

Evaluation of Zumwalt Prairie, Wallowa County, Oregon

For its Merit in Meeting National Significance Criteria as a National Natural Landmark
Representing Plateau Grasslands in the Columbia Plateau Biophysiographic Province



Zumwalt Prairie photo © Rick McEwan, courtesy of The Nature Conservancy (TNC).

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Executive Summary

The National Natural Landmarks (NNL) Program encourages the preservation of exceptional examples of the Nation's biological and geological features. To qualify for NNL designation, a site must be one of the best examples of a geological or biological feature within a biophysiographic province. Zumwalt Prairie represents a perfect example of this concept, containing one of the largest remnants of native bunchgrass prairie in North America. The site includes deep-soiled bunchgrass prairie, buttes with aspen and Ponderosa pine, hawthorn shrublands, and a network of vernal pools, scablands and mounded prairie, all sitting along the edge of Hells Canyon. It supports huge herds of elk, the only remaining population of sharp-tailed grouse in Oregon, is part of the range of the only established wolf pack in the state, and is in exceptional ecological condition.

The Potential Zumwalt Prairie National Natural Landmark (hereafter referred to as Zumwalt PNNL) is a portion of a very large, 13,350 ha (~30,000 acre) nature preserve owned and managed by The Nature Conservancy, in the largest remaining plateau grassland in North America, over 64,000 ha (158,000 acres) in size. The Nature Conservancy has consented to allow the site to be evaluated as a Potential National Natural Landmark (PNNL) and is supportive of its designation. The site was initially identified, evaluated, and recommended as meeting the criteria for a PNNL in 1986 (Kagan 1986) as the Findley Buttes proposed NNL, named after the three buttes which dominate the landscape at the southern end of the proposed NNL. This current evaluation considers whether the resources at Zumwalt PNNL remain intact, nationally significant, and deserving of NNL designation.

The initial report recommended the site as the best remaining example of Palouse grasslands, based on an initial theme study, in which four grassland themes were identified: Lowland and Valley Grasslands, Palouse and Plateau Grasslands, Canyon Grasslands and Montane Grasslands. At the time the initial 1986 report was prepared, Zumwalt was entirely in private ownership, and managed as part of four large ranches. A large area has since been bought by The Nature Conservancy, and is managed for the conservation of biodiversity. This report recommends that the Zumwalt PNNL meets the national significance criteria required for the NNL Program. The proposed site is the best remaining example of plateau grasslands, and indeed is one of the largest and most spectacular remaining grasslands in North America.

After considerable research, collaboration with subject matter experts, and site visits, we conclude that the Zumwalt PNNL still contains the requisite biological and geologic features necessary to support listing as a National Natural Landmark. A map of the proposed landmark boundary, encompassing 1,535 hectares (3,793 acres) is included, along with maps showing the vegetation and ownership.

Introduction

Source of Site Proposal

The initial Survey of Potential NNLs in the Columbia Plateau (Daubenmire 1975) recognized a single grassland theme, and did not identify Zumwalt Prairie. The Grassland Theme study was updated by the Oregon, Washington and Idaho Natural Heritage Programs, first in 1985 (Kagan et al 1985) and again in 1989 (Crawford et al 1989). The 1985 theme study identified a Palouse and Plateau Grasslands Theme, for which The Findley Buttes site at Zumwalt Prairie was recommended as the best site (Crawford et al 1987). However, when moving forward with additional theme studies, Crawford, Kagan and Moseley (1989) decided that the Palouse and Plateau Grasslands Theme identified in 1985 represented a very diverse and important theme, in spite of being very depleted due to the extensive agriculture in the central parts of the Columbia Plateau. So, the Palouse and Plateau Grassland Theme was split into three subthemes: the Northern Palouse Subtheme, the Central Palouse Subtheme, and the Plateau Grasslands Subtheme. Crawford summarized these changes in a grasslands theme brief update (1998) for the National Park Service and in more detail (Crawford and Kagan 2001) for a wildlife habitat guide. As a result of an updated theme study (Crawford 2004), The Kahlotus Ridgetop National Natural Landmark was established as the best example of the Central Palouse Grasslands subtheme (Crawford 1987, 2011), although the Northern Palouse subtheme has yet to have a NNL proposed.

There is little doubt that Zumwalt Prairie is the best example of the Plateau Grasslands Theme in the Columbia Plateau. At over 60,000 hectares (150,000 acres), it is the largest remaining grassland in the Pacific Northwest, one of the largest bunchgrass prairies remaining in North America, and the majority of the site is in exceptional condition (Kennedy et al. 2009). The proposed NNL represents a diverse, typical and protected portion of this exceptional remnant grassland, and is one of the most spectacular natural areas in the United States.

Evaluator

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Scope of Evaluation

As described above, Zumwalt Prairie was first proposed in 1985 (Kagan et al 1985) in the Phase II, National Natural Landmarks Project final report as the best example of the Palouse and Plateau Grasslands Theme. In 1986, it was evaluated as a Potential National Natural Landmark (Kagan 1986), and recommended as warranting NNL designation, but at the time, the property was entirely owned by local ranchers, who did not feel that pursuing NNL designation was in their best interest. In 2000, The Nature Conservancy acquired approximately 11,000 ha (27,000 acres) of Zumwalt Prairie, including the

majority of the area proposed for NNL designation in 1986. In 2006, The Nature Conservancy added 2,450 ha (6,065 acres), making the 132 square km (51-square mile) preserve Oregon's largest private nature sanctuary. The entire Nature Conservancy Preserve was evaluated as part of this study.

This document updates information on the status of the site, and incorporates information from the earlier theme studies. Additional field visits to the site were completed, new photographs are included, and new references in published literature were added.

Characterization of the Primary Natural Features of the Columbia Plateau Grasslands

In the 1975 theme study of the Columbia Plateau Natural Region, Daubenmire included all Grasslands and Sagebrush Shrublands within a "Grassland and Desert: Steppe Zone". He further separated these into a "Shrub Steppe" and a "Grass Steppe". In the current theme study, it is proposed that the "Grass Steppe" theme be separated into four themes. Grasslands are a major feature of the Columbia Basin, and a large number of diverse grassland types are represented in this natural region. To adequately represent the diversity of the grasslands in this region, the following types are proposed:

Grass Steppe

1. Lowland and Valley Grassland Theme
2. Palouse and Plateau Grassland Theme
3. Canyon Grassland Theme
4. Montane Grassland Theme

These four themes are easy to identify and correspond fairly well to the major zones in Daubenmire's (1975) theme study and to other classifications of the vegetation of the Columbia Basin. They are inclusive of all of Daubenmire's associations addressed in the theme study, as well as all the grasslands occurring in the Columbia Basin Natural Region.

The Palouse and Plateau Grassland Theme includes mid elevation grasslands occurring on a variety of soils. It encompasses four vegetation zones defined by Daubenmire (1970), specifically those zones in the steppe region dominated by Idaho fescue (*Festuca idahoensis*). These zones are the wheatgrass - fescue (*Agropyron-Festuca*) zone, the fescue - snowberry (*Festuca-Symphoricarpos*) zone, the fescue - wild rose (*Festuca-Rosa*) zone, and the fescue - hawkweed (*Festuca-Hieracium*) zone. Elevation of these areas range from 300 -1900 meters (1000 - 6000 feet), and include the largest expanses of grasslands in the region. These areas are typified by deep loess soils, that have been largely converted to agriculture. While these zones are not generally recognized in current literature, they help define the major grassland landscapes in the Columbia Plateau. It is proposed here that there are three subthemes of national significance within the Palouse and Plateau Grassland Theme. These are outlined below in Table 1 and the

Plateau Grassland Subtheme is defined in the following element abstract definition, which was adopted from Crawford (2004).

Table 1. Grassland Themes and Subthemes from the Columbia Plateau Biophysigraphic Province.

Grassland Theme	Sub-theme	Landscape	Slope length (feet)	Elevation (feet)	PPT (inches)	Primary Associations
Lowland and Valley						
	Lowland	wide river basins, sand dunes	0 - 100	300 - 2000	6 -15	thickspike wheatgrass - needle-and-thread grassland needle-and-thread - curly bluegrass grassland
	Valley	wide river basins, alkali basins	0 - 10	2000 - 4000	6 -15	inland saltgrass, basin wildrye – saltgrass Nebraska sedge
Palouse and Plateau						
	Northern Palouse	rolling deep loess hills in Steppe zone	10-100s	1500 - 3000	20 - 30	Idaho fescue - common snowberry Idaho fescue - wild rose rough fescue – Idaho fescue
	Central Palouse	rolling deep loess hills in Steppe zone	10-100s	1100 - 3000	15 - 20	bluebunch wheatgrass - Idaho fescue loess bluebunch wheatgrass - arrowleaf balsamroot - curly bluegrass
	Plateau	undulating basalt residium with loess plain within lower forest zone	1-10s	4000 - 6000	15 - 25	Hood sedge - Idaho fescue Idaho fescue – prairie junegrass Idaho fescue – parsnip-flower wild buckwheat Idaho fescue – hawkweed
	Canyon	steep open slopes 100 - residium/ alluvium	1000s	300 - 5000	15 - 25	bluebunch wheatgrass - Idaho fescue canyon bluebunch wheatgrass - prickly-pear - (curly bluegrass)
	Montane	Mountainous	0 - 1000s	6300 - 8400	20 - 25	green fescue grassland Idaho fescue-montane fescue grassland

Subtheme Description

Palouse and Plateau Grasslands of the Columbia Basin Biophysigraphic Province Plateau Grassland Subtheme

Plateau Grasslands are the extensive, bunchgrass dominated grasslands occurring on flat to undulating exposed ridgetops, large plateaus, and mountain foothills in and around the mountains of the Columbia Plateau. They occur at mid-elevations, are dominated by Idaho fescue and other bunchgrasses, and are often forb rich and diverse, resembling the extensive grasslands in western Montana and northwestern Wyoming more than those common in the drier parts of the Columbia Plateau and Intermountain West.

Primary Geological Features

Aspect is varied but the slopes are rarely greater than 20%. Along the south edge of the Ochoco Mountains in Oregon, these plateaus usually have a gentle north facing slope. The soil is wind deposited (loess) silts, and the soil depth is extremely variable. In some of the larger, mid-elevation plateaus they can be fairly deep, up to 2 meters (7 feet), although they appear to average around 0.5-1 meter (20-40 inches) in depth. The extinct shield volcanoes found in these plateaus, such as the Findley Buttes and Robert's Buttes, add topographic and soil diversity. These grasslands often have a number of patches with little or no soil, displaying exposed bedrock. As is the case with most of the Columbia Plateau, the geology is characterized by recent Columbia basalt flows.

Precipitation is fairly abundant in this subtheme area which falls as snow in the winter and rain in the fall and spring, unlike the other subthemes in the Palouse and Plateau Grassland Theme which tend to have milder winters. Data from a five-year old weather station at the Zumwalt Prairie shows the approximate precipitation in this subtheme area estimated at approximately 45 cm (18 inches) per year. These grasslands are often bounded by ponderosa pine (*Pinus ponderosa*) forests and savannas and often have quaking aspen (*Populus tremuloides*) stands on moist sites; and while the tree cover has tripled in the forested areas of the site over the last 70 years (Bartuszevige et al. 2012) – it is not clear why more of these areas have not been invaded by trees. Perhaps lightning caused wildfires or occasional drought may be responsible for the continued existence of some of these grasslands.

Primary Biological Features

These grasslands are characterized by the dominance of Idaho fescue (*Festuca idahoensis*), like the other grasslands in this theme. These are moist grassland sites, occurring on wind deposited silts, which tend to have a fairly high diversity and density of forbs. There are a number of plant communities which occur in this subtheme, but it is primarily defined by one, the Idaho fescue-junegrass (*Festuca idahoensis*-*Koeleria macrantha*) community (Johnson 1985a). This is a bunchgrass community dominated by Idaho fescue, with between 2-10% cover of junegrass as a key indicator, and variable cover of bluebunch wheatgrass (*Pseudoroegneria spicata*). The bluebunch wheatgrass is rhizomatous in this subtheme. Other significant grass species in this community include Sandberg's bluegrass (*Poa secunda*), great basin wildrye (*Leymus cinereus*), and western needlegrass (*Achnatherum occidentale*). Dominant forbs include slender cinquefoil (*Potentilla gracilis*), twin arnica (*Arnica sororia*), yarrow (*Achillea millefolium*), red avens (*Geum triflorum*), and Wyeth's buckwheat (*Eriogonum heracleoides*).

Also occurring on loess silts in this subtheme is the Idaho fescue-Hood sedge (*Festuca idahoensis*-*Carex hoodii*) community (Johnson 1985b). The dominant graminoids are Idaho fescue, Hood sedge (*Carex hoodii*), mountain brome (*Bromus carinatus*), and western needlegrass. Common forbs include yarrow, lupines (*Lupinus sericeus* and *L. caudatus*), thick-stemmed aster (*Aster integrifolius*), globe penstemon (*Penstemon globosus*), and buckwheat species.

There are three shallow soil, scabland communities dominated by Sandberg's bluegrass (*Poa secunda*) which occur in this subtheme: one-spike oatgrass-Sandberg's bluegrass (*Danthonia unispicata*-*Poa secunda*), Douglas' buckwheat-Sandberg's bluegrass (*Eriogonum douglasii*-*Poa secunda*), and serrate balsamroot-Sandberg's bluegrass (*Balsamorhiza serrata*-*Poa secunda*). These three communities occur on fractured bedrock, where the loess soils were eroded, blown away, or never deposited. They are typified by low productivity, high forb diversity (including a number of annual forbs), and high cover of bare rocks and cryptogams. Vernal pools often occur in this type and can support one-spike oatgrass growing with annual hairgrass (*Deschampsia danthonioides*), and white marginal knotweed (*Polygonum polygaloides*).

Plateau Grassland Subtheme Primary Plant Associations

Idaho fescue – junegrass Herbaceous vegetation

Festuca idahoensis - *Koeleria macrantha* Herbaceous Vegetation (CEGL001620¹)

This association is described from sites on the dissected basalt plateaus, biscuit-and-swale (mound) formations, and the canyon and mountain slopes of the lower Snake River drainage. Considerable variability in species composition occurs over this range of physical environmental settings. The association is found on shallow to moderately deep loess soils that overlay basalt rock or colluvium. It includes the most productive grassland stands in the Pacific Northwest. Stands occur on gentle to steep slopes at 1200-6600 feet elevation on most aspects. This plant association is characterized by a dense sward of bunchgrasses and a rich assemblage of forbs. Idaho fescue is abundant. Bluebunch wheatgrass is often the codominant bunchgrass, though the presence of junegrass on these sites is indicative of more mesic environments, compared to adjacent Idaho fescue – bluebunch wheatgrass communities. Consistent associated forbs include whitestem fraseria, harsh Indian paintbrush, houndstongue hawkweed, and twin arnica.

Hood sedge – Idaho fescue Herbaceous vegetation

Carex hoodii - *Festuca idahoensis* Herbaceous Vegetation (CEGL001595)

This plant association occurs in eastern Oregon, Washington and Idaho on high-elevation ridges of the Wallowa and Seven Devil's Mountains. Sites range from gentle, broad, dissected plateau ridgetops to steep mountain sideslopes at 1830-2410 m (6000-7900 feet) elevation. Soils are moderately deep to deep silt loam. Stands are typically dense with high and diverse cover of sedges, grasses, and perennial forbs. Abundant Idaho fescue and timber oatgrass (*Danthonia intermedia*) occur with a variety of different sedge and grass species, including Hood sedge, Geyer's sedge (*Carex geyeri*), western needlegrass, and junegrass. Commonly associated forbs are silver lupine, prairie smoke, houndstongue hawkweed, rosy pussytoes, ballhead sandwort, and alpine leafybract aster (*Lupinus argenteus* var. *laxiflorus* (= *Lupinus laxiflorus*), *Geum triflorum*, *Hieracium cynoglossoides* (= *Hieracium albertinum*), *Antennaria rosea*, *Arenaria congesta*, and *Symphyotrichum foliaceum* (= *Aster foliaceus*). This association can be mistaken for the Idaho fescue – Hood sedge Herbaceous type (CEGL001609), which is abundant in the Blue Mountains; distinguished by the presence of timber oatgrass, ballhead sandwort or rosy pussytoes in the Hood sedge – Idaho fescue community.

¹ This is the National Vegetation Classification System (NVCS), plant community code.

Idaho fescue – parsnipflower buckwheat Herbaceous Vegetation

Festuca idahoensis - *Eriogonum heracleoides* Herbaceous Vegetation (CEGL001616)

These grasslands are described from parks in the forests of the Okanogan Highlands of northeastern Washington and southern British Columbia, and from Oregon. Stands may also occur in northern Idaho. This association occurs as grassland 'parks' from 670 m to over 2000 m elevation in the Ponderosa pine and Douglas-fir zones. Sites are typically on dry slopes with southern exposures; apparently too dry during the late summer to support trees. Soils are loams to gravelly fine sandy loams, developed on bedrock controlled glacial tills. The vegetation is a medium-tall grassland association, dominated by the perennial bunchgrasses, Idaho fescue or rough fescue with bluebunch wheatgrass, Sandberg bluegrass and junegrass. The diagnostic species, parsnipflower buckwheat, a low (1-4 dm tall), perennial, suffrutescent forb, does not contribute to the physiognomic structure of this type, and is often sparsely present. There is a rich perennial forb component, including such species as yarrow, nineleaf biscuitroot, longleaf fleabane and Balsamroot (*Achillea millefolium*, *Lomatium triternatum*, *Erigeron corymbosus*, and *Balsamorhiza* spp.). Stands are distinguished from other Idaho fescue types by the presence of parsnipflower buckwheat.

Onespike oatgrass – Curly bluegrass Herbaceous Vegetation

Danthonia unispicata - *Poa secunda* Herbaceous Vegetation (CEGL001783)

This grassland association occurs in scablands of the Snake River plain in northeastern Oregon and likely occurs in Washington. It has also been reported from Wyoming, but information is not available. Stands are found on dry, level to undulating plateau and ridgetops at elevations of 1130-1830 m. This association is restricted to less xeric sites, such as slightly concave or seep areas where there is supplementary soil moisture. Vernal pools are not uncommon in this type. Soils are very shallow (7-25 cm), rocky (40-60% coarse fraction) loams that are derived from basalt and loess. These soils are underlain by non-fractured basalt bedrock. The soil surface is stabilized by high cover of rock and moss. During the winter, these soils are often saturated. Disturbance from frost boils is common. The bedrock is not fractured and therefore cannot support deeper-rooted bunchgrasses such as bluebunch wheatgrass and Idaho fescue, or shrubs. This association has a sparse to moderately dense herbaceous layer codominated by the perennial graminoids, Sandberg bluegrass and onespike danthonia (*Danthonia unispicata*). The onespike danthonia often occurs in patches where soil moisture accumulates. Common forbs may include pussytoes, hoary balsamroot, sedum, biscuitroot, dwarf yellow fleabane, knotweed, and bigflower clover (*Antennaria* spp., *Balsamorhiza incana*, *Sedum* spp., *Lomatium* spp., *Erigeron chrysopsidis*, *Polygonum* spp., and *Trifolium macrocephalum*). Stands may form a mosaic with drier sites dominated by Sandberg bluegrass without onespike danthonia in areas with fractured bedrock with an open canopy of the dwarf-shrub, rigid sagebrush (*Artemisia rigida*).

Distribution and Context

The Plateau Grassland Subtheme occurs primarily on mid-elevation plateaus and benches in the foothills of the Ochoco, Blue, Wallowa, and Seven Devil's Mountains. It has its center of distribution in Wallowa County, Oregon. It also occurs in Union, Grant, Baker,

Umatilla, and Morrow Counties of Oregon; in Asotin, Columbia, Garfield, Lincoln, Spokane and Walla Walla Counties in Washington, and Adams and Idaho Counties in Idaho. However, in both Washington and Idaho, the majority occur in canyonlands, and are small (less than 800 ha [2,000 acres]) and not very significant. Only in northeastern Oregon do the landscapes provide extensive examples of these plateau grasslands.

The elevations range from 1200 meters (4000 feet) along the north edge of the Ochoco Mountains, to 1850 meters (6000 feet) in the Seven Devil's Mountains of Idaho. Most occurrences are between 1350-1550 meters (4500-5000 feet). In the plateau grasslands the Sandberg bluegrass communities occur primarily as large or small patches within the deeper-soiled fescue grasslands, and mostly on flat or gently sloping habitats. In a number of areas, the shallow bluegrass communities and the deeper-soiled fescue types occur together in a matrix called "biscuit scablands" or "Mima mounds". Some plateaus in this subtheme have very extensive examples of this significant natural feature. The cause of the pattern of loess mounds over the fractured basalt is currently unknown, although it has been the source of numerous studies (Cox 1984).

Regional Variation

The plateau grasslands in the Columbia Plateau tend to be remarkably similar, all dominated by Idaho fescue associations, at the lower elevations occurring with bluebunch wheatgrass, at the higher elevations with junegrass, western needlegrass (*Achnatherum occidentale*), western wheatgrass (*Pascopyrum smithii*) and Hood sedge. Some sites have shallow-soiled patches, often called "scablands", dominated by buckwheat species, curly bluegrass and one-spike oatgrass embedded, occurring as shallow-soiled flats, or as mounded topography described above. Zumwalt Prairie has all of these associations, while the lowest sites known, such as Pataha Bunchgrass and Long Prairie, tend to have mostly the Idaho fescue – bluebunch wheatgrass types.

Significance

Native prairies are among the most depleted ecosystems and least conserved (Hoekstra et al. 2005) in the United States. In the northwest, most prairies quickly succumbed to the plow, making the Columbia Plateau one of the major agricultural areas in the country. However, plateau grasslands occur in areas with too short of a growing season to allow for productive cropland agriculture. While early settlers tried farming small areas of these prairies, they quickly gave up, leaving intact some of the largest and most spectacular bunchgrass prairies remaining in the United States. The areas support rare species, huge populations of native wildlife, and provide a unique view into what much of the Columbia Plateau must have looked like centuries ago.

Distinguishing Features

The Plateau Grassland subtheme is most easily separated from the other subthemes in the Palouse and Plateau Grassland Theme by its higher elevation range. The other subtheme occurrences are all below 1200 meters (4000 feet) in elevation, while these range from 1200-1850 meters (4000-6000 feet). It is somewhat similar to the Northern Palouse Grassland Subtheme in composition but tends to occur on shallower soils and is in a

cooler, shorter season area. The Northern Palouse could better be named the Eastern Palouse, occurring in the extensive low elevation areas in southwestern Washington, primarily in Whitman, Garfield, Asotin, Columbia, Adams, Franklin and southern Spokane County, and in adjacent west-central Idaho in Washington, Adams and southwestern Idaho County. Almost all of the Northern Palouse has been converted to diverse croplands (Hall et. al 1999).

It is best differentiated from the Montane Grassland Theme by the dominance of Idaho fescue in or adjacent to all Plateau Grasslands. Montane grasslands in the Columbia Plateau Natural Region tend to be dominated by other fescue and sedge species. Although Idaho fescue is often found in montane grasslands in this region, it is rarely dominant here.

This subtheme, because of its plateau character, often occurs adjacent to canyonlands. These canyons have examples of the Canyon Grassland Theme. The Plateau Grasslands can be most easily separated from the Canyon Grasslands by their flat topography, and loess deposited soils, rather than the colluvial soils in the steep and lower elevation canyons. Canyon Grasslands are widespread and varied in the Columbia Plateau Biophysiographic Province and represent a number of habitats, some of which are similar to those in this subtheme.

Zumwalt Prairie Site Description

Overview

The Zumwalt Prairie Potential National Natural Landmark (PNNL) is the central part of the last, large undisturbed grassland in the Columbia Plateau Biophysiographic Province. It includes two of the three Findley Buttes, which represent volcanic cones formed through the thick layer of Columbia River Basalt. These volcanic features define the plateaus and canyonlands of the central Columbia Basin.

The site includes loess prairie, shallow-soiled basalt garlands, biscuit scablands (Mima mound prairie with scablands in the intermound areas), talus slopes, basalt cliffs, and gently rolling hills typical of the Palouse landscape. It has aspen groves, hawthorn riparian woodlands, rigid sagebrush or snowberry shrublands, bottomland wet grasslands, and many grassland types that vary with elevation, soils, aspect and slope.

Natural History Theme Represented

Zumwalt Prairie is representative of the Plateau Grasslands subtheme in the Palouse and Plateau Grasslands theme in the Columbia Plateau Biophysiographic Province. This subtheme is quite distinct from any other subthemes in the region, and Zumwalt Prairie both characterizes and defines the subtheme.

