Rare Plant and Vegetation Survey of Palouse Falls State Park

Pacific Biodiversity Institute

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Hans M. Smith IV
hans@pacificbio.org

George Wooten
george232@centurytel.net

and

Peter H. Morrison
pm@pacificbio.org

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Pacific Biodiversity Institute
P.O. Box 298
Winthrop, Washington 98862
509-996-2490

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Executive Summary

Pacific Biodiversity Institute conducted a rare plant and vegetation survey of Palouse Falls State Park for the Washington State Parks and Recreation Commission. Palouse Falls State Park covers about 100 acres of land in the Palouse River Canyon.

Field surveys of the park were conducted on April 15 and July 23, 2008. The western portion of the park was surveyed intensively, except for very steep and dangerous terrain. Due to lack of river crossings and access issues involving private property, the portion of the park on the eastside of the Palouse River was not surveyed. Non-accessible areas were viewed and evaluated with binoculars.

A total of 46 vegetation community polygons were mapped and visited in the project area, and 15 scientifically recognized vegetation community types were encountered within these polygons. Actual vegetation cover and community conditions were more diverse than the 15 classes suggest, and data on the existing vegetation cover and ecological conditions for each vegetation community patch was collected and attributed to a GIS dataset deliverable.

Of the two rare plants thought to be in the park, only prairie cordgrass (*Spartina pectinata*) was encountered during 2008 field surveys. Twincrest onion (*Allium bisceptrum var. bisceptrum*) was not encountered. No other rare plants were encountered during 2008 field surveys.

195 vascular plant species were identified to at least genus during this project. Of these species, 62 species are known to be exotic plants, meaning 32% of the plant species diversity within the park is non-native.

Eleven noxious weeds tracked by the Washington State Noxious Weed Board were encountered within park. Reed canarygrass (*Phalaris arundinacea*) and poison hemlock (*Conium maculatum*) have the worst weed infestations among plants on the noxious weed list. Cheatgrass (*Bromus tectorum*) and bulbous bluegrass (*Poa bulbosa*), as well as other exotic annual grasses are profuse throughout the park's natural communities.

The extent of exotic plant cover in the park brings the park's overall ecological condition to fair. Continued invasion into native plant communities by exotic species could bring the overall condition to poor without management attention to weed control. Upland shrub-steppe/grassland communities on flatter landforms and riparian communities have the worst ecological condition ratings. Livestock grazing and human trampling of vegetation are two stressors on the park's natural communities that could be alleviated most efficiently. Other restoration activities should be prioritized for more sensitive communities with fair to good ecological conditions.

Getting a better understanding of where the park's boundaries actually are, and what areas of the landscape fall within park ownership needs to be a top priority for the Washington State Parks and Recreation Commission. Activities inconsistent with State Park management agendas, such as livestock grazing and camping outside of designated areas are taking place in Palouse Falls State Park. Making sure that all parties managing and affecting natural resources in the park clearly know and agree on where the park boundary lies is a necessity for adequate land stewardship. Current management and resource interests seem to be focused on the campground areas and immediate surroundings with little regard paid to outlying parcels.

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Introduction

Palouse Falls State Park was surveyed for rare plant occurrences, vegetation communities and characteristics, noxious weeds and ecological condition by Pacific Biodiversity Institute (PBI) in 2008, under contract with the Washington State Parks and Recreation Commission (WSPRC). This report summarizes the activities and findings of the contracted work.

Palouse Falls State Park is a 100 acre park located along the Palouse River, on the boundary between Franklin and Whitman Counties, Washington. It is located along the rim of and within a steep gorge of basalt cliffs containing the Palouse River and the iconic Palouse Falls waterfall. Pre-historic disturbance events such as the great basalt floods of the late Miocene and early Pliocene as well as the Missoula Floods during the Pleistocene epoch played a large role in forming the landforms and topography within the park.

Typical Columbia Plateau channeled scabland shrub-steppe and basalt cliff vegetation communities occupy most of the park's landscape. The presence of the Palouse River in the bottom of the gorge adds substantial habitat complexity to the park's landscape through riparian influence.

More recent disturbance events due to human activities have influenced most of the vegetation communities in the park. Road, trail, and railway construction has removed native vegetation and disturbed the soil profile in many places, providing good conditions for exotic and noxious weed invasion. Grazing by livestock, an activity that can promote exotic plant invasion and diminish the occurrence of certain native plant species was conducted historically, and in some cases is still conducted within portions of the park. Conversion of land to intensive agriculture near and upstream of the park has provided ample seed sources of exotic and noxious species that have become established within the park. The combining effect of all these disturbance factors has degraded the ecological condition of much of the park's vegetation communities. It is expected that without focused planning and intervention by the Park Service, the trajectory of degradation will continue and more of the native vegetation communities and rare plant populations in the park will be lost.

Survey Conditions and Survey Routes

The project area was surveyed by two botanist/ecologists on April 15, 2008 and by one botanist/ecologist and an intern on July 23, 2008. Routes from these surveys are illustrated in Figure 1.

Due to the extremely steep topography within Palouse Falls State Park not all areas of the park were directly accessible for surveys. Also, a significant portion of the park on the Whitman County (east) side of the Palouse River was not accessible due to a lack of public access through surrounding private lands. We attempted to coordinate access to this side of the park with park rangers, but they were not aware that land on the east side of the Palouse River was in park ownership and they did not know how to access that part of the property. Although not always directly accessible, most of the park was viewable from an assortment of vantage points and non-accessible areas were viewed and evaluated with binoculars.

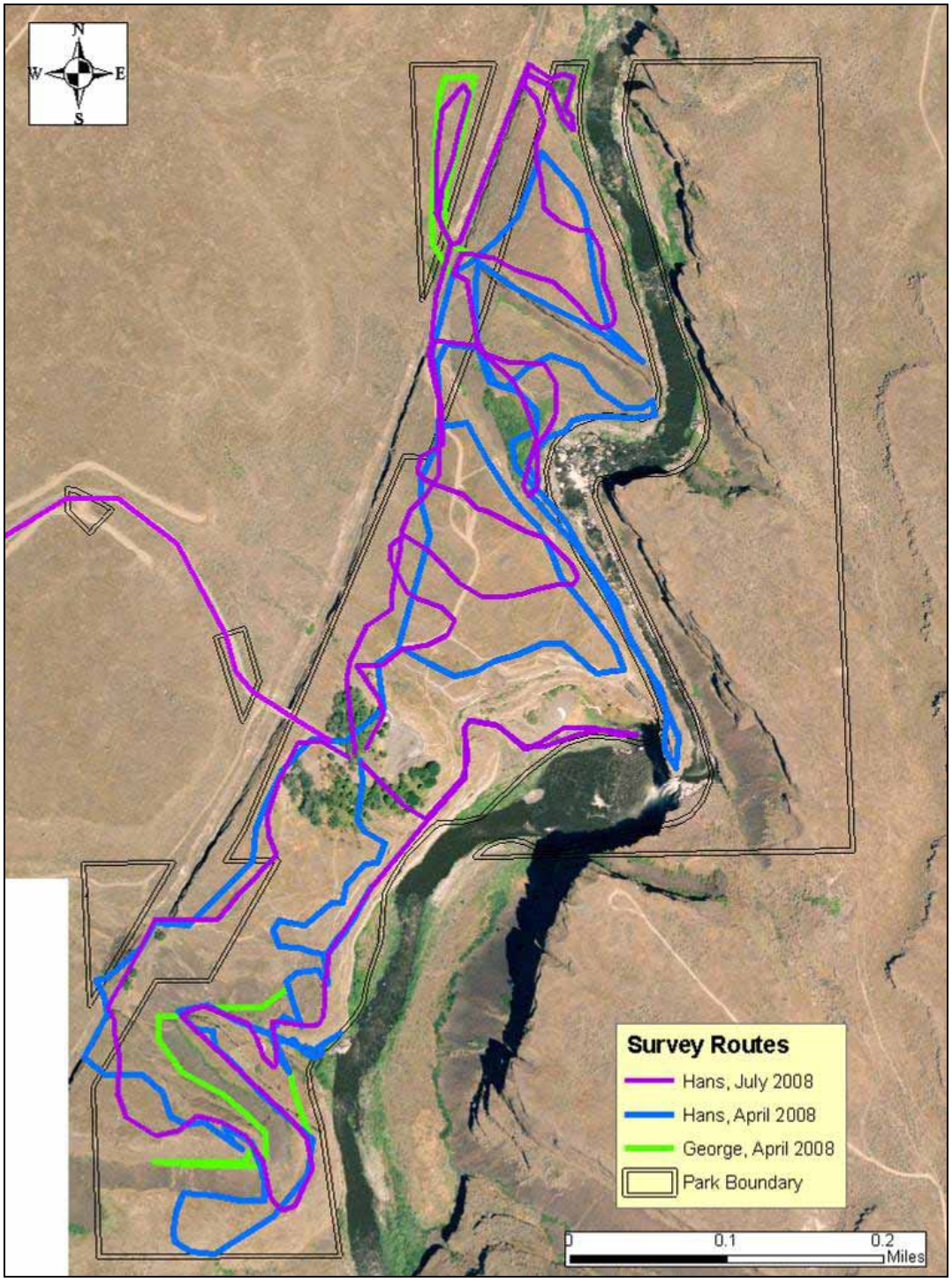

Figure 1. Field survey schedule and routes.

Vegetation Community Surveys

Methods

Pre-field reviews of literature, GIS data, and remote sensing data were conducted early in the season. Maps, GIS data, and remotely sensed data were assembled together into an ArcMap GIS project covering the project area. Topographic maps and digital elevation models (DEMs) were also assembled. Using the gathered spatial data resources, discrete vegetation polygons meant to represent specific plant communities or mosaics of plant communities were manually delineated by staff ecologists as polygon features in an ESRI shapefile format.

The park was visited twice during the field season to assure observation of both early and late-blooming plant species. The first visit was primarily a reconnaissance of the project area, meant to create a basic plant list for the park and to conduct initial rare plant surveys for early bloomers. The later visit focused on collecting field data for the vegetation polygon map and adding more species to the plant list during the summer season. Before the field season was complete, all vegetation polygons that could be accessed safely were visited and field data was collected.

Plant community data was recorded on a form initially developed by the WSPRC (Appendix C). Recorded data included a wide variety of information about the vegetation composition, environmental characteristics, disturbance history and other notes for each polygon. Each polygon was rated for its overall ecological condition. Vegetation community and land cover classifications were assigned using information and keys from standard literature sources cited in the Reference section of this document.

During field visits survey personnel had printed and digital maps available that included high resolution aerial imagery. Digital maps were accessed in the field using ArcPad software (ESRI 2007) running on pocket PC, GPS enabled devices. Use of ArcPad allowed all survey routes to be mapped on a GPS recorder in real time, and allowed for viewing and editing data directly from field locations, resulting in field-verified attributes for the vegetation polygons.

Once gathered, the field data was edited and entered into a Microsoft Access database and linked to the vegetation polygon geodatabase. Further refinements and editing of the vegetation data stored in the personal geodatabase was made based on information collected in the field with ArcPad.

Results

Vegetation Community Mapping

A total of 46 vegetation community polygons were mapped and visited in Palouse Falls State Park (Figure 2). Within these 46 polygons a total of 15 vegetation community/land cover classes were attributed as primary, secondary, or tertiary community types (Table 1). Primary community types are the dominant or matrix vegetation community within a polygon, whereas secondary and tertiary community types are less abundant vegetation community types that occur within the same polygon and were not conducive to being mapped as a separate polygon due to the size, shape, or pattern of the community patches within the polygon.

Figure 2. Map of Palouse Falls State Park showing vegetation community polygons and survey routes overlaid onto an aerial photo of the park.

Table 1. Vegetation community/land cover classes mapped in Palouse Falls State Park

Common Names	Scientific Names	Code	Authority	Global Status
boxelder	Acer negundo	ACNE2	Crawford, 2003	Not Assessed
big sagebrush / bluebunch wheatgrass	Artemisia tridentata / Pseudoroegneria spicata	ARTR2/PSSP6	Daubenmire, 1970	G5
netleaf hackberry - western poison ivy	Celtis laevigata - Toxicodendron rydbergii	CELAR-TORY	Crowe et al., 2002	G2
rubber rabbitbrush / bluebunch wheatgrass	Ericameria nauseosa / Pseudoroegneria spicata	ERNAS2/PSSP6	MTNHP, 2002	G3
snow buckwheat / Sandberg bluegrass	Eriogonum niveum / Poa secunda	ERNI2/POSE	Daubenmire, 1970	G3
seep monkeyflower	Mimulus guttatus	MIGU	Diaz and Mellen, 1996	Not Assessed
Lewis' mock orange	Philadelphus lewisii	PHLE4	Crawford, 2003	G2
Lewis' mock orange - western white clematis	Philadelphus lewisii - Clematis ligusticifolia	PHLE4-CLLI2	Crawford, 2003	~G2
Lewis' mock orange - western poison ivy	Philadelphus lewisii - Toxicodendron rydbergii	PHLE4-TORY	Crawford, 2003	~G2
chokecherry	Prunus virginiana	PRVI	Crawford, 2003	G4
bluebunch wheatgrass - Idaho fescue	Pseudoroegneria spicata - Festuca idahoensis	PSSP6-FEID	Daubenmire, 1970	G3
bluebunch wheatgrass - Sandberg bluegrass	Pseudoroegneria spicata - Poa secunda	PSSP6-POSE	Daubenmire, 1970	G4
smooth sumac / bluebunch wheatgrass	Rhus glabra / Pseudoroegneria spicata	RHGL/PSSP6	Daubenmire, 1970	G2
narrowleaf willow temporarily flooded shrubland	Salix exigua temporarily flooded shrubland	SAEX	Crawford, 2003	G5
Developed / Disturbed	Developed / Disturbed	Developed/Disturbed	PBI	

These vegetation community/land cover types represent our best determination of how the existing vegetation and land cover patterns observed within the park's landscape relate to vegetation communities, plant associations, and/or land cover categories previously described in existing reference literature (see Appendix B for description of Global Status codes). Table 2 illustrates how existing vegetation patches observed and mapped by PBI were assigned to a particular vegetation community/land cover classification.

Table 2. Relationship of observed vegetation patches to subsequent vegetation community / land cover classification.[1]

Vegetation Community/Plant Association/Land Cover Name (Code)	Existing Vegetation/Land Cover Observed
boxelder ACNE2	COSE16-ACNE2-TORY/COMA2-BRTE
big sagebrush / bluebunch wheatgrass ARTR2/PSSP6	ARTR2/ARLU-BRTE ARTR2/BRTE-ELELE-PSSP6 ARTR2/BRTE-POBU-CHJU ARTR2/BRTE-PSSP6 ARTR2/PSSP6 ARTR2/PSSP6-BRTE ARTR2/PSSP6-POBU-BRTE ARTR2-CLLI2/BRTE-LODI ARTR2-ERNAS2/BRTE-PSSP6 ARTR2/BRTE-PSSP6-HECO26
netleaf hackberry - western poison ivy CELAR-TORY	CELAR-TORY/Talus
rubber rabbitbrush / bluebunch wheatgrass ERNAS2/PSSP6	ERNAS2/BRTE-PSSP6
snow buckwheat / Sandberg bluegrass ERNI2/POSE	ERNI2/BRTE-POSE ERNI2/POSE ERNI2/PSSP6-BRTE-PTTET ERNI2/PSSP6-POSE ERNI2-ERCO12/PSSP6-BRTE-POSE
seep monkeyflower MIGU	TORY/POBU-POMO5-MIGU
Lewis' mock orange PHLE4	PHLE4-CLLI2/Talus
Lewis' mock orange - western white clematis PHLE4-CLLI2	PHLE4/POBU-BRTE
Lewis' mock orange - western poison ivy PHLE4-TORY	PHLE4-ROWO-TORY/POBU-LECI4-PSSP6
chokecherry PRVI	PRVI-CLLI2/COMA2-ELGL PRVI-SAEX/COMA2-BRTE PRVI-TORY PRVI-TORY-CLLI2 talus
bluebunch wheatgrass - Idaho fescue PSSP6-FEID	ERNAS2/PSSP6-FEID PSSP6-FEID-LODI
bluebunch wheatgrass - Sandberg bluegrass PSSP6-POSE	BRTE-LULE3-PSSP6 BRTE-POBU-POSE BRTE-POBU-PSSP6 BRTE-PSSP6-POSE BRTE-SIAL2-PSSP6 ERNI2/BRTE-PSSP6-POSE ERNI2/PSSP6-POBU-BRTE PSSP6-BRTE-POSE BRTE-PSSP6

[1] Although most Existing Vegetation patches can be intuitively assigned to a corresponding Vegetation Community or Plant Association, some existing vegetation assignments are less intuitive and require a more in-depth understanding of the vegetation conditions than what is presented in this table. Such in-depth information is better provided in Appendix D. There is not a direct one-to-one relationship between Existing Vegetation patch descriptions and the Vegetation Community or Plant Association type. Diverse sets of variables such as growth form canopy cover, ecological condition, historic conditions, and effects of natural and human caused disturbances must also be considered.

Vegetation Community/Plant Association/Land Cover Name (Code)	Existing Vegetation/Land Cover Observed
narrowleaf willow temporarily flooded shrubland SAEX	SAEX/AGPA8-CIAR4 SAEX/PHAR3-SPPE SAEX-PRVI/ARLU-ELGL
smooth sumac / bluebunch wheatgrass RHGL/PSSP6	PHLE4-RHGL-TORY/Talus
Developed / Disturbed	Campground/Day Use Entrance Road and Railway Fill

For each vegetation community polygon at least a primary vegetation community/land cover class was attributed (if not a secondary and tertiary class). Figure 3 shows a map depicting the primary vegetation community/land cover class for each polygon within the park. Appendix D provides a full accounting of all the attributes described for each polygon mapped within the project area.

