2	Onespike oatgrass-slenderfruit lomatium	PA	Hot moist UH
GS1112	FEVI-LULA3	Green fescue-spurred lupine	PA	Cold moist UH
GS1113	FEVI-JUPA	Green fescue-Parry's rush	PA	Cold dry UH
GS1115	FEVI-PENST	Green fescue-penstemon	PCT	Cold moist UH
GS50	STOC2-SIHY (Alpine)	Western needlegrass-squirreltail	PCT	Warm dry UH
SD1911	ARAR8/FEID-AGSP	Low sagebrush/Idaho fescue-bluebunch wheatgrass	PA	Warm moist US
SD1924	ARAR8/AGSP	Low sagebrush/bluebunch wheatgrass	PA	Warm dry US
SD2401	ARTR4/POSA12-DAUN	Threetip sagebrush/Sandberg's bluegrass-onespike oatgrass	PCT	Warm dry US
SD2911	ARTRV/FEID-AGSP	Mountain big sagebrush/Idaho fescue-bluebunch wheatgrass	PA	Warm moist US
SD2917	ARTRV-SYOR2/BRCA5	Mountain big sagebrush-mountain snowberry/mountain brome	PCT	Warm moist US
SD2918	ARTRV/AGSP-POSA12	Mountain big sagebrush/bluebunch wheatgrass-Sandberg's bluegrass	PA	Warm dry US
SD2919	ARTRV-SYOR2	Mountain big sagebrush-mountain snowberry	PCT	Warm moist US
SD2929	ARTRV/FEID-KOCR	Mountain big sagebrush/Idaho fescue-prairie junegrass	PA	Warm moist US
SD3010	ARTRV-PERA4	Mountain big sagebrush-squaw apple	PCT	Warm moist US
SD3011	ARTRV/ELCI2	Mountain big sagebrush/giant wildrye	PCT	Warm moist US
SD3111	PUTR2/FEID-AGSP	Bitterbrush/Idaho fescue-bluebunch wheatgrass	PA	Warm moist US
SD3124	PUTR2-ARTRV/FEID-AGSP	Bitterbrush-mountain big sagebrush/Idaho fescue-bluebunch wheatgrass	PA	Warm moist US
SD3125	PUTR2-ARTRV/FEID	Bitterbrush-mountain big sagebrush/Idaho fescue	PCT	Warm moist US
SD3126	PUTR2/ERDO	Bitterbrush/Douglas' buckwheat	PCT	Warm dry US
SD4111	CELE3/FEID-AGSP	Mountain mahogany/Idaho fescue-bluebunch wheatgrass	PA	Warm moist US
SD4112	CELE3/AGSP	Mountain mahogany/bluebunch wheatgrass	PCT	Warm dry US
SD4115	CELE3-PUTR2/AGSP	Mountain mahogany-bitterbrush/bluebunch wheatgrass	PCT	Warm moist US
SD4114	CELE3/PONEW	Mountain mahogany/Wheeler's bluegrass	PCT	Warm dry US
SD9111	ARRI2/POSA12	Stiff sagebrush/Sandberg's bluegrass	PA	Warm dry US
SD9141	ARRI2/PEGA	Stiff sagebrush/Gairdner's penstemon	PCT	Warm dry US
SD9221	ARAR8/POSA12	Low sagebrush/Sandberg's bluegrass	PA	Warm dry US
SM32	SYOR2	Mountain snowberry	PCT	Warm moist US
SS4914	ARTRV/BRCA5	Mountain big sagebrush/mountain brome	PCT	Warm moist US

¹PA = plant association, PCT = plant community type.

²Plant association group: UW = upland woodland, UF = upland forest, UH = upland herbland, US = upland shrubland.

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