Zumwalt Prairie is the largest remaining grassland ecosystem in the Pacific Northwest. Bunchgrass prairies were a dominant part of the landscape throughout much of the Columbia Basin. Most of these grasslands have been converted to agriculture. Based on information from the most recent vegetation map of the region (Kagan et al 2008), the USGS ReGAP Map Zone 8 ecological systems map, which includes the Columbia Basin of Oregon, Washington and Idaho, 4,344,000 ha (10,734,000 acres) are now farmed. In this same area, only 56,284 ha (140,000 acres) remain of native Palouse and semi-desert grasslands (the only grasslands in the Columbia Plateau which are flat enough to be suitable for agriculture. The 56,285 hectares of remaining bunchgrass represents only 1.3% of the total farmland in the region. As a result, there are almost no remaining native grasslands left in the Columbia Plateau aside from the large plateau grasslands at Zumwalt, and the extensive but very steep canyon grasslands along the many river canyons in the province.

Zumwalt Prairie represents the last large plateau grassland in the Columbia Plateau Biophysiographic Province. It has a large and high-quality example of bunchgrass prairie, characteristic of the Plateau Grassland Subtheme. It contains all of the diversity of the Subtheme, and contains good examples of the adjacent shrubland and woodland communities.

Primary Natural Features

The Columbia Basin, which was primarily known for its vast, Palouse bunchgrass prairies, is now known for its high-quality farmland. This prairie remnant is the only

place to observe a large presettlement grassland ecosystem. The proposed natural landmark has a number of diverse geological and ecological values. The PNNL includes plateau grasslands of all types, and parts of two of the three Findley Buttes. This includes all aspects and slopes and an elevational range from 4500 to 5500 feet (1375 to 1675 meters). The site includes deep loess-soiled prairie, shallow-soiled basalt garlands, biscuit scablands (Mima mound prairie with scablands in the intermound areas), talus slopes, basalt cliffs, and gently rolling hills typical of plateau grasslands. It has aspen groves, hawthorn riparian woodlands, sagebrush and snowberry shrublands, bottomland wet grasslands, and many grassland types which vary with elevation, soils, aspect and slope.

Primary Biological Features

Zumwalt Prairie represents an excellent example of Plateau Grasslands in the Columbia Plateau Biophysiographic Province (Kagan 1986). The grasslands include a number of communities, which vary largely as a result of the many physiographic features of the area. The majority of the deep-soiled grasslands present are dominated by *Festuca idahoensis* (Idaho fescue), the most important species in this subtheme.

The most widespread Idaho fescue plant community on the plateau has been named the Idaho fescue-junegrass plant association (Johnson and Simon 1987). This type occurs on the moderately deep-soiled, flat prairie areas, and on gently sloping hillsides. It covers almost half of the proposed landmark's area. This plant association is characterized by dominance of Idaho fescue, with a high frequency and approximately equal cover of both junegrass and bluebunch wheatgrass. Weedy grasses found in degraded areas are the perennial Kentucky bluegrass (*Poa pratensis*) and annuals such as bromes (*Bromus tectorum*, *B. hordeaceus*, *B. mollis*) and ventenata (*Ventenata dubia*). The principal forb indicators of this community are twin arnica (*Arnica sororia*), red avens (*Geum triflorum*), slender cinquefoil (*Potentilla gracilis*), and red besseya (*Besseya rubra*). This is a very forb-rich community, and many other forb species besides those mentioned are present, providing a spectacular floral show in June, as shown below in Figure 1.



Figure 1. Idaho fescue-junegrass community at Zumwalt. Photo(s) © Christopher Rauschenberg.

Johnson and Simon (1987) have further separated this association into three other types present in the proposed landmark. He refers to these as the Idaho fescue-junegrass

(ridgetops) association, the Idaho fescue-junegrass (mounds) association, and the Idaho fescue- junegrass (high elevation) association. All are present here but are not considered to be worth considering separately from either a statewide or national perspective. The mounds association refers to the biscuit scablands or Mima mounds which are present in the landmark area. These have regular deep-soiled mounds over a shallow-soiled, rocky scabland. The origin of this mound--intermound topography is unclear, but has been widely discussed (Cox 1984). From a vegetation standpoint, the communities on the mounds are the same as those on adjacent deep-soiled areas, and the intermound vegetation resembles adjacent scablands, although they are more often invaded by introduced annual grasses.

The NNL site has a small example of a community described by Johnson and Simon (1987) as the Idaho fescue-Hood sedge plant association. This occurs only near the tops of the three buttes, at the highest elevations in the proposed landmark. The association is dominated by Idaho fescue with both mountain brome and Hood sedge as consistent associates. This type also has a large number of species including lupine, penstemon, aster, and false dandelion species.

The north facing slopes on the buttes have examples of two plant communities common in Pacific Northwest bunchgrass prairies. These were described by Daubenmire (1970) as the Idaho fescue-snowberry habitat type (or association) and the Idaho fescue-rose habitat type. Johnson and Simon (1987) have lumped these two as the snowberry-rose association. These are forb-rich grassland communities, occurring in areas with extremely deep soils. Most of the snowberry in this community takes the form of small sterile shoots, or low shrubby patches intermixed with grasses and forbs. The most common native grasses are Idaho fescue and the rhizomatous form of bluebunch wheatgrass. At the proposed landmark, they occur at higher elevations, and are not typical of Palouse prairie. There are a number of unusual grass species, including Smith's wheatgrass, blue wildrye (*Elymus glaucus*), mountain brome (*Bromus marginatus*) and western needlegrass which occasionally dominate areas with snowberry or rose on some deep-soiled, north facing slopes.

The Zumwalt Prairie PNNL has an expanding population of Basin wildrye (*Leymus cinereus*), best known from mesic, alkaline basins from southeastern Oregon through Nevada and Utah. It is a fire resistant grass that can be quite sensitive to livestock grazing, so may be increasing at the preserve as a result of livestock exclusion, since it appears currently to be expanding most rapidly in the few pastures with no grazing, rather than the low and moderate stocking rates that occur in most of the pastures. Currently, it is still a relatively minor component in these grasslands.

The shallow-soiled scablands include three communities, dominated by Sandberg bluegrass with either a buckwheat species, one-spike oatgrass, or serrate-leaf balsamroot; although in the plateau grasslands, the Sandberg bluegrass-one-spike oatgrass association is the only common type. These occur occasionally in isolated patches in the deep-soiled grassland areas, usually on low ridges or hillsides below the ridges. They also are part of the biscuit scabland formation, occurring in the intermound areas. It is unclear why some

areas are dominated by buckwheat, oatgrass or balsamroot, and the community descriptions by Johnson and Simon (1987), Hall (1973), and Daubenmire (1970) do not point to obvious soil or geomorphic differences; although the oatgrass communities do appear to occur in areas with higher effective precipitation due to topography. All of these types have a high percentage of bare rock, high lichen and moss cover, and a diverse and showy forb assemblage. The most common forbs in these communities at Zumwalt Prairie are dwarf yellow fleabane, sedum, biscuitroot, onion, and buckwheat species.

A fourth scabland community, dominated by stiff sagebrush can occasionally be found covering small patches in the proposed landmark, mostly located at the margins of Camp Creek or Trail Creek Canyons. Rigid sagebrush can have up to 50% cover in these areas. This is called the stiff sagebrush/Sandberg bluegrass association (Daubenmire 1970, Johnson 1986), and is more common in scablands occurring within forest openings. The forb and grass layer is similar to that of the Sandberg bluegrass-onespike oatgrass community.

On talus outcrops and on some steeper slopes are occasional shrublands dominated by larger shrubs. These are not a very significant part of the vegetation on the proposed landmark, but they correspond well to the ninebark-snowberry (*Physocarpus malvaceus-Symphoricarpos albus*) community described by Johnson and Simon (1987). In these areas, ninebark is the dominant large shrub, with 20-80% cover. Other associated species include currants (*Ribes* sp.), rose (*Rosa* sp.), serviceberry (*Amelanchier alnifolia*), and chokecherry (*Prunus virginiana*). The most common forbs are bedstraw (*Galium aparine*), red avens, yampah (*Perideridia gairdneri*), and horsemint (*Agastache urticifolia*).

The other significant communities in the NNL include the riparian vegetation types. The most abundant of these is the tufted hairgrass (*Deschampsia cespitosa*) montane grassland. This community is dominated by tufted hairgrass with California oatgrass (*Danthonia californica*), meadow barley (*Hordeum brachyantherum*), and sedge (*Carex*) species.

Less common but no less significant are the shrubby or forested riparian areas and slopes. In the north facing creek drainages with more permanent water or areas where snow drifts persist late into spring, the fescue grasslands give way to quaking aspen (*Populus tremuloides*) and hawthorn (*Crataegus douglasii*) woodlands. Aspen is found in riparian drainages with the more common hawthorn, along with other shrubs including rose, snowberry, serviceberry, chokecherry, Rocky Mountain maple (*Acer glabrum*) and rarely red-osier dogwood (*Cornus stolonifera*). Most of the riparian woodlands are a matrix of grassland and riparian woodland patches. These are areas in which cattle and elk concentrate and tend to be the most disturbed communities in the landmark. However, the landmark has one large draw with two riparian areas dominated by aspen and hawthorn which is in excellent condition. Aspen also occurs in two other situations. It is found on north facing slopes with a very shrubby understory dominated by snowberry, serviceberry, and currants. Aspen can also be found in areas with springs and seeps.

These are more open areas with an understory of elkweed (*Frasera speciosa*) false hellebore (*Veratrum viride*), tufted hairgrass, and sedge species as well as occasional snowberry shrubs.

Wildlife and Wildlife Conservation Targets

The fauna of the proposed landmark consists of typical grassland species. The area has large populations of ground squirrels (*Spermophilus* sp.) which feed large nesting populations (~ 50 pair) of ferruginous hawks (*Buteo regalis*), Swainson's hawks (*Buteo swainsoni*), and golden eagles (*Aquila chrysaetos*); and many red-tailed hawks (*Buteo jamaicensis*) (Cottrell 1981). The area also has prairie falcons (*Falco mexicanus*), numerous kestrels (*Falco sparverius*), and breeding short-eared owls (*Asio flammeus*). Prairie songbird species such as the meadowlark (*Sturnella magna*), savannah sparrow (*Passerculus sandwichensis*), vesper sparrow (*Poocetes gramineus*) and horned lark (*Eremophila alpestris*) are fairly common. The proposed natural landmark is part of a large reintroduction site for the very rare (until reintroduced here, extirpated from Oregon) Columbian sharp-tailed grouse (*Tympanuchus phasianellus columbianus*), which has been primarily using the lower elevation areas closer to Enterprise, Oregon.

Probably because of the high ungulate density, Zumwalt also is part of the home range of Oregon's only established wolf pack, which use the area all year, although more extensively in the winter, when the snow in the Wallowa Mountains make them inhospitable. In spite of the wolves, the entire plateau receives concentrated elk (*Cervus canadensis*) use throughout the year, especially in the northern portions of the prairie. The local ranchers and many ecologists think the elk consume as much forage as do the cattle. Elk were observed on the proposed landmark on every other visit, and concentrate in parts of the proposed NNL, although the new resident wolf pack may have the potential to cause them to become more mobile. The area also supports mule deer (*Odocoileus hemionus*), which were also frequently observed.

In addition to these species, the NNL supports a large population of cougars (*Puma concolor*), which appear to thrive on the prairie and the adjacent steep canyonlands, along with Rocky Mountain bighorn sheep (*Ovis canadensis*), a species that is declining in the area due to introduced diseases from domestic sheep. The whitetail jackrabbit (*Lepidus townsendii*) is also another declining prairie species found at the site, which is one of The Nature Conservancy's conservation targets (The Nature Conservancy 2000). While seen regularly during visits to Zumwalt during the early 1980's, current preserve staff report only a few whitetail jackrabbit observations during the last 10 years. TNC has developed individual species lists for the birds, herpetiles (reptiles and amphibians), mammals, butterflies, vascular plants, and lichens known from the Zumwalt Prairie Preserve. These have been compiled and are included as Appendix D.

Zumwalt also has been shown to have an important diversity of native bees (Gonzalez et al, in press, Rao et al, 2011), and recent studies indicate an abundance of native pollinators (Tubbesing et al in Review, Kimoto et al in Press), not surprising in such a large, intact ecosystem with so many flowering plants, but important nevertheless.

At-Risk Species and Other Conservation Targets

The Zumwalt Prairie Preserve and the PNNL provide some of the best remaining habitat for the federally listed, threatened Spalding's catchfly (*Silene spaldingii*), and the largest population in the world. Figure 2 is a picture of this plant at Zumwalt in full bloom. The species was formerly common throughout the Pacific Northwest bunchgrass prairie area. Because of the conversion of most of these grasslands to farmlands, the plateau grasslands at Zumwalt and similar plateau bunchgrass prairies in western Montana are the remaining strongholds for this plant. Spalding's catchfly is a late-bloomer, flowering in July and August, generally well after most of the flowers in these forb rich grasslands have senesced. It is easily identified by its pale, tubular calyx, yellow-white flowers, and very sticky stem, typical of many catchfly species.



Figure 2. *Silene spaldingii* (Spalding's catchfly) in bloom at Zumwalt Prairie.

In addition to this, there are three other globally imperiled plant species found at the prairie: rough pyrocoma (*Pyrocoma scaberula*, (see Bjork and Darrach 2009 for more information, as the name has yet to be included in the NRCS Plants Database) and Palouse thistle (*Cirsium brevifolium*) which occur in the fescue grasslands, and Wallowa ricegrass (*Achnatherum wallowaense*) which occurs in the basalt, shallow-soiled scablands. All three of these species are quite rare on the proposed NNL.



Figure 3. *Aspicilia rogeri* lichen thallus on rocks at Zumwalt (~0.5 inches or 1.5 cm across, photo by Rob Taylor).

Also recently discovered at the prairie is a newly described species of vagrant lichen called “Wanderflechten” (*Aspicilia rogeri*). These small unusual species are not rooted which then can roll across the prairie in the wind (Figure 3). They are known from only a few locations in the western United States (Sohrabi et al 2011).

Primary Geological Features

The Zumwalt plateau occupies about 150,000 acres (60,000 hectares) north of the Wallowa Mountains, ranging from 4000 feet (1200 meters) to 6000 feet (1700 meters) in elevation. The soils are largely loess (wind-blown) silts deposited over several thousand meters of Miocene Yakima Basalt. These Columbia River Basalts flowed out of numerous vents between 12 and 14 million years ago. The Wallowa Mountains were uplifted later, about 9 million years ago. The three Findley Buttes represent more recent volcanic cinder cones (often called shield volcanos), erupting through the basalt and forming roughly conical peaks. The buttes have not been aged, but are likely between 4 and 8 million years old. Vents (forming cinder cones) through these thick Columbia River basalt flows are extremely unusual (John Elliot Allen, Emeritus Professor of Geology, Portland State University, personal communication).

Physical Setting

Zumwalt Prairie is a large natural plateau located in the northeastern corner of Oregon, located between the Snake River Canyon (Hell's Canyon) and the Seven Devils Mountains to the east, the Grande Ronde River Canyon to the north and west, and the Wallowa Valley and Wallowa Mountains to the south. The plateau is divided by a number of small streams, including: 1) Camp Creek at the east end of the plateau, which starts in the proposed landmark and heads north and then back south and then west to the Imnaha River, 2) Pine, Salmon and Crow Creeks, which head north into Joseph Creek and the Grande Ronde River, and 3) Trout Creek and Prairie Creek heading south into the Wallowa River.

Weather and Climate

The climate is moderate, but just a little too cold to allow for any successful farming for crops or alfalfa. The Nature Conservancy installed a Weather Station at Zumwalt in August of 2005 that collects data on precipitation, temperature, humidity, wind speed, and wind direction 24/7. The station is located at 45.577745 N and 116.971754 W and is at an elevation of 1336.59 m (4385.14 ft). Monthly temperature data from the station from August 13, 2005 through April 30, 2009 is summarized in Figure 4 below. The Zumwalt Weather Station monthly precipitation data (Figure 5 and Figure 6) also shows how variable rainfall can be in the area, especially in the spring and the fall. The entire Zumwalt Prairie area is just dry, flat and open enough to allow wildfires to have historically rapidly spread across the plateau, especially in years such as 2007 when the summer precipitation stays low.

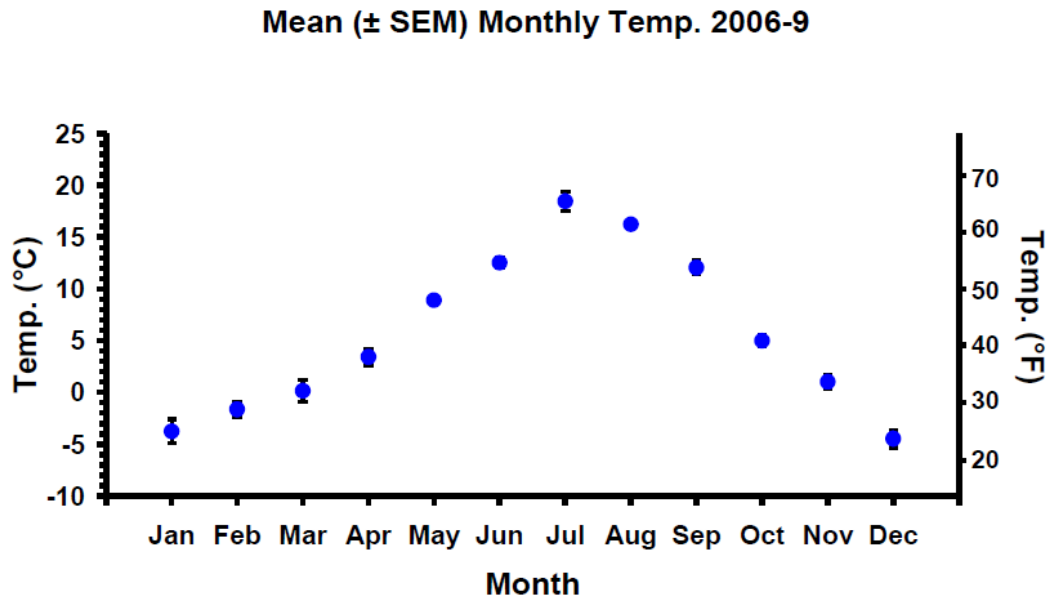


Figure 4. Mean (\pm Standard Error of Mean) of monthly temperatures ($^{\circ}\text{C}$) ($n = 4$) observed at the Zumwalt Weather Station (18 miles NE of Enterprise, Oregon) from 2006 to 2009.

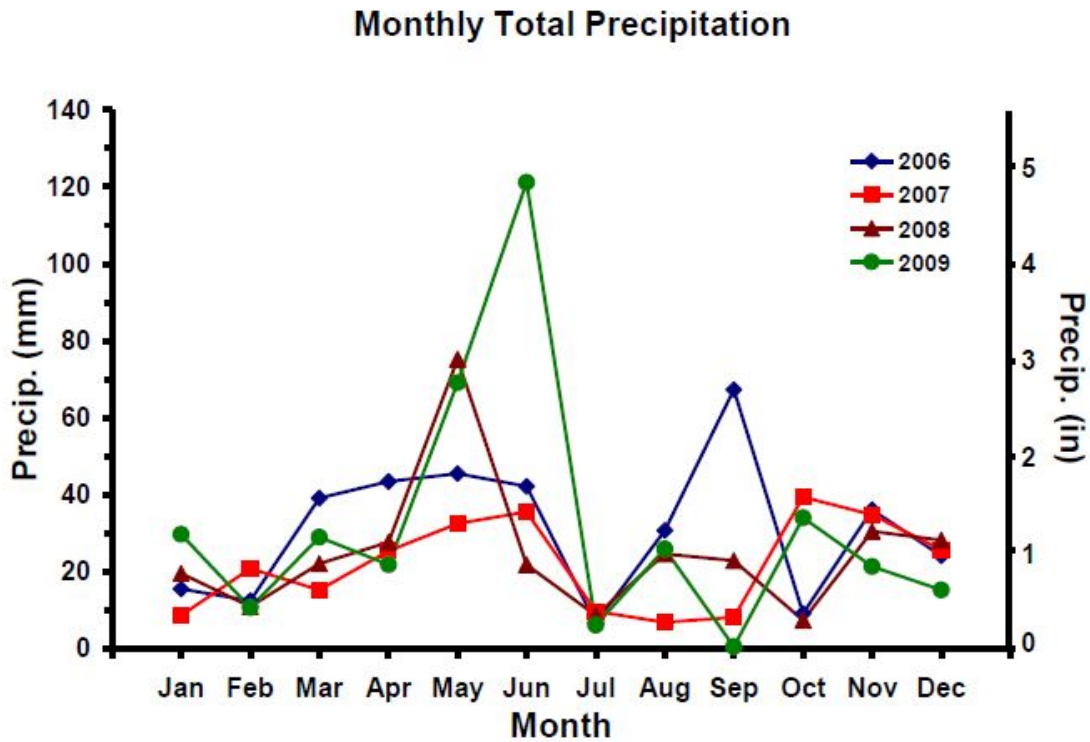


Figure 5. Precipitation observed, by month, at the Zumwalt Weather Station from 2006 to 2009.

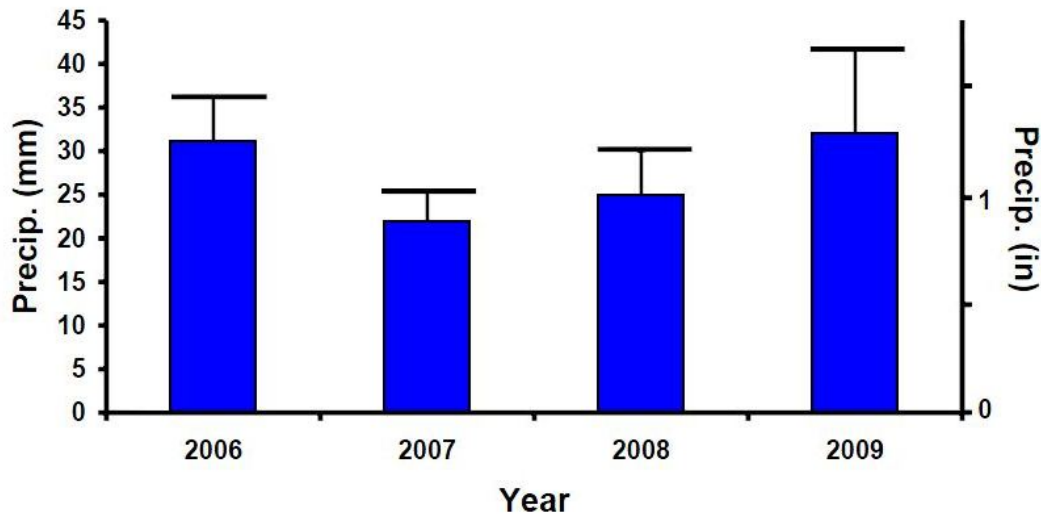


Figure 6. Monthly mean precipitation at the Zumwalt Weather Station from 2006-2009.

Location and Access

Zumwalt Prairie is located 32 km (20 mi) northeast of Enterprise, Oregon, in the extreme northeastern corner of Oregon (Figure 7 and Figure 8). The only access is by State Highway 82, which can be reached either from Interstate 84 at the town of LaGrande, Oregon, or from Oregon State Highway 3, from Clarkston, Washington (on Washington State Road 129). Clarkston is across the Snake River from Lewiston, Idaho.

To reach the site from Enterprise, head east on state highway 84 (towards Joseph) for 2 km (1.2 mi), and turn left (north) on the road to Buckhorn Springs-Elk Mountain Lookout. Follow this road north, and then west for about 3.2 km (2 mi) at which point it turns sharply left (north), becomes gravel, and splits (Y). Turn (bear) right (east) on the road to Zumwalt and Buckhorn Springs (the Elk Mountain Lookout-Crow Creek Road continues due north) and go 27 km (17 mi) to the site. The Zumwalt-Buckhorn Springs road divides the proposed National Natural Landmark.

The primary Zumwalt – Buckhorn Springs Road to access the site is on the left side of Figure 9, below. This road is paved part of the way to the site, and is a good quality gravel road through the entire Zumwalt Prairie site, to the U.S. Forest Service boundary and the forested area to the north. There are two county roads that traverse the PNNL, both unimproved dirt roads, which come together near the center of the proposed landmark. The Old Imnaha Road cuts off first diagonally from the Zumwalt – Buckhorn Springs Road, and provides the best access to the southern part of the NNL, heading between the two southerly Findley Buttes, for which the original proposed NNL was named. However, this road has no gravel, and should not be driven when wet, unless a high clearance, four-wheel drive vehicle is used. In dry weather, it is passable by most vehicles. The road continues down to Sheep Creek and then to Imnaha and Hell’s Canyon. The site can also be accessed by a better quality road, which heads east just as the Zumwalt – Buckhorn Road passes the center Findley Butte. Appendix C is a detailed road and trail map of the Nature Conservancy’s Zumwalt Prairie Preserve.