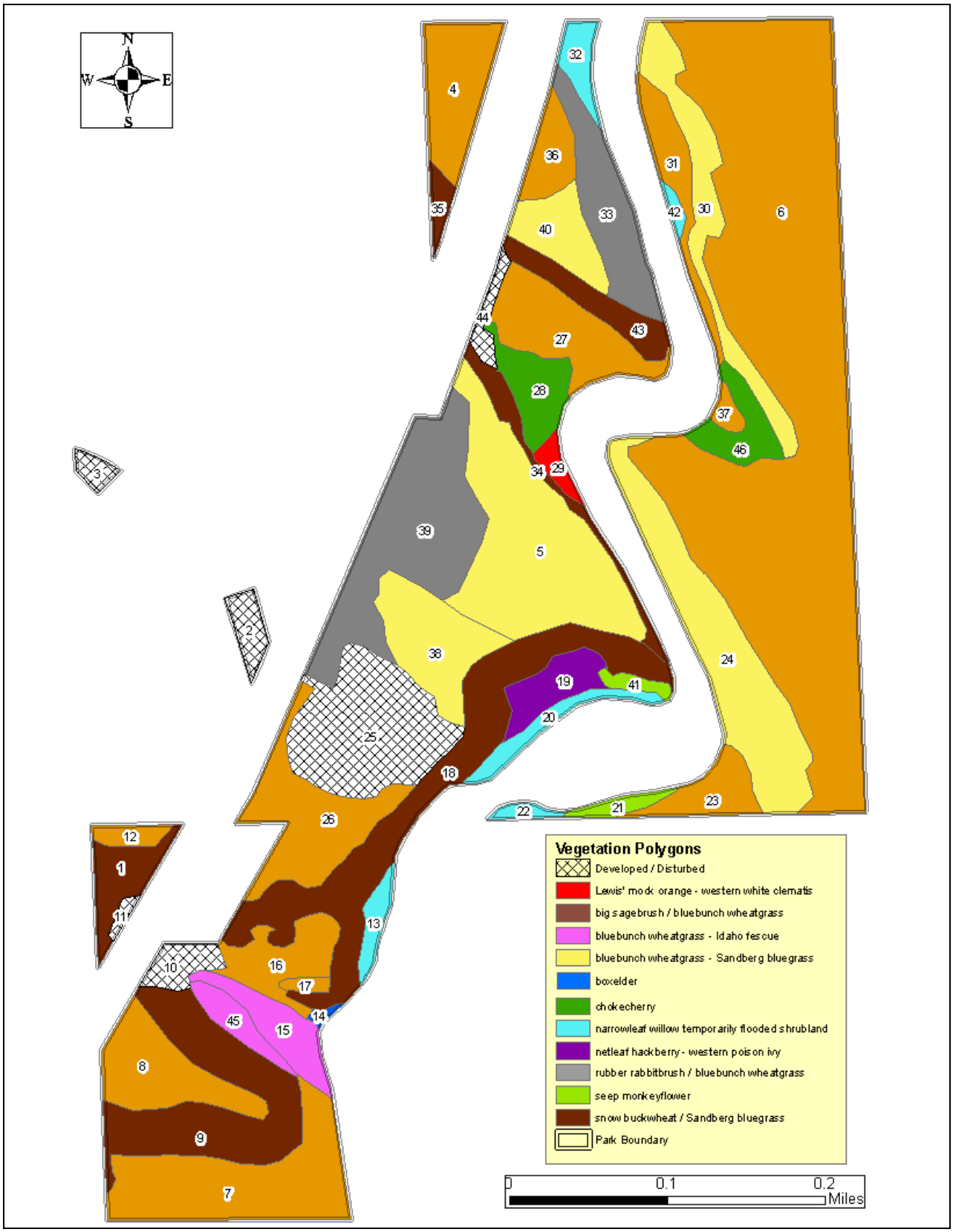

Figure 3. Primary vegetation community/land cover classes attributed to each vegetation polygon

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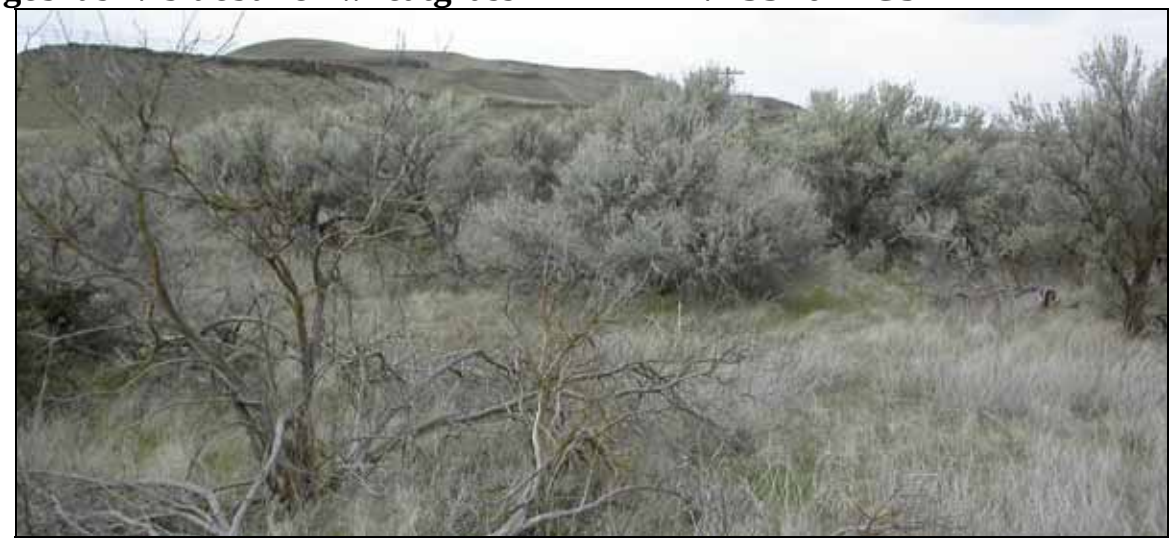
Vegetation Community Types

boxelder ACNE2

Boxelder is not a native species in Washington State. This riparian community is made up of mostly exotic and noxious plants that have invaded the river shoreline of the park. Luckily the occurrence of this community is not extensive in the park, but replacement of other native riparian vegetation communities by this exotic plant community is highly possible. Noxious weeds reed canarygrass (*Phalaris arundinaceae*) and poison hemlock (*Conium maculatum*) are abundant within this community.

big sagebrush / bluebunch wheatgrass ARTR2/PSSP6 G5



This community occurs mostly on flat dry areas with deeper soil deposits in the park. It typically occurs in an intermixed mosaic with the bluebunch wheatgrass - Sandberg bluegrass (PSSP6-POSE) community. In both of these communities invasion of exotic annual grasses, especially cheatgrass (*Bromus tectorum*), have decreased the ecological condition substantially. This is the community that is reported to have the occurrence of twincrest onion (*Allium bisceptrum var. bisceptrum*), a state review group 1 species. No occurrences of twincrest onion were observed during the 2008 surveys.

There is no clear indication of whether the current distribution and abundance of this community in relation to the PSSP6-POSE grassland community is similar to historic trends in the park, but it is likely that both fire suppression, increased wildfire severity due to increases in weedy annual grass biomass, and increased human caused wildfire risk has dramatically impacted both these communities and possibly altered their abundance, distribution, and conditions significantly. It is worth noting that polygon 7 in the southwest side of the park has had a recent wildfire, possibly linked to an old campfire ring there, that

killed part of the big sagebrush component and pushed part of the area towards the PSSP6-POSE community.

Historic livestock grazing pressures and development of transportation infrastructure have also been concentrated within these two communities in the park and have probably negatively affected the ecological condition by amplifying the effects of weed invasions. Incidental livestock grazing is still occurring within the park boundary in some of the western border sections of the park, No adequate fencing exists along the park boundary to keep livestock from getting onto park property. It is also likely that polygon 6 on the eastside of the park is still grazed since it is adjacent to grazed ranchland, with no border fences.

netleaf hackberry - western poison ivy CELAR-TORY G2

Within the park this community occurs in the shady bottoms of the Palouse River gorge above the obvious riparian zone of influence, although it is probably connected to riparian functions and/or seeps/springs deep underground. In many places it is a small patch community usually surrounded by rock face or talus with little other vegetation present. This community provides important roosting and cover habitat for migratory song birds. The G2 rank associated with this community implies that it is a globally imperiled plant community. Exceptional care should be given to management of this community to maintain its ecological integrity.

rubber rabbitbrush / bluebunch wheatgrass ERNAS2/PSSP6 G3

This community is increasingly common in this region of the Columbia Plateau. This community mosaics with the ARTR2/PSSP6 and PSSP6/POSE communities in areas with deeper soil deposits. Typically exotic grass and herb cover is high within this community due to historic human caused disturbances and livestock grazing. This community seems to be replacing the big sagebrush / bluebunch wheatgrass (ARTR2/PSSP6) community where human caused disturbances have eliminated the big sagebrush cover.

snow buckwheat / Sandberg bluegrass ERNI2/POSE G3

The snow buckwheat / Sandberg bluegrass community is what commonly occurs on the basalt cliff faces and lithosols throughout the park, along with the bluebunch wheatgrass - Sandberg bluegrass community (PSSP6-POSE). Because soil deposits are scarce within these rock cliff faces, vegetation cover is typically sparse. The ERNI2/POSE and PSSP6-POSE communities intermix with each other throughout the cliff areas and both contain much the same plant species composition, with ERNI2/POSE having more cover of snow buckwheat (*Eriogonum niveum*) than the PSSP6-POSE community. Invasions of cheatgrass and bulbous bluegrass (*Poa bulbosa*) are detrimental to the ecological condition of these communities within the park.

seep monkeyflower MIGU

This community occurs along the basalt cliff faces nearest to the waterfall spray of Palouse Falls. These cliff faces are provided annual moisture levels far beyond what is experienced in other upland parts of the dry landscape in the park. Waterfall spray provides enough moisture to support some hydrophilic plants such as seep monkeyflower and manyflowered monkeyflower. Grass cover in the spray zone is abundant and although much of these cliff faces were difficult and dangerous to access it seems that much of the grass cover is made up by the exotic invasive bulbous bluegrass. Because of the high abundance of exotic grasses this community has a poor ecological condition.

Lewis' mock orange PHLE4 G2

The Lewis' mock orange community is a small patch community that occurs in otherwise dry upland sites where subsurface soil moisture is highest, probably due to hydrologic/topographic interactions. The community is typically found near or within the bluebunch wheatgrass - Idaho fescue (PSSP6-FEID) community – a grassland type that indicates higher soil moisture retention than the bluebunch wheatgrass - Sandberg bluegrass (PSSP6-POSE) community. The Lewis' mock orange community occurs in shady areas or on north facing slopes. This is a globally imperiled vegetation community that is in good condition in the park, although its occurrence is very limited. Exceptional care should be given to management of this community to maintain its ecological integrity.

Lewis' mock orange - western white clematis PHLE4-CLLI2 ~G2
Lewis' mock orange - western poison ivy PHLE4-TORY ~G2

These two riparian communities are similar in composition and structure and they both occupy similar landforms within the park. The PHLE4-TORY community occurs on sites that are wetter than the PHLE4-CLLI2 community. Both these communities have exotic plant invasion problems, especially with exotic grasses. These communities provide important structural habitat complexity for wildlife as well as roosting and cover habitat for migratory song birds. Encroachment of the ACNE2 community into these vegetation types is a concern. The G2 ranks associated with these communities implies that they are globally imperiled. Exceptional care should be given to management of these communities to maintain their ecological integrity.

chokecherry PRVI G4

The chokecherry community mostly occurs on the low rocky benches near the largest Palouse River rapids in the central section of the park. The community is similar in species composition to the Lewis' mock orange - western white clematis, Lewis' mock orange - western poison ivy, and netleaf hackberry - western poison ivy communities, except that it contains an abundant cover of chokecherry versus the other shrub components. The largest patch of this community on the west side of the Palouse River has substantial infestations of noxious weeds including

reed canarygrass and poison hemlock. Other small patches of this community occur mixed in with or along the bases of the large basalt cliffs in this region of the park, probably in areas where soil moisture is kept high by seeps or springs. These patches of the chokecherry community are in better ecological condition than the largest riparian patch, although some exotic and noxious weeds do occur in these patches as well.

bluebunch wheatgrass - Idaho fescue PSSP6-FEID G3

This community is in the best ecological condition among the park's native grassland communities. It occurs on shady northern facing terraces with deeper soil deposits, usually close to the rim of a steep basalt cliff. Soil moisture retention is higher in these areas than the other grassland communities. This community is distinguished from the other grassland communities by the presence of Idaho fescue. Native species composition is highest within patches of this community compared to the other grassland types. Exotic grass invasion is occurring in some patches of this community which could eventually degrade the ecological condition.

bluebunch wheatgrass - Sandberg bluegrass PSSP6-POSE G4

This is the most abundant upland vegetation community in the park. It occurs in large patches by itself and it intermixes and grades into all the other shrub-steppe and grassland communities. This is the matrix vegetation community in the area. The quality and characteristics of the PSSP6-POSE communities in the park vary from site to site. Conditions are influenced by landform, disturbance history, and sub-surface hydrography. Invasions by invasive grasses such as cheatgrass and bulbous bluegrass are most notable within this community type. Exotic herbs are also abundant in some patches of this community, especially

on the plateaus and terraces most easily accessed by the developed campground where trail and road densities are highest.

Smooth sumac / bluebunch wheatgrass RHGL/PSSP6 G2

This community is characterized by talus slopes with a sparse vegetation cover that includes smooth sumac and bluebunch wheatgrass as dominant species. This community is not common within the park, and it is a globally imperiled vegetation community. It occurs in the southwest section of the park in polygon 9 and along the border of polygon 7. It is in good condition although cheatgrass and bulbous bluegrass infestations are abundant in communities surrounding this community type. The G2 rank associated with this community implies that it is a globally imperiled. Exceptional care should be given to management of this community to maintain its ecological integrity.

narrowleaf willow temporarily flooded shrubland SAEX G5

The narrowleaf willow temporarily flooded shrubland community is the most common river's edge riparian community within the park. It is identifiable by the abundance of narrowleaf willow in the shrub canopy. Exotic grass invasion by reed canarygrass is a current threat to this community, as reed canarygrass can completely displace the native herbaceous and graminoid vegetation. The state sensitive prairie cordgrass (*Spartina pectinata*) is known to occur in this community; however this sensitive species is being outcompeted by reed canarygrass within the park.

Rare Plant Surveys

Methods

We visited Palouse Falls State Park twice during the 2008 field season to conduct rare plant surveys. We used the Washington Department of Natural Resources Natural Heritage Program's (DNR NHP) rare plant list to determine the conservation status of vascular plants encountered in the field.

Field surveys were conducted on: April 15 and July 23. During the field surveys, we were equipped with reference literature; rare plant lists for the area, maps showing rare plant locations from previous surveys, and a portable plant identification lab. We looked for rare plants in habitats previously identified as being likely occurrence sites. So as not to miss a rare plant, all vascular plant species encountered during the inventory were identified on site, at base camp in the portable laboratory, or back at our office.

Survey routes were determined based on the desire to efficiently cover a large proportion of the park's area throughout the field season. We surveyed areas of the park more intensively where rare plants are more likely to occur. Survey routes for the rare plant inventory and rare plant locations were recorded either by hand, on a hardcopy topographic map, or as GPS waypoints and trackpoints, all of which were later compiled into a single GIS data layer, depicted in Figure 1 (page 7).

Results

The following rare plants were thought to occur in Palouse Falls State Park according to previous inventories:

Scientific Name	Common Name	Family	Rank
***Spartina pectinata* Bosc ex Link**	**prairie cordgrass**	**Poaceae**	**G5 S2 S**
Allium bisceptrum* S. Watson *var. bisceptrum	**Twincrest Onion**	**Liliaceae**	**G4G5 R1 S1**

Figure 4 illustrates the mapped locations of these 2 species in the park according to 2008 Washington Department of Natural Resources Natural Heritage Program (WA NHP) rare plant GIS data. The polygons provided by WA NHP are not meant to indicate exact precise locations but rather rough approximations of the area of occurrence.

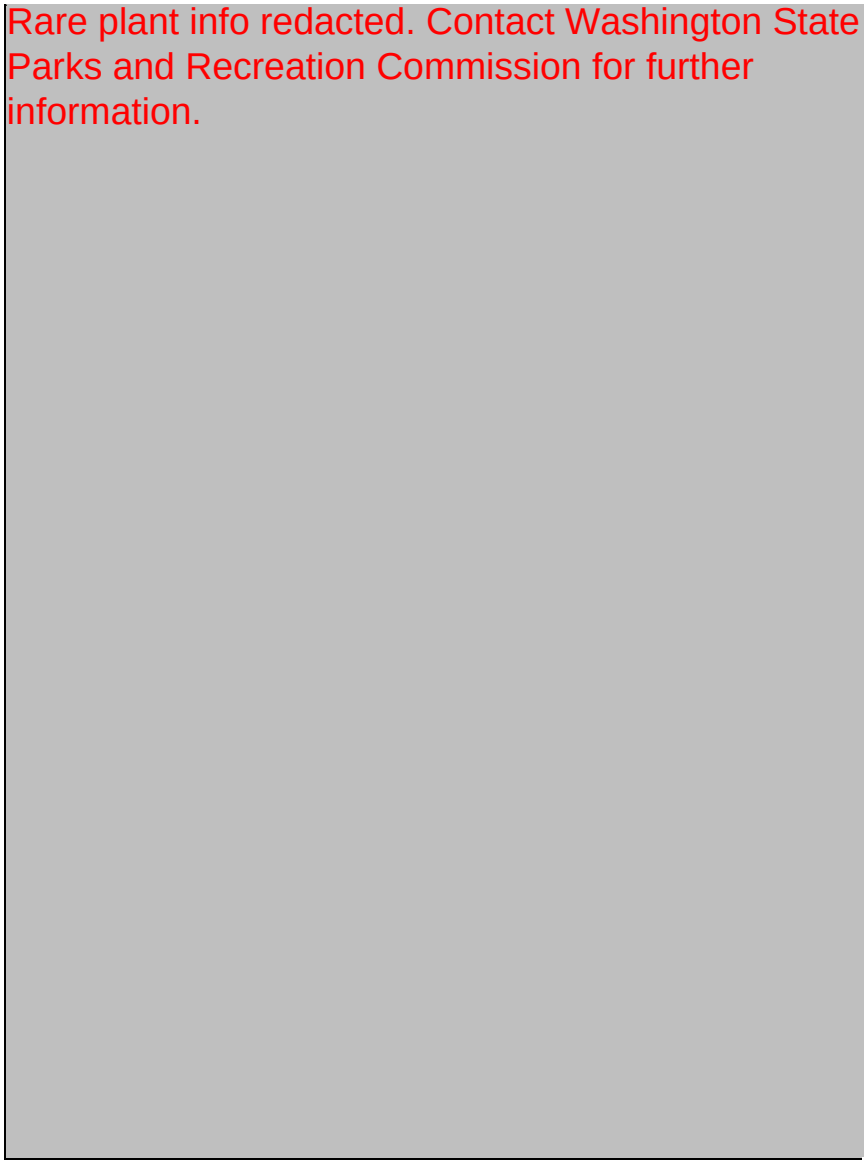


Figure 4. Previously mapped locations of rare plant occurrences in Palouse Falls State Park according to the Washington Department of Natural Resources Natural Heritage Program.

Our field inventories did not yield any new populations of rare plants apart from those previously mapped by WA NHP.

Figures 5 and 6 provide illustrations of where prairie cordgrass actually occurs in the larger polygon mapped by WA NHP. It is important to note that much of the riverbank along which prairie cordgrass actually occurs does not fall within the boundary of Palouse Falls State Park as far as the GIS park boundary data provided to us by the WSPRC suggests. Figure 6 shows just how much of the cordgrass habitat actually falls within the park boundary. Prairie cordgrass in this area does not seem to occur farther than a few meters from the rivers edge, precluding from being in most of the park's riparian habitat because the park boundary is typically further removed from the river's edge according the WSPRC GIS data.

It is likely that the populations of prairie cordgrass falling within the park boundary are being invaded and replaced by reed canarygrass (*Phalaris arundinaceae*), a noxious invasive perennial grass that is profuse along riverine systems throughout Washington State. The grass, common reed (*Phragmites australis*), is another noxious weed of concern that could eliminate cordgrass populations from the park.

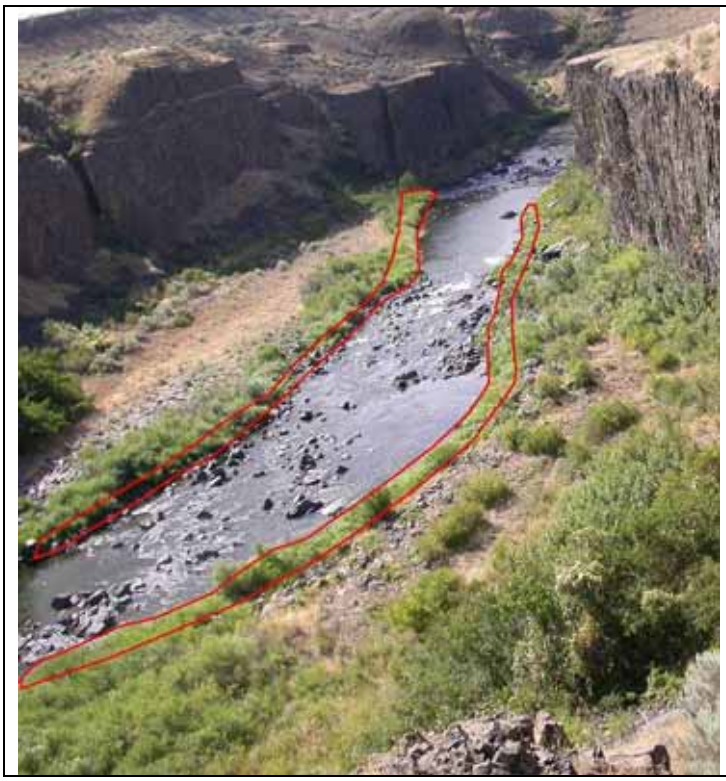


Figure 5. Prairie cordgrass habitat where populations were observed in the far northern section of Palouse Falls State Park.

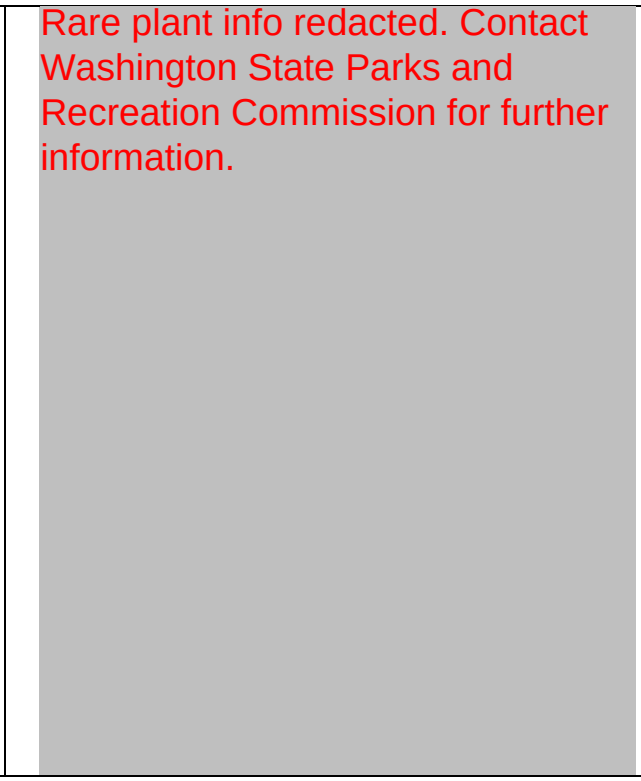


Figure 6. Map depicting how the prairie cordgrass populations overlay the WSPRC park boundary data.

We did not encounter any populations whatsoever of twincrest onion in our 2008 surveys. It seems unlikely the WA NHP polygon depicting the location of this species within the park is correctly spatially registered. The bulk of the polygon is comprised of the highly disturbed bluebunch wheatgrass - Sandberg bluegrass (PSSP6-POSE) vegetation community. The characteristics of this community in this area do not

match well with the descriptions of the vegetation community in which twincrest onion is reported to occur according to WA NHP documents (DNR NHP, No Date). Polygons 27 and 26, which are partly within the WA NHP twincrest onion location polygon, seem to possess better fitting habitat characteristics according to WA NHP documentation. Many Douglas' onion (*Allium douglasii*) specimens were encountered in this area, but no specimens matching the characteristics of twincrest onion. Follow-up conversations about the mapped twincrest onion population with WA NHP staff did not yield any insights into where the actual mapped population occurs, or whether the sighting is truly verified or not. Given that low elevation shrub-steppe in the middle of the Columbia Basin is far removed from the recognized high elevation aspen forest habitat in which twincrest onion typically occurs, we suggest a more in-depth inventory and analysis of *Allium spp.* within Palouse Falls State Park be conducted if more information is required by park staff for management or legal decisions.

Vascular Plant List for the 2008 Project Area

195 vascular plant species were identified to at least genus within the project area in 2008. Of these species, 62 species are known to be exotic plants, meaning 32% of the plant species diversity within the park is non-native. Table 3 provides the list of all 195 species encountered within Palouse Falls State Park.

Key to Vascular Plant Species Lists
Column 1: "Symbol": Four-letter plant code as shown on the USDA PLANTS database.
Column 2: Scientific name as shown on the USDA PLANTS database.
Column 3: Common name as shown on the USDA PLANTS database.
Column 5: Status as exotic to Washington State according to USDA PLANTS database.

Table 3. List of plants identified within Palouse Falls State Park during 2008 field surveys.

Symbol	Scientific Name with Author	National Common Name	Family	Exotic
ACNE2	Acer negundo L.	boxelder	Aceraceae	yes
ACMI2	Achillea millefolium L.	common yarrow	Asteraceae	
AGGR	Agoseris grandiflora (Nutt.) Greene	bigflower agoseris	Asteraceae	
AGEX	Agrostis exarata Trin.	spike bentgrass	Poaceae	
AGGI2	Agrostis gigantea Roth	redtop	Poaceae	yes
AGPA8	Agrostis pallens Trin.	seashore bentgrass	Poaceae	
ALPL	Alisma plantago-aquatica L.	European water plantain	Alismataceae	yes
AMAL2	Amelanchier alnifolia (Nutt.) Nutt. ex M. Roem.	Saskatoon serviceberry	Rosaceae	
AMLY	Amsinckia lycopsoides Lehm.	tarweed fiddleneck	Boraginaceae	
AMTE3	Amsinckia tessellata A. Gray	bristly fiddleneck	Boraginaceae	
ANCA14	Anthriscus caucalis M. Bieb.	bur chervil	Apiaceae	yes
APIN	Apera interrupta (L.) P. Beauv.	dense silkybent	Poaceae	yes
APCA	Apocynum cannabinum L.	Indianhemp	Apocynaceae	
ARPUL	Aristida purpurea Nutt. var. longiseta (Steud.) Vasey	Fendler threeawn	Poaceae	
ARDO3	Artemisia douglasiana Besser	Douglas' sagewort	Asteraceae	
ARDR4	Artemisia dracunculus L.	tarragon	Asteraceae	
ARLU	Artemisia ludoviciana Nutt.	white sagebrush	Asteraceae	
ARTR2	Artemisia tridentata Nutt.	big sagebrush	Asteraceae	
ASSP	Asclepias speciosa Torr.	showy milkweed	Asclepiadaceae	

Symbol	Scientific Name with Author	National Common Name	Family	Exotic
ASCI4	Astragalus cicer L.	chickpea milkvetch	Fabaceae	yes
ASPU9	Astragalus purshii Douglas ex Hook.	woollypod milkvetch	Fabaceae	
ASSP7	Astragalus speirocarpus A. Gray	threadstalk milkvetch	Fabaceae	
BACA3	Balsamorhiza careyana A. Gray	Carey's balsamroot	Asteraceae	
BRAR5	Bromus arvensis L.	field brome	Poaceae	yes
BRER3	Bromus erectus Huds.	erect brome	Poaceae	yes
BRIN2	Bromus inermis Leyss.	smooth brome	Poaceae	yes
BRTE	Bromus tectorum L.	cheatgrass	Poaceae	yes
CAMA5	Calochortus macrocarpus Douglas	sagebrush mariposa lily	Liliaceae	
CAPE3	Cardamine pensylvanica Muhl. ex Willd.	Pennsylvania bittercress	Brassicaceae	
CADR	Cardaria draba (L.) Desv.	whitetop	Brassicaceae	yes
CELAR	Celtis laevigata Willd. var. reticulata (Torr.) L.D. Benson	netleaf hackberry	Ulmaceae	
CEDI3	Centaurea diffusa Lam.	diffuse knapweed	Asteraceae	yes
CEST8	Centaurea stoebe L.	spotted knapweed	Asteraceae	yes
CETE5	Ceratocephala testiculata (Crantz) Roth	curveseed butterwort	Ranunculaceae	yes
CHJU	Chondrilla juncea L.	rush skeletonweed	Asteraceae	yes
CHVI8	Chrysothamnus viscidiflorus (Hook.) Nutt.	yellow rabbitbrush	Asteraceae	
CIIN	Cichorium intybus L.	chicory	Asteraceae	yes
CIAR4	Cirsium arvense (L.) Scop.	Canada thistle	Asteraceae	yes
CIUN	Cirsium undulatum (Nutt.) Spreng.	wavyleaf thistle	Asteraceae	
CIVU	Cirsium vulgare (Savi) Ten.	bull thistle	Asteraceae	yes
CLPE	Claytonia perfoliata Donn ex Willd.	miner's lettuce	Portulacaceae	
CLLI2	Clematis ligusticifolia Nutt.	western white clematis	Ranunculaceae	
CLLU2	Cleome lutea Hook.	yellow spiderflower	Capparaceae	
COPA3	Collinsia parviflora Lindl.	maiden blue eyed Mary	Scrophulariaceae	
COGR4	Collomia grandiflora Douglas ex Lindl.	grand collomia	Polemoniaceae	
COLI2	Collomia linearis Nutt.	tiny trumpet	Polemoniaceae	
COMA2	Conium maculatum L.	poison hemlock	Apiaceae	yes
COCA5	Conyza canadensis (L.) Cronquist	Canadian horseweed	Asteraceae	
COSE16	Cornus sericea L.	redosier dogwood	Cornaceae	
CRYPT	Cryptantha Lehm. ex G. Don	cryptantha	Boraginaceae	
CYFR2	Cystopteris fragilis (L.) Bernh.	brittle bladderfern	Dryopteridaceae	
DEPI	Descurainia pinnata (Walter) Britton	western tansymustard	Brassicaceae	
DIFU2	Dipsacus fullonum L.	Fuller's teasel	Dipsacaceae	yes
DOPUC	Dodecatheon pulchellum (Raf.) Merr. ssp. cusickii (Greene) Calder & Roy L. Taylor	Cusick's shootingstar	Primulaceae	
DRVE2	Draba verna L.	spring draba	Brassicaceae	yes
ECCR	Echinochloa crus-galli (L.) P. Beauv.	barnyardgrass	Poaceae	yes
ELAN	Elaeagnus angustifolia L.	Russian olive	Elaeagnaceae	yes
ELELE	Elymus elymoides (Raf.) Swezey ssp. elymoides	squirreltail	Poaceae	
ELGL	Elymus glaucus Buckley	blue wildrye	Poaceae	
ELMU3	Elymus multisetus M.E. Jones	big squirreltail	Poaceae	
ELRE4	Elymus repens (L.) Gould	quackgrass	Poaceae	yes

Symbol	Scientific Name with Author	National Common Name	Family	Exotic
EPBR3	Epilobium brachycarpum C. Presl	tall annual willowherb	Onagraceae	
EPCIC	Epilobium ciliatum Raf. ssp. ciliatum	fringed willowherb	Onagraceae	
EQHY	Equisetum hyemale L.	scouringrush horsetail	Equisetaceae	
ERNAS2	Ericameria nauseosa (Pall. ex Pursh) G.L. Nesom & Baird ssp. nauseosa var. speciosa (Nutt.) G.L. Nesom & Baird	rubber rabbitbrush	Asteraceae	
ERCO4	Erigeron compositus Pursh	cutleaf daisy	Asteraceae	
ERPU2	Erigeron pumilus Nutt.	shaggy fleabane	Asteraceae	
ERCO12	Eriogonum compositum Douglas ex Benth.	arrowleaf buckwheat	Polygonaceae	
ERHE2	Eriogonum heracleoides Nutt.	parsnipflower buckwheat	Polygonaceae	
ERNI2	Eriogonum niveum Douglas ex Benth.	snow buckwheat	Polygonaceae	
ERSP7	Eriogonum sphaerocephalum Douglas ex Benth.	rock buckwheat	Polygonaceae	
ERCI6	Erodium cicutarium (L.) L'Hér. ex Aiton	redstem stork's bill	Geraniaceae	yes
EUOC4	Euthamia occidentalis Nutt.	western goldentop	Asteraceae	
FEID	Festuca idahoensis Elmer	Idaho fescue	Poaceae	
FRPU2	Fritillaria pudica (Pursh) Spreng.	yellow fritillary	Liliaceae	
GAAP2	Galium aparine L.	stickywilly	Rubiaceae	
GAYOP	Gayophytum A. Juss.	groundsmoke	Onagraceae	
GEVI2	Geranium viscosissimum Fisch. & C.A. Mey. ex C.A. Mey.	sticky purple geranium	Geraniaceae	
GLLE2	Glyceria leptostachya Buckley	davy mannagrass	Poaceae	
HEAN3	Helianthus annuus L.	common sunflower	Asteraceae	yes
HEPE	Helianthus petiolaris Nutt.	prairie sunflower	Asteraceae	
HEMER	Hemerocallis L.	daylily	Liliaceae	
HEMI20	Hemizonella minima (A. Gray) A. Gray	opposite-leaved tarweed	Asteraceae	
HEMA80	Heracleum maximum Bartram	common cowparsnip	Apiaceae	
HECO26	Hesperostipa comata (Trin. & Rupr.) Barkworth	needle and thread	Poaceae	
HOUM	Holosteum umbellatum L.	jagged chickweed	Caryophyllaceae	yes
HOJU	Hordeum jubatum L.	foxtail barley	Poaceae	
HYPE	Hypericum perforatum L.	common St. Johnswort	Clusiaceae	yes
IRIS	Iris L.	iris	Iridaceae	
KOMA	Koeleria macrantha (Ledeb.) Schult.	prairie Junegrass	Poaceae	
LASE	Lactuca serriola L.	prickly lettuce	Asteraceae	yes
LAAM	Lamium amplexicaule L.	henbit deadnettle	Lamiaceae	yes
LAPU2	Lamium purpureum L.	purple deadnettle	Lamiaceae	yes
LEMI3	Lemna minor L.	common duckweed	Lemnaceae	
LEPE2	Lepidium perfoliatum L.	clasping pepperweed	Brassicaceae	yes
LECI4	Leymus cinereus (Scribn. & Merr.) A. Löve	basin wildrye	Poaceae	
LILEL2	Linum lewisii Pursh var. lewisii	prairie flax	Linaceae	
LIGL2	Lithophragma glabrum Nutt.	bulbous woodland-star	Saxifragaceae	
LIPA5	Lithophragma parviflorum (Hook.) Nutt. ex Torr. & A. Gray	smallflower woodland-star	Saxifragaceae	
LIRU4	Lithospermum ruderale Douglas ex Lehm.	western stoneseed	Boraginaceae	
LODI	Lomatium dissectum (Nutt.) Mathias & Constance	fernleaf biscuitroot	Apiaceae	