Figure 7. General Location of Zumwalt Prairie PNNL in the Columbia Plateau (yellow polygon).

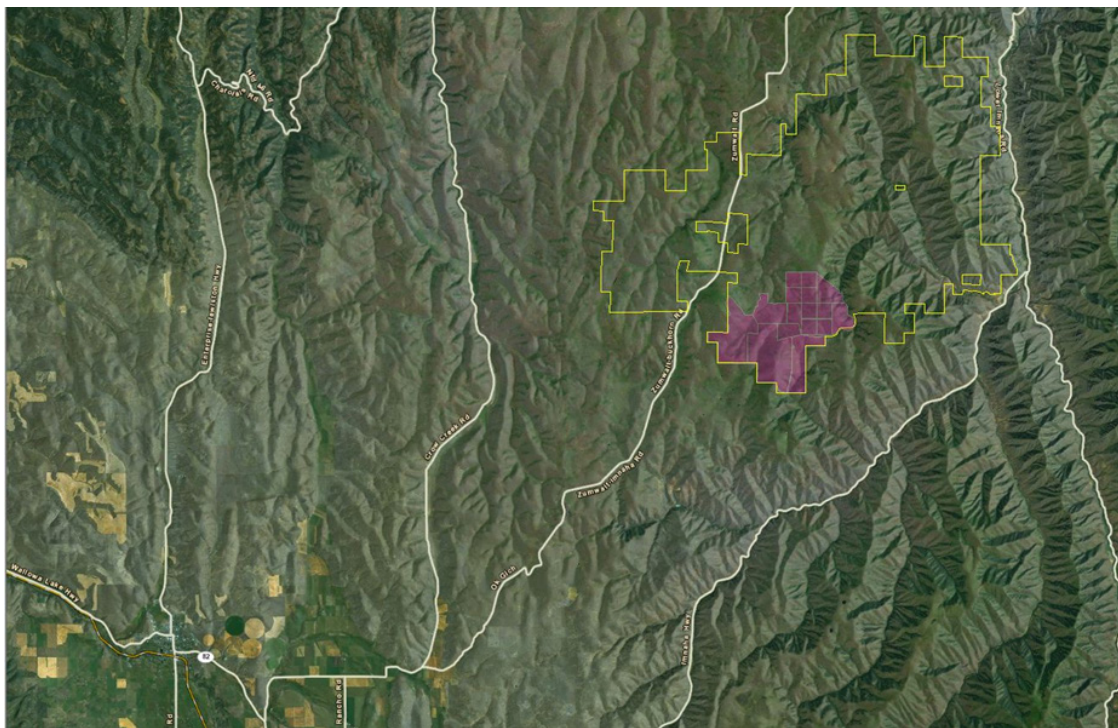


Figure 8. Zumwalt Prairie PNNL (pink) within the Zumwalt Prairie TNC Ownership (yellow).

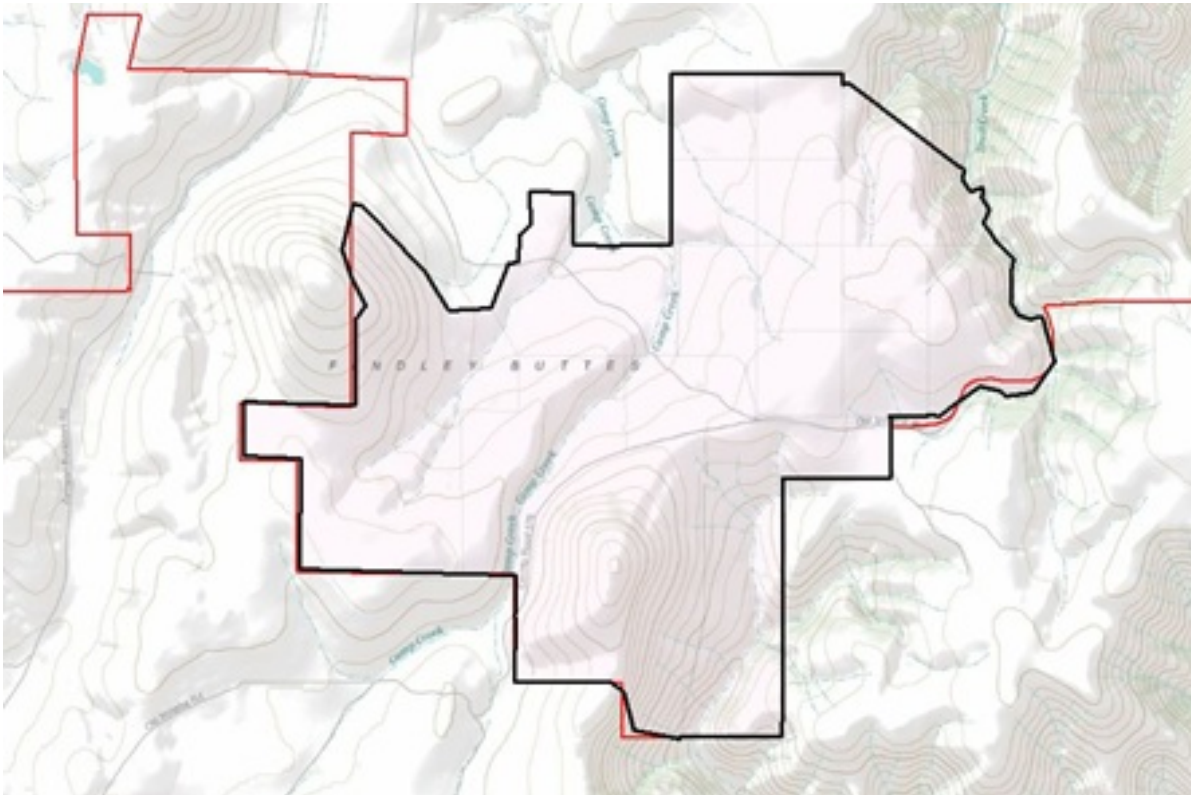


Figure 9. Zumwalt Prairie Proposed NNL Boundary (black), with the TNC ownership boundary in red and local roads in grey.

Ownership

The entire proposed NNL is owned by The Nature Conservancy, a private conservation organization, and is their largest preserve in Oregon. The proposed NNL makes up the south-central portion of their preserve ownership, approximately one-third of the very large preserve. Figure 9 above shows the general location of the proposed NNL within the larger Zumwalt Prairie, and the overall TNC ownership.

As mentioned above, the PNNL occupies the southern section of the Zumwalt Preserve. It is entirely located in Township 1 North, Range 47 East, and includes parts of Sections 20, 21, 22, 27, 28, 29, 30, 31 and 33. The ownership plat map is shown as Figure 10 below. The PNNL include taxlots 500, 501, 1500, 2000, and 2001. The boundaries of the PNNL were selected to follow the different fenced pastures and allotments, rather than tax lot boundaries, since the entire area is owned by The Nature Conservancy. The fencelines are much more relevant to how the area is currently, as well as historically been managed. The proposed NNL is 3,793 acres (1,535 ha) in size.

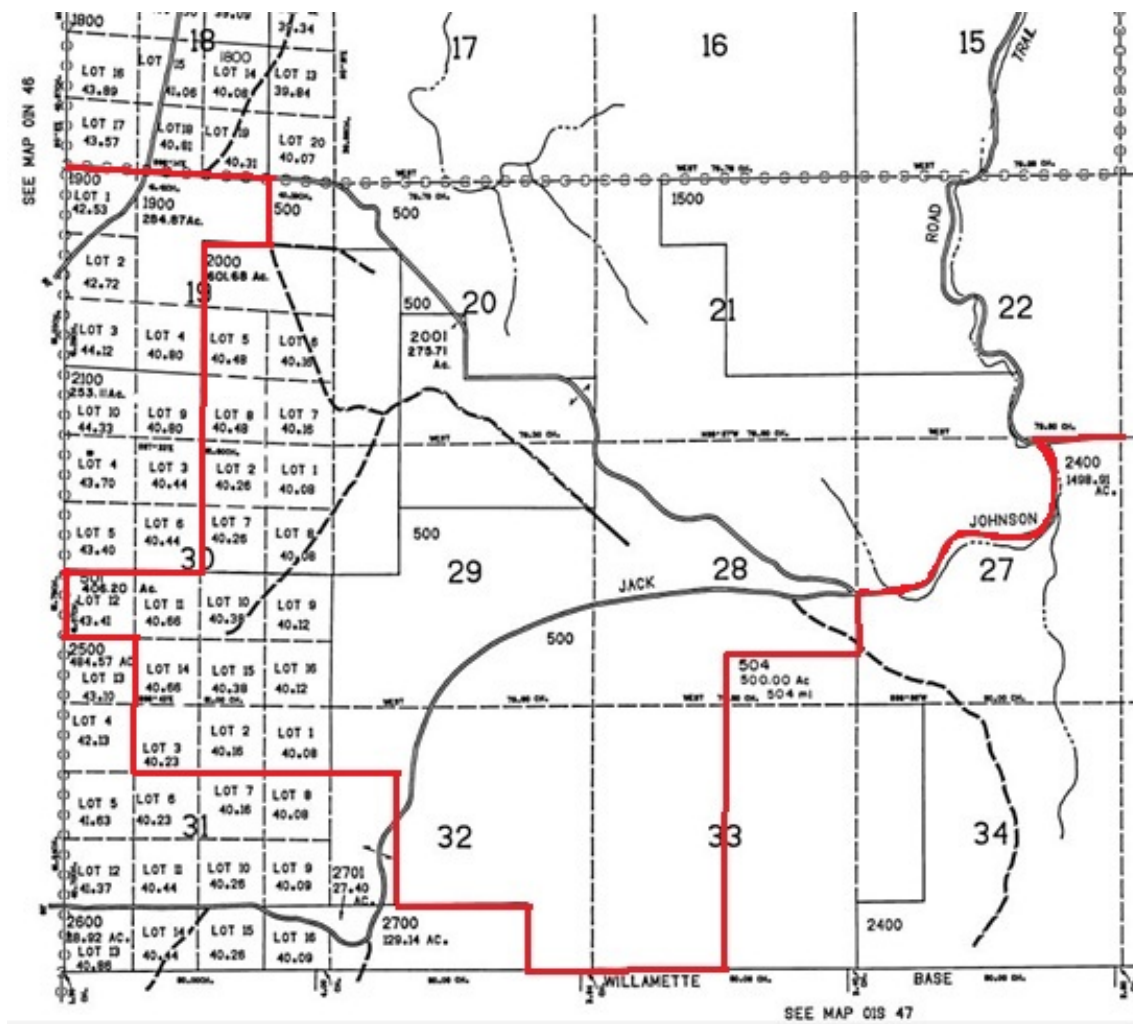


Figure 10. Wallowa County Plat Map showing tax lot boundaries at Zumwalt Prairie PNNL.

Land Use and Condition

Historic Land Use

As was the case for much of northeastern Oregon, the Zumwalt Plateau historically was used by the Nez Perce for hunting and gathering of foods. The area was homesteaded in the late nineteenth century, but most of these homesteads were short-lived. The harsh winters and early frosts, as well as the lack of available water, prevented any successful homesteading. In the 1880's, ranchers switched to sheep, but the large sheep operations disappeared by the late 1940s, due to low sheep prices (Bartuszevige et al 2012). The entire plateau has been grazed by cattle at different levels since then.

Bartuszevige et al (2012) found that while agriculture declined significantly on the Zumwalt Prairie, between 1938 and 1956 there was a 6-fold increase in the number of stock ponds. These ponds increase the ability to keep cattle on the prairie in the summer,

negatively impact the many headwater streams, and can “concentrate sediments, alter baseflows and cause excessive erosion and stream channelization”. They also found that the tree cover on the prairie has increased in the last 67 years, possibly as a result of changes in the fire frequency. In spite of the increased tree cover, aspen cover has declined. Figure 11 shows how aspen recruitment is significantly different in the livestock-elk exclosures, than other areas across the preserve (Taylor and Arends, in Review).

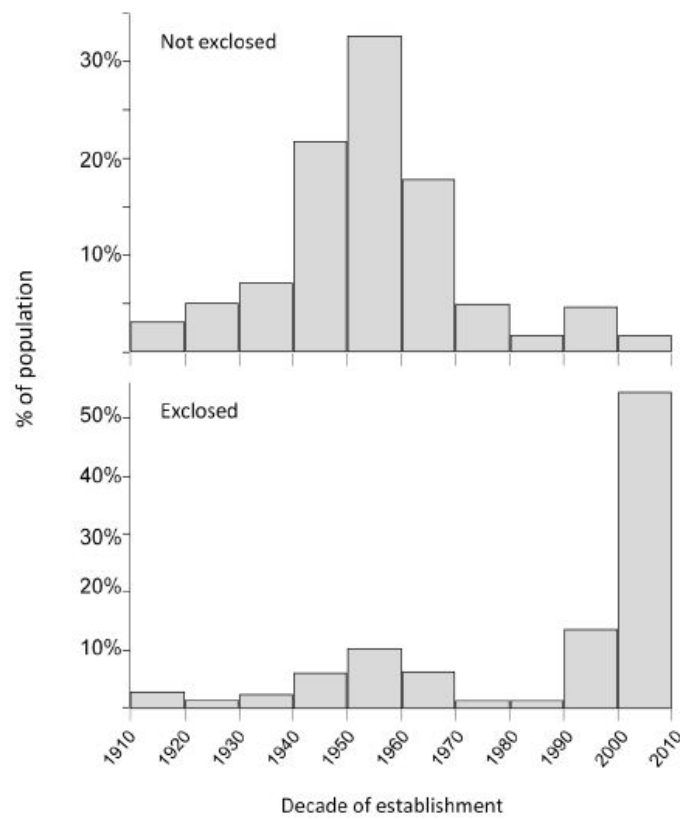


Figure 11. Age distribution of stems > 2m in height on the Zumwalt Prairie Preserve in northeastern Oregon.

Throughout the prairie, but less in the proposed NNL, grazing is concentrated around the few ponds and in some riparian meadows, causing a decline in the condition of these areas. Historically, landowners have unsuccessfully attempted to farm grain and hay for cattle on the plateau. These abandoned farmlands are dominated largely by the exotic grasses Kentucky bluegrass (*Poa pratensis*), intermediate wheatgrass (*Thinopyron intermedium*), and Hungarian brome (*Bromus inermis*). There is only a small patch of abandoned farmland within the landmark area. The majority of the entire Zumwalt plateau area still has no electric service, limited water and marginal roads, which prevents most local ranchers from setting up homesteads on the plateau.

Current Land Use and Present Condition

The entire NNL is managed by The Nature Conservancy to conserve biodiversity, both at the site and throughout the plateau. The area is generally in exceptional condition, especially for native bunchgrass prairies. Some of the area is pristine, while small portions of it have some significant weed cover remaining from past overuse of livestock or from the turn-of-the century cultivation. There are eight pastures in the NNL which are part of a long-term study to compare the impacts of different grazing regimes on the birds, wildlife and vegetation of the prairie. However, almost one-third of the area in the PNNL is totally excluded from any livestock grazing, while the rest receives limited use.

Sensitive or Hazardous Resources

Some of the significant rare species at Zumwalt Prairie, such as the Spaulding's catchfly, are not particularly sensitive or vulnerable at the site. Others, including the sharp-tail grouse and the gray wolf, are vulnerable because they are wide ranging and spend considerable amounts of time away from the protected preserve; however, the grouse does not currently occur in the proposed NNL. There are no known hazardous resources, although it does have some very steep canyon edges, which require reasonable caution, and two of the three roads through the site are unimproved dirt, which can be hazardous when wet. Because the one good gravel road provides relatively simple public access to part of the site, this should not be a problem reaching the site. However, the county road providing the access to the southern portions of the PNNL is a poorly maintained dirt road; it should be avoided whenever the road is wet.

The only damage to the rangelands in this area has come from overgrazing or from farming. None of the TNC property is ever going to be farmed, and grazing at the site is done for conservation and research purposes. The Nature Conservancy has identified six "Conservation Challenges" to be addressed at the Zumwalt Prairie Preserve, which they hope to better understand through their research and management activities at the site.

These include:

- **Incompatible livestock management** is being addressed with grazing studies.
- **Non-native species** are being controlled, based on their threat and invasiveness across the preserve, as funding permits.
- **Overuse by elk and deer** may decline with the expansion of the Imnaha wolf pack or with limited hunts tied to local community activities.
- **Pushup Dams/Culverts/Channelization** are being repaired as needed and as funding permits in the preserve. This is a minor problem in the PNNL.
- **Fire suppression** is being addressed through research into fire effects to guide fire management activities and prescribed fire, especially related to quaking aspen regeneration and wildlife habitat impacts.
- **Exurban Development** is a problem throughout the west, but not in the PNNL. However, the first house on the Zumwalt Prairie recently was built, and it is quite possible that extension of power to the area, or an increasing demand for second homes could make this more of a threat at the site.

There are no anticipated impacts of a National Natural Landmarks designation on the proposed area. While there is a potential that the designation might increase visitor use, the area is remote enough that casual use leading to damage seems unlikely. The site is spectacular throughout the spring and summer, with abundant wildflowers, extraordinary views of the Wallowa Mountains, the Seven Devils Mountains and much of Hell's Canyon. Extra attention and visitation could lead to greater appreciation of The Nature Conservancy's conservation mission at the site, and potentially greater support for their management efforts. While potential disturbance to wildlife is a concern with increased visitation, The Nature Conservancy has staff at the site throughout the field season that can assist visitors and researchers and assure all of the resources present are protected.

Comparative Assessment

Regional Site Inventory

The Regional Site Inventory was compiled through a literature search and conversations with scientific experts, some when the initial theme study was done in 1985. Because the subthemes were reorganized (Crawford 2004) a new list of potential sites was developed as part of this study.

A total of 8 sites in the Columbia Plateau Biophysiographic Province were evaluated, of which five sites were re-visited during this study to complete a more-detailed assessment as to their representativeness, quality, and ability to represent the Plateau Grasslands subtheme (Figure 12). The sites were chosen based on records in the Oregon, Washington and Idaho Natural Heritage Program databases indicating the presence of native and diverse grasslands. Three of the five sites were visited in 1985 as part of the original subtheme study (Kagan et al 1985). The four Oregon sites, Zumwalt, Clear Lake Ridge, Marr Flat and Long Prairie, were revisited by the author in 2011, to assure no significant changes had occurred. The Pataha Bunchgrass site was revisited by Crawford in 2010, as part of another project. The best remaining five sites are listed in priority order below. Of these, only the first three are fairly high quality sites, which generally meet the requirements of a national natural landmark. The remaining two are either not of sufficiently high quality or the occurrence of the subtheme is too small to be adequately representative. The sites are listed in priority order below.

1. Zumwalt Prairie (Findley Buttes), Oregon
2. Clear Lake Ridge, Oregon
3. Pataha Bunchgrass Research Natural Area, Washington
4. Marr Flat, Oregon
5. Long Prairie, Oregon

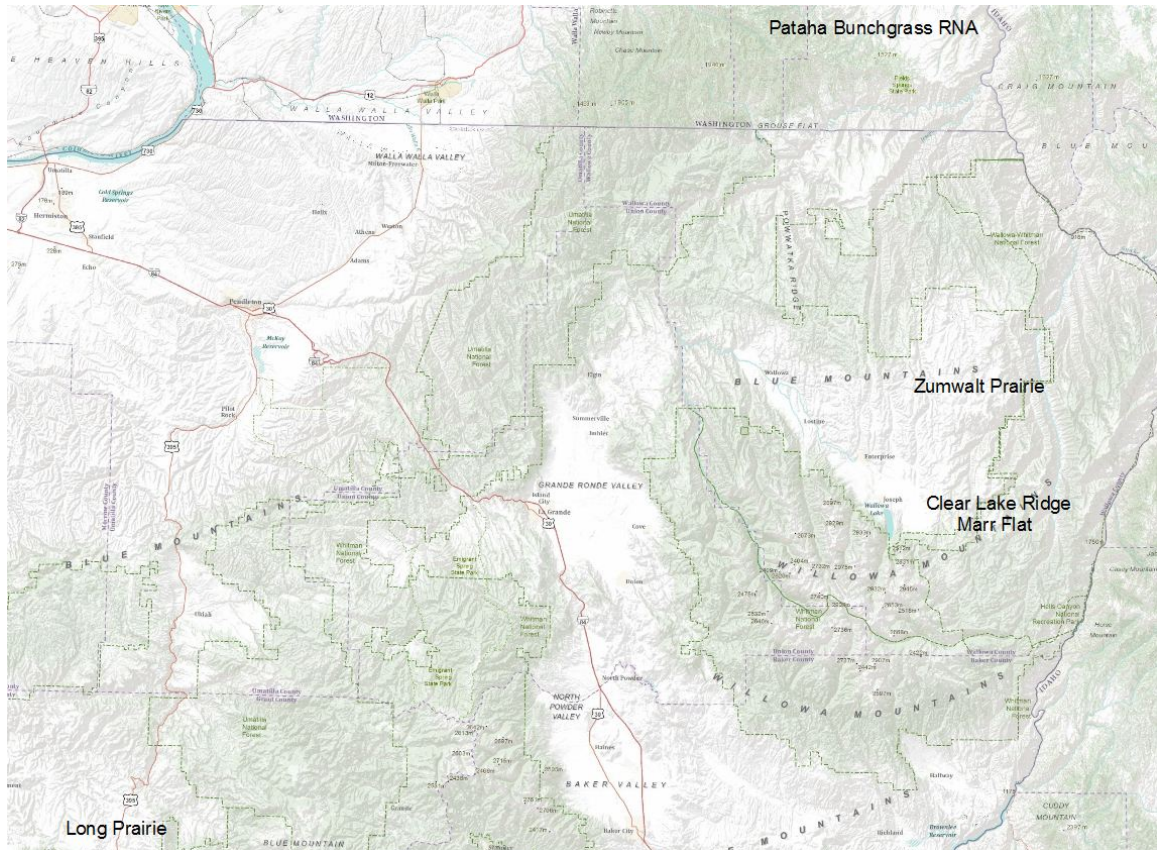


Figure 12. Location of the 5 sites evaluated for the Plateau Grasslands Subtheme.

Site Descriptions

1. Zumwalt Prairie

Oregon's largest privately owned nature sanctuary lies within the Zumwalt Prairie, North America's largest remaining grassland of its type. Studying the prairie's ecosystem for nearly 20 years led The Nature Conservancy to protect this unique place because of its size, intact bunchgrass habitats and incredible concentrations of wildlife. This diverse preserve hosts nearly a dozen native bunchgrasses and over 100 wildflower species. Early in the season, hoary balsamroot, camas and silky lupine put on a spectacular display. Later, goldenrod, pleated gentian, Gardner's yampah and other species continue to provide color and food for pollinating insects. The preserve is also home to one of the largest populations of the threatened Spalding's catchfly which blooms in mid-to-late-July.

Abundant ground squirrels and other prey support high concentrations of breeding raptors. Ferruginous and Swainson's hawks, on the decline throughout the West, but are stable here, along with golden eagles and prairie falcons. The prairie is also home to several ground-nesting songbirds including Savannah, vesper, grasshopper and Brewer's

sparrows. During the fall and winter, rough-legged hawks can be spotted after migrating south from arctic breeding grounds.

Large mammals found on the prairie include elk, mule deer, black bear and cougar. The preserve is also a great place to see coyote, short-tailed weasel and badger. Butterflies and snakes (including rattlesnakes) are other animals that visitors may observe. Snake River steelhead, a federally listed threatened species, and inland redband trout spawn in Camp Creek, although probably downstream from the proposed NNL boundaries.

2. Clear Lake Ridge Preserve and Natural Area, Oregon

On the northeastern flanks of the Wallowa Mountains, Clear Lake Ridge's 3,484 acres (1410 hectares) include rocky-soiled ridgetops, steep canyon and mile-high lakes that provide a spectacular setting and diverse habitats for birds and other wildlife.

This basalt plateau, hosting three shallow lakes amid native grasslands, gives way to Devil's Gulch, a canyon plunging 3,000 feet (914 meters) toward Little Sheep Creek. Views from the plateau include the Seven Devil's range across Hell's Canyon into Idaho, and south to the 9,000 foot (2743 meter) peaks of the Eagle Cap Wilderness in the Wallowa Mountains. Conservancy staff and partners have inventoried populations of threatened Spalding's catchfly, as well as non-native, invasive plant species. Volunteers help control invasive species such as knapweed and Scotch thistle, and monitor and repair the boundary fences and exclosures protecting aspen stands. From July through October, volunteer caretakers live here and monitor preserve activities.