Symbol	Scientific Name with Author	National Common Name	Family	Exotic
LOGO	Lomatium gormanii (Howell) J.M. Coult. & Rose	Gorman's biscuitroot	Apiaceae	
LOGR	Lomatium grayi (J.M. Coult. & Rose) J.M. Coult. & Rose	Gray's biscuitroot	Apiaceae	
LOMA3	Lomatium macrocarpum (Nutt. ex Torr. & A. Gray) J.M. Coult. & Rose	bigseed biscuitroot	Apiaceae	
LOUNU	Lotus unifoliolatus (Hook.) Benth. var. unifoliolatus	American bird's-foot trefoil	Fabaceae	
LULE3	Lupinus leucophyllus Douglas ex Lindl.	velvet lupine	Fabaceae	
MACI2	Madia citriodora Greene	lemonscented madia	Asteraceae	
MAEX	Madia exigua (Sm.) A. Gray	small tarweed	Asteraceae	
MAPA5	Malva parviflora L.	cheeseweed mallow	Malvaceae	yes
MESA	Medicago sativa L.	alfalfa	Fabaceae	yes
MEOF	Melilotus officinalis (L.) Lam.	yellow sweetclover	Fabaceae	yes
MEAR4	Mentha arvensis L.	wild mint	Lamiaceae	
MIGRH	Microsteris gracilis (Hook.) Greene var. humilior (Hook.) Cronquist	slender phlox	Polemoniaceae	
MIFL2	Mimulus floribundus Lindl.	manyflowered monkeyflower	Scrophulariaceae	
MIGU	Mimulus guttatus DC.	seep monkeyflower	Scrophulariaceae	
MOFO	Montia fontana L.	annual water minerslettuce	Portulacaceae	
MONTI	Montia L.	minerslettuce	Portulacaceae	
MUAS	Muhlenbergia asperifolia (Nees & Meyen ex Trin.) Parodi	scratchgrass	Poaceae	
MYOSU	Myosurus L.	mousetail	Ranunculaceae	
NECA2	Nepeta cataria L.	catnip	Lamiaceae	yes
ONAC	Onopordum acanthium L.	Scotch cottonthistle	Asteraceae	yes
PAPE5	Parietaria pensylvanica Muhl. ex Willd.	Pennsylvania pellitory	Urticaceae	
PERY	Penstemon rydbergii A. Nelson	Rydberg's penstemon	Scrophulariaceae	
PETR6	Penstemon triphyllus Douglas ex Lindl.	Riggin's penstemon	Scrophulariaceae	
PEGA3	Perideridia gairdneri (Hook. & Arn.) Mathias	Gardner's yampah	Apiaceae	
PHHA	Phacelia hastata Douglas ex Lehm.	silverleaf phacelia	Hydrophyllaceae	
PHLI	Phacelia linearis (Pursh) Holz.	threadleaf phacelia	Hydrophyllaceae	
PHAR3	Phalaris arundinacea L.	reed canarygrass	Poaceae	yes
PHLE4	Philadelphus lewisii Pursh	Lewis' mock orange	Hydrangeaceae	
PHLO2	Phlox longifolia Nutt.	longleaf phlox	Polemoniaceae	
PHAU7	Phragmites australis (Cav.) Trin. ex Steud.	common reed	Poaceae	
PHCA11	Physocarpus capitatus (Pursh) Kuntze	Pacific ninebark	Rosaceae	
PIEX3	Piptatherum exiguum (Thurb.) Dorn	little ricegrass	Poaceae	
PLLA	Plantago lanceolata L.	narrowleaf plantain	Plantaginaceae	yes
PLPA2	Plantago patagonica Jacq.	woolly plantain	Plantaginaceae	
PLMA4	Plectritis macrocera Torr. & A. Gray	longhorn plectritis	Valerianaceae	
POBU	Poa bulbosa L.	bulbous bluegrass	Poaceae	yes
POPR	Poa pratensis L.	Kentucky bluegrass	Poaceae	yes
POSE	Poa secunda J. Presl	Sandberg bluegrass	Poaceae	
PODOJ2	Polygonum douglasii Greene ssp. johnstonii (Munz) J.C. Hickman	Johnston's knotweed	Polygonaceae	

Symbol	Scientific Name with Author	National Common Name	Family	Exotic
POLA4	Polygonum lapathifolium L.	curlytop knotweed	Polygonaceae	yes
POMO5	Polypogon monspeliensis (L.) Desf.	annual rabbitsfoot grass	Poaceae	yes
POAL7	Populus alba L.	white poplar	Salicaceae	yes
POAR7	Potentilla arguta Pursh	tall cinquefoil	Rosaceae	
PRVU	Prunella vulgaris L.	common selfheal	Lamiaceae	
PRVI	Prunus virginiana L.	chokecherry	Rosaceae	
PSSP6	Pseudoroegneria spicata (Pursh) A. Löve		Poaceae	
PTTET	Pteryxia terebinthina (Hook.) J.M. Coult. & Rose var. terebinthina	turpentine wavewing	Apiaceae	
RAGL	Ranunculus glaberrimus Hook.	sagebrush buttercup	Ranunculaceae	
RHGL	Rhus glabra L.	smooth sumac	Anacardiaceae	
RIAU	Ribes aureum Pursh	golden currant	Grossulariaceae	
RICE	Ribes cereum Douglas	wax currant	Grossulariaceae	
ROPS	Robinia pseudoacacia L.	black locust	Fabaceae	yes
ROWO	Rosa woodsii Lindl.	Woods' rose	Rosaceae	
RUCR	Rumex crispus L.	curly dock	Polygonaceae	yes
RUSA	Rumex salicifolius Weinm.	willow dock	Polygonaceae	
SAEX	Salix exigua Nutt.	narrowleaf willow	Salicaceae	
SATR12	Salsola tragus L.	prickly Russian thistle	Chenopodiaceae	yes
SANI4	Sambucus nigra L.	black elderberry	Caprifoliaceae	
SAOF4	Saponaria officinalis L.	bouncingbet	Caryophyllaceae	yes
SAIN4	Saxifraga integrifolia Hook.	wholeleaf saxifrage	Saxifragaceae	
SANIN	Saxifraga nidifica Greene var. nidifica	peak saxifrage	Saxifragaceae	
SCAM6	Schoenoplectus americanus (Pers.) Volkart ex Schinz & R. Keller	chairmaker's bulrush	Cyperaceae	
SCPA8	Scirpus pallidus (Britton) Fernald	cloaked bulrush	Cyperaceae	
SEIN2	Senecio integerrimus Nutt.	lambstongue ragwort	Asteraceae	
SESE2	Senecio serra Hook.	tall ragwort	Asteraceae	
SEVI4	Setaria viridis (L.) P. Beauv.	green bristlegrass	Poaceae	yes
SILA21	Silene latifolia Poir.	bladder campion	Caryophyllaceae	yes
SIME	Silene menziesii Hook.	Menzies' campion	Caryophyllaceae	
SIAL2	Sisymbrium altissimum L.	tall tumblemustard	Brassicaceae	yes
SILO3	Sisymbrium loeselii L.	small tumbleweed mustard	Brassicaceae	yes
SOCA6	Solidago canadensis L.	Canada goldenrod	Asteraceae	
SPPE	Spartina pectinata Bosc ex Link	prairie cordgrass	Poaceae	
SPCR	Sporobolus cryptandrus (Torr.) A. Gray	sand dropseed	Poaceae	
STME2	Stellaria media (L.) Vill.	common chickweed	Caryophyllaceae	yes
STMI13	Stephanomeria minor (Hook.) Nutt.	lesser wirelettuce	Asteraceae	
TAVU	Tanacetum vulgare L.	common tansy	Asteraceae	yes
TAOF	Taraxacum officinale F.H. Wigg.	common dandelion	Asteraceae	yes
THLA	Thelypodium laciniatum (Hook.) Endl. ex Walp.	cutleaf thelypody	Brassicaceae	
TOFL	Tonella floribunda A. Gray	manyflower tonella	Scrophulariaceae	
TORY	Toxicodendron rydbergii (Small ex Rydb.) Greene	western poison ivy	Anacardiaceae	
TRDU	Tragopogon dubius Scop.	yellow salsify	Asteraceae	yes

Symbol	Scientific Name with Author	National Common Name	Family	Exotic
TRGRG2	Triteleia grandiflora Lindl. var. grandiflora	largeflower triteleia	Liliaceae	
TRAE	Triticum aestivum L.	common wheat	Poaceae	yes
TYLA	Typha latifolia L.	broadleaf cattail	Typhaceae	
ULPU	Ulmus pumila L.	Siberian elm	Ulmaceae	yes
URDI	Urtica dioica L.	stinging nettle	Urticaceae	
VEBL	Verbascum blattaria L.	moth mullein	Scrophulariaceae	yes
VETH	Verbascum thapsus L.	common mullein	Scrophulariaceae	yes
VEBR	Verbena bracteata Cav. ex Lag. & Rodr.	bigbract verbena	Verbenaceae	
VEAN2	Veronica anagallis-aquatica L.	water speedwell	Scrophulariaceae	
VICR	Vicia cracca L.	bird vetch	Fabaceae	yes
VUBR	Vulpia bromoides (L.) Gray	brome fescue	Poaceae	yes
WOOR	Woodsia oregana D.C. Eaton	Oregon cliff fern	Dryopteridaceae	
ZIVE	Zigadenus venenosus S. Watson	meadow deathcamas	Liliaceae	

Discussion and Recommendations

Noxious Weeds

Palouse Falls State Park has many noxious weed issues. Due to the park's geographic position relative to high intensity agricultural lands in Washington's Palouse country, there are ample seed sources of noxious weeds that are able to access the park's habitats. Table 4 lists the noxious weeds tracked by the Washington State Noxious Weed Board that occur within the park. Many of these species can be found in the riparian vegetation communities within the park along the Palouse River. Figure 7 illustrates a stretch of riverside habitat within the park that has been taken over by reed canarygrass. This location is ideal habitat for the state sensitive species prairie cordgrass. Figure 8 provides a photo of a poison hemlock infestation in the boxelder (ACNE2) riparian community.

Table 4. List of noxious weeds occurring within the project area that are currently tracked by the Washington State Noxious Weed Board

Symbol	Scientific Name with Author	National Common Name	Family	Noxious
CADR	*Cardaria draba* (L.) Desv.	whitetop	Brassicaceae	C
CEDI3	*Centaurea diffusa* Lam.	diffuse knapweed	Asteraceae	B
CHJU	*Chondrilla juncea* L.	rush skeletonweed	Asteraceae	B
CIAR4	*Cirsium arvense* (L.) Scop.	Canada thistle	Asteraceae	C
CIVU	*Cirsium vulgare* (Savi) Ten.	bull thistle	Asteraceae	C
COMA2	*Conium maculatum* L.	poison hemlock	Apiaceae	B
HYPE	*Hypericum perforatum* L.	common St. Johnswort	Clusiaceae	C
ONAC	*Onopordum acanthium* L.	Scotch cottonthistle	Asteraceae	B
PHAR3	*Phalaris arundinacea* L.	reed canarygrass	Poaceae	C
PHAU7	*Phragmites australis* (Cav.) Trin. ex Steud.	common reed	Poaceae	B
TAVU	*Tanacetum vulgare* L.	common tansy	Asteraceae	C

Figure 7. Example of riverside habitat taken over by the class C noxious weed reed canarygrass.

Figure 8. Poison hemlock infestation.

We mapped some of the larger infestations of noxious weeds encountered during the 2008 field surveys. Figure 9 provides a map of noxious weed infestations. Note that most concentrated infestations occur within the riparian communities of the park. Reed canarygrass and poison hemlock are the worst noxious invaders.

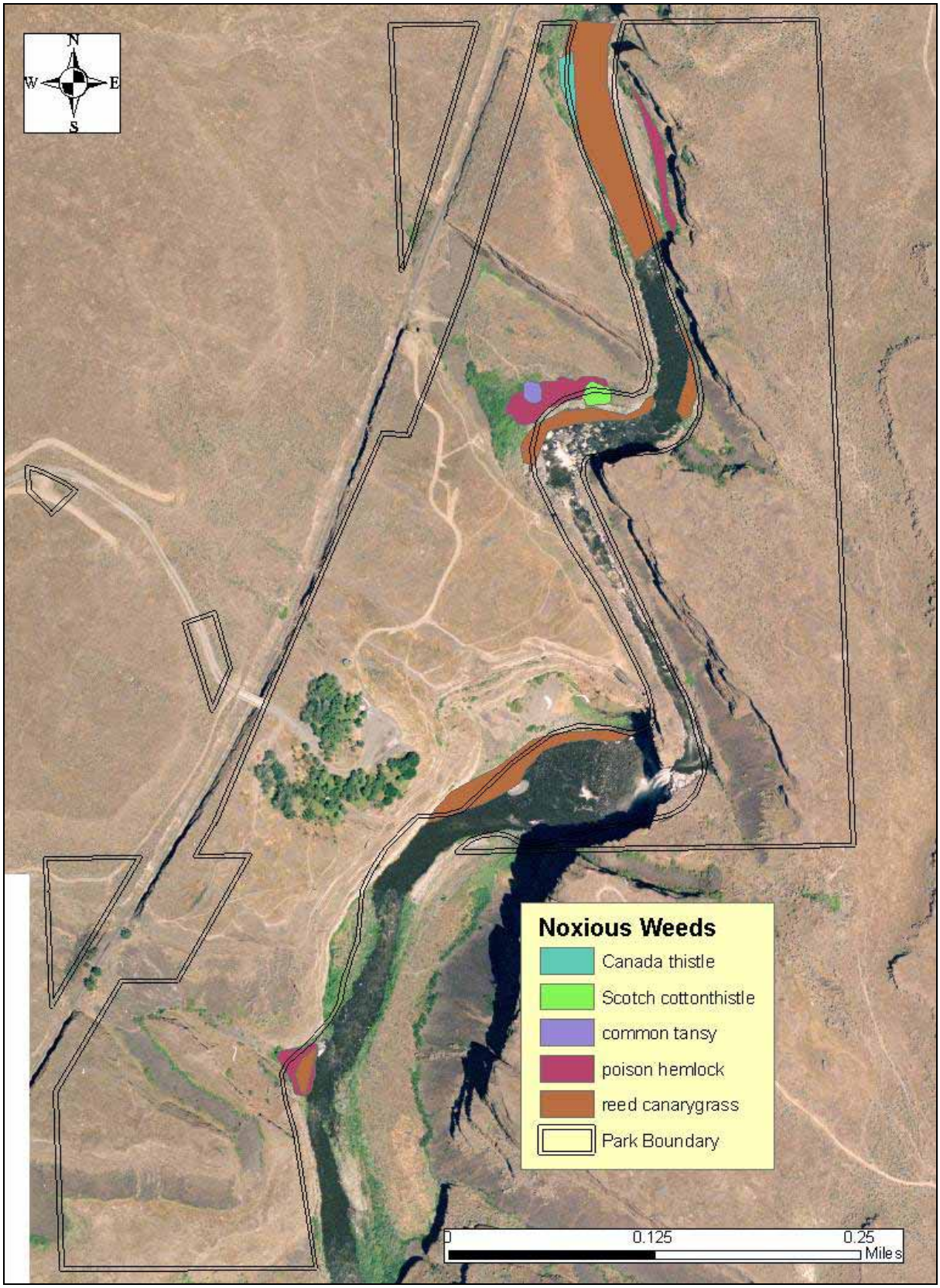


Figure 9. Map of concentrated noxious weed infestations.

Noxious weeds, such as rush skeletonweed, diffuse knapweed, and common St. Johnswort, are very prevalent in some of the poor condition upland vegetation communities, especially in the bluebunch wheatgrass - Sandberg bluegrass community. These weeds were dispersed across the landscape and not

mapped in Figure 9. However, they are tracked in the polygon database. Although not tracked as state noxious weeds, cheatgrass (*Bromus tectorum*) and bulbous bluegrass (*Poa bulbosa*), as well as many other weedy annual grasses have invaded the cliffside and dry steppe communities of Palouse Falls State Park. Most of the poor and fair ecological condition rankings for the park's natural communities stem from invasion by dryland grasses like cheatgrass. Figure 10 illustrates a cheatgrass infestation in the rubber rabbitbrush / bluebunch wheatgrass (ERNAS2/PSSP6) community.

Figure 10. Cheatgrass infestation in the shrub-steppe.

Ecological Condition

Exotic plant invasion is the number one factor influencing poor ecological condition rankings of plant communities in the park. Figure 11 provides a map of the ecological condition ranks for the primary vegetation community represented by each vegetation polygon in the park. There may be smaller, better conditioned communities within these polygons, but the condition being displayed here is that of the dominant vegetation community type.

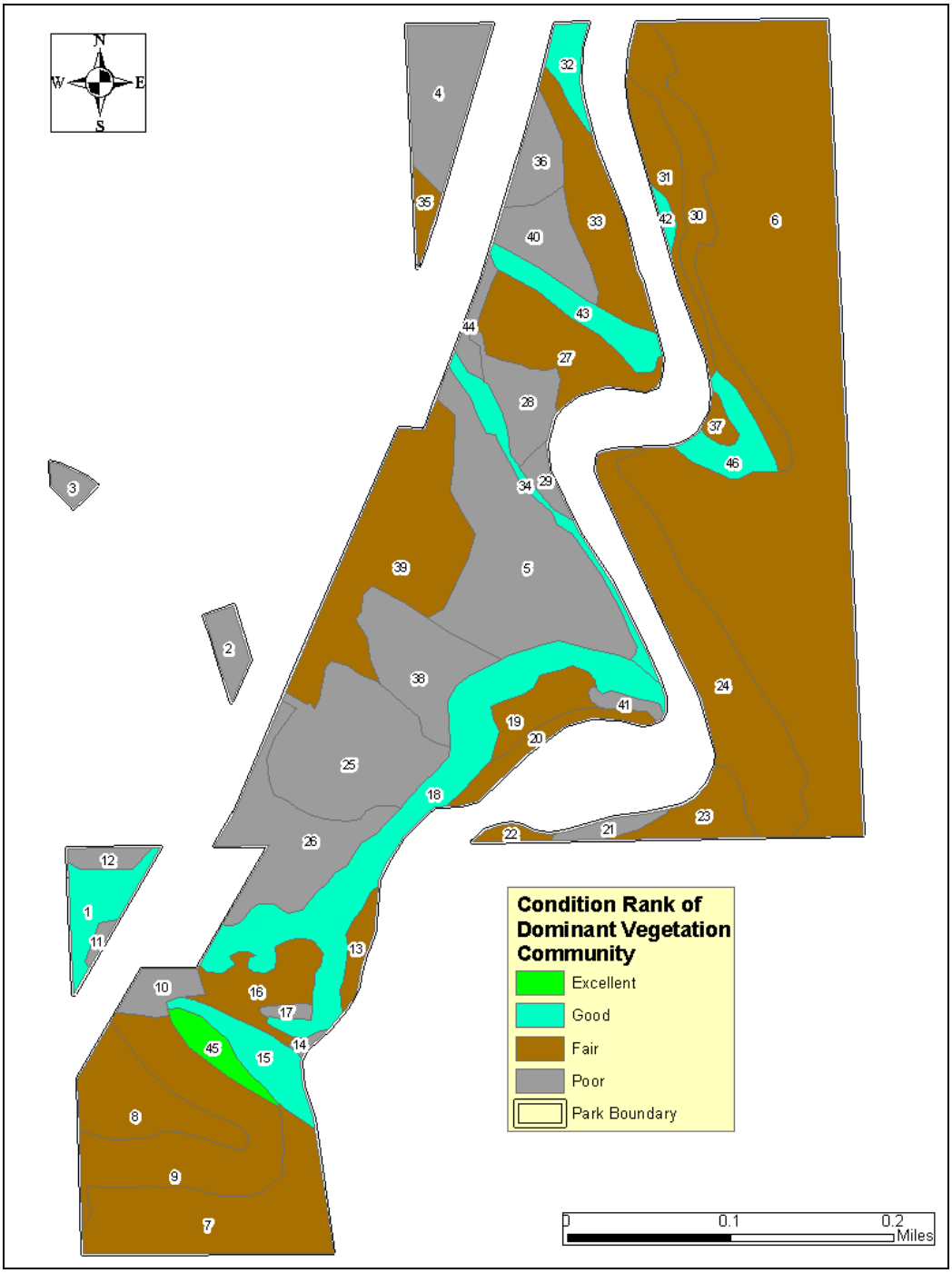


Figure 11. Map of ecological condition rankings for the primary vegetation communities within each vegetation community polygon.

There is one polygon in the southwest section of the park that has a ranking of excellent. This polygon represents a small north facing terrace in between large basalt cliffs and talus slopes where soil deposits are deep and soil moisture retention is high enough to support the bluebunch wheatgrass - Idaho fescue (PSSP6-FEID) grassland community. Most of the communities ranked as being in good condition exist on the steep basalt cliff faces and small terraces where vegetation cover is sparse due to lack of soil deposition and human caused disturbance is typically low. The snow buckwheat / Sandberg bluegrass (ERNI2/POSE) community is commonly in good condition in these cliff areas.

The riparian and upland shrub-steppe/grassland communities not on steep cliff faces are typically ranked in fair to poor condition due to exotic plant invasion. Roads and trails, off-trail trampling, livestock grazing, and development also have negatively influenced the ecological condition in some of these communities by disturbing soil conditions, removing native vegetation, and creating conditions for exotic plant colonization. The riparian communities seem to be extremely susceptible to exotic and noxious weed invasions, probably due to the interaction of disturbance cycles like seasonal flooding and dry periods combined with exotic plant seeds being carried down the river from highly disturbed agricultural lands and deposited on the parks shorelines.

Overall, the park is in fair ecological condition, but is in high risk of being in poor condition if exotic and noxious weed invasions are not controlled. Elimation of livestock grazing would also reduce ecological stress on the plant communities in the park.

Restoration Opportunities

Restoration of the natural vegetation communities in the park will not be an easy task. The overall trend for shrub-steppe and riparian communities on the Columbia Plateau is continued invasion by exotic plants and loss of native plant diversity. This trend is consistent within Palouse Falls State Park as well. Overall, limiting continued human disturbances like vegetation trampling and grazing by livestock in areas of the park currently in fair to excellent condition, especially in vegetation communities with high global conservation status, would be the most cost effective approach to protecting native vegetation resources (Figure 12 provides a map depicting the global conservation rank of communities in the park based on the most sensitive community occurring within a given vegetation polygon).

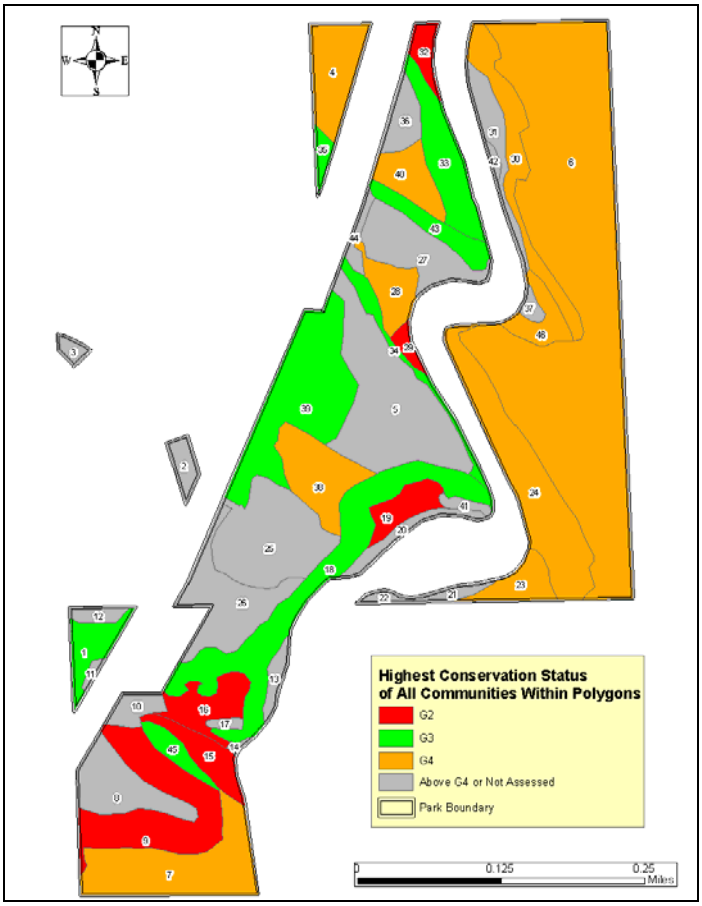


Figure 12. Map of the global conservation status rank of the most sensitive community occurring within a given vegetation polygon.

Figures 13 and 14 illustrate locations within the park where livestock grazing and off-trail human trampling of vegetation are possibly negatively affecting vegetation community conditions. Installing adequate fencing in the areas where grazing is a concern would be a good management strategy. Strategically posting signs of area closure due to resource sensitivity and directing people to use designated trails and paths would be a good management strategy for reducing the impacts of human trampling. Both these strategies would also hopefully limit the potential likelihood of people and livestock introducing more noxious and exotic seed sources into good condition vegetation communities by limiting their access to such communities.

Figure 13. Areas of the park where livestock grazing is potentially happening.

Figure 14. Areas of the park where off-trail vegetation trampling by humans is happening in a way that could negatively impact ecological condition of natural communities.

Other Recommendations

PBI strongly urges WSPRC to conduct a thorough survey of its property boundaries in each of its parks to ensure that administrators, park officials, park staff, private citizens, and park neighbors are clear about where park boundaries lie on the ground. PBI has conducted plant community surveys for many WSPRC properties and time after time park boundary issues arise where it is unclear if a particular piece of land is owned by WSPRC or not. In many cases there is an ecologically compromising land use being conducted within what seems to be the park boundary that is not being managed or controlled by park personnel. In the case of Palouse Falls State Park, this land use is grazing. It is not clear to PBI whether livestock grazing on WSPRC properties is permitted or not, but it seems doubtful that park managers are even aware that the activities are occurring in their jurisdiction because in many cases they do not know where their property boundaries lie. This situation is not unique to Palouse Falls State Park, but the consequences of this greater agency dilemma directly effect natural resource conditions in Palouse Falls State Park. It stands to reason that effective management and/or protectiong of natural resources cannot take place if it is not known exactly where these resources are.

The property boundary of Palouse Falls State Park also appears to not include the Palouse River, its riparian area and Palouse Falls itself. This needs to be investigated and perhaps corrected. It seems ironic that the main feature of the park, the Falls, is not inside the park boundary.

GIS Products Produced

Associated with this report are polygon layers created by PBI depicting the vegetation community types mapped in the project area of Palouse Falls State Park. The datasets have been converted into ESRI shapefile formats and provided to the WSPRC. The spatial datasets are complete with metadata meeting FGDC standards. Refer to the associated metadata for descriptions and attribute definitions for each spatial dataset.

References

Crawford, Rex C. 2003. A riparian vegetation classification of the Columbia Basin, Washington. 2003. Washington Natural Heritage Program, Washington Department of Natural Resources, Olympia, WA 98504-7016. Published in coordination with Bureau of Land Management, Spokane District and The Nature Conservancy.

Crawford, R.C. 1999. Preliminary key to shrub-steppe plant associations in Washington State. Washington Natural Heritage Program, Washington Department of Natural Resources, Olympia, WA.

Crowe, E., B. Kovalchik, M. J. Kerr, J. Titus, and J. S. Kagan. 2002. Riparian and wetland plant communities of eastern Oregon. Draft report. Oregon Natural Heritage Information Center, Portland, OR.

Daubenmire, R. F. 1970. Steppe vegetation of Washington. Washington State University Agricultural Experiment Station Technical Bulletin No. 62. 131 pp.

Diaz, N. M., and T. K. Mellen. 1996. Riparian ecological types, Gifford Pinchot and Mt. Hood national forests, and Columbia River Gorge National Scenic Area. USDA Forest Service, Pacific Northwest Region. Technical Report R6-NR-TP-10-96. 203 pp. plus appendices.

Hitchcock, C.L. and A. Cronquist. 1973. Flora of the Pacific Northwest: An Illustrated Manual University of Washington Press, Seattle.

Hitchcock, C.L., Cronquist, A., Ownbey, M., and J. W. Thompson. 1955. Vascular Plants of the Pacific Northwest. University of Washington Press, Seattle.

Kagan, J. S., J. A. Christy, M. P. Murray, and J. A. Titus. 2000. Classification of native vegetation of Oregon. Oregon Natural Heritage Program, Portland. 63 pp.

Kovalchik, B.L and R.R. Clausnitzer. 2004. Classification and Management of Aquatic, Riparian, and Wetland Sites on the National Forests of Eastern Washington. USDA Forest Service GTR-593.

MTNHP [Montana Natural Heritage Program]. 2002b. List of ecological communities for Montana. Montana Natural Heritage Program, Montana State Library, Helena, MT.

WANHP [Washington Natural Heritage Program]. No date. Unpublished data files. Washington Natural Heritage Program, Department of Natural Resources, Olympia, WA.

Western Ecology Working Group of NatureServe. No date. International Ecological Classification Standard: International Vegetation Classification -Terrestrial Vegetation. NatureServe, Boulder, CO.

Appendix A – Ecological Condition Ranking System

Ecological Condition Ranks

When assessing conservation priorities and management decisions, it can be useful to rank natural communities into levels of ecological condition. For example, an unfragmented area with high native species diversity, absence of non-native species and little soil erosion often has greater conservation value than another area in the same habitat type that is fragmented, infested with weeds or has erosion problems. Likewise, areas with a lower ecological condition rank may be targets for restoration activities.

The flowing ecological condition ranks were applied to vegetation polygons that were surveyed in this project:

- **Excellent Ecological Condition**

Areas in this class have very few non-native plants. The composition and structure of native vegetation in this condition class correspond to the natural range of variation characteristic to this habitat type. Old-growth conditions often exist. Species diversity of native plants and animals is often high relative to the natural community under consideration. Wildlife habitat conditions are optimal for species of conservation concern. Soil compaction, accelerated erosion and hydrologic alteration are absent. Direct signs of human-induced ecological stress is absent. Many rare plant and animal species may only exist within this condition class.

- **Good Ecological Condition**

Areas in this class have few non-native plants. The composition and structure of native vegetation in this condition class correspond to the natural range of variation characteristic to this habitat type. Old-growth conditions may exist , but have been subject to some human-induced stress. Species diversity of native plants and animals is moderately high relative to the natural community under consideration. Wildlife habitat conditions are adequate for species of conservation concern. Soil compaction, accelerated erosion and hydrologic alteration do not significantly impact the area. Direct signs of human-induced ecological stress are infrequent. Some rare plant and animal species may exist within this condition class.

- **Marginal Ecological Condition**

Areas in this class often have both native and non-native plants. The composition and structure of native vegetation in this condition class is altered from the natural range of variation characteristic to this habitat type. Old-growth conditions are absent. Species diversity of native plants and animals is lower than the two high condition classes. Wildlife habitat conditions may be adequate for some species of conservation concern, but not adequate for many. Soil compaction, accelerated erosion and hydrologic alteration may impact the area. Direct signs of human-induced ecological stress are frequent. Most rare plant and animal species are only infrequently encountered within this condition class.

- **Poor Ecological Condition**

Areas in this class are often dominated by non-native plants. The composition and structure of native vegetation in this condition class is often dramatically altered from the natural range of variation characteristic to this habitat type. Old-growth conditions are absent. Species diversity of native plants and animals is often low. Wildlife habitat conditions are not adequate for most species of conservation concern. Soil compaction, accelerated erosion and hydrologic alteration often impact the area. Direct signs of human-induced ecological stress are frequent. Rare plant and animal species are seldom encountered within this condition class.

Appendix B – Definitions of Vegetation Community Ranks

The following table defines the ranking system for plants and plant communities used by the Washington State Natural Heritage Program.

Code	Definition
G1	Critically imperiled throughout its range; extremely rare with five or fewer occurrences or very few remaining acres.
G2	Imperiled throughout its range; rare with six to 20 occurrences or few remaining acres.
G3	Either very rare and local throughout its range or found locally in a restricted range; uncommon with 21 to 100 occurrences.
G4	Apparently secure throughout its range, though it may be quite rare in some parts of its range, especially at the periphery; many occurrences.
G5	Demonstrably secure in its range, though it may be quite rare in some parts of its range, especially at the periphery; ineradicable under present conditions.
S1	Critically imperiled in Oregon; extremely rare with five or fewer occurrences or very few remaining acres.
S2	Imperiled in Oregon; rare with six to 20 occurrences or few remaining acres.
S3	Either very rare and local in Oregon or found locally in a restricted range; uncommon with 21 to 100 occurrences.
S4	Apparently secure in Oregon, though it may be quite rare in some parts; many occurrences.
S5	Demonstrably secure in Oregon, though it may be quite rare in some parts; ineradicable under present conditions.
U	Unknown
NA	Natural Heritage Rank not available
NR	Not Ranked

Appendix C – Definitions of Vegetation Survey Data

Legend:

Site = name of locality of map project

Polygon = number you put on map

Name/Date = your name / day-month-year completed polygon survey

Photo roll/number = number of roll (on canister) and number of shot

Survey intensity
1 = walked or could see most of polygon (high confidence in survey data)
2 = walked or could see part of polygon interior (moderate confidence)
3 = walked perimeter or could see part of polygon interior (low confidence)
4 = photo interpretation or other remote survey

VEGETATION COVER includes all vascular plants, mosses, lichens and foliose lichens (crustose lichens excluded they are considered rock); this never exceeds 100%. Space between leaves/branches is included in "cover".

Code	**Cover (%)**	Cover mid-pt
0	0	0
1	<1	0.5
2	1-5	3
3	5-25	15
4	25-60	43
5	60-90	75
6	>90	95

TOTAL VEGETATION COVER includes all vascular plants, mosses, lichens and foliose lichens (crustose lichens excluded they are considered rock); this never exceeds 100%.

TREES, SHRUBS, GRAMINOIDS, FORBS, EXOTICS cover includes the space between leaves/branches. Each Life form category canopy cover must be 0-100%. Therefore, the sum of all life forms (layers) can exceed 100%. List most abundant species in each life form category; when trees are cored, note DBH, species, length of core, number of rings counted.

SOIL SURFACE estimate to nearest **%** the following, the sum of the categories adds to 100%
Rock outcrop = exposed bedrock including detached boulders over 1m across
Gravel/cobble = large fragments between sand and boulder
Bare ground = exposed mineral soil
Mosses/lichens = nonvascular plant cover on soil
Litter = includes logs, branches, and basal area of plants
Describe in comments if there is wide variation in any category; note % standing water if it is persistent or characteristic of site.