3. Pataha Bunchgrass Research Natural Area, Washington

The Pataha Bunchgrass RNA is located in Garfield County, Washington. The 50-acre (21 hectare) tract has a mean elevation of 4,501 feet (1,372 meters) with a total variation of 197 feet (60 meters), and topography varies from flat to steep. The natural area is located on the edge of a dissected plateau straddling the transition from the flat plateau top to steep canyon slopes. South slopes of the RNA represent an upper elevational extension of the bunchgrass steppe, and north slopes represent a lower elevational extension of true fir forest. Bluebunch wheatgrass dominates the bunchgrass stands, and on the plateau it is associated with Idaho fescue and Sandberg bluegrass. On the transition from plateau to steep slopes, bluebunch wheatgrass co-dominates with Sandberg bluegrass. The 7 forested hectares (17 acres) are dominated by Douglas fir (*Pseudotsuga menziesii*) with occasional ponderosa pine (*Pinus ponderosa*). The understory is dominated by big huckleberry (*Vaccinium membranaceum*) and pinegrass (*Calamagrostis rubescens*). Ponderosa pine, exhibiting an open growth form with living branches within 3 m (10 ft) of the ground, dominates an interrupted transitional band between grassland and Douglas fir forest. The understory is dominated by pinegrass; associated species include elk sedge (*Carex garberi*), shinyleaf spirea (*Spiraea lucida*), broadleaf lupine (*Lupinus latifolius*), and yarrow (*Achillea millefolium*). The lack of dominant old-growth grand fir in the *Pseudotsuga-Abies/Vaccinium* community and downed western larch (*Larix occidentalis*) suggests that the entire area has burned at some time. The last fire is believed to have

occurred around 1890. The site remains in very good condition although the exotic grass North Africa grass (*Ventenata dubia*) appears to have increased since 1987.

4. Marr Flat

Marr Flat is a 1,400 ha (3,500 acre) plateau grassland located in central Wallowa County, Oregon adjacent to the eastern edge of the Wallowa Mountains, just north of Sheep Creek and just west of Hell's Canyon. The site represents a remnant and typical example of plateau grasslands, dominated by Idaho fescue and junegrass, with some bluebunch wheatgrass, western needlegrass and small areas of Sandberg's bluegrass-one-spike oatgrass scablands. The prairie is mostly in private ownership, with a small area included in the Wallowa Whitman National Forest.

5. Long Prairie

Long Prairie is a 49,420 acre (20,000 hectare) grassland located in Grant County of Oregon, between the Umatilla and Malheur National Forests. Elevations range between 3,500 and 4,000 feet (1,067 to 1,219 meters), making it somewhat lower elevation than the majority of the sites in the theme. It is entirely in private ownership, dominated by bluebunch wheatgrass and Idaho fescue, with some western juniper (*Juniperus occidentalis*) and Ponderosa pine invading the site. Some of the prairie was farmed at the turn of the century, and the entire area is currently used by livestock as part of four large ranching operations. While the majority of the site remains as a bunchgrass prairie, the overall condition of the site appears to have been deteriorating since it was first visited in 1979; in subsequent visits to the site in 1992, 2004 and 2011 the bunchgrass cover visible from the roads bisecting the site has decreased while the non-native annual grass cover has increased.

Comparative Analysis and Discussion

1. Comparison of Zumwalt Prairie as a Potential National Natural Landmark

Primary Criteria

Illustrative Character: *Excellent*. The site is the prototype example of plateau grasslands, including deep-soiled and shallow-soiled grasslands, areas dominated by Idaho fescue, Sandberg bluegrass, Great Basin wildrye, western wheatgrass, western needlegrass, and all of the other representative species. It also has examples of riparian woodlands and shrublands, quaking aspen woodlands, Ponderosa pine, hawthorn-serviceberry-snowberry shrublands and the other vegetation types that often occur in large plateau grassland systems. It is the largest remaining example, the most diverse and best representative of the type. It is managed as a preserve by The Nature Conservancy; is adjacent to the large Hell's Canyon Wilderness Area.

Present Condition: *Excellent*. The site has over 3,500 acres (1,416 hectares) of grassland, and almost all of it is in excellent condition. Areas by the roads, streams and historic developments remain weedy, but these represent a very small part of the overall area. The condition of the entire area has improved since it was acquired by TNC, and appears likely to continue to improve over time.

Secondary Criteria

Diversity: *Excellent*. The overall Zumwalt Prairie is so large that it includes the entire range of diversity present in and around this ecosystem. While the proposed NNL area evaluated is smaller (3,793 acres), it includes an exceptionally diverse area, with two buttes, all aspects and slopes, large areas of each of the main plant associations, and small examples of each of the embedded riparian, shrubland, woodland and forest types.

Rarity: *Excellent*. Zumwalt Prairie provides habitat for a large number of rare plants and animals, including the federally listed Spalding's catchfly.

Value for Science and Education: *Excellent*. The area is a nature preserve protected by The Nature Conservancy, and is accessible from two county roads, one of which is unimproved. Also, the site has exceptional value for range, wildlife, and ecological research. It is somewhat remote, located in the extreme northeastern corner of the state, but it is not difficult to access.

2. Comparison of Clear Lake Ridge as a Potential National Natural Landmark

Primary Criteria

Illustrative Character: *Good*. The site has a high quality, protected example of the plateau grasslands theme, including all of the characteristic types. It is a small plateau located on the edge of Sheep Creek Canyon, about 10 miles south of Zumwalt Plateau, and just north of Marr Flat, to other sites evaluated.

Present Condition: *Excellent*. Most of the grasslands at Clear Lake Ridge have been excluded from livestock grazing since they were acquired as a nature reserve by The Nature Conservancy almost 20 years ago. The site was historically grazed lightly, but aside from the playa lake margins, is in exceptional condition.

Secondary Criteria

Diversity: *Good*. The site is somewhat diverse, with high quality examples of each of the plateau grassland communities, along with adjacent canyon habitats. It is lacking the quaking aspen, mounded prairie and scablands present at Zumwalt Prairie.

Rarity: *Good*. Clear Lake Ridge supports a population of Spalding's catchfly and Wallowa needlegrass.

Value for Science and Education: *Good*. The site has been managed by The Nature Conservancy as a preserve since it was acquired in 1994. It can be reached by an all season, if fairly rough, gravel road.

3. Comparison of Pataha Bunchgrass Research Natural Area as a Potential National Natural Landmark

Primary Criteria

Illustrative Character: *Good.* This site illustrates an edaphic climax community of the bluebunch wheatgrass - Idaho fescue association. It occurs on shallow soils within the forest zone and is south of the "normal range" of the subtheme.

Present Condition: *Excellent.* Although the site was occasionally grazed between 1890 and 1945, livestock use was never heavy enough to alter the native vegetation or lead to extensive invasion of non-native weeds. The bluebunch wheatgrass - Idaho fescue community occupies 33 acres of a 51-acre tract (14 of 21 hectares). The associated forest lands have been high-graded for large trees. The site has been essentially undisturbed since 1968 when it was designated a Research Natural Area by the U.S. Forest Service.

Secondary Criteria

Diversity: *Excellent.* In addition to the bluebunch wheatgrass – Idaho fescue community, a ponderosa pine/pinegrass (*Pinus ponderosa/Calamagrostis rubescens*) transitional community and a grand fir/big huckleberry (*Abies grandis/Vaccinium membranaceum*) community are found on site. The grassland community displays a rich diversity of perennial forbs which flower early in the growing season. However, neither quaking aspen or the mesic forbs occur here.

Rarity: *Fair.* Grasslands of this condition are quite rare in the Blue Mountains of Washington and Oregon, although no rare species are known from the site.

Value for Science and Education: *Good.* In 1975, R.F. Daubenmire recommended this site (#54) as a potential National Natural Landmark. Pataha RNA is within a two-hour drive from Washington State University and the University of Idaho, and 75 miles from Eastern Oregon University, and all four universities faculty use the area for research and educational purposes. The Natural Area is accessible from a state highway and county road.

4. Comparison of Marr Flat as a Potential National Natural Landmark

Primary Criteria

Illustrative Character: *Good.* This area has a good, but slightly patchy occurrence of many of the plateau grasslands types. It is a relatively small site, and has small occurrences of the deep-soiled Idaho fescue – junegrass community and of the scabland communities. The site is surrounded by Ponderosa pine forest.

Present Condition: *Good.* The entire area is currently part of an occupied grazing allotment, receiving moderately heavy livestock use. For a number of years the allotment was vacant and the area had been in very good condition, and while on the whole it remains largely natural, it is declining, with some large patches now dominated by European and Eurasian pasture grasses.

Secondary Criteria

Diversity: *Fair*. The site has no known at-risk species, but a fair diversity of the grassland types and forest margin types.

Rarity: *Fair*. There are no rare species at the site. A population of Wallowa ricegrass occurs just across Sheep Creek Canyon (northwest from the Marr Flat site) and the local Cusick's primrose (*Primula cusickiana*) has been found just south of the site. However, no rare species have been reported.

Value for Science and Education: *Fair*. This area is not easy to reach, since the roads to the site are quite bad.

5. Comparison of Long Prairie as a Potential National Natural Landmark

Primary Criteria

Illustrative Character: *Fair*. While quite large, the area is the lowest elevation site, and as a result lacks the more mesic Idaho fescue – junegrass and sedge-dominated grasslands, quaking aspen, and most of the mesic shrublands.

Present Condition: *Good*. It has been grazed lightly for years, which has caused a slow but steady increase in introduced annual weeds, and a decrease in native bunchgrasses. Because it is so large, the condition remains variable, with some areas showing more livestock damage, while others remain in very good condition.

Secondary Criteria

Diversity: *Fair*. Because of the low elevations at the site, it tends to be warmer and drier, lacking the mesic habitats and the forb diversity at the other sites. It does not have the aspen or mesic forbs found at the higher elevation sites, although it does have deep-soiled prairie, scablands and Mima mounds.

Rarity: *Fair*. There are no known rare species or habitats from the site. It does support a population of the whitetail jackrabbit, a species of conservation concern.

Value for Science and Education: *Fair*. The site is relatively easy to reach, located on Oregon State Highway 395, although it is quite remote.

Other Sites

The Plateau Grassland Sub-theme is composed of a limited number of large sites, so most have been considered here. There are two other sites that were considered: Fairchild Air Force Base, Washington and the Vance Knoll Research Natural Area, Oregon.

The Fairchild Air Force Base occurrence is too weedy to merit consideration and Vance Knoll Research Area is located at the extreme north end of the Zumwalt Prairie, so could actually be considered part of the same site as the proposed NNL. It borders on and contains some ponderosa pine forests, and was established as a Research Natural Area because of its extensive representation of Mima mounds and scabland topography. However, it has no deep-soiled prairie, and has been invaded by the introduced North Africa grass (*Ventenata dubia*).

Evaluation Recommendations

Summary Significance

There is no doubt that the Zumwalt Prairie represents the best site to represent the Plateau Grasslands subtheme. It is the largest and the best quality example, has the most diversity and the greatest concentration of at-risk and rare species. The site is scenic, relatively pristine, and one of the largest remaining prairies in North America. And the proposed NNL has become the largest Nature Conservancy Preserve in the Pacific Northwest.

The Zumwalt Prairie is the only site that includes the entire diversity of the subtheme, is in excellent condition, is accessible, and is nationally significant because of its size and representativeness. All of the other remaining sites are smaller, more isolated, and lack the diversity and concentration of rare species and habitats.

Proposed Landmark Boundary and Ownership Maps

Because of the very large area of The Nature Conservancy's Zumwalt Prairie Preserve, choosing the boundaries of the proposed National Natural Landmark was difficult. A number of different areas within the preserve were evaluated including:

1. The entire preserve,
2. The preserve area in the Camp Creek drainage, which comprises the lands east of the Zumwalt – Buckhorn Springs Road, including the lands in the Imnaha Canyon,
3. The preserve area on the plateau in the Camp Creek drainage,
4. The north half of the area on the plateau in the Camp Creek drainage, or
5. The south half of the area on the plateau, including the Findley Buttes.

Of the areas evaluated, the fifth option was selected for the proposed NNL, which includes the southern portion of the Zumwalt Prairie Preserve. It was chosen because it was the most diverse and accessible area, and because it had the greatest area excluded from livestock uses.

The boundaries for the NNL were selected based on the locations of the current fences and management units, called pastures. The site includes the Holding, Road, Aspen, Quanset, Butte, Harsin, Dog Leg, B1, B2, B3, B4, A1, A2, A3, and A4 pastures, along with all of the lands in the Butte Creek pasture owned by The Nature Conservancy. Figure 13 shows the boundaries of the proposed Zumwalt Prairie NNL, along with the boundaries of the fencelines and the pastures included in the NNL.

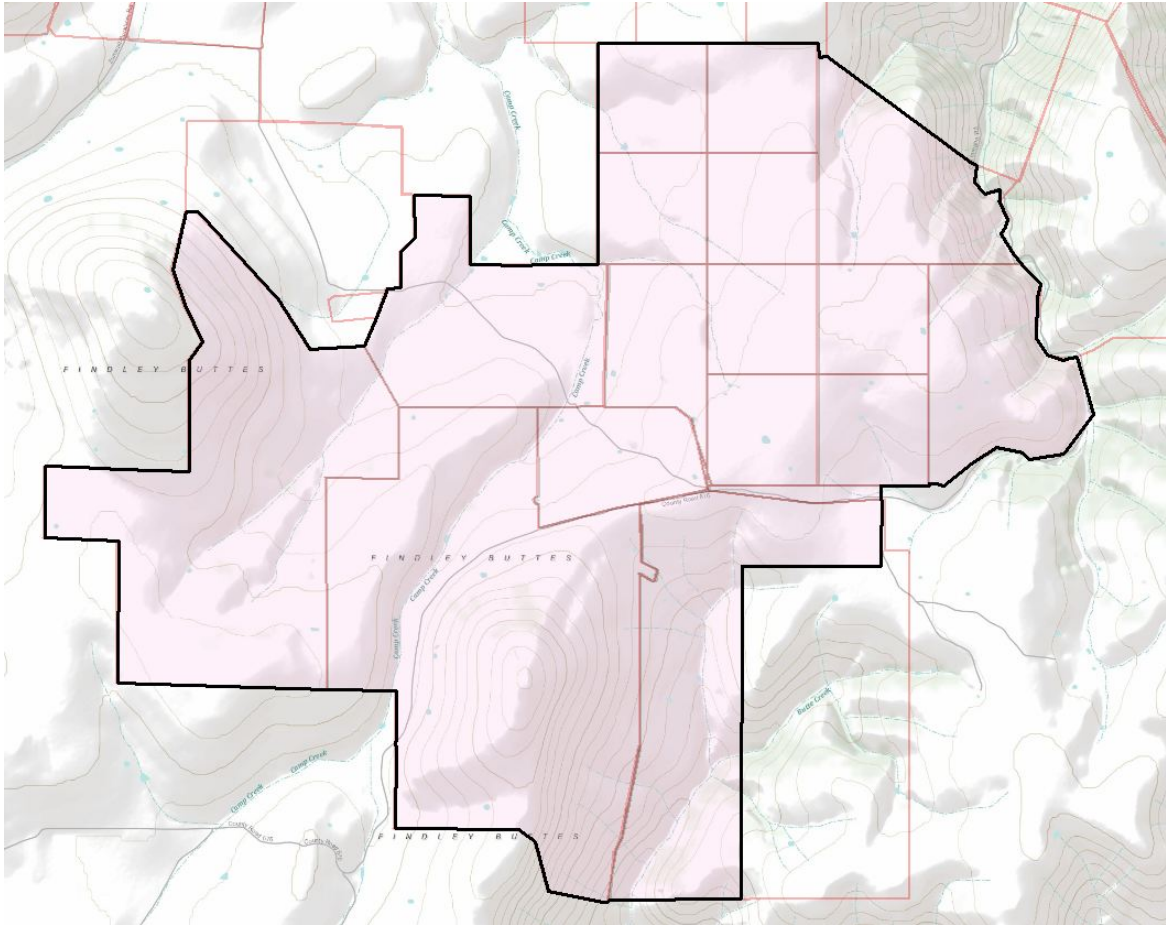


Figure 13. Proposed Zumwalt Prairie NNL boundary, fences and pastures.

Justification

The Zumwalt Prairie NNL includes many of the best quality grasslands in the area, the greatest diversity of plateau grasslands and the most accessible area in the preserve. At 3,793 acres (1,535 ha), it is large enough to represent the subtheme and to provide the feeling of how large and spectacular the prairie is. Yet, the NNL area is compact and not likely to provide management difficulties for The Nature Conservancy's Zumwalt managers.

Acknowledgements

The author would like to acknowledge the work of the many people who participated in the evaluation of the Palouse and Plateau Grassland subtheme, and the site. Work to identify important and representative grasslands ecosystem types in eastern Oregon and Washington and western Idaho started in 1981 with funding from The Nature Conservancy, and involved significant time from Reid Schuller, Jim Merzenich, Bob Moseley, and Rex Crawford. Much of the information in this report came from past work, some which was co-authored by Bob Moseley and Rex Crawford. The report was significantly improved by a very thorough review by Dr. Pat Kennedy.

The Nature Conservancy was exceptionally generous with their time, especially Rob Taylor, the Zumwalt Chief Scientist, and Jeff Fields, the Zumwalt and Northeastern Oregon Preserves Manager, along with other staff from TNC who put together the appendices and materials on their Conserve Online website. Rob also provided an exceptional review of this document, and the photograph of the vagrant lichen.

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Appendix A: Photographs of Zumwalt Prairie Potential National Natural Landmark (PNNL)



Photo 1. Findley Buttes at Zumwalt, copyright Ellen Bishop.



Photo 2. Mesic-forb rich prairie below one of the Findley Buttes in the center of the PNNL.



Photo 3. One of three elk herds seen at the Zumwalt Prairie Preserve in 2011.



Photo 4. Native, productive, high quality Idaho fescue grassland at the center of the PNNL.



Photo 5. Shallow-soiled grasslands dominated by Sandberg bluegrass and bluebunch wheatgrass.



Photo 6. PNNL edge as it drops into Trail Creek Canyon towards Imnaha and Hell's Canyon.



Photo 7. Upper Camp Creek, showing a natural seasonal streambed, with native annual grasses.



Photo 8. Shallow-soiled grasslands and mounded topography (center right) at Zumwalt.



Photo 9. Ponderosa pine and quaking aspen patches on a Findley Butte at the Zumwalt PNNL.



Photo 10. Basin wildrye expanding cover in the PNNL.



Photo 11. Scattered serviceberry, snowberry, and hawthorns on the north slope of Findley Butte.



Photo 8. Quaking aspen elk exclosure on the east slope of Findley Butte.



Photo 9. Zumwalt Prairie and a Findley Butte. Note shallow-soiled scabland in foreground.



Photo 14. Firebreak in experimental area excluded from grazing. Note the Basin wildrye.



Photo 15. Rock outcrop on hillside, looking west to the Pine Creek drainage, west of the PNNL.



Photo 16. Black hawthorn and the upper Camp Creek drainage in the proposed PNNL.



Photo 17. Columbia brome, western wheatgrass and western needlegrass prairie at the PNNL.



Photo 18. Snowberry, serviceberry, rose and small hawthorn along Camp Creek.



Photo 19. Upper Camp Creek and the southern edge of the Zumwalt Prairie PNNL.



Photo 20. County road - dirt track through the southern part of the Zumwalt Prairie PNNL.

Appendix B. Zumwalt Prairie National Natural Landmark Brief

U.S. Department of the Interior National Park Service National Natural Landmarks Program



Name: Zumwalt Prairie

Location: Wallowa County, Oregon

Description: 3,793 acres (1535 ha)

Zumwalt Prairie is located 20 miles northeast of Enterprise, Oregon, in the extreme northeastern corner of Oregon. It is part of one of the largest remaining grasslands in North America, containing over 100,000 acres of bunchgrass dominated prairies. The site includes deep loess-soiled prairie, shallow-soiled basalt garlands, biscuit scablands (Mima mound prairie with scablands in the inter-mound areas), talus slopes, basalt cliffs, and gently rolling hills typical of plateau grasslands. It has aspen groves, hawthorn riparian woodlands, sagebrush and snowberry shrublands, bottomland wet grasslands, and many other grassland types which vary with elevation, soils, aspect and slope. As a large, high quality natural area, it supports large populations of deer, elk, cougar, wolves, and part of Oregon's only population of the sharp-tailed grouse.

Significance:

Zumwalt Prairie is the best example of bunchgrass prairie remaining in North America. It is one of the largest prairie remnants, is in exceptional condition, and is being protected for its natural values by The Nature Conservancy. It is large, diverse, spectacular, representative and relatively easy to visit, study and appreciate.

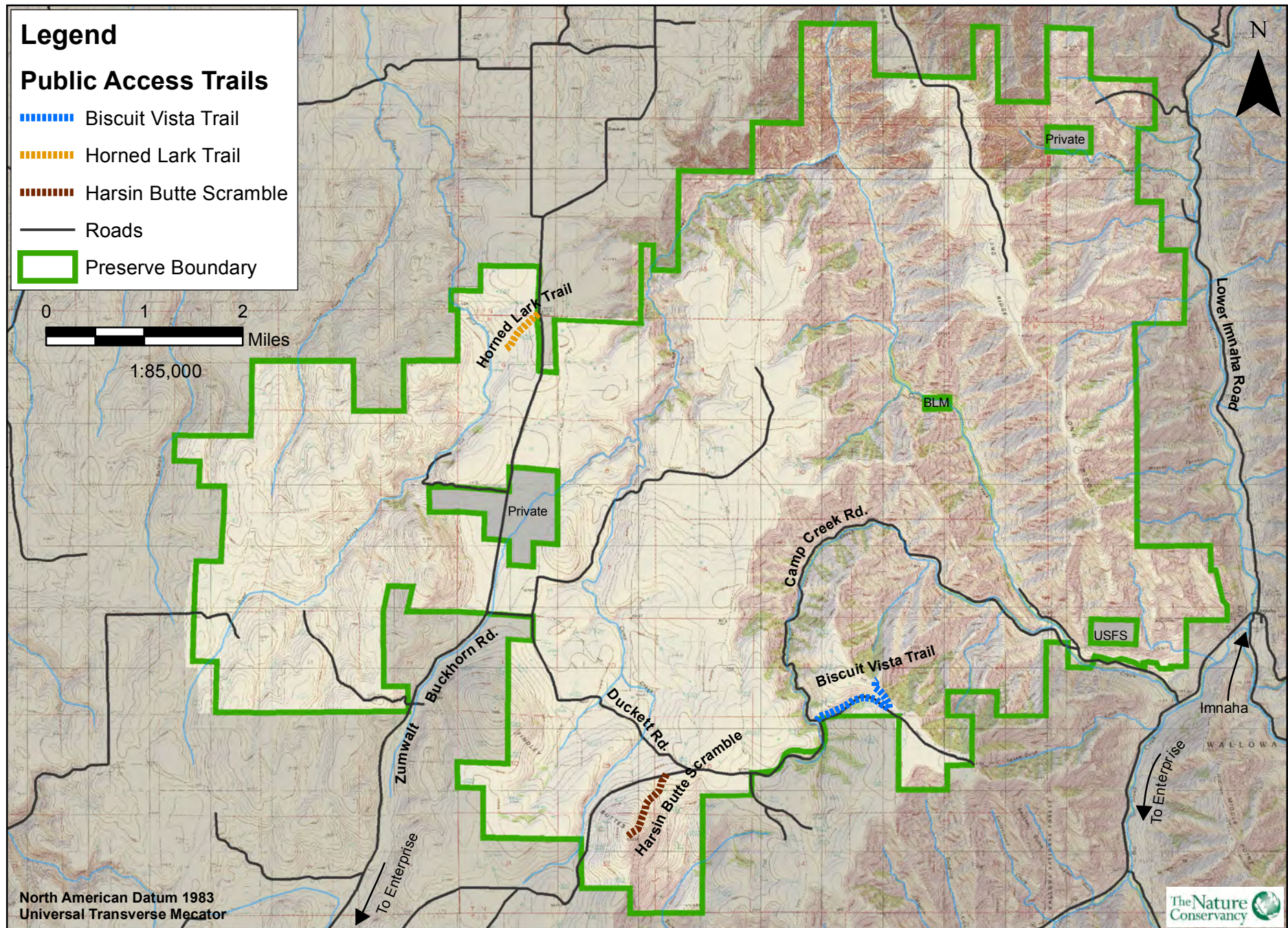
Ownership: Private

Designation:

Evaluation: James S. Kagan, Portland State University, 1987 and 2012.

Appendix C.