LAND USE - put 0 (zero) if not applicable to site.

Logging
1 = unlogged, no evidence of past logging or occasional cut stumps not part of systematic harvest of trees, no or very little impact on stand composition
2 = selectively logged: frequent cut stumps but origin of dominant or co-dominant cohort appears to be natural disturbance
3 = heavy logging disturbance with natural regeneration: many cut stumps that predate the dominant or co-dominant cohort with no tree planting
4 = tree plantation: dominant cohort appears to be planted after clearcutting

Stand Age
1 = very young 0-40 yr
2 = young 40-90 yr
3 = mature 90-200 yr
4 = old-growth 200+ yr
5 = young with scattered old trees (2-10 old trees per acre)
6 = mature with scattered old trees

Agriculture
1 = active annual cropping
2 = active perennial herbaceous cropping
3 = active woody plant cultivation
4 = fallow, plowed no crops this yr
5 = Federal CRP
6 = other

Livestock
1 = active heavy grazing (most forage used to ground soil compaction or churning)
2 = active moderate grazing (25-75% forage used)
3 = active light grazing (lots of last years litter left)
4 = no current, heavy past grazing
5 = no current, light past grazing
6 = no obvious sign of grazing

Development
1 = actively used facilities
2 = roads
3 = established trails
4 = abandoned facilities
5 = none obvious
6 = multiple types (detail in comments)

Wildlife
1 = heavy ungulate use
2 = moderate ungulate use
3 = light to no ungulate use
4 = burrowing animals
5 = active beaver
6 = active porcupine
7 = other, list animal

Recreation Use Severity
1 = heavy use, abundant soil and vegetation displacement off trail/road
2 = moderate use, frequent soil and vegetation displacement off trail/road
3 = light use, little sign of activity off trail/road

Recreation Use Primary Type
1 = wheeled
2 = hoofed
3 = pedestrian
4 = combination of above
5 = other

Hydrology
1 = unaltered
2 = altered; dams, dikes, ditches, culverts, etc
3 = not assessed

Plant Association (PA) = list all PAs encountered in polygon survey, in comments list source of name if not on provided key.

Condition Rank of PA in key or estimate

% of Polygon = your estimate

Pattern = how PA is distributed in polygon
1 = matrix (most of polygon)
2 = large patches
3 = small patches
4 = clumped, clustered, contiguous
5 = scattered, more or less evenly repeating
6 = linear
7 = other

Exotic = primary species observed; secondary species observed.

Plot Number = number of any plots established for EO (element occurrence), or other more detail sheets within polygon.

Appendix D – Vegetation Community Data Collected for Each Vegetation Community Polygon

Polygon Number 1

Survey Intensity	1
Observer	HS, DH
Date	7/23/2008
Total Vegetation	4
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	2
Dominant Shrubs	ARTR2, ERNI2, CLLI2
> 1.5' tall	2
< 1.5' tall	1
Graminoids Total	3
Dominant Graminoids	BRTE, PSSP6, POSE
Graminoids Perennial	3
Graminoids Annual	3
Forbs Total	2
Dominant Forbs	VETH
Forbs Perennial	2
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	3
Exotics Perennial	2
Exotics Annual	3
Water	0
Rock Outcrop	30
Gravel	5
Logging	0
Fire:	
Stand Age	0
Agriculture	0
Livestock	0
Development	6
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants
VETH, BRTE, POBU

Water:	0
Rock:	30
Talus:	30
Gravel:	5
Bare Ground:	5
Moss Lichen:	0
Litter:	30

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	ERNI2/PSSP6-POSE		50	Large patch	Good
Veg Community1:	ERNI2/POSE	Daubenmire, 1970			G3
Existing Veg2:	ARTR2/BRTE-PSSP6		50	Large patch	Poor
Veg Community3:	ARTR2/PSSP6	Daubenmire, 1970			G5
Existing Veg3:			0		
Veg Community3:					

Notes: some garbage dumped in polygon (old vehicles); large talus fields with sparse vegtation in polygon

Polygon Number 2

Survey Intensity 1
Observer HS, DH
Date 7/23/2008

Total Vegetation
Trees Total
Dominant Trees
emergent
maincanopy
subcanopy
Shrubs Total
Dominant Shrubs
> 1.5' tall
< 1.5' tall
Graminoids Total
Dominant Graminoids
Graminoids Perennial
Graminoids Annual
Forbs Total
Dominant Forbs
Forbs Perennial
Forbs Annual
Ferns Total
Ferns Evergreen
Ferns Deciduous
ExoticsTotal
Exotics Perennial
Exotics Annual
Water
Rock Outcrop
Gravel
Logging
Fire:
Stand Age
Agriculture
Livestock
Development
Wildlife
Recreation Severity
Recreation Type
Hydrology

Exotic Species

Noxious Exotic Plants

Other Exotic Plants

Water:
Rock:
Talus:
Gravel:
Bare Ground:
Moss Lichen:
Litter:

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	Entrance Road		100		poor
Veg Community1:	Developed/Disturbed	PBI			
Existing Veg2:			0		
Veg Community3:					
Existing Veg3:			0		
Veg Community3:					

Notes: Entrance Road

Polygon Number 3

Survey Intensity 1
Observer HS, DH
Date 7/23/2008

Total Vegetation
Trees Total
Dominant Trees
emergent
maincanopy
subcanopy
Shrubs Total
Dominant Shrubs
> 1.5' tall
< 1.5' tall
Graminoids Total
Dominant Graminoids
Graminoids Perennial
Graminoids Annual
Forbs Total
Dominant Forbs
Forbs Perennial
Forbs Annual
Ferns Total
Ferns Evergreen
Ferns Deciduous
ExoticsTotal
Exotics Perennial
Exotics Annual
Water
Rock Outcrop

Gravel

Logging
Fire:
Stand Age
Agriculture
Livestock
Development
Wildlife
Recreation Severity
Recreation Type
Hydrology

Exotic Species

Noxious Exotic Plants

Other Exotic Plants

Water:

Rock:
Talus:
Gravel:
Bare Ground:
Moss Lichen:
Litter:

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	Entrance Road		100		poor
Veg Community1:	Developed/Disturbed	PBI			
Existing Veg2:			0		
Veg Community3:					
Existing Veg3:			0		
Veg Community3:					

Notes: Entrance Road

Polygon Number 4

Survey Intensity	1
Observer	HS, DH
Date	7/23/2008
Total Vegetation	5
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	3
Dominant Shrubs	ARTR2, ERNI2
> 1.5' tall	3
< 1.5' tall	2
Graminoids Total	4
Dominant Graminoids	PSSP6, BRTE, POBU
Graminoids Perennial	3
Graminoids Annual	3
Forbs Total	3
Dominant Forbs	LULE3, ACMI2, SIAL2
Forbs Perennial	3
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	4
Exotics Perennial	3
Exotics Annual	3
Water	0
Rock Outcrop	1
Gravel	2
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	3
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants
POBU, BRTE, TRDU, SIAL2

Water:	0
Rock:	1
Talus:	0
Gravel:	2
Bare Ground:	4
Moss Lichen:	1
Litter:	92

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	ARTR2/PSSP6-BRTE		60	Matrix	Poor
Veg Community1:	ARTR2/PSSP6	Daubenmire, 1970			G5
Existing Veg2:	BRTE-SIAL2-PSSP6		40	Large patch	Poor
Veg Community3:	PSSP6-POSE	Daubenmire, 1970			G4
Existing Veg3:			0		
Veg Community3:					

Notes: many cowpies present

Polygon Number 5

Survey Intensity	1
Observer	HS, DH
Date	7/23/2008
Total Vegetation	5
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	2
Dominant Shrubs	ERNAS2, ERNI2
> 1.5' tall	2
< 1.5' tall	2
Graminoids Total	5
Dominant Graminoids	BRTE, POBU, PSSP6, ELELE
Graminoids Perennial	3
Graminoids Annual	4
Forbs Total	3
Dominant Forbs	LASE, SIAL2
Forbs Perennial	3
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	5
Exotics Perennial	3
Exotics Annual	4
Water	0
Rock Outcrop	4
Gravel	2
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	3
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants
HYPE, CEDI3
Other Exotic Plants
BRTE, POBU, SIAL2

Water:	0
Rock:	4
Talus:	1
Gravel:	2
Bare Ground:	2
Moss Lichen:	0
Litter:	91

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	BRTE-POBU-PSSP6		95	Matrix	Poor
Veg Community1:	PSSP6-POSE	Daubenmire, 1970			G4
Existing Veg2:	ERNAS2/BRTE-PSSP6		15	Small patch	Poor
Veg Community3:	ERNAS2/PSSP6	MTNHP, 2002			G3
Existing Veg3:	ERNAS2/PSSP6-FEID		5		Fair
Veg Community3:	PSSP6-FEID	Daubenmire, 1970			G3

Notes: Heavy weed cover, small undisturbed patches just above steep cliff face have PSSP6-FEID community

Polygon Number 6

Survey Intensity	3
Observer	HS, DH
Date	7/23/2008
Total Vegetation	5
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	3
Dominant Shrubs	ARTR2, ERNI2, ERNAS2
> 1.5' tall	3
< 1.5' tall	2
Graminoids Total	4
Dominant Graminoids	BRTE, PSSP6, POBU, POSE
Graminoids Perennial	3
Graminoids Annual	3
Forbs Total	3
Dominant Forbs	LULE3, ACMI2
Forbs Perennial	3
Forbs Annual	2
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	4
Exotics Perennial	3
Exotics Annual	3
Water	0
Rock Outcrop	8
Gravel	5
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	3
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants
BRTE, POBU

Water:	0
Rock:	8
Talus:	5
Gravel:	5
Bare Ground:	3
Moss Lichen:	0
Litter:	79

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	ARTR2/BRTE-PSSP6		70	Matrix	Fair
Veg Community1:	ARTR2/PSSP6	Daubenmire, 1970			G5
Existing Veg2:	PSSP6-BRTE-POSE		30	Large patch	Fair
Veg Community3:	PSSP6-POSE	Daubenmire, 1970			G4
Existing Veg3:			0		
Veg Community3:					

Notes: some old fences throughout polygon; could not directly access polygon; suspect grazing may be occurring here,

Polygon Number 7

Survey Intensity	2
Observer	HS, DH
Date	7/23/2008
Total Vegetation	5
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	3
Dominant Shrubs	ARTR2, ERNAS2
> 1.5' tall	3
< 1.5' tall	1
Graminoids Total	5
Dominant Graminoids	BRTE, PSSP6, ELELE
Graminoids Perennial	3
Graminoids Annual	4
Forbs Total	2
Dominant Forbs	ACMI2
Forbs Perennial	2
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	4
Exotics Perennial	2
Exotics Annual	4
Water	0
Rock Outcrop	2
Gravel	1
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	6
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants
BRTE, ELELE, POBU, LASE, HEAN3

Water:	0
Rock:	2
Talus:	0
Gravel:	1
Bare Ground:	5
Moss Lichen:	2
Litter:	90

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	ARTR2/BRTE-ELELE-PSSP6		60	Matrix	Poor
Veg Community1:	ARTR2/PSSP6	Daubenmire, 1970			G5
Existing Veg2:	BRTE-PSSP6		40	Large patch	Poor
Veg Community3:	PSSP6-POSE	Daubenmire, 1970			G4
Existing Veg3:			0		
Veg Community3:					

Notes: polygon appears to have had recent fire - old campfire ring present -

Polygon Number 8

Survey Intensity	1
Observer	HS, DH
Date	7/23/2008
Total Vegetation	5
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	3
Dominant Shrubs	ARTR2, ERNAS2
> 1.5' tall	3
< 1.5' tall	2
Graminoids Total	5
Dominant Graminoids	PSSP6, BRTE, POBU
Graminoids Perennial	4
Graminoids Annual	3
Forbs Total	3
Dominant Forbs	ACMI2, LULE3, POBU
Forbs Perennial	3
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	3
Exotics Perennial	2
Exotics Annual	3
Water	0
Rock Outcrop	6
Gravel	3
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants
HYPE
Other Exotic Plants
BRTE, POBU

Water:	0
Rock:	6
Talus:	2
Gravel:	3
Bare Ground:	5
Moss Lichen:	0
Litter:	84

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	ARTR2-ERNAS2/BRTE-PSSP6		100	Matrix	Fair
Veg Community1:	ARTR2/PSSP6	Daubenmire, 1970			G5
Existing Veg2:			0		
Veg Community3:					
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 9

Survey Intensity	1
Observer	HS, DH
Date	7/23/2008
Total Vegetation	3
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	3
Dominant Shrubs	PHLE4, RHGL, ERNI2, TORY, ERCO12
> 1.5' tall	2
< 1.5' tall	2
Graminoids Total	3
Dominant Graminoids	PSSP6, BRTE, POSE
Graminoids Perennial	3
Graminoids Annual	2
Forbs Total	2
Dominant Forbs	PTTET
Forbs Perennial	2
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	2
Exotics Perennial	2
Exotics Annual	2
Water	0
Rock Outcrop	25
Gravel	3
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants
BRTE, POBU

Water:	0
Rock:	25
Talus:	60
Gravel:	3
Bare Ground:	0
Moss Lichen:	0
Litter:	12

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	ERNI2-ERCO12/PSSP6-BRTE-POSE		60	Matrix	Fair
Veg Community1:	ERNI2/POSE	Daubenmire, 1970			G3
Existing Veg2:	PHLE4-RHGL-TORY/Talus		40	Large patch	Good
Veg Community3:	RHGL/PSSP6	Daubenmire, 1970			G2
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 10

Survey Intensity 2
Observer HS, DH
Date 7/23/2008

Total Vegetation
Trees Total
Dominant Trees
emergent
maincanopy
subcanopy
Shrubs Total
Dominant Shrubs
> 1.5' tall
< 1.5' tall
Graminoids Total
Dominant Graminoids
Graminoids Perennial
Graminoids Annual
Forbs Total
Dominant Forbs
Forbs Perennial
Forbs Annual
Ferns Total
Ferns Evergreen
Ferns Deciduous
ExoticsTotal
Exotics Perennial
Exotics Annual
Water
Rock Outcrop
Gravel
Logging
Fire:
Stand Age
Agriculture
Livestock
Development
Wildlife
Recreation Severity
Recreation Type
Hydrology

Exotic Species

Noxious Exotic Plants

Other Exotic Plants

Water:
Rock:
Talus:
Gravel:
Bare Ground:
Moss Lichen:
Litter:

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	Railway Fill		100		poor
Veg Community1:	Developed/Disturbed	PBI			
Existing Veg2:			0		
Veg Community3:					
Existing Veg3:			0		
Veg Community3:					

Notes: highly disturbed; railway infill and garbage deposit

Polygon Number 11

Survey Intensity 1
Observer HS, DH
Date 7/23/2008

Total Vegetation
Trees Total
Dominant Trees
emergent
maincanopy
subcanopy
Shrubs Total
Dominant Shrubs
> 1.5' tall
< 1.5' tall
Graminoids Total
Dominant Graminoids
Graminoids Perennial
Graminoids Annual
Forbs Total
Dominant Forbs
Forbs Perennial
Forbs Annual
Ferns Total
Ferns Evergreen
Ferns Deciduous
ExoticsTotal
Exotics Perennial
Exotics Annual
Water
Rock Outcrop
Gravel
Logging
Fire:
Stand Age
Agriculture
Livestock
Development
Wildlife
Recreation Severity
Recreation Type
Hydrology

Exotic Species

Noxious Exotic Plants

Other Exotic Plants

Water:
Rock:
Talus:
Gravel:
Bare Ground:
Moss Lichen:
Litter:

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	Railway Fill		100		poor
Veg Community1:	Developed/Disturbed	PBI			
Existing Veg2:			0		
Veg Community3:					
Existing Veg3:			0		
Veg Community3:					

Notes: highly disturbed; railway infill and garbage deposit

Polygon Number 45

Survey Intensity	1
Observer	HS, DH
Date	7/23/2008
Total Vegetation	5
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	1
Dominant Shrubs	ERNAS2
> 1.5' tall	1
< 1.5' tall	1
Graminoids Total	5
Dominant Graminoids	PSSP6, FEID, KOMA
Graminoids Perennial	5
Graminoids Annual	3
Forbs Total	3
Dominant Forbs	LODI, LULE3, ACMI2
Forbs Perennial	3
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	2
Exotics Perennial	1
Exotics Annual	2
Water	0
Rock Outcrop	1
Gravel	1
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	3
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants

BRTE

Water:	0
Rock:	1
Talus:	1
Gravel:	1
Bare Ground:	4
Moss Lichen:	5
Litter:	88

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	PSSP6-FEID-LODI		100	Matrix	Excellent
Veg Community1:	PSSP6-FEID	Daubenmire, 1970			G3
Existing Veg2:			0		
Veg Community3:					
Existing Veg3:			0		
Veg Community3:					

Notes: very nice grassland community

Polygon Number 12

Survey Intensity	2
Observer	HS, DH
Date	7/23/2008
Total Vegetation	5
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	3
Dominant Shrubs	ARTR2, ERNAS2
> 1.5' tall	3
< 1.5' tall	1
Graminoids Total	5
Dominant Graminoids	BRTE, PSSP6, ELELE
Graminoids Perennial	3
Graminoids Annual	4
Forbs Total	2
Dominant Forbs	ACMI2
Forbs Perennial	2
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	4
Exotics Perennial	2
Exotics Annual	4
Water	0
Rock Outcrop	2
Gravel	1
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	6
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants
BRTE, ELELE, POBU, LASE, HEAN3

Water:	0
Rock:	2
Talus:	0
Gravel:	1
Bare Ground:	5
Moss Lichen:	2
Litter:	90

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	ARTR2/BRTE-ELELE-PSSP6		100	Matrix	Poor
Veg Community1:	ARTR2/PSSP6	Daubenmire, 1970			G5
Existing Veg2:			0		
Veg Community3:					
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 13