Zumwalt Prairie Preserve



Common Name (Scientific name)	Habitat/Migration¹
Snow Goose (<i>Chen caerulescens</i>)	Wetland (M)
Canada Goose (<i>Branta canadensis</i>)	Wetland (S)
Trumpeter Swan (<i>Cygnus buccinator</i>)	Wetland (M)
Tundra Swan (<i>Cygnus columbianus</i>)	Wetland (M)
Wood Duck (<i>Aix sponsa</i>)	Wetland (M)
Gadwall (<i>Anas strepera</i>)	Wetland (S)
Eurasian Wigeon (<i>Anas penelope</i>)	Wetland (V)
American Wigeon (<i>Anas americana</i>)	Wetland (S)
Mallard (<i>Anas platyrhynchos</i>)	Wetland (S)
Blue-winged Teal (<i>Anas discors</i>)	Wetland (S)
Cinnamon Teal (<i>Anas cyanoptera</i>)	Wetland (S)
Northern Shoveler (<i>Anas clypeata</i>)	Wetland (S)
Northern Pintail (<i>Anas acuta</i>)	Wetland (S)
Green-winged Teal (<i>Anas crecca</i>)	Wetland (S)
Canvasback (<i>Aythya valisineria</i>)	Wetland (U)
Redhead (<i>Aythya americana</i>)	Wetland (S)
Ring-necked Duck (<i>Aythya collaris</i>)	Wetland (M)
Lesser Scaup (<i>Aythya affinis</i>)	Wetland (S)
Bufflehead (<i>Bucephala albeola</i>)	Wetland (M)
Ruddy Duck (<i>Oxyura jamaicensis</i>)	Wetland (S)
Chukar (<i>Alectoris chukar</i>)	Canyon/Riparian (S,W)
Gray Partridge (<i>Perdix perdix</i>)	Prairie (S,W)
Ring-necked Pheasant (<i>Phasianus colchicus</i>)	Prairie (S,W)
Ruffed Grouse (<i>Bonasa umbellus</i>)	Pine, Canyon/Riparian (S,W)
Dusky Grouse (<i>Dendragapus obscurus</i>)	Pine (S,W)
Columbian Sharp-tailed Grouse (<i>Tympanuchus phasianellus columbianus</i>)	Prairie (S,W)
Wild Turkey (<i>Meleagris gallopavo</i>)	Canyon/Riparian (S,W)
Mountain Quail (<i>Oreortyx pictus</i>)	Pine, Canyon/Riparian (S,W)
California Quail (<i>Callipepla californica</i>)	Pine, Canyon/Riparian (S,W)
Pied-billed Grebe (<i>Podilymbus podiceps</i>)	Wetland (S,W)
Horned Grebe (<i>Podiceps auritus</i>)	Wetland (S,W)
Eared Grebe (<i>Podiceps nigricollis</i>)	Wetland (S)
American White Pelican (<i>Pelecanus erythrorhynchos</i>)	Wetland (M)
Great Blue Heron (<i>Ardea herodias</i>)	Wetland (S,W)
Turkey Vulture (<i>Cathartes aura</i>)	Prairie, Pine, Canyon/Riparian (M)
Osprey (<i>Pandion haliaetus</i>)	Prairie (M)
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	Prairie (W)
Northern Harrier (<i>Circus cyaneus</i>)	Prairie (S,W)
Sharp-shinned Hawk (<i>Accipiter striatus</i>)	Pine, Canyon/Riparian (S,W)
Cooper's Hawk (<i>Accipiter cooperi</i>)	Pine, Canyon/Riparian (S,W)
Northern Goshawk (<i>Accipiter gentilis</i>)	Pine, Canyon/Riparian (S,W)
Swainson's Hawk (<i>Buteo swainsoni</i>)	Prairie (S)
Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Prairie, Pine, Canyon/Riparian (S,W)
Ferruginous Hawk (<i>Buteo regalis</i>)	Prairie (S,W)
Rough-legged Hawk (<i>Buteo lagopus</i>)	Prairie (W)
Golden Eagle (<i>Aquila chrysaetos</i>)	Prairie, Canyon/Riparian (S,W)

¹ Migration: S = summer, W = winter, M = migrant (only observed during migration and not during summer or winter), V = vagrant.

Common Name (Scientific name)	Habitat/Migration ¹
American Kestrel (<i>Falco sparverius</i>)	Prairie, Canyon/Riparian (S,W)
Merlin (<i>Falco columbarius</i>)	Prairie (W)
Gyr Falcon (<i>Falco rusticolus</i>)	Prairie (W)
Peregrine Falcon (<i>Falco peregrinus</i>)	Prairie (W)
Prairie Falcon (<i>Falco mexicanus</i>)	Prairie (S,W)
Virginia Rail (<i>Rallus limicola</i>)	Wetland (S,W)
Sora (<i>Porzana carolina</i>)	Wetland (S)
American Coot (<i>Fulica americana</i>)	Wetland (S)
Sandhill Crane (<i>Grus canadensis</i>)	Prairie (M)
Killdeer (<i>Charadrius vociferus</i>)	Wetland (S)
American Avocet (<i>Recurvirostra americana</i>)	Wetland (M)
Spotted Sandpiper (<i>Actitis macularius</i>)	Wetland (S)
Solitary Sandpiper (<i>Tringa solitaria</i>)	Wetland (M)
Greater Yellowlegs (<i>Tringa melanoleuca</i>)	Wetland (S)
Lesser Yellowlegs (<i>Tringa flavipes</i>)	Wetland (M)
Long-billed Curlew (<i>Numenius americanus</i>)	Wetland (S)
Semipalmated Sandpiper (<i>Calidris pusilla</i>)	Wetland (M)
Western Sandpiper (<i>Calidris mauri</i>)	Wetland (M)
Least Sandpiper (<i>Calidris minutilla</i>)	Wetland (M)
Baird's Sandpiper (<i>Calidris bairdii</i>)	Wetland (M)
Pectoral Sandpiper (<i>Calidris melanotos</i>)	Wetland (M)
Long-billed Dowitcher (<i>Limnodromus scolopaceus</i>)	Wetland (M)
Common Snipe (<i>Gallinago gallinago</i>)	Wetland (S,W)
Wilson's Phalarope (<i>Phalaropus tricolor</i>)	Wetland (S)
Black Tern (<i>Chlidonias niger</i>)	Wetland (S)
Rock Pigeon (<i>Columbia livia</i>)	Prairie, Canyon/Riparian (S,W)
Mourning Dove (<i>Zenaida macroura</i>)	Prairie, Pine, Canyon/Riparian (S,W)
Western Screech-Owl (<i>Megascops kennicottii</i>)	Canyon/Riparian (S,W)
Great Horned Owl (<i>Bubo virginianus</i>)	Prairie, Pine, Canyon/Riparian (S,W)
Snowy Owl (<i>Bubo scandiacus</i>)	Prairie (V)
Northern Pygmy-Owl (<i>Glaucidium gnoma</i>)	Pine (S,W)
Burrowing Owl (<i>Athene cunicularia</i>)	Prairie (U)
Short-eared Owl (<i>Asio flammeus</i>)	Prairie (S,W)
Common Nighthawk (<i>Chordeiles minor</i>)	Prairie, Canyon/Riparian (S)
Common Poorwill (<i>Phalaenoptilus nuttalli</i>)	Prairie, Canyon/Riparian (S)
White-throated Swift (<i>Aeronautes saxatalis</i>)	Canyon/Riparian (S)
Black-chinned Hummingbird (<i>Archilochus alexandri</i>)	Prairie, Canyon/Riparian (S)
Calliope Hummingbird (<i>Stellula calliope</i>)	Prairie, Canyon/Riparian (S)
Broad-tailed Hummingbird (<i>Selasphorus platycercus</i>)	Prairie, Canyon/Riparian (M)
Rufous Hummingbird (<i>Selasphorus rufus</i>)	Pine, Canyon/Riparian (S)
Belted Kingfisher (<i>Megaceryle alcyon</i>)	Canyon/Riparian (S,W)
Lewis's Woodpecker (<i>Melanerpes lewis</i>)	Canyon/Riparian (S)
Williamson's Sapsucker (<i>Sphyrapicus thyroideus</i>)	Pine (S)
Red-naped Sapsucker (<i>Sphyrapicus nuchalis</i>)	Pine, Canyon/Riparian (S)
Downy Woodpecker (<i>Picoides pubescens</i>)	Pine, Canyon/Riparian (S,W)
Hairy Woodpecker (<i>Picoides villosus</i>)	Pine, Canyon/Riparian (S,W)
White-headed Woodpecker (<i>Picoides albolarvatus</i>)	Pine (S)
Northern Flicker (<i>Colaptes auratus</i>)	Pine, Canyon/Riparian (S,W)
Pileated Woodpecker (<i>Dryocopus pileatus</i>)	Pine, Canyon/Riparian (S,W)
Western Wood-Pewee (<i>Contopus sordidulus</i>)	Pine, Canyon/Riparian (S)

Common Name (Scientific name)	Habitat/Migration ¹
Willow Flycatcher (<i>Empidonax traillii</i>)	Canyon/Riparian (S)
Dusky Flycatcher (<i>Empidonax oberholseri</i>)	Pine (S)
Cordilleran Flycatcher (<i>Empidonax difficilis</i>)	Pine, Canyon/Riparian (S)
Say's Phoebe (<i>Sayornis saya</i>)	Prairie (S)
Western Kingbird (<i>Tyrannus verticalis</i>)	Prairie (S)
Eastern Kingbird (<i>Tyrannus tyrannus</i>)	Prairie (S)
Loggerhead Shrike (<i>Lanius ludovicianus</i>)	Prairie (S,W)
Northern Shrike (<i>Lanius excubitor</i>)	Prairie (W)
Cassin's Vireo (<i>Vireo cassinii</i>)	Pine, Canyon/Riparian (S)
Warbling Vireo (<i>Vireo gilvus</i>)	Canyon/Riparian (S)
Red-eyed Vireo (<i>Vireo olivaceus</i>)	Canyon/Riparian (S)
Steller's Jay (<i>Cyanocitta stelleri</i>)	Pine (S,W)
Clark's Nutcracker (<i>Nucifraga columbiana</i>)	Pine (S,W)
Black-billed Magpie (<i>Pica hudsonia</i>)	Prairie, Canyon/Riparian (S,W)
American Crow (<i>Corvus brachyrhynchos</i>)	Canyon/Riparian (S)
Common Raven (<i>Corvus corax</i>)	Prairie, Pine, Canyon/Riparian (S,W)
Horned Lark (<i>Eremophila alpestris</i>)	Prairie (S,W)
Tree Swallow (<i>Tachycineta bicolor</i>)	Prairie (S)
Violet-green Swallow (<i>Tachycineta thalassina</i>)	Prairie, Canyon/Riparian (S)
Northern Rough-winged Swallow (<i>Stelgidopteryx serripennis</i>)	Canyon/Riparian, Wetland (S)
Cliff Swallow (<i>Petrochelidon pyrrhonota</i>)	Prairie, Canyon/Riparian (S)
Barn Swallow (<i>Hirundo rustica</i>)	Prairie, Wetland (S)
Black-capped Chickadee (<i>Poecile atricapillus</i>)	Pine, Canyon/Riparian (S,W)
Mountain Chickadee (<i>Poecile gambeli</i>)	Pine (S,W)
Chestnut-backed Chickadee (<i>Poecile rufescens</i>)	Pine, Canyon/Riparian (S,W)
Red-breasted Nuthatch (<i>Sitta canadensis</i>)	Pine, Canyon/Riparian (S,W)
White-breasted Nuthatch (<i>Sitta carolinensis</i>)	Pine, Canyon/Riparian (S,W)
Pygmy Nuthatch (<i>Sitta pygmaea</i>)	Pine (S,W)
Brown Creeper (<i>Certhia americana</i>)	Pine, Canyon/Riparian (S,W)
Rock Wren (<i>Salpinctes obsoletus</i>)	Canyon/Riparian (S)
Canyon Wren (<i>Catherpes mexicanus</i>)	Canyon/Riparian (S,W)
Bewick's Wren (<i>Thryomanes bewickii</i>)	Canyon/Riparian (M)
House Wren (<i>Troglodytes aedon</i>)	Canyon/Riparian (S)
Winter Wren (<i>Troglodytes troglodytes</i>)	Canyon/Riparian (S,W)
American Dipper (<i>Cinclus mexicanus</i>)	Canyon/Riparian (S,W)
Golden-crowned Kinglet (<i>Regulus satrapa</i>)	Pine (S,W)
Ruby-crowned Kinglet (<i>Regulus calendula</i>)	Pine, Canyon/Riparian (S,W)
Western Bluebird (<i>Sialia mexicana</i>)	Pine (S)
Mountain Bluebird (<i>Sialia currucoides</i>)	Prairie, Pine (S)
Townsend's Solitaire (<i>Myadestes townsendi</i>)	Pine (S,W)
Veery (<i>Catharus fuscescens</i>)	Canyon/Riparian (S)
Swainson's Thrush (<i>Catharus ustulatus</i>)	Canyon/Riparian (S)
American Robin (<i>Turdus migratorius</i>)	Prairie, Pine, Canyon/Riparian (S,W)
Gray Catbird (<i>Dumetella carolinensis</i>)	Canyon/Riparian (S)
Sage Thrasher (<i>Oreoscoptes montanus</i>)	Prairie (S)
European Starling (<i>Sturnus vulgaris</i>)	Prairie (S,W)
American Pipit (<i>Anthus rubescens</i>)	Prairie (M)
Bohemian Waxwing (<i>Bombycilla garrulus</i>)	Pine (W)
Cedar Waxwing (<i>Bombycilla cedrorum</i>)	Pine, Canyon/Riparian (S,W)
Orange-crowned Warbler (<i>Vermivora celata</i>)	Canyon/Riparian (S)

Common Name (Scientific name)	Habitat/Migration ¹
Nashville Warbler (<i>Vermivora ruficapilla</i>)	Canyon/Riparian (S)
Yellow Warbler (<i>Dendroica petechia</i>)	Canyon/Riparian (S)
Yellow-rumped Warbler (<i>Dendroica coronata</i>)	Pine, Canyon/Riparian (S)
Townsend's Warbler (<i>Dendroica townsendi</i>)	Pine (S)
MacGillivray's Warbler (<i>Oporornis tolmiei</i>)	Canyon/Riparian (S)
Wilson's Warbler (<i>Wilsonia pusilla</i>)	Canyon/Riparian (S)
Yellow-breasted Chat (<i>Icteria virens</i>)	Canyon/Riparian (S)
Western Tanager (<i>Piranga ludoviciana</i>)	Pine, Canyon/Riparian (S)
Spotted Towhee (<i>Pipilo maculatus</i>)	Canyon/Riparian (S)
American Tree Sparrow (<i>Spizella arborea</i>)	Canyon/Riparian, Prairie (W)
Chipping Sparrow (<i>Spizella passerina</i>)	Pine (S)
Brewer's Sparrow (<i>Spizella breweri</i>)	Prairie (S)
Vesper Sparrow (<i>Poocetes gramineus</i>)	Prairie (S)
Lark Sparrow (<i>Chondestes grammacus</i>)	Prairie (S)
Savannah Sparrow (<i>Passerculus sandwichensis</i>)	Prairie (S)
Grasshopper Sparrow (<i>Ammodramus savannarum</i>)	Prairie (S)
Song Sparrow (<i>Melospiza melodia</i>)	Canyon/Riparian (S,W)
Lincoln's Sparrow (<i>Melospiza lincolni</i>)	Canyon/Riparian (S,W)
Harris' Sparrow (<i>Zonotrichia querula</i>)	Canyon/Riparian (M)
White-crowned Sparrow (<i>Zonotrichia leucophrys</i>)	Canyon/Riparian (M)
Dark-eyed Junco (<i>Junco hyemalis</i>)	Pine, Canyon/Riparian (S,W)
Lapland Longspur (<i>Calcarius lapponicus</i>)	Prairie (V)
Chestnut-collared Longspur (<i>Calcarius ornatus</i>)	Prairie (V)
Snow Bunting (<i>Plectrophenax nivalis</i>)	Prairie (W)
Black-headed Grosbeak (<i>Pheucticus melanocephalus</i>)	Canyon/Riparian (S)
Lazuli Bunting (<i>Passerina amoena</i>)	Canyon/Riparian (S)
Red-winged Blackbird (<i>Agelaius phoeniceus</i>)	Canyon/Riparian, Wetland (S)
Western Meadowlark (<i>Sturnella neglecta</i>)	Prairie (S,W)
Yellow-headed Blackbird (<i>Xanthocephalus xanthocephalus</i>)	Wetland (S)
Brewer's Blackbird (<i>Euphagus cyanocephalus</i>)	Prairie (S,W)
Brown-headed Cowbird (<i>Molothrus ater</i>)	Prairie (S)
Bullock's Oriole (<i>Icterus bullockii</i>)	Canyon/Riparian (S)
Gray-crowned Rosy-Finch (<i>Leucosticte tephrocotis</i>)	Prairie (W)
Cassin's Finch (<i>Carpodacus cassinii</i>)	Pine, Canyon/Riparian (S,W)
House Finch (<i>Carpodacus mexicanus</i>)	Canyon/Riparian (S)
Red Crossbill (<i>Loxia curvirostra</i>)	Pine, Canyon/Riparian (S,W)
Common Redpoll (<i>Carduelis flammea</i>)	Prairie (W)
Pine Siskin (<i>Carduelis pinus</i>)	Pine, Canyon/Riparian (S,W)
American Goldfinch (<i>Carduelis tristis</i>)	Canyon/Riparian (S,W)
Evening Grosbeak (<i>Coccothraustes vespertinus</i>)	Canyon/Riparian (W)
House Sparrow (<i>Passer domesticus</i>)	Canyon/Riparian (S,W)

This list was made possible by the valiant efforts of ornithologist and TNC volunteer Andrea S Lueders.
Thank you Andie!

Zumwalt Prairie Reptile/Amphibian List

<i>Class</i>	<i>Family</i>	<i>Scientific Name</i>	<i>Common Name</i>
Amphibia	Ambystomatidae	Ambystoma macrodactylum	long-toed salamander
	Hylidae	Pseudacris regilla	Pacific chorus from (Pacific treefrog)
	Ranidae	Rana luteiventris	Columbian spotted frog
	Bufonidae	Bufo boreas	Western toad
Reptilia	Colubridae	Coluber constrictor mormon	Western yellow-bellied racer
	Colubridae	Pituophis Catenifer	Gopher snake
	Colubridae	Thamniohis sirtalis	common garter snake
	Colubridae	Thamnophis elegans	Western terrestrial garter snake
	Phrynosomatidae	Sceloporus occidentalis	Western fence lizard
	Phrynosomatidae	Uta stansburiana	common side-blotched lizard
	Viperidae	Crotalus viridis	Western rattlesnake

Mammal species of the Zumwalt Prairie

Order	Scientific Name	Common Name	Status
Insectivora	<i>Sorex preblei</i>	Preble's Shrew	P
	<i>Sorex vagrans</i>	Vagrant Shrew	P
Chiroptera	<i>Myotis californicus</i>	California Myotis	S
	<i>Myotis ciliolabrum</i>	Western Small-footed Myotis	P
	<i>Myotis evotis</i>	Long-eared Myotis	S
	<i>Myotis lucifugus</i>	Little Brown Myotis	S
	<i>Myotis thysanodes</i>	Fringed Myotis	P
	<i>Myotis volans</i>	Long-legged Myotis	S
	<i>Lasionycthis noctivagans</i>	Silver-haired Bat	P
	<i>Eptesicus fuscus</i>	Big Brown Bat	S
	<i>Corynorhinus townsendii</i>	Townsend's Big-eared Bat	P
Lagomorpha	<i>Ochotona princeps</i>	American Pika	S
	<i>Sylvilagus nuttallii</i>	Mountain Cottontail	K
	<i>Lepus townsendii</i>	White-tailed Jackrabbit	K
Rodentia	<i>Tamias amoenus</i>	Yellow-pine Chipmunk	K
	<i>Tamias minimus</i>	Least Chipmunk	P
	<i>Marmota flaviventris</i>	Yellow-bellied Marmot	S
	<i>Spermophilus beldingi</i>	Belding's Ground Squirrel	K
	<i>Spermophilus columbianus</i>	Columbian Ground Squirrel	S
	<i>Spermophilus lateralis</i>	Golden-mantled Ground Squirrel	K
	<i>Tamiasciurus hudsonicus</i>	Red Squirrel	P
	<i>Thomomys talpoides</i>	Northern Pocket Gopher	K
	<i>Reithrodontomys megalotis</i>	Western Harvest Mouse	P
	<i>Peromyscus maniculatus</i>	Deer Mouse	K
	<i>Neotoma cinerea</i>	Bushy-tailed Woodrat	K
	<i>Clethrionomys gapperi</i>	Southern Red-backed Vole	P
	<i>Microtus longicaudus</i>	Long-tailed Vole	S
	<i>Microtus montanus</i>	Montane Vole	S
	<i>Zapus princeps</i>	Western Jumping Mouse	P
	<i>Erethizon dorsatum</i>	Common Porcupine	S
Carnivora	<i>Canis latrans</i>	Coyote	K
	<i>Canis lupus</i>	Gray Wolf	K
	<i>Vulpes vulpes</i>	Red Fox	S
	<i>Ursus americanus</i>	Black Bear	K
	<i>Martes americana</i>	American Marten	P
	<i>Mustela frenata</i>	Long-tailed Weasel	S
	<i>Mustela vison</i>	Mink	P
	<i>Gulo gulo</i>	Wolverine	P
	<i>Taxidea taxus</i>	American Badger	K
	<i>Spilogale gracilis</i>	Western Spotted Skunk	K
	<i>Mephitis mephitis</i>	Striped Skunk	S
	<i>Puma concolor</i>	Mountain Lion	K
	<i>Lynx rufus</i>	Bobcat	K
Artiodactyla	<i>Cervus elaphus</i>	Wapiti (Elk)	K
	<i>Odocoileus hemionus</i>	Mule Deer	K
	<i>Odocoileus virginianus</i>	White-tailed Deer	P
	<i>Oreamnos americanus</i>	Mountain Goat	P
	<i>Ovis canadensis</i>	Bighorn Sheep	K

Status: K = known to occur, P = possible, S = suspected

Extra special thanks to TNC volunteer Mindy Trask for making this list possible.

Zumwalt Butterfly List

Family	Scientific Name	Common Name
HESPERIIDAE	Amblyscirtes vialis (W. H. Edwards)	Common Roadside-Skipper
	Erynnis persius ssp. (Scudder)	Persius Duskywing
	Hesperia colorado (W. H. Edwards)	Common Branded Skipper
	Hesperia colorado idaho (W. H. Edwards)	Western Branded Skipper
	Hesperia juba (Scudder)	Juba Skipper
	Ochlodes sylvanoides sylvanoides (Bdv.)	Woodland Skipper
	Pyrgus communis communis (Grote)	Common Checkered-Skipper
	Pyrgus ruralis nr. ruralis (Bdv.)	Two-banded Checkered-Skipper
PAPILIONIDAE	Parnassius smintheus magnus (W. H. Edwards)	Rocky Mountain Parnassian
	Papilio multicaudata pusillus (W. H. Edwards)	Two-tailed Swallowtail
	Papilio rutulus rutulus (Lucas)	Western Tiger Swallowtail
PIERIDAE	Papilio zelicaon zelicaon (W. H. Edwards)	Anise Swallowtail
	Anthocharis sara nr. stella (W. H. Edwards)	Pacific Orangetip
	Colias alexandra edwardsii (W. H. Edwards)	Queen Alexandra's Sulphur
	Colias eurytheme (Boisduval)	Orange Sulphur
	Colias philodice eriphyle (W. H. Edwards)	Clouded Sulphur
	Euchloe ausonides transmontana (Lucas)	Large Marble
	Pieris rapae rapae (L.)	Cabbage White
	Pontia beckerii (W. H. Edwards)	Becker's White
LYCAENIDAE	Pontia occidentalis occidentalis (Reakirt)	Western White
	Celastrina echo ssp. (Cramer)	Spring Azure
	Chalceria heteronea rava (Bdv.)	Blue Copper
	Epidemia helloides helloides (Bdv.)	Purplish Copper
	Euphilotes battoides complex on Eriogonum heracleoides (W. H. Edwards)	Western Square-dotted Blue
	Gaeides editha nr. editha (Mead)	Edith's Copper
	Glaucopsyche lygdamus columbia (Scudder)	Silvery Blue
	Glaucopsyche piasus toxseuma (W. H. Edwards)	Arrowhead Blue
LYCAENIDAE	Plebejus acmon ssp. (W. H. Edwards)	Acmon Blue
	Incisalia eryphon eryphon (W. H. Edwards)	Western Pine Elfin
	Lycaena heteronea rava (W. H. Edwards)	Blue Copper
	Plebejus icarioides pembina (W. H. Edwards)	Boisduval's Blue
	Plebejus melissa ssp. (W. H. Edwards)	Melissa Blue (includes Karner Blue)
	Plebejus saepiolus rufescens (Bdv.)	Greenish Blue
NYMPHALIDAE	Aglais milberti (Godart)	Milberts Tortoiseshell
	Charidryas palla spp. (Bdv.)	Northern Checkerspot
	Euphydryas chalcedona wallacensis (Gunder)	Chalcedon Checkerspot
	Euphydryas editha nr. edithana (Strand)	Edith's Checkerspot
	Limenitis lorquini burrisoni (W. H. Edwards)	Lorquin's Admiral
	Nymphalis antiopa (L.)	Mourning Cloak
	Nymphalis californica (W. H. Edwards)	California Tortoiseshell
	Phyciodes mylitta mylitta (W. H. Edwards)	Mylitta Crescent
	Phyciodes pulchella owimba (W. H. Edwards)	Field Crescent
	Polygonia satyrus neomarsyas (W. H. Edwards)	Satyr Comma
	Speyeria callippe semivirida (McDunnough)	Callippe Fritillary
	Speyeria cybele leto (Behr)	Great Spangled Fritillary
	Speyeria hesperis dodgei (W. H. Edwards)	Northwestern Fritillary
	Speyeria mormonia erinna (W. H. Edwards)	Mormon Fritillary
	Speyeria zerene picta (W. H. Edwards)	Zerene Fritillary
	Vanessa atalanta rubria (Fruh.)	Red Admiral
	Vanessa cardui (L.)	Painted Lady
	Cercyonis oetus oetus (Bdv.)	Small Wood Nymph
	Cercyonis pegala nr. ariane (Behr)	Common Wood Nymph
	Coenonympha tullia ampelos (W. H. Edwards)	Common Ringlet
	Erebia epipsodea epipsodea (P. Ehrlich)	Common Alpine

Zumwalt Prairie Plant List

491 species



Family	Botanical Name (Common Name)	USDA Code	ID	GF [LS] Endm	H
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Aceraceae

Acer glabrum (Rocky Mountain maple)	ACGL	2	T [P] NAm_W	<input checked="" type="checkbox"/>
Acer negundo (boxelder)	ACNE2	3	T [P] NAm	<input type="checkbox"/>

Alismataceae

Sagittaria latifolia (broadleaf arrowhead)	SALA2	3	SH [P] NAm	<input type="checkbox"/>
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Amaranthaceae

Amaranthus albus (prostrate pigweed)	AMAL	3	F [A] EXOTIC	<input type="checkbox"/>
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Anacardiaceae

Rhus glabra (smooth sumac)	RHGL	2	SH [P] NAm	<input checked="" type="checkbox"/>
Toxicodendron rydbergii (western poison ivy)	TORY	3	SH [P] NAm	<input type="checkbox"/>

Apiaceae

Anthriscus caucalis (burr chervil)	ANCA14	2	F [A] EXOTIC	<input checked="" type="checkbox"/>
Heracleum maximum (common cowparsnip)	HEMA80	2	F [P] NAm	<input checked="" type="checkbox"/>
Lomatium ambiguum (Wyeth biscuitroot)	LOAM	2	F [P] NAm_PNW	<input checked="" type="checkbox"/>
Lomatium cous (cous biscuitroot)	LOCO4	2	F [P] NAm_W	<input checked="" type="checkbox"/>
Lomatium dissectum var. multifidum (carrotleaf biscuitroot)**	LODIM	1	F [P] NAm_W	<input checked="" type="checkbox"/>
Lomatium macrocarpum (bigseed biscuitroot)	LOMA3	2	F [P] NAm_W	<input checked="" type="checkbox"/>
Lomatium triternatum (nineleaf biscuitroot)	LOTR2	2	F [P] US_PNW	<input checked="" type="checkbox"/>
Osmorhiza berteroi (sweetcicely)	OSBE	2	F [P] NAm	<input checked="" type="checkbox"/>
Pastinaca sativa (wild parsnip)	PASA2	2	F [P] EXOTIC	<input checked="" type="checkbox"/>
Perideridia gairdneri (Gardner's yampah)	PEGA3	2	F [P] NAm_W	<input checked="" type="checkbox"/>

Family	Botanical Name (Common Name)	USDA Code	ID	GF [LS] Endm	H
	Pteryxia terebinthina (turpentine wavewing)	PTTE	3	F [P] NAm_W	<input type="checkbox"/>
Apocynaceae					
	Apocynum androsaemifolium (spreading dogbane)	APAN2	3	F [P] NAm	<input type="checkbox"/>
Asclepiadaceae					
	Asclepias speciosa (showy milkweed)**	ASSP	2	F [P] NAm	<input checked="" type="checkbox"/>
Asteraceae					
	Achillea millefolium var. occidentalis (western yarrow)	ACMIO	3	F [P] NAm	<input type="checkbox"/>
	Agoseris elata (tall agoseris)	AGEL	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	Agoseris glauca (pale agoseris)	AGGL	2	F [P] NAm	<input checked="" type="checkbox"/>
	Agoseris grandiflora (bigflower agoseris)	AGGR	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	Anaphalis margaritacea (western pearly everlasting)	ANMA	3	F [P] NAm	<input type="checkbox"/>
	Antennaria anaphaloides (pearly pussytoes)	ANAN2	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	Antennaria dimorpha (low pussytoes)	ANDI2	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	Antennaria luzuloides (rush pussytoes)	ANLU2	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	Antennaria microphylla (littleleaf pussytoes)	ANMI3	2	F [P] NAm	<input checked="" type="checkbox"/>
	Antennaria rosea (rosy pussytoes)	ANRO2	2	F [P] NAm	<input checked="" type="checkbox"/>
	Arctium minus (lesser burrdock)	ARMI2	3	F [B] EXOTIC	<input type="checkbox"/>
	Arnica cordifolia (heartleaf arnica)	ARCO9	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	Arnica longifolia (spearleaf arnica)	ARLO6	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	Arnica sororia (twin arnica)	ARSO2	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	Artemisia arbuscula (little sagebrush)	ARAR8	3	SH [P] US_W	<input type="checkbox"/>

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	<i>Artemisia dracunculus</i> (tarragon)	ARDR4	2	F [P] NAm	<input checked="" type="checkbox"/>
	<i>Artemisia ludoviciana</i> ssp. <i>candicans</i> (white sagebrush)	ARLUC8	2	SH [P] NAm_W	<input checked="" type="checkbox"/>
	<i>Artemisia ludoviciana</i> ssp. <i>ludoviciana</i> (white sagebrush)	ARLUL2	2	SS [P] NAm	<input checked="" type="checkbox"/>
	<i>Artemisia rigida</i> (scabland sagebrush)	ARRI2	3	SH [P] US_PNW	<input type="checkbox"/>
	<i>Balsamorhiza incana</i> (hoary balsamroot)	BAIN	2	F [P] US_PNW	<input checked="" type="checkbox"/>
	<i>Balsamorhiza sagittata</i> (arrowleaf balsamroot)	BASA3	3	F [P] NAm_W	<input type="checkbox"/>
	<i>Blepharipappus scaber</i> (rough eyelashweed)	BLSC	3	F [A] US_PNW	<input type="checkbox"/>
	<i>Brickellia grandiflora</i> (tasselflower brickellbush)	BRGR	3	F [P] NAm_W	<input type="checkbox"/>
	<i>Centaurea diffusa</i> (white knapweed)	CEDI3	3	F [P] EXOTIC	<input type="checkbox"/>
	<i>Centaurea solstitialis</i> (yellow star-thistle)	CESO3	2	F [A] EXOTIC	<input checked="" type="checkbox"/>
	<i>Chaenactis douglasii</i> var. <i>douglasii</i> (Douglas' dustymaiden)	CHDOD	3	F [P] NAm_W	<input type="checkbox"/>
	<i>Chrysothamnus viscidiflorus</i> (yellow rabbitbrush)	CHVI8	2	SH [P] NAm_W	<input checked="" type="checkbox"/>
	<i>Cichorium intybus</i> (chicory)	CIIN	3	F [B] EXOTIC	<input type="checkbox"/>
	<i>Cirsium arvense</i> (Canada thistle)	CIAR4	3	F [P] EXOTIC	<input type="checkbox"/>
	<i>Cirsium brevifolium</i> (Palouse thistle)	CIBR	2	F [A] US_W	<input checked="" type="checkbox"/>
	<i>Cirsium undulatum</i> (wavyleaf thistle)	CIUN	3	F [P] NAm	<input type="checkbox"/>
	<i>Cirsium vulgare</i> (bull thistle)	CIVU	3	F [B] EXOTIC	<input type="checkbox"/>
	<i>Conyza canadensis</i> (Canadian horseweed)	COCA5	3	F [I] NAm	<input type="checkbox"/>
	<i>Crepis acuminata</i> (tapertip hawksbeard)	CRAC2	3	F [P] US_W	<input type="checkbox"/>
	<i>Crepis atribarba</i> ssp. <i>originalis</i> (slender hawksbeard)	CRATO	3	F [P] NAm_W	<input type="checkbox"/>

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	<i>Crepis occidentalis</i> (largeflower hawksbeard)**	CROC	2	F [P] Nam_W	<input checked="" type="checkbox"/>
	<i>Crupina vulgaris</i> (common crupina)	CRVU2	2	F [A] EXOTIC	<input checked="" type="checkbox"/>
	<i>Erigeron chrysopsidis</i> (dwarf yellow fleabane)	ERCH4	2	F [P] US_PNW	<input checked="" type="checkbox"/>
	<i>Erigeron peregrinus</i> ssp. <i>callianthemus</i> var. <i>callianthemus</i> (subalpine fleabane)	ERPEC2	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	<i>Erigeron pumilus</i> (shaggy fleabane)	ERPU2	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	<i>Erigeron speciosus</i> (aspen fleabane)**	ERSP4	2	F [P] Nam_W	<input checked="" type="checkbox"/>
	<i>Erigeron strigosus</i> var. <i>strigosus</i> (prairie fleabane)	ERSTS2	3	F [P] NAm	<input type="checkbox"/>
	<i>Eriophyllum lanatum</i> (common woolly sunflower)	ERLA6	3	F [P] NAm_W	<input type="checkbox"/>
	<i>Grindelia nana</i> (Idaho gumweed)	GRNA	3	F [P] US_W	<input type="checkbox"/>
	<i>Grindelia squarrosa</i> (curlycup gumweed)	GRSQ	3	F [P] NAm	<input type="checkbox"/>
	<i>Helianthus annuus</i> (common sunflower)	HEAN3	3	F [A] EXOTIC	<input type="checkbox"/>
	<i>Hieracium caespitosum</i> (meadow hawkweed)	HICA10	2	F [P] EXOTIC	<input checked="" type="checkbox"/>
	<i>Hieracium cynoglossoides</i> (houndstongue hawkweed)	HICY	2	F [P] US_W	<input checked="" type="checkbox"/>
	<i>Lactuca serriola</i> (prickly lettuce)	LASE	3	F [A] EXOTIC	<input type="checkbox"/>
	<i>Logfia arvensis</i> (field cottonrose)	LOAR5	3	F [A] EXOTIC	<input type="checkbox"/>
	<i>Madia glomerata</i> (mountain tarweed)	MAGL2	3	F [A] NAm	<input type="checkbox"/>
	<i>Matricaria discoidea</i> (disc mayweed)	MADI6	3	F [A] EXOTIC	<input type="checkbox"/>
	<i>Microseris nutans</i> (nodding microseris)	MINU	2	F [P] US_PNW	<input checked="" type="checkbox"/>
	<i>Nothocalais alpestris</i> (alpine lake prairie-dandelion)	NOAL2	3	F [P] US_PNW	<input type="checkbox"/>
	<i>Onopordum acanthium</i> (Scotch cottonthistle)	ONAC	3	F [B] EXOTIC	<input type="checkbox"/>

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	<i>Packera pseud aurea</i> var. <i>pseud aurea</i> (falsegold groundsel)	PAPSP2	3	F [P] US_W	<input type="checkbox"/>
	<i>Pseudognaphalium canescens</i> (Wright's cudweed)	PSCA11	3	F [I] NAm_W	<input type="checkbox"/>
	<i>Pyrrocoma carthamoides</i> var. <i>cusickii</i> (largeflower goldenweed)	PYCAC3	3	F [P] US_PNW	<input type="checkbox"/>
	<i>Senecio crassulus</i> (thickleaf ragwort)	SECR	2	F [P] US_W	<input checked="" type="checkbox"/>
	<i>Senecio hydrophiloides</i> (tall groundsel)	SEHY	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	<i>Senecio integerrimus</i> (lambstongue ragwort)	SEIN2	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	<i>Solidago canadensis</i> (Canada goldenrod)	SOCA6	3	F [P] NAm	<input type="checkbox"/>
	<i>Solidago missouriensis</i> var. <i>missouriensis</i> (Missouri goldenrod)	SOMIM	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	<i>Stenotus lanuginosus</i> (woolly mock goldenweed)	STLA7	2	F [P] US_W	<input checked="" type="checkbox"/>
	<i>Symphyotrichum campestre</i> var. <i>campestre</i> (western meadow aster)	SYCAC	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	<i>Symphyotrichum foliaceum</i> var. <i>parryi</i> (Parry's aster)	SYFOP	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	<i>Symphyotrichum hendersonii</i> (Lyll aster)	SYHE5	2	F [P] US_W	<input checked="" type="checkbox"/>
	<i>Symphyotrichum spathulatum</i> var. <i>intermedium</i> (larger western mountain aster)	SYSPI	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	<i>Symphyotrichum spathulatum</i> var. <i>spathulatum</i> (western mountain aster)	SYSPS	3	F [P] NAm_W	<input type="checkbox"/>
	<i>Taraxacum officinale</i> (common dandelion)	TAOF	3	F [P] EXOTIC	<input type="checkbox"/>
	<i>Tetradymia canescens</i> (spineless horsebrush)**	TECA2	2	SH [P] NAm_W	<input checked="" type="checkbox"/>
	<i>Tragopogon dubius</i> (yellow salsify)	TRDU	3	F [A] EXOTIC	<input type="checkbox"/>
	<i>Wyethia amplexicaulis</i> (mule-ears)	WYAM	3	F [P] US_W	<input type="checkbox"/>
	<i>Wyethia helianthoides</i> (sunflower mule-ears)	WYHE2	2	F [P] US_PNW	<input checked="" type="checkbox"/>
Berberidaceae					
	<i>Mahonia repens</i> (creeping barberry)	MARE11	3	SS [P] NAm	<input type="checkbox"/>

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Betulaceae					
	<i>Alnus rhombifolia</i> (white alder)	ALRH2	3	T [P] US_PNW	<input type="checkbox"/>
	<i>Betula occidentalis</i> (water birch)	BEOC2	3	T [P] NAm	<input type="checkbox"/>
Boraginaceae					
	<i>Amsinckia menziesii</i> var. <i>intermedia</i> (common fiddleneck)	AMMEI2	3	F [P] NAm	<input type="checkbox"/>
	<i>Anchusa officinalis</i> (common bugloss)	ANOF	2	F [P] EXOTIC	<input checked="" type="checkbox"/>
	<i>Asperugo procumbens</i> (German-madwort)	ASPR	3	F [A] EXOTIC	<input type="checkbox"/>
	<i>Buglossoides arvensis</i> (corn gromwell)	BUAR3	2	F [A] EXOTIC	<input checked="" type="checkbox"/>
	<i>Cryptantha ambigua</i> (basin cryptantha)**	CRAM3	2	F [A] Nam_W	<input checked="" type="checkbox"/>
	<i>Cryptantha torreyana</i> (Torrey's cryptantha)	CRT04	3	F [A] NAm_W	<input type="checkbox"/>
	<i>Cynoglossum officinale</i> (gypsyflower)	CYOF	3	F [B] EXOTIC	<input type="checkbox"/>
	<i>Lappula occidentalis</i> var. <i>occidentalis</i> (flatspine stickseed)	LAOCO	3	F [I] NAm	<input type="checkbox"/>
	<i>Lithospermum ruderales</i> (western stoneseed)	LIRU4	3	F [P] NAm_W	<input type="checkbox"/>
	<i>Mertensia longiflora</i> (small bluebells)	MELO4	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	<i>Myosotis stricta</i> (strict forget-me-not)	MYST2	2	F [A] EXOTIC	<input checked="" type="checkbox"/>
Brassicaceae					
	<i>Alyssum alyssoides</i> (pale madwort)	ALAL3	2	F [I] EXOTIC	<input checked="" type="checkbox"/>
	<i>Arabis holboellii</i> (Holboell's rockcress)	ARHO2	3	F [P] NAm	<input type="checkbox"/>
	<i>Camelina microcarpa</i> (littlepod false flax)	CAMI2	3	F [I] EXOTIC	<input type="checkbox"/>
	<i>Capsella bursa-pastoris</i> (shepherd's purse)	CABU2	3	F [A] EXOTIC	<input type="checkbox"/>
	<i>Cardaria draba</i> (whitetop)	CADR	2	F [P] EXOTIC	<input checked="" type="checkbox"/>

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	Cardaria pubescens (hairy whitetop)	CAPU6	2	F [P] NAm	<input checked="" type="checkbox"/>
	Descurainia incana (mountain tansymustard)**	DEIN5	2	F [U] NAm	<input checked="" type="checkbox"/>
	Draba verna (spring draba)	DRVE2	3	F [A] NAm	<input type="checkbox"/>
	Erysimum repandum (spreading wallflower)	ERRE4	2	F [A] EXOTIC	<input checked="" type="checkbox"/>
	Lepidium campestre (field pepperweed)	LECA5	3	F [P] EXOTIC	<input type="checkbox"/>
	Lepidium latifolium (broadleaved pepperweed)	LELA2	3	F [P] EXOTIC	<input type="checkbox"/>
	Lepidium perfoliatum (clasping pepperweed)	LEPE2	3	F [I] EXOTIC	<input type="checkbox"/>
	Rorippa nasturtium-aquaticum (watercress)	RONA2	3	F [P] EXOTIC	<input type="checkbox"/>
	Sisymbrium altissimum (tall tumbledmustard)	SIAL2	3	F [A] EXOTIC	<input type="checkbox"/>
	Thelypodium laciniatum (cutleaf thelypody)	THLA	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	Thlaspi arvense (field pennycress)	THAR5	2	F [A] EXOTIC	<input checked="" type="checkbox"/>
Cactaceae					
	Opuntia polyacantha (plains pricklypear)	OPPO	3	SH [P] NAm_W	<input type="checkbox"/>
Campanulaceae					
	Triodanis perfoliata (clasping Venus' looking-glass)	TRPE4	3	F [A] NAm	<input type="checkbox"/>
Caprifoliaceae					
	Lonicera utahensis (Utah honeysuckle)	LOUT2	3	SH [P] NAm_W	<input type="checkbox"/>
	Sambucus nigra ssp. cerulea (blue elderberry)	SANIC5	2	SH [P] NAm_W	<input checked="" type="checkbox"/>
	Symphoricarpos acutus (sharp-leaf snowberry)	SYAC	3	SH [P] US_W	<input type="checkbox"/>
	Symphoricarpos albus (common snowberry)	SYAL	2	SH [P] NAm	<input checked="" type="checkbox"/>
	Symphoricarpos oreophilus (mountain snowberry)	SYOR2	3	SH [P] NAm_W	<input type="checkbox"/>
Caryophyllaceae					

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	<i>Arenaria aculeata</i> (prickly sandwort)	ARAC2	3	F [P] NAm_W	<input type="checkbox"/>
	<i>Arenaria congesta</i> (ballhead sandwort)	ARCO5	3	F [P] NAm_W	<input type="checkbox"/>
	<i>Cerastium arvense</i> (field chickweed)	CEAR4	3	F [P] NAm	<input type="checkbox"/>
	<i>Dianthus armeria</i> (Deptford pink)	DIAR	2	F [I] EXOTIC	<input checked="" type="checkbox"/>
	<i>Holosteum umbellatum</i> (jagged chickweed)	HOUM	3	F [A] EXOTIC	<input type="checkbox"/>
	<i>Silene douglasii</i> (seabluff catchfly)	SIDO	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	<i>Silene latifolia</i> ssp. <i>alba</i> (bladder campion)	SILAA3	3	F [I] EXOTIC	<input type="checkbox"/>
	<i>Silene oregana</i> (Oregon silene)	SIOR3	2	F [P] US_W	<input checked="" type="checkbox"/>
	<i>Silene scaposa</i> (Blue Mountain catchfly)	SISC	3	F [P] NAm_W	<input type="checkbox"/>
	<i>Silene scouleri</i> (simple campion)**	SISC7	3	F [P] NAm_W	<input type="checkbox"/>
	<i>Silene spaldingii</i> (Spalding's silene)	SISP2	2	F [P] NAm_PNW	<input checked="" type="checkbox"/>
	<i>Stellaria crispa</i> (curled starwort)	STCR2	3	F [P] NAm_W	<input type="checkbox"/>
	<i>Stellaria longifolia</i> (longleaf starwort)	STLO	3	F [P] NAm	<input type="checkbox"/>
	<i>Stellaria longipes</i> (longstalk starwort)	STLO2	3	F [P] NAm	<input type="checkbox"/>
	<i>Stellaria media</i> (common chickweed)	STME2	2	F [A] EXOTIC	<input checked="" type="checkbox"/>
	<i>Stellaria umbellata</i> (umbrella starwort)	STUM	3	F [A] NAm_W	<input type="checkbox"/>
Chenopodiaceae					
	<i>Kochia scoparia</i> (Mexican-fireweed)	KOSC	3	F [A] EXOTIC	<input type="checkbox"/>
	<i>Monolepis nuttalliana</i> (Nuttall's povertyweed)**	MONU	3	F [A] NAm	<input type="checkbox"/>
Clusiaceae					
	<i>Hypericum perforatum</i> (common St. Johnswort)	HYPE	3	F [P] EXOTIC	<input type="checkbox"/>

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	<i>Hypericum scouleri</i> ssp. <i>scouleri</i> (Scouler's St. Johnswort)	HYSCS2	3	F [P] NAm_W	<input type="checkbox"/>
Convolvulaceae					
	<i>Convolvulus arvensis</i> (field bindweed)	COAR4	3	F [P] EXOTIC	<input type="checkbox"/>
Cornaceae					
	<i>Cornus sericea</i> ssp. <i>sericea</i> (redosier dogwood)	COSES	3	SH [P] NAm	<input type="checkbox"/>
Crassulaceae					
	<i>Sedum lanceolatum</i> (spearleaf stonecrop)	SELA	3	F [P] NAm_W	<input type="checkbox"/>
	<i>Sedum stenopetalum</i> (wormleaf stonecrop)	SEST2	2	F [P] NAm_W	<input checked="" type="checkbox"/>
Crossosomataceae					
	<i>Glossopetalon spinescens</i> var. <i>aridum</i> (spiny greasebush)	GLSPA	3	SH [P] US_W	<input type="checkbox"/>
Cupressaceae					
	<i>Juniperus occidentalis</i> var. <i>occidentalis</i> (western juniper)	JUOCO	3	T [P] US_W	<input type="checkbox"/>
Cuscutaceae					
	<i>Cuscuta epilinum</i> (flax dodder)	CUEP2	3	F [P] EXOTIC	<input type="checkbox"/>
	<i>Cuscuta epithymum</i> (clover dodder)**	CUEP	2	F [P] EXOTIC	<input checked="" type="checkbox"/>
Cyperaceae					
	<i>Carex amplifolia</i> (bigleaf sedge)	CAAM10	2	S/R [P] NAm_W	<input checked="" type="checkbox"/>
	<i>Carex athrostachya</i> (slenderbeak sedge)	CAAT3	1	S/R [P] NAm_W	<input checked="" type="checkbox"/>
	<i>Carex concinnoides</i> (northwestern sedge)	CACO11	3	S/R [P] NAm_PNW	<input type="checkbox"/>
	<i>Carex filifolia</i> (threadleaf sedge)	CAFI	2	S/R [P] NAm	<input checked="" type="checkbox"/>
	<i>Carex hoodii</i> (Hood's sedge)	CAHO5	3	S/R [P] NAm_W	<input type="checkbox"/>
	<i>Carex hystericina</i> (bottlebrush sedge)	CAHY4	2	S/R [P] NAm	<input checked="" type="checkbox"/>
	<i>Carex jonesii</i> (Jones' sedge)	CAJO	3	S/R [P] US_W	<input type="checkbox"/>

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	Carex lasiocarpa var. americana (American woollyfruit sedge)	CALAA	2	S/R [P] NAm	<input checked="" type="checkbox"/>
	Carex microptera (smallwing sedge)	CAMI7	1	S/R [P] NAm_W	<input checked="" type="checkbox"/>
	Carex nebrascensis (Nebraska sedge)	CANE2	1	S/R [P] NAm	<input checked="" type="checkbox"/>
	Carex pachystachya (chamisso sedge)	CAPA14	3	S/R [P] NAm_W	<input type="checkbox"/>
	Carex pellita (woolly sedge)	CAPE42	1	S/R [P] NAm	<input checked="" type="checkbox"/>
	Carex petasata (Liddon sedge)	CAPE7	1	S/R [P] NAm_W	<input checked="" type="checkbox"/>
	Carex phaeocephala (dunhead sedge)	CAPH2	3	S/R [P] NAm	<input type="checkbox"/>
	Carex praegracilis (clustered field sedge)	CAPR5	2	S/R [P] NAm	<input checked="" type="checkbox"/>
	Carex praticola (meadow sedge)	CAPR7	2	S/R [P] NAm	<input checked="" type="checkbox"/>
	Carex rossii (Ross' sedge)	CARO5	2	S/R [P] NAm	<input checked="" type="checkbox"/>
	Carex sheldonii (Sheldon's sedge)	CASH	1	S/R [P] US_W	<input checked="" type="checkbox"/>
	Carex stipata (owlfruit sedge)	CAST5	2	S/R [P] NAm	<input checked="" type="checkbox"/>
	Carex stipata var. stipata (owlfruit sedge)**	CASTS3	1	S/R [P] NAm	<input checked="" type="checkbox"/>
	Carex utriculata (Northwest Territory sedge)	CAUT	3	S/R [P] NAm	<input type="checkbox"/>
	Eleocharis acicularis (needle spikerush)	ELAC	2	S/R [P] NAm	<input checked="" type="checkbox"/>
	Eleocharis macrostachya (pale spikerush)**	ELMA5	1	S/R [P] NAm	<input checked="" type="checkbox"/>
	Eleocharis palustris (common spikerush)	ELPA3	1	S/R [P] NAm	<input checked="" type="checkbox"/>
	Schoenoplectus acutus (hardstem bulrush)	SCAC3	3	S/R [P] NAm	<input type="checkbox"/>
	Schoenoplectus tabernaemontani (softstem bulrush)**	SCTA2	1	S/R [P] NAm	<input checked="" type="checkbox"/>
	Scirpus microcarpus (panicled bulrush)	SCMI2	2	S/R [P] NAm	<input checked="" type="checkbox"/>

Family	Botanical Name (Common Name)	USDA Code	ID	GF [LS] Endm	H
	Scirpus pallidus (cloaked bulrush)**	SCPA8	1	S/R [P] NAm	<input checked="" type="checkbox"/>
Dipsacaceae					
	Dipsacus fullonum ssp. Sylvestris (Fuller's teasel)	DIFUS2	3	F [B] EXOTIC	<input type="checkbox"/>
Dryopteridaceae					
	Athyrium filix-femina (common ladyfern)	ATFI	3	F [P] NAm	<input type="checkbox"/>
	Cystopteris fragilis (brittle bladderfern)	CYFR2	3	F [P] NAm	<input type="checkbox"/>
	Woodsia oregana (Oregon cliff fern)	WOOR	3	F [P] NAm	<input type="checkbox"/>
Equisetaceae					
	Equisetum arvense (field horsetail)	EQAR	3	F [P] NAm	<input type="checkbox"/>
	Equisetum hyemale (scouringrush horsetail)	EQHY	2	F [P] NAm	<input checked="" type="checkbox"/>
	Equisetum laevigatum (smooth horsetail)	EQLA	2	F [P] NAm	<input checked="" type="checkbox"/>
	Equisetum palustre (marsh horsetail)	EQPA	2	F [P] NAm	<input checked="" type="checkbox"/>
Euphorbiaceae					
	Chamaesyce glyptosperma (ribseed sandmat)	CHGL13	3	F [A] NAm	<input type="checkbox"/>
Fabaceae					
	Astragalus canadensis (Canadian milkvetch)	ASCA11	2	F [P] NAm	<input checked="" type="checkbox"/>
	Astragalus inflexus (bent milkvetch)	ASIN5	3	F [P] US_W	<input type="checkbox"/>
	Astragalus newberryi (Newberry's milkvetch)	ASNE6	2	F [P] US_W	<input checked="" type="checkbox"/>
	Astragalus obscurus (arcane milkvetch)	ASOB4	2	F [P] US_W	<input checked="" type="checkbox"/>
	Astragalus sheldonii (Sheldon's milkvetch)	ASSH2	3	F [P] US_W	<input type="checkbox"/>
	Lupinus caudatus (tailcup lupine)	LUCA	2	F [P] US_W	<input checked="" type="checkbox"/>
	Lupinus lepidus (Pacific lupine)	LULE2	2	F [P] US_W	<input checked="" type="checkbox"/>

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	Lupinus leucophyllus (velvet lupine)	LULE3	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	Lupinus sericeus (silky lupine)	LUSE4	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	Medicago lupulina (black medick)	MELU	3	F [P] EXOTIC	<input type="checkbox"/>
	Medicago sativa (alfalfa)	MESA	3	F [P] EXOTIC	<input type="checkbox"/>
	Trifolium cyathiferum (cup clover)	TRCY	3	F [P] NAm_W	<input type="checkbox"/>
	Trifolium hybridum (alsike clover)	TRHY	3	F [P] EXOTIC	<input type="checkbox"/>
	Trifolium longipes (longstalk clover)	TRLO	3	F [P] US_W	<input type="checkbox"/>
	Trifolium macrocephalum (largehead clover)	TRMA3	2	F [P] US_PNW	<input checked="" type="checkbox"/>
	Trifolium repens (white clover)	TRRE3	3	F [P] EXOTIC	<input type="checkbox"/>
	Trifolium wormskioldii (cows clover)	TRWO	2	F [P] NAm_W	<input checked="" type="checkbox"/>
Gentianaceae					
	Frasera albicaulis (whitestem fraseria)	FRAL2	2	F [P] US_W	<input checked="" type="checkbox"/>
	Frasera speciosa (elkweed)	FRSP	2	F [P] US_W	<input checked="" type="checkbox"/>
	Gentiana affinis (pleated gentian)	GEAF	2	F [P] NAm_W	<input checked="" type="checkbox"/>
Geraniaceae					
	Erodium cicutarium (redstem stork's bill)	ERCI6	3	F [I] EXOTIC	<input type="checkbox"/>
	Geranium pusillum (small geranium)	GEPU2	2	F [A] EXOTIC	<input checked="" type="checkbox"/>
	Geranium viscosissimum (sticky purple geranium)	GEVI2	2	F [I] NAm_W	<input checked="" type="checkbox"/>
Grossulariaceae					
	Ribes cereum (wax currant)	RICE	3	SH [P] NAm_W	<input type="checkbox"/>
	Ribes montigenum (gooseberry currant)	RIMO2	3	SH [P] NAm_W	<input type="checkbox"/>

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	Ribes niveum (snow currant)	RINI2	2	SH [P] US_W	<input checked="" type="checkbox"/>
	Ribes oxycanthoides ssp. irriguum (Idaho gooseberry)	RIOXI	2	SH [P] NAm_PNW	<input checked="" type="checkbox"/>
	Ribes velutinum (desert gooseberry)	RIVE	3	SH [P] US_W	<input type="checkbox"/>
Hydrangeaceae					
	Philadelphus lewisii (Lewis' mock orange)	PHLE4	2	SH [P] NAm_W	<input checked="" type="checkbox"/>
Hydrophyllaceae					
	Hesperochiron pumilus (dwarf hesperochiron)	HEPU6	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	Hydrophyllum capitatum (ballhead waterleaf)	HYCA4	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	Nemophila kirtleyi (Kirtley's nemophila)	NEKI	2	F [A] US_PNW	<input checked="" type="checkbox"/>
	Phacelia heterophylla (varileaf phacelia)	PHHE2	3	F [P] US_W	<input type="checkbox"/>
	Phacelia linearis (threadleaf phacelia)	PHLI	3	F [A] NAm	<input type="checkbox"/>
Iridaceae					
	Olsynium douglasii var. inflatum (inflated grasswidow)	OLDOI	2	F [P] NAm_PNW	<input checked="" type="checkbox"/>
Juglandaceae					
	Juglans nigra (black walnut)	JUNI	3	T [P] EXOTIC	<input type="checkbox"/>
Juncaceae					
	Juncus articulatus (jointleaf rush)**	JUAR4	1	S/R [P] NAm	<input checked="" type="checkbox"/>
	Juncus balticus (Baltic rush)	JUBA	1	S/R [P] NAm	<input checked="" type="checkbox"/>
	Juncus bufonius (toad rush)	JUBU	2	S/R [P] NAm	<input checked="" type="checkbox"/>
	Juncus confusus (Colorado rush)	JUCO2	2	S/R [P] NAm_W	<input checked="" type="checkbox"/>
	Juncus dudleyi (Dudley's rush)**	JUDU2	1	S/R [P] NAm	<input checked="" type="checkbox"/>
	Juncus effusus var. gracilis (lamp rush)	JUEFG	2	S/R [P] US_PNW	<input checked="" type="checkbox"/>

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	Juncus ensifolius (swordleaf rush)	JUEN	1	S/R [P] NAm	<input checked="" type="checkbox"/>
	Juncus longistylis var. longistylis (longstyle rush)	JULOL	2	S/R [P] NAm	<input checked="" type="checkbox"/>
	Juncus nevadensis var. nevadensis (Sierra rush)**	JUNEN	1	S/R [P] NAm_W	<input checked="" type="checkbox"/>
	Juncus orthophyllus (straightleaf rush)	JUOR	2	S/R [P] US_W	<input checked="" type="checkbox"/>
	Juncus saximontanus (Rocky Mountain rush)**	JUSA	1	S/R [P] NAm	<input checked="" type="checkbox"/>
	Juncus tenuis (poverty rush)	JUTE	1	S/R [P] NAm	<input checked="" type="checkbox"/>
	Juncus torreyi (Torrey's rush)	JUTO	2	S/R [P] NAm	<input checked="" type="checkbox"/>
	Luzula campestris (field woodrush)	LUCA2	2	S/R [P] NAm	<input checked="" type="checkbox"/>
	Luzula multiflora ssp. multiflora var. multiflora (common woodrush)	LUMUM2	2	S/R [P] US	<input checked="" type="checkbox"/>

Lamiaceae

Agastache urticifolia (nettleleaf giant hyssop)	AGUR	3	F [P] NAm_W	<input type="checkbox"/>
Lamium amplexicaule (henbit deadnettle)	LAAM	3	F [B] EXOTIC	<input type="checkbox"/>
Lamium purpureum var. purpureum (purple deadnettle)	LAPUP	2	F [A] EXOTIC	<input checked="" type="checkbox"/>
Marrubium vulgare (horehound)	MAVU	3	F [P] EXOTIC	<input type="checkbox"/>
Melissa officinalis (common balm)	MEOF2	3	F [P] EXOTIC	<input type="checkbox"/>
Mentha arvensis (wild mint)	MEAR4	2	F [P] NAm	<input checked="" type="checkbox"/>
Monardella odoratissima (mountain monardella)	MOOD	2	F [P] NAm_W	<input checked="" type="checkbox"/>
Prunella vulgaris (common selfheal)	PRVU	2	F [P] NAm	<input checked="" type="checkbox"/>
Scutellaria angustifolia (narrowleaf skullcap)	SCAN3	2	F [P] NAm_PNW	<input checked="" type="checkbox"/>
Scutellaria antirrhinoides (nose skullcap)	SCAN4	2	F [P] US_PNW	<input checked="" type="checkbox"/>

Liliaceae

Family	Botanical Name (Common Name)	USDA Code	ID	GF [LS] Endm	H
	<i>Allium acuminatum</i> (tapertip onion)	ALAC4	3	F [P] NAm_W	<input type="checkbox"/>
	<i>Allium fibrillum</i> (Cuddy Mountain onion)	ALFI	2	F [P] US_PNW	<input checked="" type="checkbox"/>
	<i>Allium tolmiei</i> var. <i>platyphyllum</i> (Wallowa onion)**	ALTOP2	2	F [P] US_PNW	<input checked="" type="checkbox"/>
	<i>Allium tolmiei</i> var. <i>tolmiei</i> (Tolm's onion)**	ALTOT	2	F [P] US_W	<input checked="" type="checkbox"/>
	<i>Calochortus elegans</i> (elegant mariposa lily)	CAEL	2	F [P] US_W	<input checked="" type="checkbox"/>
	<i>Calochortus eurycarpus</i> (white mariposa lily)	CAEU	3	F [P] NAm_PNW	<input type="checkbox"/>
	<i>Calochortus macrocarpus</i> (sagebrush mariposa lily)	CAMA5	3	F [P] NAm_PNW	<input type="checkbox"/>
	<i>Camassia cusickii</i> (Cusick's camas)	CACU2	3	F [P] US_W	<input type="checkbox"/>
	<i>Camassia quamash</i> ssp. <i>breviflora</i> (small camas)**	CAQUB2	1	F [P] US_W	<input checked="" type="checkbox"/>
	<i>Dichelostemma capitatum</i> (bluedicks)	DICA14	3	F [P] US_W	<input type="checkbox"/>
	<i>Fritillaria pudica</i> (yellow fritillary)	FRPU2	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	<i>Maianthemum racemosum</i> ssp. <i>amplexicaule</i> (feathery false lily of the vally)	MARAA	3	F [P] NAm_W	<input type="checkbox"/>
	<i>Maianthemum stellatum</i> (starry false lily of the vally)	MAST4	3	F [P] NAm	<input type="checkbox"/>
	<i>Trillium petiolatum</i> (Idaho trillium)	TRPE3	3	F [P] US_PNW	<input type="checkbox"/>
	<i>Triteleia grandiflora</i> var. <i>grandiflora</i> (largeflower triteleia)	TRGRG2	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	<i>Zigadenus venenosus</i> (meadow deathcamas)	ZIVE	2	F [P] NAm_W	<input checked="" type="checkbox"/>
Limnanthaceae					
	<i>Floerkea proserpinacoides</i> (false mermaidweed)	FLPR	3	F [A] NAm	<input type="checkbox"/>
Malvaceae					
	<i>Malva neglecta</i> (common mallow)	MANE	3	F [B] EXOTIC	<input type="checkbox"/>
	<i>Sidalcea oregana</i> (Oregon checkerbloom)	SIOR	2	F [P] NAm_W	<input checked="" type="checkbox"/>

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Marsileaceae					
	Marsilea vestita (hairy waterclover)**	MAVE2	2	F [P] NAm	<input checked="" type="checkbox"/>
Onagraceae					
	Camissonia subacaulis (diffuseflower evening-primrose)**	CASU18	2	F [P] US_W	<input checked="" type="checkbox"/>
	Circaea alpina (small enchanter's nightshade)	CIAL	3	F [P] NAm_W	<input type="checkbox"/>
	Clarkia pulchella (pinkfairies)	CLPU	2	F [A] NAm_W	<input checked="" type="checkbox"/>
	Epilobium brachycarpum (tall annual willowherb)	EPBR3	3	F [A] NAm	<input type="checkbox"/>
	Epilobium ciliatum ssp. ciliatum (fringed willowherb)	EPCIC	2	F [P] NAm	<input checked="" type="checkbox"/>
	Epilobium ciliatum ssp. glandulosum (fringed willowherb)	EPCIG	1	F [P] NAm	<input checked="" type="checkbox"/>
	Epilobium densiflorum (denseflower willowherb)**	EPDE4	2	F [A] NAm_W	<input checked="" type="checkbox"/>
	Epilobium glaberrimum (glaucus willowherb)	EPGL	2	F [A] NAm_W	<input checked="" type="checkbox"/>
	Gaura mollis (velvetweed)	GAMO5	2	F [A] EXOTIC	<input checked="" type="checkbox"/>
	Oenothera caespitosa (tufted evening-primrose)	OECA10	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	Oenothera flava (yellow evening-primrose)**	OEFL	3	F [P] NAm_W	<input type="checkbox"/>
Orchidaceae					
	Platanthera dilatata var. dilatata (scentbottle)	PLDID	2	F [P] NAm	<input checked="" type="checkbox"/>
	Spiranthes romanzoffiana (hooded ladies'-tresses)**	SPRO	3	F [P] NAm	<input type="checkbox"/>
Orobanchaceae					
	Orobanche uniflora (oneflowered broomrape)	ORUN	3	F [A] NAm	<input type="checkbox"/>
Paeoniaceae					
	Paeonia brownii (Brown's peony)	PABR	3	F [P] US_W	<input type="checkbox"/>
Pinaceae					
	Pinus ponderosa (ponderosa pine)	PIPO	3	T [P] NAm_W	<input type="checkbox"/>

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	<i>Pseudotsuga menziesii</i> (Douglas-fir)	PSME	3	T [P] NAm_W	<input type="checkbox"/>
Plantaginaceae					
	<i>Plantago major</i> (common plantain)	PLMA2	3	F [P] EXOTIC	<input type="checkbox"/>
	<i>Plantago patagonica</i> (woolly plantain)	PLPA2	3	F [A] NAm	<input type="checkbox"/>
Poaceae					
	<i>Achnatherum occidentale</i> ssp. <i>californicum</i> (California needlegrass)	ACOCC	2	G [P] NAm_PNW	<input checked="" type="checkbox"/>
	<i>Achnatherum wallowaensis</i> (Wallowa needlegrass)	ACWA4	2	G [P] OR_E	<input checked="" type="checkbox"/>
	<i>Aegilops cylindrica</i> (jointed goatgrass)	AECY	2	G [A] EXOTIC	<input checked="" type="checkbox"/>
	<i>Agropyron cristatum</i> (crested wheatgrass)	AGCR	3	G [P] EXOTIC	<input type="checkbox"/>
	<i>Agrostis exarata</i> (spike bentgrass)	AGEX	3	G [A] NAm_W	<input type="checkbox"/>
	<i>Agrostis stolonifera</i> (creeping bentgrass)	AGST2	3	G [P] EXOTIC	<input type="checkbox"/>
	<i>Alopecurus aequalis</i> (shortawn foxtail)	ALAE	2	G [P] NAm	<input checked="" type="checkbox"/>
	<i>Alopecurus pratensis</i> (meadow foxtail)	ALPR3	1	G [P] EXOTIC	<input checked="" type="checkbox"/>
	<i>Apera interrupta</i> (dense silkybent)	APIN	2	G [A] EXOTIC	<input checked="" type="checkbox"/>
	<i>Aristida purpurea</i> (purple threeawn)	ARPU9	3	G [P] NAm	<input type="checkbox"/>
	<i>Arrhenatherum elatius</i> (tall oatgrass)	AREL3	3	G [P] EXOTIC	<input type="checkbox"/>
	<i>Bromus briziformis</i> (rattlesnake brome)	BRBR5	3	G [A] EXOTIC	<input type="checkbox"/>
	<i>Bromus carinatus</i> (California brome)	BRCA5	2	G [P] NAm_PNW	<input checked="" type="checkbox"/>
	<i>Bromus diandrus</i> (ripgut brome)	BRDI3	2	G [A] EXOTIC	<input checked="" type="checkbox"/>
	<i>Bromus hordeaceus</i> ssp. <i>hordeaceus</i> (soft brome)	BRHOH	2	G [A] EXOTIC	<input checked="" type="checkbox"/>
	<i>Bromus inermis</i> (smooth brome)	BRIN2	3	G [P] EXOTIC	<input type="checkbox"/>

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	Bromus japonicus (Japanese brome)	BRJA	2	G [A] EXOTIC	<input checked="" type="checkbox"/>
	Bromus rigidus (ripgut brome)	BRR18	3	G [P] EXOTIC	<input type="checkbox"/>
	Bromus secalinus (rye brome)	BRSE	2	G [P] EXOTIC	<input checked="" type="checkbox"/>
	Bromus sterilis (poverty brome)	BRST2	2	G [P] EXOTIC	<input checked="" type="checkbox"/>
	Bromus tectorum (cheatgrass)	BRTE	2	G [A] EXOTIC	<input checked="" type="checkbox"/>
	Calamagrostis rubescens (pinegrass)	CARU	1	G [P] NAm_W	<input checked="" type="checkbox"/>
	Cinna latifolia (drooping woodreed)	CILA2	2	G [P] NAm	<input checked="" type="checkbox"/>
	Dactylis glomerata (orchardgrass)	DAGL	3	G [P] EXOTIC	<input type="checkbox"/>
	Danthonia californica (California oatgrass)	DACA3	2	G [P] NAm_W	<input checked="" type="checkbox"/>
	Danthonia intermedia (timber oatgrass)	DAIN	2	G [P] NAm	<input checked="" type="checkbox"/>
	Danthonia spicata (poverty oatgrass)	DASP2	3	G [P] NAm	<input type="checkbox"/>
	Danthonia unispicata (onespike danthonia)	DAUN	3	G [P] NAm_W	<input type="checkbox"/>
	Deschampsia caespitosa (tufted hairgrass)	DECA18	2	G [P] NAm	<input checked="" type="checkbox"/>
	Deschampsia danthonioides (annual hairgrass)	DEDA	1	G [A] NAm_W	<input checked="" type="checkbox"/>
	Deschampsia elongata (slender hairgrass)	DEEL	3	G [A] NAm_W	<input type="checkbox"/>
	Elymus canadensis (Canada wildrye)	ELCA4	3	G [P] NAm	<input type="checkbox"/>
	Elymus elymoides ssp. elymoides (squirreltail)	ELELE	3	G [P] NAm_W	<input type="checkbox"/>
	Elymus glaucus ssp. glaucus (blue wildrye)	ELGLG	2	G [P] NAm	<input checked="" type="checkbox"/>
	Elymus repens (quackgrass)	ELRE4	3	G [P] EXOTIC	<input type="checkbox"/>
	Elymus trachycaulus ssp. trachycaulus (slender wheatgrass)	ELTRT	1	G [P] NAm	<input checked="" type="checkbox"/>

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	<i>Festuca idahoensis</i> (Idaho fescue)	FEID	3	G [P] NAm_W	<input type="checkbox"/>
	<i>Festuca occidentalis</i> (western fescue)	FEOC	2	G [P] US_W	<input checked="" type="checkbox"/>
	<i>Festuca rubra</i> ssp. <i>rubra</i> (red fescue)**	FERUR2	1	G [P] NAm	<input checked="" type="checkbox"/>
	<i>Festuca subulata</i> (bearded fescue)	FESU	2	G [P] NAm_W	<input checked="" type="checkbox"/>
	<i>Festuca viridula</i> (greenleaf fescue)	FEVI	2	G [P] NAm_PNW	<input checked="" type="checkbox"/>
	<i>Glyceria borealis</i> (small floating mannagrass)	GLBO	2	G [P] NAm	<input checked="" type="checkbox"/>
	<i>Glyceria grandis</i> var. <i>grandis</i> (American mannagrass)**	GLGRG	1	G [P] NAm	<input checked="" type="checkbox"/>
	<i>Glyceria striata</i> (fowl mannagrass)	GLST	1	G [P] NAm	<input checked="" type="checkbox"/>
	<i>Hordeum brachyantherum</i> ssp. <i>brachyantherum</i> (meadow barley)	HOBRB2	1	G [P] NAm	<input checked="" type="checkbox"/>
	<i>Hordeum murinum</i> (mouse barley)	HOMU	3	G [A] EXOTIC	<input type="checkbox"/>
	<i>Koeleria macrantha</i> (prairie Junegrass)	KOMA	2	G [P] NAm	<input checked="" type="checkbox"/>
	<i>Leymus cinereus</i> (basin wildrye)	LECI4	3	G [P] NAm_W	<input type="checkbox"/>
	<i>Lolium arundinaceum</i> (tall fescue)	LOAR10	2	G [P] EXOTIC	<input checked="" type="checkbox"/>
	<i>Lolium pratense</i> (meadow ryegrass)	LOPR7	2	G [P] NAm	<input checked="" type="checkbox"/>
	<i>Melica bulbosa</i> (oniongrass)	MEBU	3	G [P] NAm_W	<input type="checkbox"/>
	<i>Muhlenbergia filiformis</i> (pullup muhly)	MUFI2	3	G [A] NAm_W	<input type="checkbox"/>
	<i>Panicum capillare</i> (witchgrass)**	PACA6	1	G [P] NAm	<input checked="" type="checkbox"/>
	<i>Pascopyrum smithii</i> (western wheatgrass)	PASM	3	G [P] NAm	<input type="checkbox"/>
	<i>Phalaris arundinacea</i> (reed canarygrass)	PHAR3	3	G [P] EXOTIC	<input type="checkbox"/>
	<i>Phleum pratense</i> (timothy)	PHPR3	3	G [P] EXOTIC	<input type="checkbox"/>

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	<i>Phragmites australis</i> (common reed)	PHAU7	3	G [P] EXOTIC	<input type="checkbox"/>
	<i>Poa bulbosa</i> (bulbous bluegrass)	POBU	2	G [P] EXOTIC	<input checked="" type="checkbox"/>
	<i>Poa compressa</i> (Canada bluegrass)	POCO	2	G [P] EXOTIC	<input checked="" type="checkbox"/>
	<i>Poa cusickii</i> ssp. <i>cusickii</i> (Cusick's bluegrass)	POCUC4	3	G [P] NAm_W	<input type="checkbox"/>
	<i>Poa palustris</i> (fowl bluegrass)	POPA2	3	F [P] NAm	<input type="checkbox"/>
	<i>Poa pratensis</i> (Kentucky bluegrass)	POPR	2	G [P] EXOTIC	<input checked="" type="checkbox"/>
	<i>Poa secunda</i> (Sandberg bluegrass)	POSE	2	G [P] NAm	<input checked="" type="checkbox"/>
	<i>Pseudoroegneria spicata</i> ssp. <i>spicata</i> (bluebunch wheatgrass)	PSSPS	3	G [P] NAm_W	<input type="checkbox"/>
	<i>Setaria pumila</i> (yellow bristlegrass)	SEPU8	2	G [A] EXOTIC	<input checked="" type="checkbox"/>
	<i>Sporobolus cryptandrus</i> (sand dropseed)	SPCR	3	G [P] NAm	<input type="checkbox"/>
	<i>Taeniatherum caput-medusae</i> (medusahead)	TACA8	2	G [A] EXOTIC	<input checked="" type="checkbox"/>
	<i>Thinopyrum intermedium</i> (intermediate wheatgrass)	THIN6	3	G [P] EXOTIC	<input type="checkbox"/>
	<i>Torreyochloa pallida</i> var. <i>pauciflora</i> (pale false mannagrass)	TOPAP3	3	F [P] NAm_W	<input type="checkbox"/>
	<i>Trisetum canescens</i> (tall trisetum)	TRCA21	3	G [P] NAm_W	<input type="checkbox"/>
	<i>Trisetum spicatum</i> (spike trisetum)	TRSP2	3	G [P] NAm	<input type="checkbox"/>
	<i>Ventenata dubia</i> (North Africa grass)	VEDU	2	G [A] EXOTIC	<input checked="" type="checkbox"/>
	<i>Vulpia myuros</i> (rat-tail fescue)	VUMY	3	G [A] EXOTIC	<input type="checkbox"/>
Polemoniaceae					
	<i>Collomia linearis</i> (tiny trumpet)	COLI2	2	F [A] NAm	<input checked="" type="checkbox"/>
	<i>Ipomopsis aggregata</i> ssp. <i>aggregata</i> (scarlet gilia)	IPAGA3	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	<i>Microsteris gracilis</i> var. <i>humilior</i> (slender phlox)	MIGRH	2	F [A] NAm_W	<input checked="" type="checkbox"/>

Family	Botanical Name (Common Name)	USDA Code	ID	GF [LS] Endm	H
	Navarretia divaricata (divaricate navarretia)	NADI3	3	F [A] NAm_PNW	<input type="checkbox"/>
	Phlox caespitosa (tufted phlox)	PHCA7	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	Phlox gracilis ssp. humilis (slender phlox)	PHGRH	2	F [A] NAm_W	<input checked="" type="checkbox"/>
	Phlox hoodii (spiny phlox)	PHHO	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	Phlox longifolia (longleaf phlox)**	PHLO2	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	Phlox pulvinata (cushion phlox)	PHPU5	2	F [P] US_W	<input checked="" type="checkbox"/>
	Phlox viscida (sticky phlox)	PHVI3	2	SH [P] US_W	<input checked="" type="checkbox"/>
Polygonaceae					
	Eriogonum compositum var. leianthum (arrowleaf buckwheat)	ERCOL2	2	F [P] US_PNW	<input checked="" type="checkbox"/>
	Eriogonum douglasii (Douglas' buckwheat)	ERDO	2	SS [P] US_PNW	<input checked="" type="checkbox"/>
	Eriogonum flavum (alpine golden buckwheat)	ERFL4	3	SS [P] NAm_W	<input type="checkbox"/>
	Eriogonum heracleoides var. angustifolium (parsnipflower buckwheat)	ERHEA2	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	Eriogonum niveum (snow buckwheat)	ERNI2	3	SS [P] NAm_PNW	<input type="checkbox"/>
	Eriogonum sphaerocephalum (rock buckwheat)**	ERSP7	2	SS [P] US_W	<input checked="" type="checkbox"/>
	Eriogonum strictum (Blue Mountain buckwheat)	ERST4	3	SS [P] NAm_PNW	<input type="checkbox"/>
	Polygonum aviculare (prostrate knotweed)	POAV	3	F [A] EXOTIC	<input type="checkbox"/>
	Polygonum convolvulus var. convolvulus (black bindweed)**	POCOC2	2	F [A] EXOTIC	<input checked="" type="checkbox"/>
	Polygonum douglasii (Douglas' knotweed)	PODO4	2	F [A] NAm	<input checked="" type="checkbox"/>
	Polygonum polygaloides (milkwort knotweed)	POPO4	3	F [A] NAm	<input type="checkbox"/>
	Rumex acetosella (common sheep sorrel)	RUAC3	2	F [P] EXOTIC	<input checked="" type="checkbox"/>
	Rumex crispus (curly dock)	RUCR	3	F [P] EXOTIC	<input type="checkbox"/>

Family	Botanical Name (Common Name)	USDA Code	ID	GF [LS] Endm	H
Portulacaceae					
	Claytonia lanceolata var. lanceolata (lanceleaf springbeauty)	CLLAL	3	F [P] NAm_W	<input type="checkbox"/>
	Lewisia columbiana var. wallowensis (Wallowa lewisia)**	LECOW	2	F [P] US_PNW	<input checked="" type="checkbox"/>
	Montia linearis (narrowleaf minerslettuce)	MOLI4	2	F [A] NAm	<input checked="" type="checkbox"/>
Primulaceae					
	Dodecatheon conjugens (Bonneville shootingstar)	DOCO	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	Dodecatheon pulchellum (darkthroat shootingstar)	DOPU	2	F [P] NAm_W	<input checked="" type="checkbox"/>
Ranunculaceae					
	Aquilegia formosa (western columbine)	AQFO	3	F [P] NAm_W	<input type="checkbox"/>
	Ceratocephala testiculata (curveseed butterwort)	CETE5	2	F [A] EXOTIC	<input checked="" type="checkbox"/>
	Clematis hirsutissima (hairy clematis)	CLHI	2	F [P] US_W	<input checked="" type="checkbox"/>
	Clematis ligusticifolia (western white clematis)	CLLI2	3	SS [P] US_W	<input type="checkbox"/>
	Delphinium ×burkei (depauperatum × nuttallianum)	DEBU	2	F [A] NAm_PNW	<input checked="" type="checkbox"/>
	Ranunculus glaberrimus var. glaberrimus (sagebrush buttercup)	RAGLG	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	Ranunculus repens (creeping buttercup)	RARE3	2	F [P] EXOTIC	<input checked="" type="checkbox"/>
	Ranunculus sceleratus var. multifidus (cursed buttercup)**	RASCM	3	F [A] NAm	<input type="checkbox"/>
	Ranunculus uncinatus (woodland buttercup)	RAUN	2	F [A] NAm_W	<input checked="" type="checkbox"/>
	Thalictrum venulosum (veiny meadow-rue)	THVE	2	F [P] NAm	<input checked="" type="checkbox"/>
Rhamnaceae					
	Ceanothus velutinus (snowbrush ceanothus)	CEVE	3	SH [P] NAm_W	<input type="checkbox"/>
	Frangula purshiana (Pursh's buckthorn)**	FRPU7	2	T [P] NAm_W	<input checked="" type="checkbox"/>
Rosaceae					

Family	Botanical Name (Common Name)	USDA Code	ID	GF [LS] Endm	H
	Amelanchier alnifolia (Saskatoon serviceberry)	AMAL2	2	SH [P] NAm	<input checked="" type="checkbox"/>
	Crataegus douglasii (black hawthorn)	CRDO2	3	SH [P] NAm	<input type="checkbox"/>
	Crataegus monogyna (oneseed hawthorn)	CRMO3	2	SH [P] EXOTIC	<input checked="" type="checkbox"/>
	Crataegus piperi (Piper's hawthorn)	CRPI4	3	SH [P] NAm_W	<input type="checkbox"/>
	Fragaria vesca (woodland strawberry)	FRVE	2	F [P] NAm	<input checked="" type="checkbox"/>
	Fragaria virginiana (Virginia strawberry)	FRVI	3	F [P] NAm	<input type="checkbox"/>
	Geum aleppicum (yellow avens)	GEAL3	2	F [P] NAm	<input checked="" type="checkbox"/>
	Geum macrophyllum (largeleaf avens)	GEMA4	2	F [P] NAm	<input checked="" type="checkbox"/>
	Geum triflorum (old man's whiskers)	GETR	2	F [P] NAm	<input checked="" type="checkbox"/>
	Holodiscus discolor (oceanspray)	HODI	2	SH [P] NAm_W	<input checked="" type="checkbox"/>
	Physocarpus malvaceus (mallow ninebark)	PHMA5	2	SH [P] NAm_W	<input checked="" type="checkbox"/>
	Potentilla biennis (biennial cinquefoil)	POBI7	2	F [B] NAm_W	<input checked="" type="checkbox"/>
	Potentilla flabellifolia (high mountain cinquefoil)	POFL3	3	F [P] NAm_W	<input type="checkbox"/>
	Potentilla glandulosa ssp. glandulosa (sticky cinquefoil)	POGLG4	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	Potentilla gracilis var. flabelliformis (slender cinquefoil)**	POGRF	2	F [P] NAm	<input checked="" type="checkbox"/>
	Potentilla recta (sulphur cinquefoil)	PORE5	3	F [P] EXOTIC	<input type="checkbox"/>
	Prunus avium (sweet cherry)	PRAV	3	T [P] EXOTIC	<input type="checkbox"/>
	Prunus virginiana (chokecherry)	PRVI	3	SH [P] NAm	<input type="checkbox"/>
	Pyrus communis (common pear)	PYCO	3	T [P] EXOTIC	<input type="checkbox"/>
	Rosa gymnocarpa (dwarf rose)	ROGY	3	SH [P] NAm_PNW	<input type="checkbox"/>

Family	Botanical Name (Common Name)	USDA Code	ID	GF [LS] Endm	H
	Rosa nutkana (Nootka rose)	RONU	3	SH [P] NAm_W	<input type="checkbox"/>
	Rosa woodsii (Woods' rose)	ROWO	3	SH [P] NAm	<input type="checkbox"/>
	Rubus idaeus (American red raspberry)	RUID	3	SH [P] NAm	<input type="checkbox"/>
	Sanguisorba annua (prairie burnet)	SAAN2	3	F [U] NAm	<input type="checkbox"/>
	Sanguisorba minor ssp. muricata (small burnet)	SAMIM	2	F [P] EXOTIC	<input checked="" type="checkbox"/>
	Spiraea betulifolia (white spirea)	SPBE2	2	SH [P] NAm	<input checked="" type="checkbox"/>
Rubiaceae					
	Galium aparine (stickywilly)	GAAP2	3	F [A] NAm	<input type="checkbox"/>
	Galium boreale (northern bedstraw)	GABO2	2	F [P] NAm	<input checked="" type="checkbox"/>
	Galium trifidum (threepetal bedstraw)**	GATR2	2	F [P] Nam	<input checked="" type="checkbox"/>
Salicaceae					
	Populus balsamifera ssp. trichocarpa (black cottonwood)	POBAT	3	T [P] NAm_W	<input type="checkbox"/>
	Populus tremuloides (quaking aspen)	POTR5	3	T [P] NAm	<input type="checkbox"/>
	Salix amygdaloides (peachleaf willow)	SAAM2	2	SH [P] NAm	<input checked="" type="checkbox"/>
	Salix bebbiana (Bebb willow)	SABE2	2	SH [P] NAm	<input checked="" type="checkbox"/>
	Salix boothii (Booth's willow)	SABO2	2	SH [P] NAm_W	<input checked="" type="checkbox"/>
	Salix exigua (narrowleaf willow)	SAEX	3	SH [P] NAm_W	<input type="checkbox"/>
	Salix geyeriana (Geyer's willow)	SAGE2	2	SH [P] NAm_W	<input checked="" type="checkbox"/>
	Salix lucida ssp. caudata (greenleaf willow)	SALUC	2	SH [P] NAm_W	<input checked="" type="checkbox"/>
	Salix scouleriana (Scouler's willow)**	SASC	2	T [P] NAm_W	<input checked="" type="checkbox"/>
Saxifragaceae					

Family	Botanical Name (Common Name)	USDA Code	ID	GF [LS] Endm	H
	Heuchera cylindrica (roundleaf alumroot)	HECY2	3	F [P] NAm_PNW	<input type="checkbox"/>
	Heuchera grossulariifolia (gooseberryleaf alumroot)	HEGR8	2	F [P] NAm_PNW	<input checked="" type="checkbox"/>
	Lithophragma glabrum (bulbous woodland-star)	LIGL2	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	Saxifraga integrifolia (wholeleaf saxifrage)	SAIN4	2	F [P] NAm_W	<input checked="" type="checkbox"/>
Scrophulariaceae					
	Besseyia rubra (red besseyia)	BERU	2	F [P] US_PNW	<input checked="" type="checkbox"/>
	Castilleja cusickii (Cusick's Indian paintbrush)**	CACU7	3	F [P] NAm_W	<input type="checkbox"/>
	Castilleja hispida (harsh Indian paintbrush)	CAHI9	2	F [P] NAm_PNW	<input checked="" type="checkbox"/>
	Castilleja lutescens (stiff yellow Indian paintbrush)**	CALU14	3	F [P] NAm_W	<input type="checkbox"/>
	Castilleja oresbia (pale Wallowa Indian paintbrush)	CAOR4	2	F [P] US_PNW	<input checked="" type="checkbox"/>
	Castilleja tenuis (hairy Indian paintbrush)	CATE26	3	F [A] NAm_PNW	<input type="checkbox"/>
	Collinsia parviflora (maiden blue eyed Mary)	COPA3	2	F [A] NAm	<input checked="" type="checkbox"/>
	Mimulus cusickii (Cusick's monkeyflower)	MICU2	2	F [P] US_W	<input checked="" type="checkbox"/>
	Mimulus guttatus (seep monkeyflower)	MIGU	3	F [A] NAm_W	<input type="checkbox"/>
	Mimulus nanus (dwarf purple monkeyflower)	MINA	2	F [A] US_W	<input checked="" type="checkbox"/>
	Orthocarpus luteus (yellow owl's-clover)	ORLU2	3	F [A] NAm	<input type="checkbox"/>
	Orthocarpus tenuifolius (thinleaved owl's-clover)	ORTE2	2	F [A] NAm_PNW	<input checked="" type="checkbox"/>
	Penstemon cusickii (Cusick's beardtongue)	PECU	2	F [P] US_W	<input checked="" type="checkbox"/>
	Penstemon deustus (scabland penstemon)	PEDE4	2	F [P] US_W	<input checked="" type="checkbox"/>
	Penstemon fruticosus (bush penstemon)	PEFR3	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	Penstemon glandulosus var. glandulosus (stickystem penstemon)	PEGLG3	2	F [P] US_PNW	<input checked="" type="checkbox"/>

Family	Botanical Name (Common Name)	USDA Code	ID	GF [LS] Endm	H
	Penstemon globosus (globe penstemon)	PEGL5	2	F [P] US_PNW	<input checked="" type="checkbox"/>
	Penstemon procerus (littleflower penstemon)	PEPR2	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	Penstemon rydbergii (Rydberg's penstemon)**	PERY	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	Penstemon triphyllus (Riggin's penstemon)	PETR6	3	F [P] US_PNW	<input type="checkbox"/>
	Penstemon venustus (Venus penstemon)	PEVE2	2	F [P] US_W	<input checked="" type="checkbox"/>
	Scrophularia lanceolata (lanceleaf figwort)	SCLA	2	F [P] NAm	<input checked="" type="checkbox"/>
	Tonella floribunda (manyflower tonella)	TOFL	3	F [A] US_PNW	<input type="checkbox"/>
	Verbascum blattaria (moth mullein)	VEBL	3	F [B] EXOTIC	<input type="checkbox"/>
	Verbascum thapsus (common mullein)	VETH	3	F [B] EXOTIC	<input type="checkbox"/>
	Veronica americana (American speedwell)	VEAM2	2	F [P] NAm	<input checked="" type="checkbox"/>
	Veronica anagallis-aquatica (water speedwell)**	VEAN2	2	F [P] NAm	<input checked="" type="checkbox"/>
	Veronica arvensis (corn speedwell)	VEAR	3	F [A] EXOTIC	<input type="checkbox"/>
	Veronica peregrina (neckweed)	VEPE2	3	F [P] NAm	<input type="checkbox"/>
	Veronica serpyllifolia (thymeleaf speedwell)	VESE	3	F [P] NAm	<input type="checkbox"/>
Solanaceae					
	Solanum dulcamara (climbing nightshade)	SODU	3	F [P] EXOTIC	<input type="checkbox"/>
Typhaceae					
	Typha latifolia (broadleaf cattail)	TYLA	3	G [P] NAm	<input type="checkbox"/>
Ulmaceae					
	Celtis laevigata var. reticulata (netleaf hackberry)	CELAR	3	T [P] NAm_W	<input type="checkbox"/>
Urticaceae					
	Urtica dioica (stinging nettle)	URDI	3	F [P] NAm	<input type="checkbox"/>

Family	Botanical Name (Common Name)	USDA Code	ID	GF [LS] Endm	H
	Urtica urens (dwarf nettle)**	URUR	2	F [P] EXOTIC	<input checked="" type="checkbox"/>
Valerianaceae					
	Valeriana edulis var. edulis (tobacco root)	VAEDE	2	F [P] NAm_W	<input checked="" type="checkbox"/>
	Valerianella locusta (Lewiston cornsalad)	VALO	2	F [A] EXOTIC	<input checked="" type="checkbox"/>
Violaceae					
	Viola adunca (hookedspur violet)	VIAD	2	F [P] NAm	<input checked="" type="checkbox"/>
	Viola vallicola var. vallicola (sagebrush violet)	VIVAV	3	F [P] NAm_W	<input type="checkbox"/>
Viscaceae					
	Arceuthobium douglasii (Douglas fir dwarf mistletoe)**	ARDO	3	SS [P] Nam_W	<input type="checkbox"/>
Zygophyllaceae					
	Tribulus terrestris (puncturevine)	TRTE	3	F [A] EXOTIC	<input type="checkbox"/>

The Zumwalt Prairie Plant list attempts to document all vascular plant species occurring on the Zumwalt Prairie and adjacent canyon lands. The list is a work in progress and should not be considered comprehensive. Sources of data are many and include observations made by Nature Conservancy staff, volunteers, University researchers, and others.

Asterisks ("**") after the name indicates a plant that has been added to the list in this last revision (i.e., since July 2010).

ID = Identification status ::: 1 = most confident; 2 = confident; 3 = less confident

GF = Growth Form ::: T(ree), SH(rub); F(orb); G(rass); S(edge)/R(ush)

LS = Life Span ::: P(errennial); B(iennial); A(nnual) (U)unknown or Mixed

Endm = Endemism, or locations where this species/subsp/variety occur ::: N_AM = North America; W_NAm = W. North Am.; NAm_PNW = Pacific Northwest and adj. Canadian Provinces; US=United States (lower 48); US_PNW = Pacific Northwest (US states, only.); US_W=Western US (west of Mississippi River); OR_E = Eastern Oregon; EXOTIC = not native to Oregon.

H = Herbarium ::: Records with a checkmark have been vouchered at the Conservancy's NE OR Office.

If you have questions/concerns or comments regarding this list, please contact Rob Taylor (rtaylor@tnc.org).

Lichens of the Zumwalt Prairie

Family	Species	Substrate, (Occurrence*)	Alternative Name
CANDELARIACEAE	Candelaria concolor	Various trees (not pine), (c)	Candleflame lichen, lemon lichen
CATILLARIACEAE	Toninia ruginosa	Fence post, (c)	Bruised lichen
CLADONIAACEAE	Cladonia coniocraea	Rotten log, (o)	Common powderhorn
	Cladonia pocillum	Soil, (c)	Rosette pixie-cup, carpet pixie-cup
	Cladonia pyxidata	Soil, (c)	Pebbled pixie-cup
COLLEMATACEAE	Collema tenax	Soil, (o)	Soil jelly lichen, tar-jelly
	Leptogium lichenoides	Soil, (c)	Tattered jellyskin
HYMENELIACEAE	Aspicilia desertorum	Rock, (o)	Desert aspicilia
	Aspicilia fruticulosa	Soil, (r)	Lecanora fruticulosa
	Aspicilia hispida	Soil, (o)	Vagabond lichen
	Megaspora verrucosa	Soil, (c)	False sunken disk lichen
LECANORACEAE	Rhizoplaca melanophthalma	Rock, soil, (c)	Green rock posy
LECIDEACEAE	Lecidea tessellata	Rock, (c)	Tile lichen
PARMELIACEAE	Bryoria fuscescens	Pinus ponderosa, (c)	Pale-footed horsehair lichen
	Evernia prunastri	Crataegus douglasii, (r)	Oakmoss lichen
	Hypogymnia imshaugii	Pinus ponderosa, (c)	Forked tube lichen
	Hypogymnia physodes	Pinus ponderosa, (o)	Monk's hood lichen, hooded tube lichen, puffed lichen
	Hypogymnia tubulosa	Pinus ponderosa, (c)	Power-headed tube lichen
	Letharia vulpina	Pinus ponderosa, (c)	Wolf lichen
	Melanelia fuliginosa	Crataegus douglasii, (c)	Shiny camouflage lichen
	Melanelia multispora	Crataegus douglasii, (c)	Many-spored camouflage lichen
	Nodobryoria abbreviata	Pinus ponderosa, (c)	Tufted foxtail lichen
	Parmelia sulcata	Crataegus douglasii, (c)	Hammered shield lichen
	Parmeliopsis ambigua	Rotten log, (c)	Shield lichen
	Tuckermannopsis chlorophylla	Pinus ponderosa, (o)	Powdered wrinkle lichen
	Tuckermannopsis merrillii	Pinus ponderosa, (c)	Kaernefeltia merrillii, greenleaf tuckermannopsis lichen
	Tuckermannopsis platyphylla	Pinus ponderosa, (c)	Broad wrinkle lichen
	Usnea filipendula	Crataegus douglasii, (c)	Inflated beard lichen
	Vulpicida canadensis	Pinus ponderosa, (o)	Brown-eyed sunshine lichen
	Xanthoparmelia plittii	Rock, (c)	Plitt's rock shield
	Xanthoria polycarpa	Crataegus douglasii, (c)	Pin-cushion sunburst lichen
PELTIGERACEAE	Peltigera canina	Soil, (o)	Dog lichen
	Peltigera didactyla	Soil, (o)	Alternating dog lichen
	Peltigera ponojensis	Soil, (o)	Pale-bellied dog lichen
	Peltigera rufescens	Soil, (c)	Field dog lichen
PERTUSARIACEAE	Ochrolechia upsaliensis	Soil, (o)	Tundra saucer lichen
	Pertusaria amara	Rotten log, (c)	Bitter wart lichen
PHYSICIACEAE	Physcia dimidiata	Rock, Populus tremuloides, (c)	Powder-tipped rosette lichen
	Physcia tenella	Populus tremuloides, (c)	Fringed rosette lichen
PSORACEAE	Psora montana	Soil, (c)	Mountain fishscale lichen
	Psora nipponica	Soil, (o)	Psora novomexicana, butterfly scale lichen
TELOSCHISTALES	Xanthoria fallax	Crataegus douglasii, (c)	Hooded sunburst lichen
THELOTREMATAACEAE	Diploschistes muscorum	Soil, (o)	Cowpie lichen
UMBILICARIACEAE	Umbilicaria hyperborea	Rock, (c)	Blistered rock tripe

VERRUCARIACEAE	Umbilicaria krascheninnikovii	Rock, (o)	Salty rock tripe
	Umbilicaria phaea	Rock, (o)	Emery rock tripe
	Catapyrenium rufescens	Soil, (c)	Placidium rufescens (?)
	Dermatocarpon miniatum	Soil, (o)	Common stippleback, leather lichen
	Dermatocarpon bachmannii	Rock, vagrant (o)	Stippleback lichen variety
	Placidium squamulosum	Soil, (c)	Brown stipplescale lichen

**Occurrence: Common=c, Occasional=o, Rare=r*