Survey Intensity	1
Observer	HS, DH
Date	7/23/2008
Total Vegetation	5
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	4
Dominant Shrubs	SAEX, TORY
> 1.5' tall	4
< 1.5' tall	2
Graminoids Total	3
Dominant Graminoids	AGPA8, ELRE4, VUBR
Graminoids Perennial	3
Graminoids Annual	2
Forbs Total	3
Dominant Forbs	CIAR4, RUCR, DIFU2
Forbs Perennial	3
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	3
Exotics Perennial	3
Exotics Annual	1
Water	0
Rock Outcrop	0
Gravel	1
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants
CIAR4
Other Exotic Plants
DIFU2, ELRE4

Water:	0
Rock:	0
Talus:	20
Gravel:	1
Bare Ground:	0
Moss Lichen:	5
Litter:	74

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	SAEX/AGPA8-CIAR4		100	Matrix	Fair
Veg Community1:	SAEX	Crawford, 2003			G5
Existing Veg2:			0		
Veg Community3:					
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 14

Survey Intensity	1
Observer	HS, DH
Date	7/23/2008
Total Vegetation	5
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	5
Dominant Shrubs	PRVI, SAEX, ACNE2, TORY, SARA2, PHLE4
> 1.5' tall	5
< 1.5' tall	2
Graminoids Total	3
Dominant Graminoids	BRTE, BRAR5, PHAR3
Graminoids Perennial	2
Graminoids Annual	3
Forbs Total	3
Dominant Forbs	RUCR, COMA2, GAAP2
Forbs Perennial	3
Forbs Annual	2
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	3
Exotics Perennial	3
Exotics Annual	3
Water	0
Rock Outcrop	1
Gravel	1
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	3
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants
CIVU, CIAR4
Other Exotic Plants
VETH, COMA2, BRTE, BRAR5

Water:	0
Rock:	1
Talus:	5
Gravel:	1
Bare Ground:	1
Moss Lichen:	2
Litter:	90

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	COSE16-ACNE2-TORY/COMA2-		100	Matrix	Poor
Veg Community1:	ACNE2	Crawford, 2003			Not
Existing Veg2:			0		
Veg Community3:					
Existing Veg3:			0		
Veg Community3:					

Notes: dense, impenetrable thicket

Polygon Number 15

Survey Intensity	1
Observer	HS, DH
Date	7/23/2008
Total Vegetation	5
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	2
Dominant Shrubs	PHLE4, CLLI2, ARTR2, ERNI2
> 1.5' tall	2
< 1.5' tall	1
Graminoids Total	4
Dominant Graminoids	PSSP6, FEID, BRTE
Graminoids Perennial	3
Graminoids Annual	3
Forbs Total	3
Dominant Forbs	LODI, ACMI2
Forbs Perennial	3
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	3
Exotics Perennial	2
Exotics Annual	3
Water	0
Rock Outcrop	15
Gravel	1
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants
CIAR4
Other Exotic Plants
BRTE, POBU

Water:	0
Rock:	15
Talus:	5
Gravel:	1
Bare Ground:	3
Moss Lichen:	5
Litter:	71

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	PSSP6-FEID-LODI		75	Matrix	Good
Veg Community1:	PSSP6-FEID	Daubenmire, 1970			G3
Existing Veg2:	ERNI2/POSE		15	Small patch	Good
Veg Community3:	ERNI2/POSE	Daubenmire, 1970			G3
Existing Veg3:	PHLE4-CLLI2/Talus		10	Small patch	Good
Veg Community3:	PHLE4	Crawford, 2003			G2

Notes:

Polygon Number 16

Survey Intensity	1
Observer	HS, DH
Date	7/23/2008
Total Vegetation	3
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	2
Dominant Shrubs	ARTR2, PHLE4, CLLI2
> 1.5' tall	2
< 1.5' tall	2
Graminoids Total	3
Dominant Graminoids	PSSP6, BRTE, POSE
Graminoids Perennial	2
Graminoids Annual	3
Forbs Total	2
Dominant Forbs	GAAP2, PTTET
Forbs Perennial	2
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	3
Exotics Perennial	1
Exotics Annual	3
Water	0
Rock Outcrop	10
Gravel	0
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants
BRTE, POBU

Water:	0
Rock:	10
Talus:	75
Gravel:	0
Bare Ground:	0
Moss Lichen:	0
Litter:	15

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	ARTR2/PSSP6-BRTE		50	Large patch	Fair
Veg Community1:	ARTR2/PSSP6	Daubenmire, 1970			G5
Existing Veg2:	PHLE4-CLLI2/Talus		50	Large patch	Good
Veg Community3:	PHLE4	Crawford, 2003			G2
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 17

Survey Intensity	1
Observer	HS, DH
Date	7/23/2008
Total Vegetation	5
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	3
Dominant Shrubs	ARTR2, ERNI2, CLLI2
> 1.5' tall	3
< 1.5' tall	2
Graminoids Total	5
Dominant Graminoids	BRTE, PSSP6, VUBR
Graminoids Perennial	2
Graminoids Annual	5
Forbs Total	4
Dominant Forbs	LODI, CIUN
Forbs Perennial	4
Forbs Annual	2
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	5
Exotics Perennial	1
Exotics Annual	5
Water	0
Rock Outcrop	1
Gravel	1
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants
BRTE

Water:	0
Rock:	1
Talus:	2
Gravel:	1
Bare Ground:	3
Moss Lichen:	2
Litter:	91

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	ARTR2-CLLI2/BRTE-LODI		100	Matrix	poor
Veg Community1:	ARTR2/PSSP6	Daubenmire, 1970			G5
Existing Veg2:			0		
Veg Community3:					
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 18

Survey Intensity	1
Observer	HS, DH
Date	7/23/2008
Total Vegetation	3
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	2
Dominant Shrubs	CELAR, ERNI2, CLLI2
> 1.5' tall	2
< 1.5' tall	2
Graminoids Total	3
Dominant Graminoids	BRTE, PSSP6, POSE
Graminoids Perennial	2
Graminoids Annual	2
Forbs Total	2
Dominant Forbs	ACMI2, PTTET
Forbs Perennial	2
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	3
Exotics Perennial	2
Exotics Annual	2
Water	0
Rock Outcrop	79
Gravel	2
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants
CEDI3
Other Exotic Plants
BRTE, SIAL2, POBU

Water:	0
Rock:	79
Talus:	5
Gravel:	2
Bare Ground:	1
Moss Lichen:	3
Litter:	10

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	ERNI2/BRTE-POSE		80	Matrix	Good
Veg Community1:	ERNI2/POSE	Daubenmire, 1970			G3
Existing Veg2:	ERNI2/BRTE-PSSP6-POSE		20	Small patch	Fair
Veg Community3:	PSSP6-POSE	Daubenmire, 1970			G4
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 19

Survey Intensity	1
Observer	HS, DH
Date	7/23/2008
Total Vegetation	4
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	3
Dominant Shrubs	CELAR, TORY, PHLE4
> 1.5' tall	3
< 1.5' tall	2
Graminoids Total	3
Dominant Graminoids	APIN, POMO5, POBU, BRTE
Graminoids Perennial	3
Graminoids Annual	2
Forbs Total	2
Dominant Forbs	CIAR4, RUCR
Forbs Perennial	2
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	2
Exotics Perennial	1
Exotics Annual	2
Water	0
Rock Outcrop	5
Gravel	3
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants
CIAR4
Other Exotic Plants
APIN, BRTE

Water:	0
Rock:	5
Talus:	80
Gravel:	3
Bare Ground:	2
Moss Lichen:	0
Litter:	10

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	CELAR-TORY/Talus		100	Matrix	Fair
Veg Community1:	CELAR-TORY	Crowe et al., 2002			G2
Existing Veg2:			0		
Veg Community3:					
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 20

Survey Intensity	1
Observer	HS, DH
Date	7/23/2008
Total Vegetation	5
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	4
Dominant Shrubs	SAEX, TORY
> 1.5' tall	4
< 1.5' tall	2
Graminoids Total	3
Dominant Graminoids	AGPA8, ELRE4, VUBR
Graminoids Perennial	3
Graminoids Annual	2
Forbs Total	3
Dominant Forbs	CIAR4, RUCR, DIFU2
Forbs Perennial	3
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	3
Exotics Perennial	3
Exotics Annual	1
Water	0
Rock Outcrop	0
Gravel	1
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants
CIAR4
Other Exotic Plants
DIFU2, ELRE4

Water:	0
Rock:	0
Talus:	20
Gravel:	1
Bare Ground:	0
Moss Lichen:	5
Litter:	74

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	SAEX/AGPA8-CIAR4		100	Matrix	Fair
Veg Community1:	SAEX	Crawford, 2003			G5
Existing Veg2:			0		
Veg Community3:					
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 21

Survey Intensity	2
Observer	HS, DH
Date	7/23/2008
Total Vegetation	2
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	1
Dominant Shrubs	TORY
> 1.5' tall	0
< 1.5' tall	1
Graminoids Total	2
Dominant Graminoids	POBU, POMO5
Graminoids Perennial	2
Graminoids Annual	0
Forbs Total	1
Dominant Forbs	MIGU
Forbs Perennial	1
Forbs Annual	0
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	2
Exotics Perennial	2
Exotics Annual	0
Water	0
Rock Outcrop	95
Gravel	0
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants

POBU

Water:	0
Rock:	95
Talus:	0
Gravel:	0
Bare Ground:	0
Moss Lichen:	0
Litter:	5

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	TORY/POBU-POMO5-MIGU		100	Matrix	Poor
Veg Community1:	MIGU	Diaz and Mellen, 1996			Not
Existing Veg2:			0		
Veg Community3:					
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 22

Survey Intensity	1
Observer	HS, DH
Date	7/23/2008
Total Vegetation	5
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	4
Dominant Shrubs	SAEX, TORY
> 1.5' tall	4
< 1.5' tall	2
Graminoids Total	3
Dominant Graminoids	AGPA8, ELRE4, VUBR
Graminoids Perennial	3
Graminoids Annual	2
Forbs Total	3
Dominant Forbs	CIAR4, RUCR, DIFU2
Forbs Perennial	3
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	3
Exotics Perennial	3
Exotics Annual	1
Water	0
Rock Outcrop	0
Gravel	1
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants
CIAR4
Other Exotic Plants
DIFU2, ELRE4

Water:	0
Rock:	0
Talus:	20
Gravel:	1
Bare Ground:	0
Moss Lichen:	5
Litter:	74

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	SAEX/AGPA8-CIAR4		100	Matrix	Fair
Veg Community1:	SAEX	Crawford, 2003			G5
Existing Veg2:			0		
Veg Community3:					
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 23

Survey Intensity	3
Observer	HS, DH
Date	7/23/2008
Total Vegetation	5
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	3
Dominant Shrubs	ARTR2, ERNI2, ERNAS2
> 1.5' tall	3
< 1.5' tall	2
Graminoids Total	4
Dominant Graminoids	BRTE, PSSP6, POBU, POSE
Graminoids Perennial	3
Graminoids Annual	3
Forbs Total	3
Dominant Forbs	LULE3, ACMI2
Forbs Perennial	3
Forbs Annual	2
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	4
Exotics Perennial	3
Exotics Annual	3
Water	0
Rock Outcrop	8
Gravel	5
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	3
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants
BRTE, POBU

Water:	0
Rock:	8
Talus:	5
Gravel:	5
Bare Ground:	3
Moss Lichen:	0
Litter:	79

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	ARTR2/BRTE-PSSP6		70	Matrix	Fair
Veg Community1:	ARTR2/PSSP6	Daubenmire, 1970			G5
Existing Veg2:	PSSP6-BRTE-POSE		30	Large patch	Fair
Veg Community3:	PSSP6-POSE	Daubenmire, 1970			G4
Existing Veg3:			0		
Veg Community3:					

Notes: same as polygon 6; some old fences throughout polygon, could not access polygon directly

Polygon Number 24

Survey Intensity	3
Observer	HS, DH
Date	7/23/2008
Total Vegetation	4
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	2
Dominant Shrubs	PRVI, TORY, CLLI2
> 1.5' tall	2
< 1.5' tall	1
Graminoids Total	3
Dominant Graminoids	BRTE, PSSP6, POSE
Graminoids Perennial	3
Graminoids Annual	3
Forbs Total	2
Dominant Forbs	COMA2
Forbs Perennial	0
Forbs Annual	0
Ferns Total	1
Ferns Evergreen	0
Ferns Deciduous	1
ExoticsTotal	3
Exotics Perennial	2
Exotics Annual	3
Water	0
Rock Outcrop	50
Gravel	2
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants
BRTE, POBU

Water:	0
Rock:	50
Talus:	205
Gravel:	2
Bare Ground:	0
Moss Lichen:	22
Litter:	0

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	BRTE-PSSP6-POSE		95	Matrix	Fair
Veg Community1:	PSSP6-POSE	Daubenmire, 1970			G4
Existing Veg2:	PRVI-TORY		5	Small patch	Good
Veg Community3:	PRVI	Crawford, 2003			G4
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 25

Survey Intensity 1
Observer HS, DH
Date 7/23/2008

Total Vegetation
Trees Total
Dominant Trees
emergent
maincanopy
subcanopy
Shrubs Total
Dominant Shrubs
> 1.5' tall
< 1.5' tall
Graminoids Total
Dominant Graminoids
Graminoids Perennial
Graminoids Annual
Forbs Total
Dominant Forbs
Forbs Perennial
Forbs Annual
Ferns Total
Ferns Evergreen
Ferns Deciduous
ExoticsTotal
Exotics Perennial
Exotics Annual
Water
Rock Outcrop
Gravel
Logging
Fire:
Stand Age
Agriculture
Livestock
Development
Wildlife
Recreation Severity
Recreation Type
Hydrology

Exotic Species

Noxious Exotic Plants

Other Exotic Plants

Water:
Rock:
Talus:
Gravel:
Bare Ground:
Moss Lichen:
Litter:

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	Campground/Day Use		100		poor
Veg Community1:	Developed/Disturbed	PBI			
Existing Veg2:			0		
Veg Community3:					
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 26

Survey Intensity	2
Observer	HS, DH
Date	7/23/2008
Total Vegetation	5
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	3
Dominant Shrubs	ARTR2, ERNAS2
> 1.5' tall	3
< 1.5' tall	1
Graminoids Total	5
Dominant Graminoids	BRTE, PSSP6, ELELE
Graminoids Perennial	3
Graminoids Annual	4
Forbs Total	2
Dominant Forbs	ACMI2
Forbs Perennial	2
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	4
Exotics Perennial	2
Exotics Annual	4
Water	0
Rock Outcrop	2
Gravel	1
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	6
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants
BRTE, ELELE, POBU, LASE, HEAN3

Water:	0
Rock:	2
Talus:	0
Gravel:	1
Bare Ground:	5
Moss Lichen:	2
Litter:	90

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	ARTR2/BRTE-ELELE-PSSP6		70	Matrix	Poor
Veg Community1:	ARTR2/PSSP6	Daubenmire, 1970			G5
Existing Veg2:	ERNAS2/BRTE-ELELE-PSSP6		30	Large patch	Poor
Veg Community3:	ERNAS2/PSSP6	MTNHP, 2002			G3
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 27

Survey Intensity	1
Observer	HS, DH
Date	7/23/2008
Total Vegetation	5
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	3
Dominant Shrubs	ARTR2, CLLI2, ERNI2
> 1.5' tall	3
< 1.5' tall	2
Graminoids Total	5
Dominant Graminoids	BRTE, POBU, PSSP6, HECO26
Graminoids Perennial	3
Graminoids Annual	4
Forbs Total	2
Dominant Forbs	EQHY
Forbs Perennial	2
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	4
Exotics Perennial	3
Exotics Annual	4
Water	0
Rock Outcrop	1
Gravel	1
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	3
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants
HYPE
Other Exotic Plants
BRTE, POBU, VEBL

Water:	0
Rock:	1
Talus:	3
Gravel:	1
Bare Ground:	5
Moss Lichen:	0
Litter:	90

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	ARTR2/BRTE-PSSP6-HECO26		100	Matrix	Fair
Veg Community1:	ARTR2/PSSP6	Daubenmire, 1970			G5
Existing Veg2:			0		
Veg Community3:					
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 28

Survey Intensity	1
Observer	HS, DH
Date	7/23/2008
Total Vegetation	5
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	5
Dominant Shrubs	PRVI, SAEX, ACNE2, TORY, SARA2, PHLE4
> 1.5' tall	5
< 1.5' tall	2
Graminoids Total	3
Dominant Graminoids	BRTE, BRAR5, PHAR3
Graminoids Perennial	2
Graminoids Annual	3
Forbs Total	3
Dominant Forbs	RUCR, COMA2, GAAP2
Forbs Perennial	3
Forbs Annual	2
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	3
Exotics Perennial	3
Exotics Annual	3
Water	0
Rock Outcrop	1
Gravel	1
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	3
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants
CIVU, CIAR4
Other Exotic Plants
VETH, COMA2, BRTE, BRAR5

Water:	0
Rock:	1
Talus:	5
Gravel:	1
Bare Ground:	1
Moss Lichen:	2
Litter:	90

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	PRVI-SAEX/COMA2-BRTE		100	Matrix	Poor
Veg Community1:	PRVI	Crawford, 2003			G4
Existing Veg2:			0		
Veg Community3:					
Existing Veg3:			0		
Veg Community3:					

Notes: dense, impenetrable thicket

Polygon Number 29

Survey Intensity	1
Observer	HS, DH
Date	7/23/2008
Total Vegetation	3
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	2
Dominant Shrubs	PHLE4, CLLI2
> 1.5' tall	2
< 1.5' tall	1
Graminoids Total	3
Dominant Graminoids	POBU, BRAR5, BRTE, POSE
Graminoids Perennial	3
Graminoids Annual	2
Forbs Total	2
Dominant Forbs	ACMI2
Forbs Perennial	2
Forbs Annual	2
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	3
Exotics Perennial	3
Exotics Annual	2
Water	0
Rock Outcrop	50
Gravel	3
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	6
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants
CEDI3
Other Exotic Plants
VETH, BRTE, POBU, BRAR5

Water:	0
Rock:	50
Talus:	20
Gravel:	3
Bare Ground:	2
Moss Lichen:	3
Litter:	22

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	PHLE4/POBU-BRTE		100	Matrix	Poor
Veg Community1:	PHLE4-CLLI2	Crawford, 2003			~G2
Existing Veg2:			0		
Veg Community3:					
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 30

Survey Intensity	2
Observer	HS, DH
Date	7/23/2008
Total Vegetation	4
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	2
Dominant Shrubs	PRVI, TORY, CLLI2
> 1.5' tall	2
< 1.5' tall	1
Graminoids Total	3
Dominant Graminoids	BRTE, PSSP6, POSE
Graminoids Perennial	3
Graminoids Annual	3
Forbs Total	2
Dominant Forbs	COMA2
Forbs Perennial	0
Forbs Annual	0
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	3
Exotics Perennial	2
Exotics Annual	3
Water	0
Rock Outcrop	50
Gravel	5
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants
BRTE, POBU

Water:	0
Rock:	50
Talus:	20
Gravel:	5
Bare Ground:	2
Moss Lichen:	1
Litter:	22

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	BRTE-PSSP6-POSE		95	Matrix	Fair
Veg Community1:	PSSP6-POSE	Daubenmire, 1970			G4
Existing Veg2:	PRVI-TORY		5	Small patch	Good
Veg Community3:	PRVI	Crawford, 2003			G4
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 31

Survey Intensity	3
Observer	HS, DH
Date	7/23/2008
Total Vegetation	5
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	4
Dominant Shrubs	ARTR2, PRVI, CLLI2
> 1.5' tall	4
< 1.5' tall	2
Graminoids Total	4
Dominant Graminoids	BRTE, PSSP6, ELGL
Graminoids Perennial	3
Graminoids Annual	4
Forbs Total	3
Dominant Forbs	ARLU, RUCR, COMA2
Forbs Perennial	3
Forbs Annual	2
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	3
Exotics Perennial	0
Exotics Annual	0
Water	0
Rock Outcrop	5
Gravel	15
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants
BRTE, COMA2

Water:	0
Rock:	5
Talus:	15
Gravel:	15
Bare Ground:	2
Moss Lichen:	0
Litter:	63

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	ARTR2/ARLU-BRTE		60	Matrix	Fair
Veg Community1:	ARTR2/PSSP6	Daubenmire, 1970			G5
Existing Veg2:	PRVI-CLLI2/COMA2-ELGL		30	Large patch	Fair
Veg Community3:	PRVI	Crawford, 2003			G4
Existing Veg3:	CELAR-TORY/Talus		10	Small patch	Fair
Veg Community3:	CELAR-TORY	Crowe et al., 2002			G2

Notes:

Polygon Number 32

Survey Intensity	1
Observer	HS, DH
Date	7/23/2008
Total Vegetation	5
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	4
Dominant Shrubs	SAEX, PRVI, ACNE2
> 1.5' tall	4
< 1.5' tall	2
Graminoids Total	4
Dominant Graminoids	ELGL, PHAR3, ELRE4, BRIN2
Graminoids Perennial	4
Graminoids Annual	2
Forbs Total	3
Dominant Forbs	ARLU, ARDR4, SOCA6
Forbs Perennial	3
Forbs Annual	2
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	3
Exotics Perennial	3
Exotics Annual	1
Water	0
Rock Outcrop	2
Gravel	5
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants
PHAR3, ELRE4, CIIN

Water:	0
Rock:	2
Talus:	12
Gravel:	5
Bare Ground:	1
Moss Lichen:	0
Litter:	80

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	SAEX-PRVI/ARLU-ELGL		60	Matrix	Good
Veg Community1:	SAEX	Crawford, 2003			G5
Existing Veg2:	PHLE4-ROWO-TORY/POBU-LECI4-		40	2	fair
Veg Community3:	PHLE4-TORY	Crawford, 2003			~G2
Existing Veg3:			0		
Veg Community3:					

Notes: Spartina pectinata found just outside park boundary; apparent seasonal flooding

Polygon Number 33

Survey Intensity	1
Observer	HS, DH
Date	7/23/2008
Total Vegetation	5
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	3
Dominant Shrubs	ERNAS2, CHVI8, ARTR2
> 1.5' tall	2
< 1.5' tall	2
Graminoids Total	4
Dominant Graminoids	PSSP6, BRTE, POBU, FEID
Graminoids Perennial	3
Graminoids Annual	3
Forbs Total	3
Dominant Forbs	LULE3, ACMI2
Forbs Perennial	3
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	3
Exotics Perennial	2
Exotics Annual	3
Water	0
Rock Outcrop	3
Gravel	0
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants
BRTE, POBU

Water:	0
Rock:	3
Talus:	0
Gravel:	0
Bare Ground:	5
Moss Lichen:	0
Litter:	92

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	ERNAS2/BRTE-PSSP6		100	Matrix	Fair
Veg Community1:	ERNAS2/PSSP6	MTNHP, 2002			G3
Existing Veg2:			0		
Veg Community3:					
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 34

Survey Intensity	1
Observer	HS, DH
Date	7/23/2008
Total Vegetation	3
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	2
Dominant Shrubs	ERNI2
> 1.5' tall	1
< 1.5' tall	2
Graminoids Total	3
Dominant Graminoids	PSSP6, BRTE
Graminoids Perennial	2
Graminoids Annual	2
Forbs Total	1
Dominant Forbs	PTTET
Forbs Perennial	1
Forbs Annual	0
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	2
Exotics Perennial	1
Exotics Annual	2
Water	0
Rock Outcrop	50
Gravel	5
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants
BRTE

Water:	0
Rock:	50
Talus:	30
Gravel:	5
Bare Ground:	5
Moss Lichen:	0
Litter:	10

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	ERNI2/PSSP6-BRTE-PTTET		100	Matrix	Good
Veg Community1:	ERNI2/POSE	Daubenmire, 1970			G3
Existing Veg2:			0		
Veg Community3:					
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 35

Survey Intensity	2
Observer	HS, DH
Date	7/23/2008
Total Vegetation	4
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	3
Dominant Shrubs	ARTR2, ERNI2, TORY
> 1.5' tall	3
< 1.5' tall	2
Graminoids Total	4
Dominant Graminoids	PSSP6, BRTE, POSE
Graminoids Perennial	3
Graminoids Annual	3
Forbs Total	2
Dominant Forbs	BACA3, PTTET
Forbs Perennial	2
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	3
Exotics Perennial	1
Exotics Annual	3
Water	0
Rock Outcrop	60
Gravel	3
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants
BRTE

Water:	0
Rock:	60
Talus:	8
Gravel:	3
Bare Ground:	1
Moss Lichen:	1
Litter:	27

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	ERNI2/POSE		50	Large patch	Fair
Veg Community1:	ERNI2/POSE	Daubenmire, 1970			G3
Existing Veg2:	ARTR2/PSSP6		50	Large patch	Fair
Veg Community3:	ARTR2/PSSP6	Daubenmire, 1970			G5
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 36

Survey Intensity	1
Observer	HS, DH
Date	7/23/2008
Total Vegetation	6
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	4
Dominant Shrubs	ARTR2
> 1.5' tall	4
< 1.5' tall	1
Graminoids Total	5
Dominant Graminoids	BRTE, POBU
Graminoids Perennial	3
Graminoids Annual	4
Forbs Total	3
Dominant Forbs	CHJU, LULE3
Forbs Perennial	3
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	5
Exotics Perennial	3
Exotics Annual	4
Water	0
Rock Outcrop	0
Gravel	0
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants
CHJU
Other Exotic Plants
BRTE, POBU

Water:	0
Rock:	0
Talus:	0
Gravel:	0
Bare Ground:	5
Moss Lichen:	0
Litter:	95

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	ARTR2/BRTE-POBU-CHJU		100	Matrix	Poor
Veg Community1:	ARTR2/PSSP6	Daubenmire, 1970			G5
Existing Veg2:			0		
Veg Community3:					
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 37

Survey Intensity	3
Observer	HS, DH
Date	7/23/2008
Total Vegetation	5
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	3
Dominant Shrubs	ARTR2, CLLI2, ERNI2
> 1.5' tall	3
< 1.5' tall	2
Graminoids Total	5
Dominant Graminoids	BRTE, POBU, PSSP6, HECO26
Graminoids Perennial	3
Graminoids Annual	4
Forbs Total	2
Dominant Forbs	EQHY
Forbs Perennial	2
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	4
Exotics Perennial	3
Exotics Annual	4
Water	0
Rock Outcrop	1
Gravel	1
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	3
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants
HYPE
Other Exotic Plants
BRTE, POBU, VEBL

Water:	0
Rock:	1
Talus:	3
Gravel:	1
Bare Ground:	5
Moss Lichen:	0
Litter:	90

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	ARTR2/BRTE-PSSP6-HECO26		100	Matrix	Fair
Veg Community1:	ARTR2/PSSP6	Daubenmire, 1970			G5
Existing Veg2:			0		
Veg Community3:					
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 38

Survey Intensity	1
Observer	HS,DH
Date	7/23/2008
Total Vegetation	5
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	2
Dominant Shrubs	ARTR2, ERNI2, ELAN
> 1.5' tall	2
< 1.5' tall	2
Graminoids Total	4
Dominant Graminoids	POBU, BRTE, PSSP6
Graminoids Perennial	4
Graminoids Annual	2
Forbs Total	3
Dominant Forbs	ACMI2, ARDR4, SIAL2
Forbs Perennial	3
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	4
Exotics Perennial	3
Exotics Annual	3
Water	0
Rock Outcrop	5
Gravel	2
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	3
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants
POBU, BRTE

Water:	0
Rock:	5
Talus:	3
Gravel:	2
Bare Ground:	2
Moss Lichen:	0
Litter:	88

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	ERNI2/PSSP6-POBU-BRTE		80	Matrix	Poor
Veg Community1:	PSSP6-POSE	Daubenmire, 1970			G4
Existing Veg2:	ARTR2/PSSP6-POBU-BRTE		20	Large patch	Poor
Veg Community3:	ARTR2/PSSP6	Daubenmire, 1970			G5
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 39

Survey Intensity	1
Observer	HS, DH
Date	7/23/2008
Total Vegetation	5
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	2
Dominant Shrubs	ERNAS2, ERNI2, CHVI8
> 1.5' tall	2
< 1.5' tall	2
Graminoids Total	5
Dominant Graminoids	BRTE, PSSP6, POSE
Graminoids Perennial	3
Graminoids Annual	4
Forbs Total	3
Dominant Forbs	ACMI2
Forbs Perennial	3
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	4
Exotics Perennial	2
Exotics Annual	4
Water	0
Rock Outcrop	1
Gravel	1
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	3
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants
BRTE, POBU, LASE

Water:	0
Rock:	1
Talus:	1
Gravel:	1
Bare Ground:	5
Moss Lichen:	3
Litter:	89

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	ERNAS2/BRTE-PSSP6		70	Matrix	Fair
Veg Community1:	ERNAS2/PSSP6	MTNHP, 2002			G3
Existing Veg2:	BRTE-LULE3-PSSP6		30	Large patch	Poor
Veg Community3:	PSSP6-POSE	Daubenmire, 1970			G4
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 40

Survey Intensity	1
Observer	HS, DH
Date	7/23/2008
Total Vegetation	5
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	2
Dominant Shrubs	ERNI2, ERNAS2
> 1.5' tall	2
< 1.5' tall	1
Graminoids Total	5
Dominant Graminoids	BRTE, POSE, PSSP6
Graminoids Perennial	3
Graminoids Annual	4
Forbs Total	3
Dominant Forbs	LULE3, ACMI2
Forbs Perennial	3
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	4
Exotics Perennial	3
Exotics Annual	4
Water	0
Rock Outcrop	1
Gravel	1
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants
BRTE

Water:	0
Rock:	1
Talus:	1
Gravel:	1
Bare Ground:	15
Moss Lichen:	0
Litter:	82

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	BRTE-LULE3-PSSP6		100	Matrix	Poor
Veg Community1:	PSSP6-POSE	Daubenmire, 1970			G4
Existing Veg2:			0		
Veg Community3:					
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 41

Survey Intensity	2
Observer	HS, DH
Date	7/23/2008
Total Vegetation	2
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	1
Dominant Shrubs	TORY
> 1.5' tall	0
< 1.5' tall	1
Graminoids Total	2
Dominant Graminoids	POBU, POMO5
Graminoids Perennial	2
Graminoids Annual	0
Forbs Total	1
Dominant Forbs	MIGU
Forbs Perennial	1
Forbs Annual	0
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	2
Exotics Perennial	2
Exotics Annual	0
Water	0
Rock Outcrop	95
Gravel	0
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants

POBU

Water:	0
Rock:	95
Talus:	0
Gravel:	0
Bare Ground:	0
Moss Lichen:	0
Litter:	5

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	TORY/POBU-POMO5-MIGU		100	Matrix	Poor
Veg Community1:	MIGU	Diaz and Mellen, 1996			Not
Existing Veg2:			0		
Veg Community3:					
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 42

Survey Intensity	2
Observer	HS, DH
Date	7/23/2008
Total Vegetation	5
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	4
Dominant Shrubs	SAEX
> 1.5' tall	4
< 1.5' tall	2
Graminoids Total	4
Dominant Graminoids	PHAR3, SPPE, SCAM6
Graminoids Perennial	4
Graminoids Annual	0
Forbs Total	3
Dominant Forbs	SOCA6, COMA2
Forbs Perennial	3
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	3
Exotics Perennial	3
Exotics Annual	1
Water	4
Rock Outcrop	1
Gravel	1
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants
COMA2, PHAR3

Water:	4
Rock:	1
Talus:	5
Gravel:	1
Bare Ground:	0
Moss Lichen:	0
Litter:	89

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	SAEX/PHAR3-SPPE		100	Matrix	Good
Veg Community1:	SAEX	Crawford, 2003			G5
Existing Veg2:			0		
Veg Community3:					
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 43

Survey Intensity	1
Observer	HS, DH
Date	7/23/2008
Total Vegetation	3
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	2
Dominant Shrubs	ERNI2
> 1.5' tall	1
< 1.5' tall	2
Graminoids Total	3
Dominant Graminoids	PSSP6, BRTE
Graminoids Perennial	2
Graminoids Annual	2
Forbs Total	1
Dominant Forbs	PTTET
Forbs Perennial	1
Forbs Annual	0
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	2
Exotics Perennial	1
Exotics Annual	2
Water	0
Rock Outcrop	50
Gravel	5
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants
BRTE

Water:	0
Rock:	50
Talus:	30
Gravel:	5
Bare Ground:	5
Moss Lichen:	0
Litter:	10

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	ERNI2/PSSP6-BRTE-PTTET		100	Matrix	Good
Veg Community1:	ERNI2/POSE	Daubenmire, 1970			G3
Existing Veg2:			0		
Veg Community3:					
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 44

Survey Intensity 1
Observer HS, DH
Date 7/23/2008

Total Vegetation
Trees Total
Dominant Trees
emergent
maincanopy
subcanopy
Shrubs Total
Dominant Shrubs
> 1.5' tall
< 1.5' tall
Graminoids Total
Dominant Graminoids
Graminoids Perennial
Graminoids Annual
Forbs Total
Dominant Forbs
Forbs Perennial
Forbs Annual
Ferns Total
Ferns Evergreen
Ferns Deciduous
ExoticsTotal
Exotics Perennial
Exotics Annual
Water
Rock Outcrop
Gravel
Logging
Fire:
Stand Age
Agriculture
Livestock
Development
Wildlife
Recreation Severity
Recreation Type
Hydrology

Exotic Species

Noxious Exotic Plants

Other Exotic Plants

Water:
Rock:
Talus:
Gravel:
Bare Ground:
Moss Lichen:
Litter:

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	Railway Fill		100		poor
Veg Community1:	Developed/Disturbed	PBI			
Existing Veg2:			0		
Veg Community3:					
Existing Veg3:			0		
Veg Community3:					

Notes:

Polygon Number 46

Survey Intensity	2
Observer	HS, DH
Date	7/23/2008
Total Vegetation	4
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	2
Dominant Shrubs	PRVI, TORY, CLLI2
> 1.5' tall	2
< 1.5' tall	1
Graminoids Total	3
Dominant Graminoids	BRTE, PSSP6, POSE
Graminoids Perennial	3
Graminoids Annual	3
Forbs Total	2
Dominant Forbs	COMA2
Forbs Perennial	0
Forbs Annual	0
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	3
Exotics Perennial	2
Exotics Annual	3
Water	0
Rock Outcrop	14
Gravel	5
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants
BRTE, POBU

Water:	0
Rock:	14
Talus:	60
Gravel:	5
Bare Ground:	0
Moss Lichen:	1
Litter:	20

Vegetation Types

			Percent	Pattern	Rank
Existing Veg1:	PRVI-TORY-CLLI2 tallus		60	Matrix	Good
Veg Community1:	PRVI	Crawford, 2003			G4
Existing Veg2:	BRTE-POBU-POSE		40	Small patch	Fair
Veg Community3:	PSSP6-POSE	Daubenmire, 1970			G4
Existing Veg3:			0		
Veg Community3:					

Notes: