

# **Rare Plant and Vegetation Survey of Klickitat Rail Trail State Park**



*Pacific Biodiversity Institute*



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## Executive Summary

Pacific Biodiversity Institute (PBI) conducted a rare plant and vegetation survey of Klickitat Rail Trail State Park (KRT) for the Washington State Parks and Recreation Commission (WSPRC). The KRT property covers about 305 acres and is located along the north side of the Columbia River, east of the town of Lyle, in Klickitat County, Washington.

WSPRC ownership along the KRT is comprised of a narrow strip of land surrounding the old railroad bed. WSPRC ownership contains mostly disturbed/developed land cover types and surrounding natural vegetation communities mostly do not occur within WSPRC ownership. The surrounding vegetation communities and landforms are best described when broken into sections of similar conditions. We divided the trail into 6 sections for this report.

In a few locations the width of WSPRC ownership around the railroad bed increases and in these places some natural communities occur. A total of 6 natural vegetation communities were mapped inside of WSPRC ownership along the KRT. Some of these communities are Globally Imperiled and are in good to excellent condition.

Rare plant populations abound along the KRT, both within WSPRC ownership and on adjacent properties. Within WSPRC ownership, Gooseberry-leaved Alumroot (*Heuchera grossulariifolia* var. *tenuifolia*) and Suksdorf's Desert-parsley (*Lomatium suksdorfii*) were found in multiple locations along the lower half of the trail.

Ecological condition of many of the vegetation communities surrounding the KRT is good to excellent. Many imperiled and threatened vegetation communities occur within the Klickitat Valley, and these communities support a distinct abundance of rare plants and animals not typical of other areas of the state.

Restoration opportunities are limited within WSPRC ownership due to the disturbed/developed condition of the old railroad bed that comprises most of the WSPRC properties. A control program for exotic/noxious species along the disturbed/developed corridor should be instituted, however the use of chemical sprays should be limited due to the high abundance of rare plant populations and the proximity to the Klickitat River. Areas where the ownership boundary widens should be better protected from livestock grazing that is crossing over from adjacent lands.

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## Introduction

The KRT was surveyed for rare plant occurrences, vegetation communities and characteristics, noxious weeds and ecological condition by PBI under contract with WSPRC. This park is located in Klickitat County, Washington. This report summarizes the activities and findings of the contracted work.

The KRT property follows an old railroad bed up the Klickitat River from the town of Lyle along the Columbia River to the farmlands west of Goldendale. Much of the KRT lies within the federally designated Columbia River Gorge Scenic Area.

The WSPRC ownership along the trail corridor, as defined in the WSPRC GIS boundary layer, is very narrow – only 80 feet wide in most places. The vegetation communities and land cover within this narrow trail corridor is nearly all categorized as developed or highly disturbed. Very little native vegetation communities occur in this narrow corridor. Some native plants, including some rare plants have survived and even flourished within the WSPRC trail corridor. There are a few, limited places where the WSPRC ownership expands in width, according to the WSPRC GIS boundary layer. In one short section, the width of the corridor is about 185 feet. There are two other very short sections where the boundary expands out a little over 200 feet. In addition, in the middle portion of the trail, there is one small 40-acre square parcel within the property boundary at the northwest corner of Township 3N Range 13E Section 17.

The park wholly consists of a developed recreation trail and the lower portion is heavily used by bicyclists, hikers, strollers and equestrians. As the trail proceeds up the Klickitat River Gorge, the condition deteriorates and the trail gets less use. However, some mountain bikers and hikers do use the entire trail.

The KRT lies primarily in the pine-oak woodland habitat, but extends into shrub-steppe and agricultural lands at its uppermost reaches (Jolley 1988). The Klickitat River valley lies in a unique situation in Washington State from an ecological perspective. The mouth of the Klickitat River is near the middle of the Columbia River Gorge. Most of the valley experiences a moderated climate, influenced by both the wetter, western portion of the state and the drier eastern portion of the state. The area has some unique ecosystems that are not found in other parts of the state. The KRT traverses an area of very high biodiversity from a state-wide perspective.

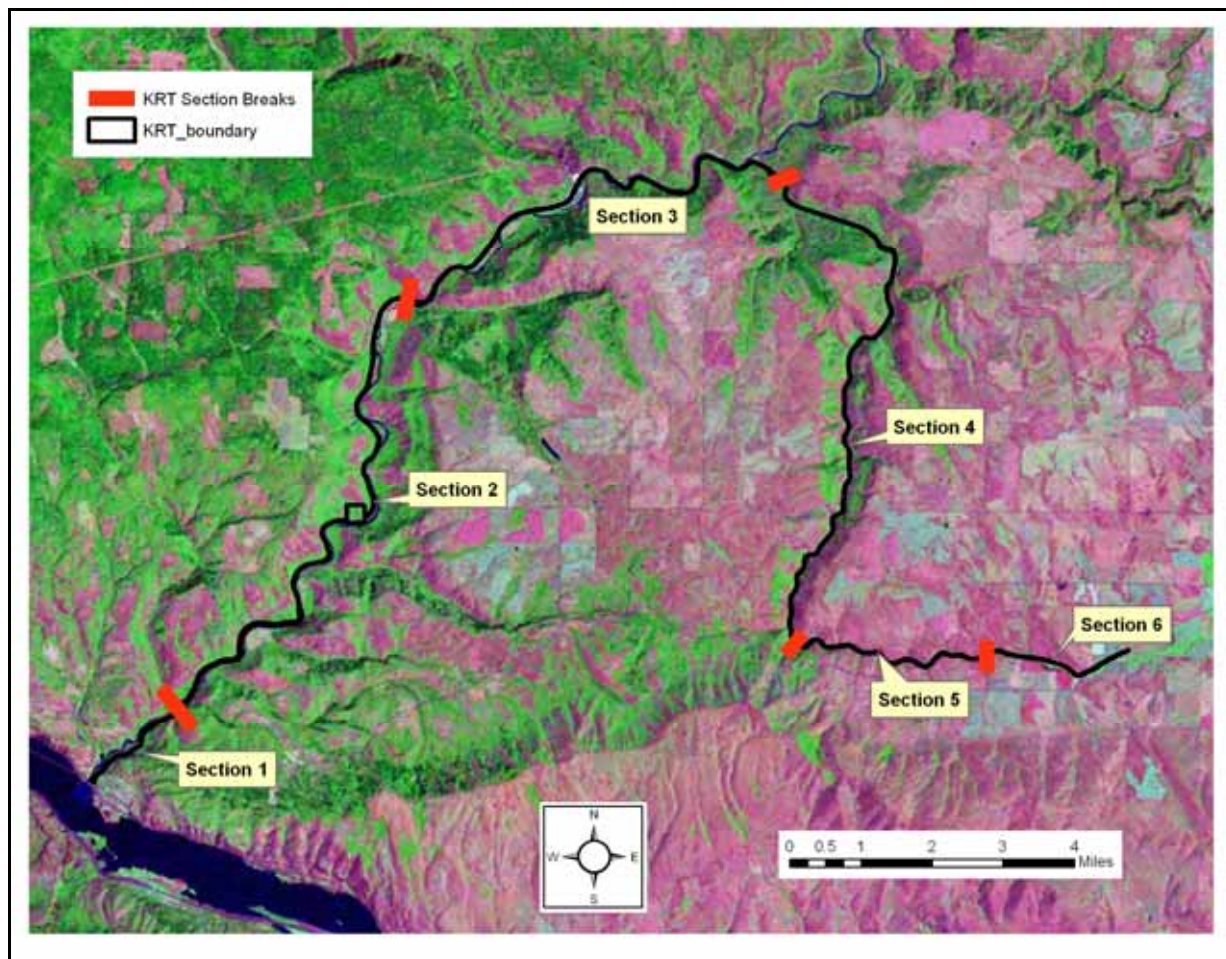
## Survey Conditions and Survey Routes

The project area was surveyed by two botanist/ecologists on April 10 and 12, 2008 and by one botanist/ecologist on August 5 and 6, 2008. Our routes from these surveys are not illustrated on a map in this report (as usual for our reports of this nature) because the trail corridor is so narrow and the trail covers a large expanse of landscape. It is impossible to depict our routes in a meaningful way at the scale required of a map in this report. However, all our routes are supplied as a digital GIS layer, which is delivered in conjunction with this report.

The trail is readily accessible in most places. Some sections of the trail are not maintained and are in deteriorating condition, making travel difficult, but not impossible.

## Description of KRT Sections

For descriptive purposes, we have broken the length of the KRT into six sections based on overall landscape characteristics and trail conditions (Figure 1). These sections are described below. Our contract requires only collection of data within the KRT boundary, so we do not go into much detail on the plant communities found outside of the KRT, which is mapped as a developed/disturbed narrow corridor. However, the following section description will give the reader a sense of the surrounding landscape and conditions along the trail.



**Figure 1. Sections of the KRT.**

## Section 1

This section is the lowest section of the trail. It begins with a very small westward extension of the trail that touches the Klickitat River where the old rail bridge crossed the river. At that spot, there are steep basalt cliffs that drop to the river from the bench. A small population of a state-sensitive rare plant, gooseberry-leaved alumroot (*Heuchera grossulariifolia* Rydb. var. *tenuifolia*), clings to the cliffs above the river (Figure 2). This population is probably within the KRT right-of-way.

The trail starts at Highway 14 (Figure 3). Much of Section 1 is within the town of Lyle. This section of the trail lies on the east side of the Klickitat River. This part of the trail has houses and cultivated or disturbed vegetation next to the trail, with mostly non-native vegetation. Highway 142 lies immediately to the east of this section of trail. Nevertheless, right above the town of Lyle, native vegetation, primarily pine-oak woodlands border the trail and the Klickitat River lies below and to the west of the trail, in a very steep, but relatively shallow gorge (Figures 4 and 5). Some rare plants are found in this section and are described in more detail in the rare plant section of this report.



**Figure 2. Small population of gooseberry-leaved alumroot in Section 1, between the bench where the trail starts and the river.**





**Figure 3. Beginning of KRT at Highway 14, in Lyle.**



**Figure 4. Middle part of KRT Section 1. Note that Highway 142 lies above and to the east (left) of the trail.**





**Figure 5. Looking down the Klickitat River from the upper part of Section 1 of the KRT.**

## ***Section 2***

This section lies above Section 1. There is an old rail bridge over the river and this section of the trail lies on the west side of the Klickitat River. This section of trail is not close to a major public road and is only accessible from the ends. It is visible in most areas from the highway on the east side of the river. This section of trail is bordered by native vegetation, primarily pine-oak woodlands, with small patches of shrub-steppe vegetation. Some parts of the trail are close to the river and the bordering vegetation is riparian shrub and forest communities (Figure 6). The Klickitat River lies to the east of the trail and spreads across a narrow to wide floodplain. In some places, it comes fairly close to the trail. There is one larger parcel (about 40-acres) near the middle of Section 2. This parcel contains high quality oak/fescue and pine-oak woodlands. However, there is some livestock grazing in this parcel (Figure 7). Rare plants are found along Section 2 and are described in more detail in the rare plant section of this report.



**Figure 6. Looking up the Klickitat River valley along the middle part of Section 2 of the KRT. Note the landslide deposit, nearly blocking the trail.**



**Figure 7. Oak/fescue woodland in the 40-acre parcel that is included in the KRT in the middle of Section 2. Note the cattle grazing in the parcel.**



### Section 3

This is the middle section of the trail and represents the section where the trail and river valley bends to the east. This section starts where a highway bridge crosses the river and the same road crosses the trail. At the beginning of this section, there is a broad trailhead area (Figure 8). This area is bordered by a broad riparian forest, which is in the KRT boundary. The rest of this section is a narrow trail corridor and the trail stays on the north side of the river for the first part, and then crosses over to the south side of the river. The trail goes right through the town of Klickitat. Much of the trail is bordered by riparian forest and shrub communities on the south side of the trail and a mixture of pine-oak woodlands and shrub-steppe communities (Figure 9). Some Douglas-fir communities are found in colder microsites along this section of trail. We found a small population of Suksdorf's desert-parsley (*Lomatium suksdorfii* (S. Wats.) Coult. and Rose) on the lower part of this section, but otherwise there are no known rare plants along this section. A map and description of this plant is found in the Rare Plant section of this report.



**Figure 8. Trailhead area and adjacent riparian forests at the beginning of Section 3 of the KRT.**





**Figure 9. Oak and riparian forests in the middle of Section 3 of the KRT.**

### **Section 4**

After following the Klickitat River east, the KRT bends to the southeast and leaves the Klickitat River near the small community of Wahkiacus. Section 4 of the KRT follows Swale Creek from its confluence with the Klickitat up Swale Creek Canyon. This section of trail runs nearly due south, up a deep, rugged and inaccessible canyon (Figure 10). This section of trail is the most inaccessible portion of the KRT. No roads parallel the trail in this section. The adjacent plateau is about 1000 feet above the canyon in this section of the KRT. The adjacent vegetation is riparian forest and shrub-steppe communities on the side of the trail next to the river. Pine-oak, Douglas-fir-oak (Figure 11) and shrub-steppe communities are found on the uphill side of the KRT. Some Douglas-fir communities are found in colder microsites along this section of trail. There are known populations of obscure buttercup (*Ranunculus reconditus* Nels. & Macbr.) along this section of trail.



**Figure 10. Google Earth view of the KRT in Swale Creek Canyon in Section 4.**



**Figure 11. Douglas-fir and Oregon white oak forests rise above the trail in portions of Section 4.**

## **Section 5**

The Swale Creek Canyon bends abruptly to the east in its upper reaches and the KRT follows along this stream course. Section 5 lies in a more shallow canyon than Section 4. The pine-oak and riparian forests largely give way to shrub-steppe communities and riparian shrub and herbaceous communities along the stream (Figures 12 and 13). This section of trail is actively used rangeland and there is abundant cattle grazing occurring within the trail corridor. We found some small populations of the state-sensitive rare plant, gooseberry-leaved alumroot, which is characteristic of the lower Klickitat Valley, growing on north-facing basalt cliffs on the uphill side of the trail in this section.



**Figure 12. View down the KRT as it drops into the upper part of Swale Creek Canyon in Section 5. Note the basalt cliffs that come down to the trail.**





**Figure 13. View down the KRT as it emerges from the upper part of Swale Creek Canyon in Section 5. The valley is shallow and starts to merge with the surrounding plateau.**

## ***Section 6***

Swale Creek opens up into the flat plateau west of Goldendale and the KRT follows the creek as it opens into the flats. The trail is bordered by heavily grazed rangelands and then finally bordered by agricultural fields as it approaches its upper terminus (Figure 14). No known rare plants have been found in this section of the trail.



**Figure 14. View along Section 6 of the KRT. Note much of the vegetation along this section is non-native.**



# **Vegetation Communities**

## ***Methods***

The first step of this project was to assemble and review the existing data and literature available about the park and its vegetation characteristics. Maps and remotely sensed data were assembled for each park and rare plant sightings were located on these maps. Initially, we used aerial photography and satellite imagery to digitize plant communities or mosaics of plant communities in a GIS environment. We reviewed orthorectified aerial photography and recent satellite images for discernable vegetation or landform patterns. Topographic maps and digital elevation models (DEMs) were also employed to assist the process of vegetation community delineation. Vegetation polygons were created by hand in a GIS by ocular assessment. The vegetation polygon data was edited and stored in an ESRI personal geodatabase. Vegetation polygons represent specific plant communities or unique mosaics of plant communities. They may also represent a significant variation in the ecological condition within a plant community.

Because the KRT is only 80-feet wide in most places, we mapped many sections of the trail as one long polygon. We mapped additional small vegetation polygons along the trail in places where it expanded out beyond a narrow corridor.

The KRT 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 area to create a basic plant list and conduct initial rare plant surveys. We also took notes on this visit related to vegetation communities along the trail. The later visit added more species to the plant list and vegetation polygon surveys were completed. Fieldwork concluded with an ecological assessment of the polygons delineated within the KRT.

Most polygons contained more than one plant community type; therefore, we often assigned a secondary or tertiary vegetation community type to each polygon. We relied on plant association keys and descriptions from several recognized sources to make vegetation community assignments (Beck and Arnett 2001; Bourgeron and Engelking 1994; Clausnitzer and Zamora 1987; Crawford 1999; Crawford 2003; Crowe et al 2002; Daubenmire 1970; Diaz and Mellen 1996; Kagan et al 2000; Kovalchik and Clausnitzer 2004; NatureServe 2008; Topik et al 1988; Washington Natural Heritage Program, Department of Natural Resources, Oregon Natural Heritage Data Base, and The Nature Conservancy 1989; Wolter and Fonda 2002). We also used the NatureServe website ([www.natureserve.org](http://www.natureserve.org)) to evaluate existing plant community names and descriptions and compare them to the vegetation conditions we encountered in the field. In some cases, the vegetation community descriptions in existing studies were not adequate in describing distinctive vegetation associations in the project area. In these cases, new land cover type or plant association names and descriptions were created by PBI.

Survey personnel had printed and digital aerial imagery available during field visits. The latter was accessed in the field using ArcPad software (ESRI 2007) running on pocket PC, GPS enabled devices. This allowed us to view the data in the field, to evaluate our polygon delineations, and to make changes if necessary. It also allowed all survey routes to be mapped on a GPS while performing the vegetation surveys. Data could be viewed and edited directly from field locations, resulting in a field-verified vegetation map.

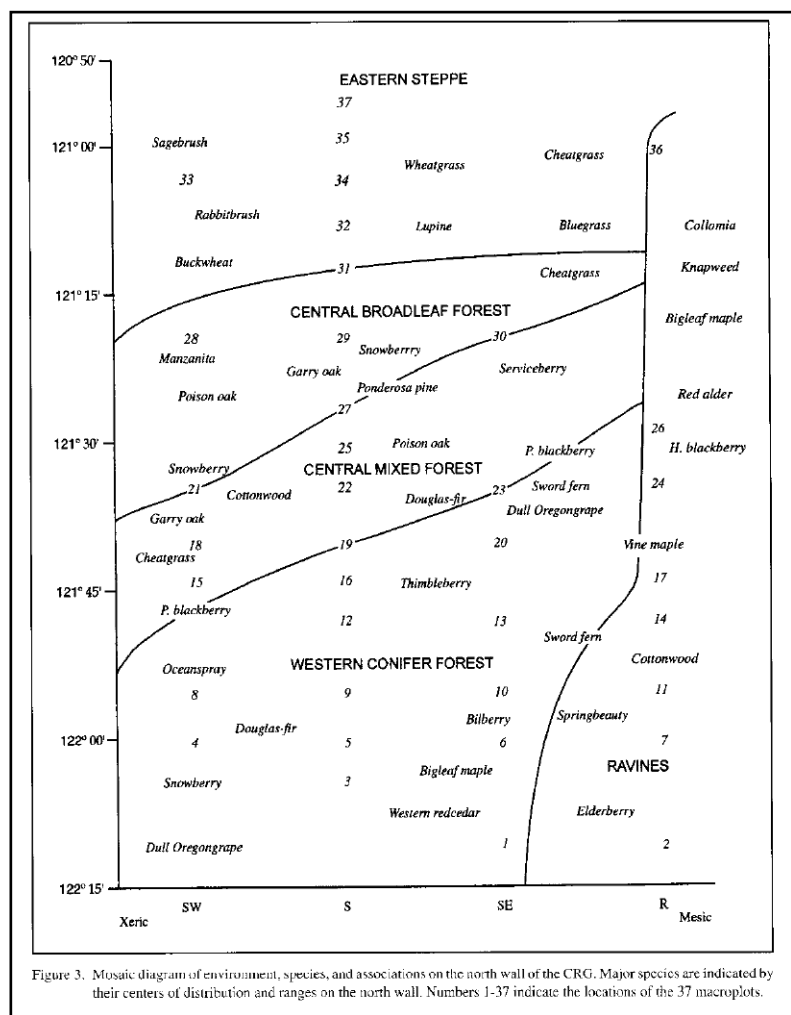
Plant community data was recorded based on methods developed by WSPRC (Appendix A). Recorded data included a wide variety of information about vegetation, environmental characteristics, disturbance

history and notes for each polygon. Each polygon was rated for its overall ecological condition according to a simple ranking system (Appendix B).

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.

## Historical Vegetation

Early explorers first started recording information about vegetation in the Klickitat Valley in the 1800's. The first botanical study in the general area was conducted by J. G. Cooper as part of the Northern Pacific Railroad Survey (Cooper et al 1859, 1860 and 1994). The KRT starts at the confluence of the Klickitat and Columbia Rivers in an area once dominated by Oregon oak woodlands. Now, the lowest part of the trail is within the town of Lyle and is largely developed. The trail extends up the valley, through what still is ponderosa pine – oak woodlands, with scattered more open shrub-steppe covered slopes. There are human developments along the middle portion of the trail, including the town of Klickitat. The uppermost part of the trail becomes progressively more open with basalt cliffs, talus and shrub-steppe communities dominating. The historic vegetation along the trail was probably similar to what exists today. A notable exception is that the uppermost part of the trail now traverses through agricultural fields, which were historically steppe vegetation.



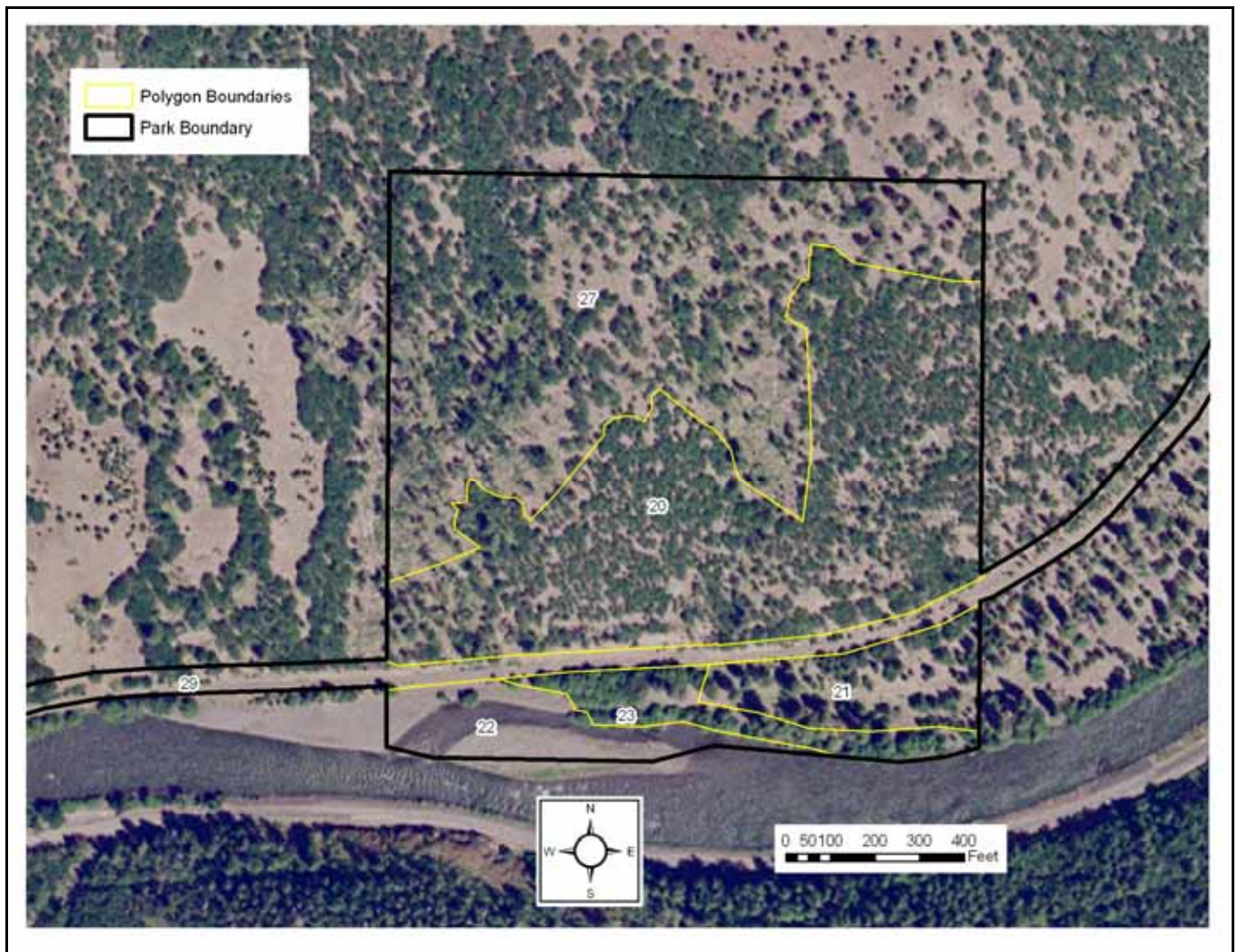
No accurate vegetation maps exist for the park area, but a historic vegetation map (Kiilsgaard and Barrett 1999) corresponds to our observations. Wolter and Fonda (2002) examined the geographic and environmental gradients that affect native plant species and vegetation communities on the Washington side of the Columbia Gorge (Figure 15). The KRT falls primarily in the Central Mixed Forest and Central Broadleaf Forest zones. The upper portion of the KRT falls in the Eastern Steppe zone.

**Figure 15. Diagram of species and associations vs. longitude and moisture on the Washington side of the Columbia River Gorge (from Wolter and Fonda 2002).**

Despite considerable botanical and ecological interest in the Klickitat River Valley and Columbia River Gorge area (Cooper et al 1859, 1860 and 1994, Jolley 1988, Diaz, and Mellen 1996, Columbia River Gorge Commission 2007), the KRT has not been the subject of a prior vegetation survey. It was included in part of the area covered by Wolter and Fonda (2002) in their gradient analysis of vegetation on the north wall of the Columbia River Gorge, but no vegetation surveys or maps were created as part of that study. It was also included in a report on the identification of representative plant communities in the Columbia River Gorge National Scenic Area (Washington Natural Heritage Program, Department of Natural Resources, Oregon Natural Heritage Data Base, The Nature Conservancy. 1989). Both of these reports offer some guidance on existing plant communities.

## Results

A total of 24 vegetation community polygons covered by 6 vegetation and 3 land cover types were mapped and visited in KRT (Figure 17, Tables 1 and 2).



**Figure 16. Map of the KRT showing vegetation community polygons in a 40-acre parcel that is within the KRT boundary.**

**Table 1. Plant communities and land cover observed in KRT.**

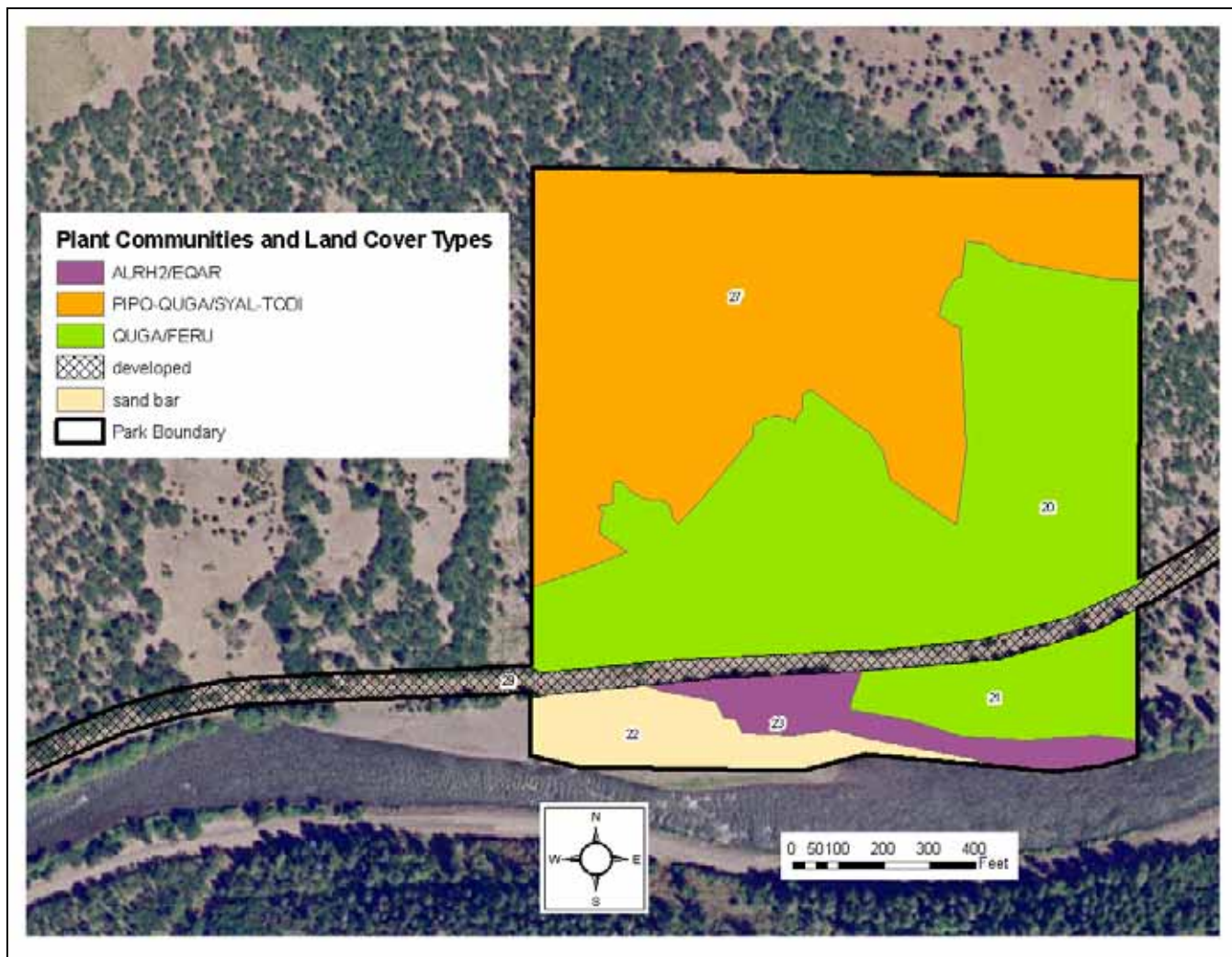
Vegetation Community/Plant Association/Land Cover Name (Code)	Existing Vegetation/Land Cover Observed
POBAT/ALRH2	ACMA3-ALRH2 WETTER FOREST
	ACMA3-ALRH2-POBAT/mixed shrub wet area
ALRH2/EQAR	ALRH2 riparian forest
POBAT/COSE16	POBAT/COSE16/PHAR
PSME-QUGA/SYAL	PSME-QUGA-PIPO/PHLE-HODI-SYAL-RUUR
QUGA/FERU	QUGA/FERU
	QUGA-PIPO/FERU
PIPO-QUGA/SYAL-TODI	QUGA-PIPO FOREST
	QUGA-PIPO/grasses
	QUGA-PIPO/open steep grassland
	QUGA-PIPO/TODI/grasses
WATER	RIVER
sand bar	SAND BARS
developed	DEVELOPED TRAIL / RAIL BED
	DEVELOPED TRAIL / RAIL BED, roads, parking, disturbed vegetation
	DISTURBED AREA old rail bed - QUGA/grasses-exotics
	DISTURBED OLD RAIL ROAD BED AND SIDES
	DISTURBED VEG - DEVELOPED TRAIL / RAIL BED

**Table 2. Plant association reference table for KRT. (See Appendix C for status codes. Note that the “~” under Global Status represents the rank estimated by PBI.)**

Code	Scientific Names	Common Names	Authority	Global Status
POBAT/ALRH2	<i>Populus balsamifera</i> ssp. <i>trichocarpa</i> - <i>Alnus rhombifolia</i>	black cottonwood - white alder	Kagan 2004	G1
ALRH2/EQAR	<i>Alnus rhombifolia</i> / <i>Equisetum arvense</i>	white - alder / field horsetail	Crawford 2003	NR
PIPO-QUGA/SYAL-TODI	<i>Pinus ponderosa</i> - <i>Quercus garryana</i> / <i>Symphoricarpos albus</i> – <i>Toxidendron diversilobum</i>	Ponderosa Pine - Oregon White Oak / Common Snowberry – Poison oak	PBI	~G2
POBAT/COSE16	<i>Populus balsamifera</i> ssp. <i>trichocarpa</i> / <i>Cornus sericea</i>	black cottonwood / red-osier dogwood	Kovalchik 1993	G3G4
PSME-QUGA/SYAL	<i>Pseudotsuga menziesii</i> - <i>Quercus garryana</i> / <i>Symphoricarpos albus</i>	Douglas-fir - Oregon White Oak / Pacific Poison-oak	Kagan 2004	G3
QUGA/FERU	<i>Quercus garryana</i> / <i>Festuca</i> (roemerii, <i>rubra</i> )	Oregon White Oak / (Roemer's Fescue, Red Fescue)	Kagan 2004	G1

Figure 17 shows a map of a 40-acre parcel that is within the KRT boundary classified into the primary land cover types attributed to each polygon. Maps for the rest of the park were not possible due to the very narrow nature of the trail. The GIS database created for this project can be queried and displayed to show the more complex mixtures of vegetation communities that occur in many polygons. Appendix D lists the attributes for each polygon in the project area.





**Figure 17. Primary vegetation communities and land cover types attributed to each vegetation polygon in a 40-acre parcel that is within the KRT boundary (Vegetation data for the other polygons is provided in a GIS dataset delivered in association with this report).**

## ***Vegetation Community and Land Cover Types***

Only the plant communities that are found in the extended parcels that are part of the KRT boundary are described here. Description of adjacent vegetation communities was beyond the scope of work for this project.

### ***Quercus garryana* / *Festuca (roemerii, rubra)* Wooded Herbaceous Vegetation – (QUGA-FERU) G1**

Translated Name: **Oregon White Oak / (Roemer's Fescue, Red Fescue) Wooded Herbaceous Vegetation**



**Figure 18. Oregon white oak / fescue woodland in the 40-acre parcel in Section 2 of the KRT.**

The Oregon white oak / (Roemer's fescue, red fescue) wooded herbaceous vegetation community is best represented in polygons 20 and 21, which are in the 40-acre parcel that is part of Section 2 of the KRT (Figure 18). This community is also found adjacent to the trail in other areas, but not represented well within the KRT boundary. This association is primarily known from a few remaining sites in Washington, Oregon, and northwestern California (NatureServe 2008). It is found at low elevations, particularly in the Columbia River Gorge area, on southerly aspects. Annual precipitation is relatively low, and there is a distinct summer dry season. Soils are moderately deep, rocky silt loams to loams, derived from mixed colluvium of basaltic materials with a minor component of loess. This association is dominated by the perennial grasses Roemer's fescue or red fescue with a sparse tree layer of Oregon white oak (10-30% canopy cover). Other tree species may include occasional ponderosa pine individuals (NatureServe 2008). This community has a G1 global conservation rank, indicating it is critically imperiled. Cattle were



observed grazing in this parcel at the time of the spring survey. This parcel should be fenced and this use eliminated if this critically imperiled is to be adequately protected.

***Pinus ponderosa* - *Quercus garryana* / *Symphoricarpos albus* – *Toxidendron diversilobum* Woodland (PIPO-QUGA/SYAL-TODI) ~G2**

**Translated Name:** Ponderosa Pine - Oregon White Oak / Common Snowberry – Poison oak Woodland



**Figure 19. Ponderosa Pine - Oregon White Oak / Common Snowberry – Poison oak Woodland in the 40-acre parcel in Section 2 of the KRT.**

The Ponderosa Pine - Oregon White Oak / Common Snowberry – Poison oak Woodland community is best represented in polygon 27, which is in the 40-acre parcel that is part of Section 2 of the KRT (Figure 19). This community is similar to the *Pinus ponderosa* - *Quercus garryana* / *Symphoricarpos albus* Woodland described by Kagan et al (2000). Here, however, snowberry is replaced largely with poison oak. It also has many of the characteristics of the Oregon white oak / (Roemer's fescue, red fescue) wooded herbaceous vegetation community described above, but has more ponderosa pine and more shrub cover. This is a new community, not defined before, but we would give it a G2 rank based on similarities with other adjacent communities.



***Pseudotsuga menziesii* - *Quercus garryana* / *Symphoricarpos albus* Woodland (PSME-QUGA/SYAL) G3**

**Translated Name:** Douglas-fir - Oregon White Oak / snowberry Woodland

The Douglas-fir - Oregon White Oak / snowberry Woodland is found in Sections 3 and 4 of the KRT (Figure 11). It is similar to the community described above, with the addition of Douglas-fir. Some times Douglas-fir occurs in combination with ponderosa pine. This is a seral, fire-dependant association, which did not cover an important part of the pre-settlement landscape until fire suppression. These oak forests became quite widespread over the last 100 years, but are now rapidly declining due to secondary succession, development and other threats (NatureServe 2008). This is a G3 plant community and quite rare along the KRT.

***Populus balsamifera* ssp. *trichocarpa* - *Alnus rhombifolia* Seasonally Flooded Forest (POBAT-ALRH2) G1**

**Translated Name:** Black cottonwood / white alder community type

This is a deciduous broad-leaved forest association found in the lower Oregon white oak zone or shrub-steppe zone in eastern Washington and Oregon. It is a riparian community typically found in narrow canyons with some floodplain development. The tree layer is characterized by an open layer of black cottonwood over a denser layer of white alder. The tree canopy is mostly closed. The undergrowth is poorly documented and maybe highly variable displaying tall-shrub to herbaceous dominance. This is an existing vegetation type that merges into more strict potential types indicated by white alder.

***Alnus rhombifolia* / *Equisetum arvense* Seasonally Flooded Forest (ALRH2/EQAR) NR**

**Translated Name:** White alder / common horsetail community type



**Figure 20. White alder riparian forest (foreground) in the 40-acre parcel in Section 2 of the KRT.**

There is a small patch of a white alder riparian forest in polygon 23, which is in the 40-acre parcel that is part of Section 2 of the KRT (Figure 20). This riparian forest type also occurs all along the Klickitat River and other portions of the trail touch or partially include this forest type. This community type was described by Crawford (2003). Variants of white alder riparian forests that include mock orange or water birch as diagnostic secondary species are also found along the Klickitat River and are adjacent or small pieces of these communities may be included within the KRT boundary.

### **Cliffs**

Steep basalt cliffs with moss and other patchy vegetation occur in places along the KRT. These are small patch communities and were not sampled due to the difficulty and danger associated with this steep terrain.

### **Sandbars**

Sandbars with sparse (or no) vegetation are found along the Klickitat River. Polygon 22 represents such a sandbar. Other parts of the KRT may lie adjacent or partially include such features. These seasonally flooded areas are composed of sand and gravel. Sparse herbaceous cover as well as small shrubs or tree seedling/saplings may also be present.

### **Developed**

Most of the KRT is mapped as a developed recreational site with disturbed borders. The KRT consists of an old railroad bed that is in the process of being converted to a recreational trail. The KRT boundary width is about 80-feet in most places (as depicted in the GIS data provided by WA Parks). It is usually not marked or fenced, so verification of this boundary is impossible in the field.

### **Other Plant Communities found adjacent to the KRT**

Several other plant communities are found adjacent to the KRT, but not well represented within its boundaries. These are described briefly below.

#### **Oregon white oak / poison oak / blue wildrye Woodland (QUGA/TODI/ELGL)**

This vegetation community was described in Washington NHP and Oregon NHDB (1989). It is composed of an overstory of Oregon white oak with patches of poison oak in the understory. In addition, there is usually a high cover of annual and perennial grasses. Currently, much of the grass component is exotic annual species. The Columbia River Gorge Scenic Area Management Plan identifies the Oregon white oak woodlands as a high priority habitat with “comparatively high fish and wildlife density, species diversity, declining availability, high vulnerability” (Columbia River Gorge Commission 2007). It occurs frequently on the slopes adjacent to the KRT.

This plant community is identical to the Oregon white oak / poison oak – common snowberry / wildrye community described by Bourgeron and Engelking (1994) and has some similarities to the Oregon white oak / bluebunch wheatgrass associations described by Lillybridge et al (1995) and Bourgeron and Engelking (1994).

This is a fire-dependant association throughout most of its range. Maintenance of a natural fire regime with frequent, low-intensity fire may be important to maintain the ecological health of this community.

## **Snow buckwheat / Sandberg bluegrass – bluebunch wheatgrass (ERNI2/POSE-PSSP6)**

This vegetation community is found on lithosol soils in the project area in Section 5 of the KRT. It is characterized by sparse cover of snow buckwheat with grass cover of curly bluegrass, bluebunch wheatgrass and annual exotic grasses. Perennial and annual forbs are also common. Exposed rock, gravel and mineral soil, often covered with ground lichens and mosses, is a prominent feature of most communities. This is a variant of the Snow buckwheat / Sandberg bluegrass Dwarf-shrub Herbaceous Vegetation community (NatureServe) and the Snow buckwheat / Sandberg bluegrass community (Bourgeron and Engelking 1994). These communities are restricted to the Columbia Basin. It has a Global Conservation Status of G3 (vulnerable). A major threat to this association is alteration of composition with exotic plant invasion. Adverse impact from livestock grazing is also a significant factor within KRT.

## **Talus with poison oak (TODI) and Lewis' mock orange (PHLE4)**

Talus slopes are common on the slopes above the KRT. Some slopes are very extensive, while others are small patches below cliffs or on steep hillsides. The talus may be partially vegetated or completely absent of vegetation. Often poison oak is common on or adjacent to the talus slopes. Mock orange and chokecherry are also common associates. This community has similarities to the "talus with PHLE4, TODI" plant community described in Washington NHP and Oregon NHDB (1989).

## **Rare Plant Surveys**

### ***Methods***

We visited the project area of the KRT 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. We brought a portable plant identification lab with us to the State Park, complete with microscopes and other of plant identification tools. We collected plant specimens for later identification when needed. We used a wide range of floras and other plant identification references (e.g. Boersma et al 2006, Flora of North America 1993+, Jolley 1988, Hitchcock and Cronquist 1973, Hitchcock et al 1955, Hickman 1993, University of Washington Burke Museum Herbarium Vascular Plant Collection, USDA 2008, Washington Natural Heritage Program 2008, Washington Natural Heritage Program. no date, Whitson et al 2000, Wilson 2006).

Field surveys were conducted during the April 8-11, 2008 and August 4-6, 2008 periods. We looked for rare plants in habitats previously identified as being likely occurrence sites based on DNR NHP rare plant lists and maps of previous sightings in the surrounding area. 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 cover efficiently 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. This method is referred to as the intuitive-controlled method of rare plant surveys (Whiteaker et al. 1998). Survey routes for the rare plant inventory, as well as rare plant locations were recorded either as GPS waypoints and trackpoints, which were later compiled into GIS layers provided to WSPRC in association with this report.



## Results

The Klickitat River Valley is a hot spot for rare plants. There are nine rare plant element occurrences (comprising 4 vascular plant species and one moss species) recorded in the WA DNR NHP database that are either in the KRT boundary or within a 100-ft buffer of the KRT (Table 3). These species and sightings are described below and mapped in Figures 21-25. There are three additional rare plant species within a 1-mile buffer of the KRT recorded in the NHP database (Table 4).

**Table 3. Rare Plants within a 100-ft buffer of the KRT and associated State Park property.**

Scientific Name	Common Name	CODE	FED STAT	ST STAT	S RANK	G RANK	LAST OBS
<i>Scouleria marginata</i>	A Moss	SCMA10		T	S2	G3	1996
<i>Heuchera grossulariifolia</i> var. <i>tenuifolia</i>	Gooseberry-leaved Alumroot	HEGRT		S	S3	G4T3T4	2003
<i>Lomatium suksdorfii</i>	Suksdorf's Desert-parsley	LOSU4	SC	S	S3	G3	1988
<i>Heuchera grossulariifolia</i> var. <i>tenuifolia</i>	Gooseberry-leaved Alumroot	HEGRT		S	S3	G4T3T4	1988
<i>Ranunculus reconditus</i>	Obscure Buttercup	RARE5	SC	E	S1	G2	2006
<i>Meconella oregano</i>	White Meconella	MEOR	SC	T	S1	G2G3	1988
<i>Meconella oregano</i>	White Meconella	MEOR	SC	T	S1	G2G3	1991
<i>Meconella oregano</i>	White Meconella	MEOR	SC	T	S1	G2G3	1988
<i>Heuchera grossulariifolia</i> var. <i>tenuifolia</i>	Gooseberry-leaved Alumroot	HEGRT		S	S3	G4T3T4	1988

**Table 4. Additional rare plants within 1 mile buffer of KRT and associated State Park property.**

Scientific Name	Common Name	CODE	FED STAT	ST STAT	S RANK	G RANK	LAST OBS
<i>Linanthus bolanderi</i>	Baker's Linanthus	LIBO2		S	S2	G4G5	1986
<i>Penstemon deustus</i> var. <i>variabilis</i>	Hot-rock Penstemon	PEDEV2		T	S1S2	G5T1T2	2001
<i>Githopsis specularioides</i>	Common Blue-cup	GISP3		S	S3	G5	2003

We located some of these known rare populations and identified other populations. The rare plant species we located are listed in Table 5. These species and sightings are described below and mapped in Figures 21-25.

**Table 5. Rare plant populations that PBI located at the KRT.**

Scientific Name	Common Name	CODE	FED STAT	ST STAT	S RANK	G RANK
<i>Heuchera grossulariifolia</i> var. <i>tenuifolia</i>	Gooseberry-leaved Alumroot	HEGRT		S	S3	G4T3T4
<i>Lomatium suksdorfii</i>	Suksdorf's Desert-parsley	LOSU4	SC	S	S3	G3

The GIS data on rare plants provided by the WA DNR NHP program shows a previous sighting location for white meconella (*Meconella oregana*), a state threatened plant, in Section 1 of the KRT (Figure 21). The population of meconella is centered outside of the KRT boundary. We surveyed this location and did not find any plants matching the description of this species. As described below, this species has a very short blooming window and it is very likely that we were not there at the right time. This species is only identifiable when in flower. However, this section of the KRT is very narrow and highly developed/disturbed and it is quite unlikely that suitable habitat for this species exists within the KRT boundary. The WA DNR NHP sightings are normally mapped very generously and often the mapped boundary extends a good distance beyond the known population.

The GIS data on rare plants provided by the WA DNR NHP program shows a previous sighting location for obscure buttercup (*Ranunculus reconditus*), a state endangered plant, in Sections 4 and 5 of the KRT (Figure 25). Most of the populations of obscure buttercup are on the plateau above the trail, outside of the KRT boundary. As described below, this species also has a very short blooming window and it is very likely that we were not there at the right time. This species is only identifiable when in flower. However, this section of the KRT is also very narrow and highly developed/disturbed and suitable habitat for this species may not exist within the KRT boundary. The WA DNR NHP sightings are normally mapped very generously and often the mapped boundary extends a good distance beyond the known population.

Rare plant info redacted. Contact Washington State Parks and Recreation Commission for further information.

**Figure 21. Rare plant populations in Section 1 of the KRT.**



Rare plant info redacted. Contact Washington State Parks and Recreation Commission for further information.

**Figure 22. Rare plant populations in the lower part of Section 2 of the KRT.**

Rare plant info redacted. Contact Washington State Parks and Recreation Commission for further information.

**Figure 23. Rare plant populations in the middle part of Section 2 of the KRT.**

Rare plant info redacted. Contact Washington State Parks and Recreation Commission for further information.

**Figure 24. Rare plant populations in the upper part of Section 2 and lower part of Section 3 of the KRT.**



Rare plant info redacted. Contact Washington State Parks and Recreation Commission for further information.

**Figure 25. Rare plant populations in the upper part of Section 4 and Section 5 of the KRT.**

## Descriptions of Rare Plants along the KRT

***Heuchera grossulariifolia*** Rydb. **var. *tenuifolia*** (Wheelock) C.L. Hitchc.

gooseberry-leaved alumroot

Saxifragaceae (Saxifrage Family)

**Status:** State Sensitive

**Rank:** G4T3T4S3



**Figure 26. Gooseberry-leaved alumroot (*Heuchera grossulariifolia*) found growing along the KRT.**

This species occurs along the KRT in numerous places (Figure 26). We found it growing on basalt cliffs and basalt railbed cuts and mapped several new meta-populations. Its habitat may have actually been enhanced by the construction of the railroad, as more suitable cliff habitat was created in the railbed cuts. Most of the population of this species is centered on the lower Klickitat Valley, but we found a small, new population in Section 5 of the KRT. Its habitat is moist basalt cliffs and talus. Currently there are no imminent threats to this species along the KRT, but the WA DNR NHP (2008) lists herbicide applications, road maintenance, recreation, residential development, and timber harvesting as threats to the species.

***Lomatium suksdorfii* (S. Wats.) Coult. and Rose**

Suksdorf's desert-parsley

Apiaceae (Parsley Family)

**Status:** State Sensitive, USFWS Species of Concern

**Rank:** G3S3



**Figure 27. Suksdorf's desert-parsley (*Lomatium suksdorfii*) found growing along Sections 2 and 3 of the KRT.**

This species occurs along the KRT in several places (Figure 27). We found it growing on the uphill railbed cut and mapped several new meta-populations, both within the KRT boundary and outside it. It grows more profusely on the open slopes above the KRT in the lower and middle Klickitat Valley. Its habitat is semi-open to open, dry rocky hillsides on moderate to steep slopes (WA DNR NHP 2008). Currently there are no immanent threats to this species along the KRT, but the WA DNR NHP (2008) lists livestock grazing, timber harvesting, residential development as threats to the species. Pesticide applications related to forest management are also listed as a threat, in that they may kill of pollinators of this species.



**Meconella oregana** Nutt.

white meconella

Papaveraceae (Poppy Family)

**Status:** State Threatened, USFWS Species of Concern

**Rank:** G2G3S2



**Figure 28. White meconella (*Meconella oregana*) (from Reid Schuller, WA DNR NHP rare plant guide)**

This state threatened rare plant species is a slender annual, 1-4 inches tall, with a very short blooming period, which varies, depending on the year, from late March to early April (Figure 28) (WA DNR NHP 2008). It occurs primarily in open grassland, sometimes within a mosaic of forest/grassland on gradual to steep slopes with Oregon white oak, ponderosa pine and/or Douglas fir present (WA DNR NHP 2008). As mentioned above, we did not observe this species during our surveys and habitat for this species is unlikely in the very narrow KRT trail corridor. However, before the presence of this species is ruled out within the KRT, surveys that are more extensive should be conducted throughout late March and early April at likely locations. It may be difficult to catch the narrow blooming period of this species.

Fire probably played a role historically in maintenance of the habitat in terms of both reducing tree and shrub invasion of its habitat and in terms of expansion and growth of competing grasses and forbs (WA DNR NHP 2008). Restoration of a natural fire regime would benefit this species, as long as weedy annuals did not take over. Threats to this species include livestock grazing, herbicide applications, timber harvesting, and residential development.

## **Ranunculus reconditus** Nels. & Macbr.

obscure buttercup

Ranunculaceae (Buttercup Family)

**Status:** State Endangered, USFWS Species of Concern

**Rank:** G2S1



**Figure 29. Obscure buttercup (*Ranunculus reconditus*) from Elise Augenstein (left) and Reid Schuller (right) in WA NHP rare plant guide.**

This state threatened rare plant species is a showy, yellow-flowered perennial that grows 2-8 inches in height with flowers on the ends of the tallest stems (Figure 29) (WA DNR NHP 2008). The leaves are cut or incised into 3 distinct leaflets and occur along the flower-stalk as well as on shorter vegetative stems which originate at the base of the plant. The leaves emerge by the initiation of flowering in the first week of March. Blooming typically occurs during the second and third weeks of March. By mid to late April the fruits have dispersed and the plant has senesced. As mentioned above, this species has been reported before, on, or near the KRT in Section 5 of the trail. In order to confirm this previous sighting and to find new populations for this species, our surveys would have to be conducted during March. As our contract was not finalized at that time, we were not able to survey for this species during the necessary period. We recommend that the upper part of the KRT be surveyed in the future for the obscure buttercup, as this is an exceedingly rare and endangered species during the blooming period.

Portions of the historic range of this species have been lost to or degraded by livestock grazing and agricultural practices. The primary land use within the species range is livestock grazing, which is occurring along the portion of the KRT where this species is found. The species response to grazing appears to depend on stocking levels, timing of grazing, proximity of available water, etc (WA DNR NHP 2008). Competition with non-native plants is also a concern with respect to this species. Efforts to control non-natives with herbicides would likely also eliminate *R. reconditus*. Another concern is how the species will respond when a fire burns in the area. Past fire-exclusion has increased litter build-up and current wildfires could be hotter than in the past. Prescribed fires could result in cooler burns, which might benefit this species.

## **Flora of the KRT**

During our rare plant surveys, we found 190 vascular plant species at KRT. 54 of these species were non-native (Table 6).

**Table 6. Vascular Plant Species for KRT.**

Symbol	Scientific Name with Author	National Common Name	Family	Exotic	Global Rank	State Rank	State Status	Federal Status
ACMA3	<i>Acer macrophyllum</i> Pursh	bigleaf maple	Aceraceae					
ACMI2	<i>Achillea millefolium</i> L.	common yarrow	Asteraceae					
AGCR	<i>Agropyron cristatum</i> (L.) Gaertn.	crested wheatgrass	Poaceae	YES				
AGGR	<i>Agoseris grandiflora</i> (Nutt.) Greene	bigflower agoseris	Asteraceae					
AGRE	<i>Agoseris retrorsa</i> (Benth.) Greene	spearleaf agoseris	Asteraceae					
AGROP2	<i>Agropyron</i> Gaertn.	wheatgrass	Poaceae					
AIAL	<i>Ailanthus altissima</i> (Mill.) Swingle	tree of heaven	Simaroubaceae	YES				
ALIN2	<i>Alnus incana</i> (L.) Moench	gray alder	Betulaceae					
ALRH2	<i>Alnus rhombifolia</i> Nutt.	white alder	Betulaceae					
ALRU2	<i>Alnus rubra</i> Bong.	red alder	Betulaceae					
AMAL2	<i>Amelanchier alnifolia</i> (Nutt.) Nutt. ex M. Roem.	Saskatoon serviceberry	Rosaceae					
AMMEM2	<i>Amsinckia menziesii</i> (Lehm.) A. Nelson & J.F. Macbr. var. <i>menziesii</i>	Menzies' fiddleneck	Boraginaceae					
APAN2	<i>Apocynum androsaemifolium</i> L.	spreading dogbane	Apocynaceae					
ARLU	<i>Artemisia ludoviciana</i> Nutt.	white sagebrush	Asteraceae					
ASOF	<i>Asparagus officinalis</i> L.	garden asparagus	Liliaceae	YES				
ASTRA	<i>Astragalus</i> L.	milkvetch	Fabaceae					
BACA3	<i>Balsamorhiza careyana</i> A. Gray	Carey's balsamroot	Asteraceae					
BOYKI	<i>Boykinia</i> Nutt.	brookfoam	Saxifragaceae					
BRTE	<i>Bromus tectorum</i> L.	cheatgrass	Poaceae	YES				
CAGE2	<i>Carex geyeri</i> Boott	Geyer's sedge	Cyperaceae					
CANUN2	<i>Cardamine nuttallii</i> Greene var. <i>nuttallii</i>	palmate toothwort	Brassicaceae					
CAOL	<i>Cardamine oligosperma</i> Nutt.	little western bittercress	Brassicaceae					
CAQUB2	<i>Camassia quamash</i> (Pursh) Greene ssp. <i>breviflora</i> Gould	small camas	Liliaceae					
CAST	<i>Callitriche stagnalis</i> Scop.	pond water-starwort	Callitricaceae	YES				
CECY2	<i>Centaurea cyanus</i> L.	garden cornflower	Asteraceae	YES				
CEDI3	<i>Centaurea diffusa</i> Lam.	diffuse knapweed	Asteraceae	YES				
CEDU2	<i>Cerastium dubium</i> (Bast.) Guépin	doubtful chickweed	Caryophyllaceae	YES				
CEGL2	<i>Cerastium glomeratum</i> Thuill.	sticky chickweed	Caryophyllaceae	YES				
CEIN3	<i>Ceanothus integerrimus</i> Hook. & Arn.	deerbrush	Rhamnaceae					
CESO3	<i>Centaurea solstitialis</i> L.	yellow star-thistle	Asteraceae	YES				
CESTM	<i>Centaurea stoebe</i> L. ssp. <i>micranthos</i> (Gugler) Hayek	spotted knapweed	Asteraceae	YES				
CIIN	<i>Cichorium intybus</i> L.	chicory	Asteraceae	YES				
CIRSI	<i>Cirsium</i> Mill.	thistle	Asteraceae					
CIUN	<i>Cirsium undulatum</i> (Nutt.) Spreng.	wavyleaf thistle	Asteraceae					
CLI2	<i>Clematis ligusticifolia</i> Nutt.	western white clematis	Ranunculaceae					
CLPE	<i>Claytonia perfoliata</i> Donn ex Willd.	miner's lettuce	Portulacaceae					
CLPEP	<i>Claytonia perfoliata</i> Donn ex Willd. ssp. <i>perfoliata</i>	miner's lettuce	Portulacaceae					
COCA5	<i>Conyza canadensis</i> (L.) Cronquist	Canadian horseweed	Asteraceae					
COCO6	<i>Corylus cornuta</i> Marsh.	beaked hazelnut	Betulaceae					



Symbol	Scientific Name with Author	National Common Name	Family	Exotic	Global Rank	State Rank	State Status	Federal Status
COLLI	Collinsia Nutt.	blue eyed Mary	Scrophulariaceae					
COPA3	Collinsia parviflora Lindl.	maiden blue eyed Mary	Scrophulariaceae					
CORA2	Collinsia rattanii A. Gray	sticky blue eyed Mary	Scrophulariaceae					
COSE16	Cornus sericea L.	redosier dogwood	Cornaceae					
COUM	Comandra umbellata (L.) Nutt.	bastard toadflax	Santalaceae					
COUMC	Comandra umbellata (L.) Nutt. ssp. californica (Eastw. ex Rydb.) Piehl	California bastard toadflax	Santalaceae					
CRDO2	Crataegus douglasii Lindl.	black hawthorn	Rosaceae					
CRIN8	Cryptantha intermedia (A. Gray) Greene	Clearwater cryptantha	Boraginaceae					
CRMU	Crocidium multicaule Hook.	common spring-gold	Asteraceae					
CYEC	Cynosurus echinatus L.	bristly dogstail grass	Poaceae	YES				
CYGR	Cynoglossum grande Douglas ex Lehm.	Pacific hound's tongue	Boraginaceae					
CYSC4	Cytisus scoparius (L.) Link	Scotch broom	Fabaceae	YES				
DACA6	Daucus carota L.	Queen Anne's lace	Apiaceae	YES				
DAGL	Dactylis glomerata L.	orchardgrass	Poaceae	YES				
DELPH	Delphinium L.	larkspur	Ranunculaceae					
DEMEM	Delphinium menziesii DC. ssp. menziesii	Menzies' larkspur	Ranunculaceae					
DEOC	Delphinium xoccidentale (S. Watson) S. Watson (pro sp.) [barbeyi x glaucum]		Ranunculaceae					
DIFU2	Dipsacus fullonum L.	Fuller's teasel	Dipsacaceae	YES				
DOCOC3	Dodecatheon conjugens Greene ssp. conjugens	Bonneville shootingstar	Primulaceae					
DRVE2	Draba verna L.	spring draba	Brassicaceae	YES				
EPMI	Epilobium minutum Lindl. ex Lehm.	chaparral willowherb	Onagraceae					
EQHY	Equisetum hyemale L.	scouringrush horsetail	Equisetaceae					
EQTE	Equisetum telmateia Ehrh.	giant horsetail	Equisetaceae					
ERIC6	Erodium cicutarium (L.) L'Hér. ex Aiton	redstem stork's bill	Geraniaceae	YES				
ERCO12	Eriogonum compositum Douglas ex Benth.	arrowleaf buckwheat	Polygonaceae					
EREL5	Eriogonum elatum Douglas ex Benth.	tall woolly buckwheat	Polygonaceae					
ERGR9	Erythronium grandiflorum Pursh	yellow avalanche-lily	Liliaceae					
ERNI2	Eriogonum niveum Douglas ex Benth.	snow buckwheat	Polygonaceae					
ESCA2	Eschscholzia californica Cham.	California poppy	Papaveraceae					
FRAFA2	Fritillaria affinis (Schult.) Sealy var. affinis	checker lily	Liliaceae					
FRALA	Fraseria albicaulis Douglas ex Griseb. var. albicaulis	whitestem fraseria	Gentianaceae					
FRITI	Fritillaria L.	fritillary	Liliaceae					
GAAP2	Galium aparine L.	stickywilly	Rubiaceae					
GEMO	Geranium molle L.	dovefoot geranium	Geraniaceae	YES				
HEGRT	Heuchera grossularifolia Rydb. var. tenuifolia (Wheelock) C.L. Hitchc.	gooseberryleaf alumroot	Saxifragaceae		G4T3T4	S3	S	
HEVIF	Heterotheca villosa (Pursh) Shinnars var. foliosa (Nutt.) V.L. Harms	hairy false goldenaster	Asteraceae					
HODI	Holodiscus discolor (Pursh) Maxim.	oceanspray	Rosaceae					
HOUM	Holosteum umbellatum L.	jagged chickweed	Caryophyllaceae	YES				

Symbol	Scientific Name with Author	National Common Name	Family	Exotic	Global Rank	State Rank	State Status	Federal Status
HYCA4	Hydrophyllum capitatum Douglas ex Benth.	ballhead waterleaf	Hydrophyllaceae					
HYCAT	Hydrophyllum capitatum Douglas ex Benth. var. thompsonii (M. Peck) Constance	Thompson's waterleaf	Hydrophyllaceae					
HYOR	Hyacinthus orientalis L.	garden hyacinth	Liliaceae	YES				
HYPE	Hypericum perforatum L.	common St. Johnswort	Clusiaceae	YES				
HYRA	Hydrocotyle ranunculoides L. f.	floating marshpennywort	Apiaceae					
HYRA3	Hypochaeris radicata L.	hairy cat's ear	Asteraceae	YES				
IRSI	Iris sibirica L.	Siberian iris	Iridaceae	YES				
ISOET	Isoetes L.	quillwort	Isoetaceae					
JUEN	Juncus ensifolius Wikstr.	swordleaf rush	Juncaceae					
LAAM	Lamium amplexicaule L.	henbit deadnettle	Lamiaceae	YES				
LALA4	Lathyrus latifolius L.	perennial pea	Fabaceae	YES				
LAPU2	Lamium purpureum L.	purple deadnettle	Lamiaceae	YES				
LATHY	Lathyrus L.	pea	Fabaceae					
LIDAD	Linaria dalmatica (L.) Mill. ssp. dalmatica	Dalmatian toadflax	Scrophulariaceae	YES				
LIGL2	Lithophragma glabrum Nutt.	bulbous woodland-star	Saxifragaceae					
LIPA5	Lithophragma parviflorum (Hook.) Nutt. ex Torr. & A. Gray	smallflower woodland-star	Saxifragaceae					
LOBIL	Lomatium bicolor (S. Watson) J.M. Coult. & Rose var. leptocarpum (Torr. & A. Gray) Schlessman	Wasatch desertparsley	Apiaceae					
LOCO	Lomatium columbianum Mathias & Constance	purple leptotaenia	Apiaceae					
LOCO6	Lotus corniculatus L.	bird's-foot trefoil	Fabaceae	YES				
LODI	Lomatium dissectum (Nutt.) Mathias & Constance	fernleaf biscuitroot	Apiaceae					
LONU2	Lomatium nudicaule (Pursh) J.M. Coult. & Rose	barestem biscuitroot	Apiaceae					
LOSU4	Lomatium suksdorfii (S. Watson) J.M. Coult. & Rose	Suksdorf's desertparsley	Apiaceae		G3	S3	S	SC
LOTR2	Lomatium triternatum (Pursh) J.M. Coult. & Rose	nineleaf biscuitroot	Apiaceae					
LUBI	Lupinus bicolor Lindl.	miniature lupine	Fabaceae					
LUBIS	Lupinus bingenensis Suksd. var. subsaccatus Suksd.	Bingen lupine	Fabaceae					
LUCA2	Luzula campestris (L.) DC.	field woodrush	Juncaceae					
LULE3	Lupinus leucophyllus Douglas ex Lindl.	velvet lupine	Fabaceae					
LUPIN	Lupinus L.	lupine	Fabaceae					
LURI	Lupinus rivularis Douglas ex Lindl.	riverbank lupine	Fabaceae					
LUWY	Lupinus wyethii S. Watson	Wyeth's lupine	Fabaceae					
LUZUL	Luzula DC.	woodrush	Juncaceae					
LYCO	Lychnis coronaria (L.) Desr.	rose campion	Caryophyllaceae	YES				
MAAQ2	Mahonia aquifolium (Pursh) Nutt.	hollyleaved barberry	Berberidaceae					
MAHON	Mahonia Nutt.	barberry	Berberidaceae					
MAOR3	Marah oreganus (Torr. ex S. Watson) Howell	coastal manroot	Cucurbitaceae					
MAPU	Malus pumila Mill.	paradise apple	Rosaceae	YES				

Symbol	Scientific Name with Author	National Common Name	Family	Exotic	Global Rank	State Rank	State Status	Federal Status
MESA	<i>Medicago sativa</i> L.	alfalfa	Fabaceae	YES				
MIGR	<i>Microsteris gracilis</i> (Hook.) Greene	slender phlox	Polemoniaceae					
MIGRH	<i>Microsteris gracilis</i> (Hook.) Greene var. <i>humilior</i> (Hook.) Cronquist	slender phlox	Polemoniaceae					
MIGU	<i>Mimulus guttatus</i> DC.	seep monkeyflower	Scrophulariaceae					
MIMUL	<i>Mimulus</i> L.	monkeyflower	Scrophulariaceae					
MYDI	<i>Myosotis discolor</i> Pers.	changing forget-me-not	Boraginaceae	YES				
NECA2	<i>Nepeta cataria</i> L.	catnip	Lamiaceae	YES				
NEMOP	<i>Nemophila</i> Nutt.	baby blue eyes	Hydrophyllaceae					
NEPAP	<i>Nemophila parviflora</i> Douglas ex Benth. var. <i>parviflora</i>	smallflower nemophila	Hydrophyllaceae					
OLDOD	<i>Olsynium douglasii</i> (A. Dietr.) E.P. Bicknell var. <i>douglasii</i>	Douglas' grasswidow	Iridaceae					
PERI	<i>Penstemon richardsonii</i> Douglas ex Lindl.	cutleaf beardtongue	Scrophulariaceae					
PERY	<i>Penstemon rydbergii</i> A. Nelson	Rydberg's penstemon	Scrophulariaceae					
PHAR3	<i>Phalaris arundinacea</i> L.	reed canarygrass	Poaceae	YES				
PHCA11	<i>Physocarpus capitatus</i> (Pursh) Kuntze	Pacific ninebark	Rosaceae					
PHHA	<i>Phacelia hastata</i> Douglas ex Lehm.	silverleaf phacelia	Hydrophyllaceae					
PHLE4	<i>Philadelphus lewisii</i> Pursh	Lewis' mock orange	Hydrangeaceae					
PIPO	<i>Pinus ponderosa</i> C. Lawson	ponderosa pine	Pinaceae					
PLLA	<i>Plantago lanceolata</i> L.	narrowleaf plantain	Plantaginaceae	YES				
PLMA4	<i>Plectritis macrocera</i> Torr. & A. Gray	longhorn plectritis	Valerianaceae					
PLNO	<i>Plagiobothrys nothofulvus</i> (A. Gray) A. Gray	rusty popcornflower	Boraginaceae					
PLPA2	<i>Plantago patagonica</i> Jacq.	woolly plantain	Plantaginaceae					
PLTE	<i>Plagiobothrys tenellus</i> (Nutt. ex Hook.) A. Gray	Pacific popcornflower	Boraginaceae					
POBAT	<i>Populus balsamifera</i> L. ssp. <i>trichocarpa</i> (Torr. & A. Gray ex Hook.) Brayshaw	black cottonwood	Salicaceae					
POBU	<i>Poa bulbosa</i> L.	bulbous bluegrass	Poaceae	YES				
POHE3	<i>Polypodium hesperium</i> Maxon	western polypody	Polypodiaceae					
POLYG4	<i>Polygonum</i> L.	knotweed	Polygonaceae					
POMU	<i>Polystichum munitum</i> (Kaulf.) C. Presl	western swordfern	Dryopteridaceae					
POSE	<i>Poa secunda</i> J. Presl	Sandberg bluegrass	Poaceae					
POTEN	<i>Potentilla</i> L.	cinquefoil	Rosaceae					
PRAV	<i>Prunus avium</i> (L.) L.	sweet cherry	Rosaceae	YES				
PRDO	<i>Prunus domestica</i> L.	European plum	Rosaceae	YES				
PSME	<i>Pseudotsuga menziesii</i> (Mirb.) Franco	Douglas-fir	Pinaceae					
PTAQ	<i>Pteridium aquilinum</i> (L.) Kuhn	western brackenfern	Dennstaedtiaceae					
PUTR2	<i>Purshia tridentata</i> (Pursh) DC.	antelope bitterbrush	Rosaceae					
QUGA4	<i>Quercus garryana</i> Douglas ex Hook.	Oregon white oak	Fagaceae					
RACY	<i>Ranunculus cymbalaria</i> Pursh	alkali buttercup	Ranunculaceae					
RANUN	<i>Ranunculus</i> L.	buttercup	Ranunculaceae					
RAOCO	<i>Ranunculus occidentalis</i> Nutt. var. <i>occidentalis</i>	western buttercup	Ranunculaceae					



Symbol	Scientific Name with Author	National Common Name	Family	Exotic	Global Rank	State Rank	State Status	Federal Status
RHGL	<i>Rhus glabra</i> L.	smooth sumac	Anacardiaceae					
RHRH2	<i>Rheum rhabarbarum</i> L.	garden rhubarb	Polygonaceae	YES				
ROPS	<i>Robinia pseudoacacia</i> L.	black locust	Fabaceae	YES				
ROWO	<i>Rosa woodsii</i> Lindl.	Woods' rose	Rosaceae					
RUAR9	<i>Rubus armeniacus</i> Focke	Himalayan blackberry	Rosaceae	YES				
RUCR	<i>Rumex crispus</i> L.	curly dock	Polygonaceae	YES				
RUID	<i>Rubus idaeus</i> L.	American red raspberry	Rosaceae					
RULA	<i>Rubus laciniatus</i> Willd.	cutleaf blackberry	Rosaceae	YES				
RUPA	<i>Rubus parviflorus</i> Nutt.	thimbleberry	Rosaceae					
RUUR	<i>Rubus ursinus</i> Cham. & Schltdl.	California blackberry	Rosaceae					
SAIN4	<i>Saxifraga integrifolia</i> Hook.	wholeleaf saxifrage	Saxifragaceae					
SANIC2	<i>Saxifraga nidifica</i> Greene var. <i>claytoniifolia</i> (Canby ex Small) Elvander	peak saxifrage	Saxifragaceae					
SANIC5	<i>Sambucus nigra</i> L. ssp. <i>cerulea</i> (Raf.) R. Bolli	blue elderberry	Caprifoliaceae					
SAOD2	<i>Saxifraga odontoloma</i> Piper	brook saxifrage	Saxifragaceae					
SAOF4	<i>Saponaria officinalis</i> L.	bouncingbet	Caryophyllaceae	YES				
SALIX	<i>Salix</i> L.	willow	Salicaceae					
SASC	<i>Salix scouleriana</i> Barratt ex Hook.	Scouler's willow	Salicaceae					
SCIRP	<i>Scirpus</i> L.	bulrush	Cyperaceae					
SCPE	<i>Scandix pecten-veneris</i> L.	shepherdsneedle	Apiaceae	YES				
SEDUM	<i>Sedum</i> L.	stonecrop	Crassulaceae					
SELE	<i>Sedum leibergii</i> Britton	Leiberg stonecrop	Crassulaceae					
SIORP2	<i>Sidalcea oregana</i> (Nutt. ex Torr. & A. Gray) A. Gray ssp. <i>oregana</i> var. <i>procera</i> C.L. Hitchc.	Oregon checkerbloom	Malvaceae					
SPDO	<i>Spiraea douglasii</i> Hook.	rose spirea	Rosaceae					
STNI	<i>Stellaria nitens</i> Nutt.	shiny chickweed	Caryophyllaceae					
SYAL	<i>Symphoricarpos albus</i> (L.) S.F. Blake	common snowberry	Caprifoliaceae					
TAOF	<i>Taraxacum officinale</i> F.H. Wigg.	common dandelion	Asteraceae	YES				
TODI	<i>Toxicodendron diversilobum</i> (Torr. & A. Gray) Greene	Pacific poison oak	Anacardiaceae					
TORY	<i>Toxicodendron rydbergii</i> (Small ex Rydb.) Greene	western poison ivy	Anacardiaceae					
TRDU	<i>Tragopogon dubius</i> Scop.	yellow salsify	Asteraceae	YES				
TRGRH	<i>Triteleia grandiflora</i> Lindl. var. <i>howellii</i> (S. Watson) Hoover	Howell's triteleia	Liliaceae					
TRWI3	<i>Trifolium willdenovii</i> Spreng.	tomcat clover	Fabaceae					
VEBL	<i>Verbascum blattaria</i> L.	moth mullein	Scrophulariaceae	YES				
VEBR	<i>Verbena bracteata</i> Cav. ex Lag. & Rodr.	bigbract verbena	Verbenaceae					
VETH	<i>Verbascum thapsus</i> L.	common mullein	Scrophulariaceae	YES				
VICIA	<i>Vicia</i> L.	vetch	Fabaceae					
VISA	<i>Vicia sativa</i> L.	garden vetch	Fabaceae	YES				
VIVI	<i>Vicia villosa</i> Roth	winter vetch	Fabaceae	YES				
VUMY	<i>Vulpia myuros</i> (L.) C.C. Gmel.	rat-tail fescue	Poaceae	YES				
WOOR	<i>Woodsia oregana</i> D.C. Eaton	Oregon cliff fern	Dryopteridaceae					

## Discussion and Recommendations

### Noxious Weeds

There are significant occurrences of noxious weeds in the park. The weeds were not mapped as they occur in diffuse patches. The noxious weeds that we observed in each vegetation community polygon are recorded in the corresponding record in the vegetation polygon database for the park, which is included in this report as Appendix C.

A list of the noxious weeds is presented in Table 7. We found seven Class B weeds and two Class C weeds.

**Table 7. State listed noxious weeds at KRT.**

Symbol	Scientific Name with Author	National Common Name	Family	State Weed Status
CEDI3	<i>Centaurea diffusa</i> Lam.	diffuse knapweed	Asteraceae	B
CESO3	<i>Centaurea solstitialis</i> L.	yellow star-thistle	Asteraceae	B
CESTM	<i>Centaurea stoebe</i> L. ssp. <i>micranthos</i> (Gugler) Hayek	spotted knapweed	Asteraceae	B
CYSC4	<i>Cytisus scoparius</i> (L.) Link	Scotch broom	Fabaceae	B
DACA6	<i>Daucus carota</i> L.	Queen Anne's lace	Apiaceae	B
HYRA3	<i>Hypochaeris radicata</i> L.	hairy cat's ear	Asteraceae	B
LIDAD	<i>Linaria dalmatica</i> (L.) Mill. ssp. <i>dalmatica</i>	Dalmatian toadflax	Scrophulariaceae	B
HYPE	<i>Hypericum perforatum</i> L.	common St. Johnswort	Clusiaceae	C
PHAR3	<i>Phalaris arundinacea</i> L.	reed canarygrass	Poaceae	C

### Ecological Condition

The ecological condition of KRT is mostly that of a developed rail trail. The sides of the trail are disturbed, but occasionally support native plant communities and rare plants are infrequently found within the KRT boundary. There are several larger parcels within the KRT boundary and the ecological condition of these parcels is usually good to excellent. The largest parcel is about 40-acres in size and has five polygons in good to excellent condition. Some of these communities are globally ranked as critically imperiled (G1). Cattle-grazing is occurring within this parcel and could cause significant degradation of this very rare and valuable community.

The landscape adjacent to the KRT is often in excellent to good ecological condition. It is largely undeveloped and contains many G1, G2 and G3 plant communities. It also contains significant rare plant populations. Consideration should be given to expanding the KRT boundaries to include more of this biodiversity hotspot.

Most of the plant species found in the park are native to Washington State. Although we did not record all the non-native species that we found in the developed portion of the park, we did find 54 non-native species or 28.4% of the park flora that was non-native.

## ***Restoration Opportunities***

Restoration of the trail corridor is inconsistent to maintenance of a recreational trail. Some restoration of the sides of the trail to native vegetation should be considered. Control of noxious weeds through ecologically responsible techniques should be explored. Herbicide use is not encouraged, as the KRT is very close to the Klickitat River. Since rare plants are found along the trail and adjacent lands, special care must insure that restoration efforts and weed control efforts do not adversely affect these populations. Some of these species only occur in the Klickitat Valley.

## ***Other Recommendations***

The park boundary is not marked or fenced in any manner in many locations. Cattle-grazing is occurring at numerous locations along the trail and may have adverse impacts on rare plant populations. Adequate survey, marking and fencing of the trail is recommended. Since it is the responsibility of the adjacent rancher to prevent his livestock from entering the State Park, this measure would not negatively affect the state budget.

Additionally, PBI recommends targeted rare plant surveys be conducted along any portion of the KRT where managerial activities may adversely impact native vegetation outside of the developed railbed. Such surveys should be focused around the estimated zone of impact and should be conducted as many times in a field season as necessary to account for the diverse phenology of rare plants that may use the habitat types to be impacted by management activities.

## ***GIS Products Produced***

Associated with this report are polygon layers created by PBI depicting the vegetation community types mapped in the project area of within KRT. The datasets have been converted into ESRI shapefile formats and provided to 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.



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# Appendix A – Vegetation Survey Codes and Instructions

**Site** = name of locality of map project

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

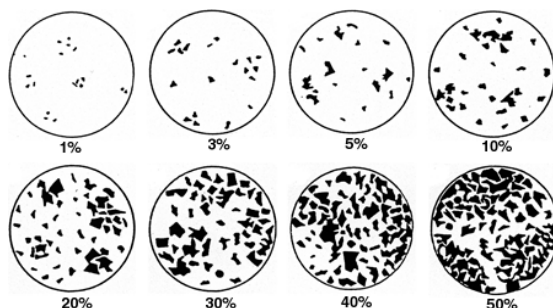
**Polygon #** = number you put on map

## 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

**TOTAL 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



**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.

**EXOTICS** = primary species observed; secondary species observed (please pay special attention to noxious weeds). Also, note the relative abundance of exotics in each polygon, using the 1-6 cover codes noted above.

**SUBSTRATES** estimate to nearest % the following, the sum of the categories adds to 100%. Describe in comments if there is wide variation in any category; note % standing water if it is persistent or characteristic of site.

Water = exposed standing or flowing water

Rock Outcrop = exposed bedrock including detached boulders over 1m across

Talus = exposed large, loose rocks

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

Caves = area covered by caves

Mines = area covered by mines

**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

## Fire

Note presence of fire (i.e. charcoal, fire scars, etc.) and, if present, estimate time of fire.

## 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, soil compaction or churning)
- 2 = active moderate grazing (25-75% forage used)
- 3 = active light grazing (lots of last yr's 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

### **Descriptions of Plant Communities**

**PLANT ASSOCIATION (PA)** = list all PAs encountered in polygon survey, in comments list source of name if not on provided key. NOTE: Contractor is required to consult with the WNHP to obtain the most current classification and condition ranking information available.

**Existing Vegetation Community** – Write down the major tree/shrub/grass-forb-fern community type. Pay attention to indicator species. Alien species may be included in community description.

**Ecological Condition Rank** of PA in key or estimate. (The condition of each plant vegetation community polygon shall be rated using the codes listed in Appendix B.)

**% of Polygon** = your estimate of % of polygon covered by this plant community. (PA1 is the matrix and a greater % than PA2, if there is a PA2; PA2 is a greater % than PA3, if there is a PA3.)

**Pattern** = how PA is distributed in stand

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

## **Appendix B – 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 following 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 are 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 influence 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 influence the area. Direct signs of human-induced ecological stress are frequent. Rare plant and animal species are seldom encountered within this condition class.



## Appendix C – 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 D – Vegetation Survey Polygon Data

**Polygon Number**                      **18A**                      **ParkName:**

**Survey Intensity**                      1                      **KRT**

**Observer**                      PM

**Date**                      8/5/2008

**Total Vegetation**                      4

**Trees Total**                      3

**Dominant Trees**                      PIPO, ALAL, ROPS, ACMA3, QUGA

**emergent**                      0

**maincanopy**                      3

**subcanopy**                      0

**Shrubs Total**                      3

**Dominant Shrubs**                      TODI, TODI

**> 1.5' tall**                      0

**< 1.5' tall**                      0

**Graminoids Total**                      3

**Dominant Graminoids**                      annual bromus, POBU, BRTE

**Graminoids Perennial**                      2

**Graminoids Annual**                      3

**Forbs Total**                      3

**Dominant Forbs**                      CECY, MESA, CIIN, DACA, ACMI2, VIVI

**Forbs Perennial**                      0

**Forbs Annual**                      0

**Ferns Total**                      0

**Ferns Evergreen**                      0

**Ferns Deciduous**                      0

**ExoticsTotal**                      3

**Exotics Perennial**                      3

**Exotics Annual**                      3

**Water**                      0

**Rock Outcrop**                      1

**Gravel**                      20

**Logging**                      1

**Fire:**                      0

**Stand Age**                      2

**Agriculture**                      0

**Livestock**                      0

**Development**                      6

**Wildlife**                      3

**Recreation Severity**                      1

**Recreation Type**                      4

**Hydrology**                      2

## Exotic Species

### Noxious Exotic Plants

AIAL, CIIL

### Other Exotic Plants

RUDI, ROPS,

**Water:**                      0

**Rock:**                      1

**Talus:**                      10

**Gravel:**                      20

**Bare Ground:**                      15

**Moss Lichen:**                      0

**Litter:**                      54

## Vegetation Types

Vegetation Types	Percent	Pattern	Rank
<b>Existing Veg1:</b> DISTURBED OLD RAIL ROAD BED AND	SIDES	85	Matrix D

**Veg Community1:** developed

<b>Existing Veg2:</b> QUGA-PIPO FOREST	15	F
--	----	---

**Veg Community3:** QUGA-PIPO/TODI

<b>Existing Veg3:</b>	0
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**Veg Community3:**

**Notes:** LOWER SECTION HAS A LOT OF AIAL; WEST OF TRAIL RIGH OF WAY IS EXOTICS/UPPER PART OF POLY HAS MORE ACMA3 AND QUGA



# **Polygon Number      18B      ParkName:**

**Survey Intensity**      1  
**Observer**      PM  
**Date**      8/5/2008  
**Total Vegetation**      5  
**Trees Total**      3  
**Dominant Trees**      QUGA, tree of heaven, PYDO  
**emergent**      0  
**maincanopy**      3  
**subcanopy**      2  
**Shrubs Total**      0  
**Dominant Shrubs**      TODI  
**> 1.5' tall**      0  
**< 1.5' tall**      0  
**Graminoids Total**      4  
**Dominant Graminoids**      annual bromus, POBU, BRTE, PSSP6  
**Graminoids Perennial**      2  
**Graminoids Annual**      4  
**Forbs Total**      3  
**Dominant Forbs**      MESA, PLLA, CIIN, HYPE, CECY, VIVI  
**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**      15  
  
**Logging**      1  
**Fire:**      0  
**Stand Age**      2  
**Agriculture**      0  
**Livestock**      0  
**Development**      6  
**Wildlife**      3  
**Recreation Severity**      1  
**Recreation Type**      4  
**Hydrology**      2

## **Exotic Species**

### **Noxious Exotic Plants**

CIIN, HYPE

### **Other Exotic Plants**

VIVI

**Water:**      0  
  
**Rock:**      1  
**Talus:**      1  
**Gravel:**      15  
**Bare Ground:**      15  
**Moss Lichen:**      0  
**Litter:**      68

## **Vegetation Types**

	Percent	Pattern	Rank
<b>Existing Veg1:</b> DISTURBED AREA old rail bed -	QUGA/grasses-exotics	100	Matrix   D
<b>Veg Community1:</b> developed			

**Existing Veg2:**      0

### **Veg Community3:**

**Existing Veg3:**      0

### **Veg Community3:**

**Notes:**      SHORT EXTENSION TOWARD RIVER, HEAVILY DISTURBED

# Polygon Number 19A

ParkName:

Survey Intensity	1	KRT
Observer	PM	
Date	8/5/2008	
Total Vegetation	5	
Trees Total	5	
Dominant Trees	POBAT, PIPO, PRAV, QUGA, AIAL, ROPS, ALIN	
emergent	2	
maincanopy	4	
subcanopy	3	
Shrubs Total	3	
Dominant Shrubs	CLLI, SACE, PHLE4, RUUR, PHCA, CRDO, TODI, COSE16, HODI,	
> 1.5' tall	3	
< 1.5' tall	2	
Graminoids Total	3	
Dominant Graminoids	PHAR, DAGL, POBU, FEID, bromus-annual, BRTE	
Graminoids Perennial	3	
Graminoids Annual	2	
Forbs Total	3	
Dominant Forbs	DACA, MADR, NECA, EQTE, PLPA, LALA	
Forbs Perennial	3	
Forbs Annual	2	
Ferns Total	0	
Ferns Evergreen	0	
Ferns Deciduous	0	
ExoticsTotal	4	
Exotics Perennial	4	
Exotics Annual	3	
Water	1	
Rock Outcrop	2	
Gravel	20	
Logging	1	
Fire:	0	
Stand Age	2	
Agriculture	0	
Livestock	0	
Development	6	
Wildlife	3	
Recreation Severity	1	
Recreation Type	4	
Hydrology	2	

## Exotic Species

**Noxious Exotic Plants**  
CEDI3, AIAL, LIDAD, HYPE  
**Other Exotic Plants**  
VETH, PHAR, BRTE, POBU

<b>Water:</b>	1
<b>Rock:</b>	2
<b>Talus:</b>	3
<b>Gravel:</b>	20
<b>Bare Ground:</b>	10
<b>Moss Lichen:</b>	1
<b>Litter:</b>	65

## Vegetation Types

	Percent	Pattern	Rank		
<b>Existing Veg1:</b>	DEVELOPED TRAIL / RAIL BED, roads, parking, disturbed vegetation		45	Matrix	D
<b>Veg Community1:</b>	developed				
<b>Existing Veg2:</b>	POBAT/COSE16/PHAR	30 Large patch	G		
<b>Veg Community3:</b>	POBAT/COSE16				
<b>Existing Veg3:</b>	QUGA-PIPO/TODI/grasses	25 Large patch	F		
<b>Veg Community3:</b>	QUGA-PIPO/TODI				
<b>Notes:</b>	TRAIL, TRAIL ENTERANCE AREA AND ADJACENT DECIDUOUS FOREST AND QUITE A BIT OF AIAL HERE				

# **Polygon Number      19B**

**ParkName:**

<b>Survey Intensity</b>	1	<b>KRT</b>
<b>Observer</b>	PM	
<b>Date</b>	8/5/2008	
<b>Total Vegetation</b>	4	
<b>Trees Total</b>	3	
<b>Dominant Trees</b>	PIPO, QUGA, ACMA3	
<b>emergent</b>	1	
<b>maincanopy</b>	5	
<b>subcanopy</b>	2	
<b>Shrubs Total</b>	2	
<b>Dominant Shrubs</b>	TODI, COCO	
<b>&gt; 1.5' tall</b>	2	
<b>&lt; 1.5' tall</b>	1	
<b>Graminoids Total</b>	4	
<b>Dominant Graminoids</b>	AGCR, POBU, BRTE, BROMUS1	
<b>Graminoids Perennial</b>	3	
<b>Graminoids Annual</b>	3	
<b>Forbs Total</b>	3	
<b>Dominant Forbs</b>	ERLA5, CIIN, LONU, TRDU, VIVI, LULE, LALA, PLLA, ACMI, PLPA,	
<b>Forbs Perennial</b>	3	
<b>Forbs Annual</b>	2	
<b>Ferns Total</b>	0	
<b>Ferns Evergreen</b>	0	
<b>Ferns Deciduous</b>	0	
<b>ExoticsTotal</b>	4	
<b>Exotics Perennial</b>	4	
<b>Exotics Annual</b>	3	
<b>Water</b>	0	
<b>Rock Outcrop</b>	0	
<b>Gravel</b>	40	
<b>Logging</b>	1	
<b>Fire:</b>	0	
<b>Stand Age</b>	1	
<b>Agriculture</b>	0	
<b>Livestock</b>	0	
<b>Development</b>	6	
<b>Wildlife</b>	0	
<b>Recreation Severity</b>	1	
<b>Recreation Type</b>	4	
<b>Hydrology</b>	2	

## **Exotic Species**

### **Noxious Exotic Plants**

CIIL, CEDI3, HYPE, LIDAD, VETH, AIAL

### **Other Exotic Plants**

POBU, AGCR

<b>Water:</b>	0
<b>Rock:</b>	0
<b>Talus:</b>	1
<b>Gravel:</b>	40
<b>Bare Ground:</b>	15
<b>Moss Lichen:</b>	0
<b>Litter:</b>	45

## **Vegetation Types**

	<b>Percent</b>	<b>Pattern</b>	<b>Rank</b>
<b>Existing Veg1:</b>	DISTURBED VEG - DEVELOPED TRAIL / RAIL	BED	100
<b>Veg Community1:</b>	developed		Matrix D
<b>Existing Veg2:</b>	0		
<b>Veg Community3:</b>			
<b>Existing Veg3:</b>	0		
<b>Veg Community3:</b>			
<b>Notes:</b>	MOSTLY DISTURBED; OPEN AREA WITH A LITTLE YOUNG; QUGA- PIPO-ACMA3 FOREST AT WEST END.		

## Polygon Number 20

ParkName:

Survey Intensity 2  
Observer PM  
Date 8/5/2008  
Total Vegetation 6  
Trees Total 5  
Dominant Trees QUGA, PIPO  
emergent 0  
maincanopy 0  
subcanopy 0  
Shrubs Total 2  
Dominant Shrubs TODI, SYAL  
> 1.5' tall 2  
< 1.5' tall 1  
Graminoids Total 5  
Dominant Graminoids FERU, POBU, BRTE, PSSP6  
Graminoids Perennial 5  
Graminoids Annual 2  
Forbs Total 2  
Dominant Forbs CANUN2, RAOCO  
Forbs Perennial 2  
Forbs Annual 0  
Ferns Total 0  
Ferns Evergreen 0  
Ferns Deciduous 0  
ExoticsTotal 0  
Exotics Perennial 0  
Exotics Annual 0  
Water 0  
Rock Outcrop 0  
Gravel 1  
Logging 1  
Fire: 0  
Stand Age 6  
Agriculture 0  
Livestock 3 CATTLE HERE IN  
Development 0  
Wildlife 3  
Recreation Severity 3  
Recreation Type 3  
Hydrology 1

KRT

### Exotic Species

#### Noxious Exotic Plants

#### Other Exotic Plants

POBU, BRTE

Water: 0

Rock: 0

Talus: 1

Gravel: 1

Bare Ground: 5

Moss Lichen: 3

Litter: 90

## Vegetation Types

Existing Veg1: QUGA/FERU

Percent Pattern Rank

100 Matrix E

Veg Community1: QUGA/FERU

Existing Veg2: 0

Veg Community3:

Existing Veg3: 0

Veg Community3:

Notes: YOUNG QUGA FOREST; LOTS OF DOWN LOGS AND SNAGS-MOSTLY FROM PIPO.



# Polygon Number 21

ParkName:

Survey Intensity 2  
Observer PM  
Date 8/5/2008  
Total Vegetation 5  
Trees Total 3  
Dominant Trees PIPO, QUGA, POBAT  
emergent 2  
maincanopy 3  
subcanopy 2  
Shrubs Total 3  
Dominant Shrubs TODI, SYAL, PHLE4  
> 1.5' tall 3  
< 1.5' tall 2  
Graminoids Total 4  
Dominant Graminoids FERU, POBU, BRTE, PSSP6  
Graminoids Perennial 4  
Graminoids Annual 0  
Forbs Total 2  
Dominant Forbs CANUN2, RAOCO  
Forbs Perennial 2  
Forbs Annual 0  
Ferns Total 0  
Ferns Evergreen 0  
Ferns Deciduous 0  
ExoticsTotal 0  
Exotics Perennial 0  
Exotics Annual 0  
Water 0  
Rock Outcrop 0  
Gravel 3  
Logging 1  
Fire: 0  
Stand Age 6  
Agriculture 0  
Livestock 3  
Development 0  
Wildlife 3  
Recreation Severity 3  
Recreation Type 3  
Hydrology 1

KRT

## Exotic Species

### Noxious Exotic Plants

### Other Exotic Plants

POBU, BRTE

Water: 0

Rock: 0

Talus: 2

Gravel: 3

Bare Ground: 5

Moss Lichen: 2

Litter: 88

## Vegetation Types

Existing Veg1: QUGA-PIPO/FERU

Percent

Pattern

Rank

100

Matrix

G

Veg Community1: QUGA/FERU

Existing Veg2: 0

Veg Community3:

Existing Veg3: 0

Veg Community3:

Notes: DRY RIVER FLOOD PLAIN BETWEEN TRAIL AND RIVER

## Polygon Number 22

ParkName:

KRT

Survey Intensity 2  
 Observer PM  
 Date 8/5/2008  
 Total Vegetation 2  
 Trees Total 1  
 Dominant Trees ALIN  
 emergent 0  
 maincanopy 1  
 subcanopy 0  
 Shrubs Total 0  
 Dominant Shrubs  
 > 1.5' tall 0  
 < 1.5' tall 0  
 Graminoids Total 0  
 Dominant Graminoids  
 Graminoids Perennial 0  
 Graminoids Annual 0  
 Forbs Total 2  
 Dominant Forbs VETH, HYPE, VEBA  
 Forbs Perennial 2  
 Forbs Annual 0  
 Ferns Total 0  
 Ferns Evergreen 0  
 Ferns Deciduous 0  
 ExoticsTotal 2  
 Exotics Perennial 2  
 Exotics Annual 0  
 Water 40  
 Rock Outcrop 0  
 Gravel 30  
 Logging 1  
 Fire: 0  
 Stand Age 1  
 Agriculture 0  
 Livestock 3  
 Development 0  
 Wildlife 0  
 Recreation Severity 3  
 Recreation Type 3  
 Hydrology 1

### Exotic Species

#### Noxious Exotic Plants

HYPE, VEBA

#### Other Exotic Plants

VETH MEOF

Water: 40  
 Rock: 0  
 Talus: 2  
 Gravel: 30  
 Bare Ground: 26  
 Moss Lichen: 0  
 Litter: 2

### Vegetation Types

Existing Veg1: SAND BARS

Veg Community1: sand bar

Existing Veg2: RIVER

Veg Community3: WATER

Existing Veg3:

Veg Community3:

Notes: sand bars

Percent	Pattern	Rank
60	Matrix	F
40	Large patch	E
0		

## Polygon Number 23

ParkName:

Survey Intensity 2  
 Observer PM  
 Date 8/5/2008  
 Total Vegetation 6  
 Trees Total 5  
 Dominant Trees ALIN, PIPO  
 emergent 5  
 maincanopy 1  
 subcanopy 5  
 Shrubs Total 3  
 Dominant Shrubs SYAL, COSE16, SABE2  
 > 1.5' tall 0  
 < 1.5' tall 0  
 Graminoids Total 3  
 Dominant Graminoids POBU, FERU  
 Graminoids Perennial 3  
 Graminoids Annual 0  
 Forbs Total 2  
 Dominant Forbs CANUN2, RAOCO  
 Forbs Perennial 2  
 Forbs Annual 0  
 Ferns Total 0  
 Ferns Evergreen 0  
 Ferns Deciduous 0  
 ExoticsTotal 0  
 Exotics Perennial 0  
 Exotics Annual 0  
 Water 1  
 Rock Outcrop 0  
 Gravel 5  
 Logging 1  
 Fire: 0  
 Stand Age 1  
 Agriculture 0  
 Livestock 3  
 Development 0  
 Wildlife 3  
 Recreation Severity 3  
 Recreation Type 3  
 Hydrology 1

KRT

### Exotic Species

#### Noxious Exotic Plants

#### Other Exotic Plants

POBU

Water: 1  
 Rock: 0  
 Talus: 1  
 Gravel: 5  
 Bare Ground: 3  
 Moss Lichen: 2  
 Litter: 88

## Vegetation Types

Percent	Pattern	Rank
100	Matrix	E

Existing Veg1: ALIN riparian forest

Veg Community1: ALIN

Existing Veg2: 0

Veg Community3:

Existing Veg3: 0

Veg Community3:

Notes: riparian forests

# **Polygon Number      27**

**ParkName:**

**Survey Intensity**      3  
**Observer**      PM  
**Date**      8/5/2008  
**Total Vegetation**      5  
**Trees Total**      4  
**Dominant Trees**      QUGA, PIPO  
**emergent**      3  
**maincanopy**      4  
**subcanopy**      2  
**Shrubs Total**      3  
**Dominant Shrubs**      TODI, PHLE4, SYAL  
**> 1.5' tall**      0  
**< 1.5' tall**      0  
**Graminoids Total**      0  
**Dominant Graminoids**      PSSP6, FERU, POBU, BRTE  
**Graminoids Perennial**      0  
**Graminoids Annual**      0  
**Forbs Total**      2  
**Dominant Forbs**      CANUN2, RAOCO  
**Forbs Perennial**      2  
**Forbs Annual**      0  
**Ferns Total**      0  
**Ferns Evergreen**      0  
**Ferns Deciduous**      0  
**ExoticsTotal**      0  
**Exotics Perennial**      0  
**Exotics Annual**      0  
**Water**      0  
**Rock Outcrop**      1  
  
**Gravel**      10  
  
**Logging**  
**Fire:**      0  
**Stand Age**      6  
**Agriculture**      0  
**Livestock**      3  
**Development**      0  
**Wildlife**      0  
**Recreation Severity**      3  
**Recreation Type**      3  
**Hydrology**      1

**KRT**

## **Exotic Species**

### **Noxious Exotic Plants**

### **Other Exotic Plants**

POBU, BRTE

**Water:**      0

**Rock:**      1

**Talus:**      4

**Gravel:**      10

**Bare Ground:**      10

**Moss Lichen:**      3

**Litter:**      72

## **Vegetation Types**

**Existing Veg1:**      QUGA-PIPO/TODI/grasses

**Percent**

**Pattern**

**Rank**

100

Matrix

G

**Veg Community1:**      PIPO-QUGA/SYAL-TODI

**Existing Veg2:**      0

**Veg Community3:**

**Existing Veg3:**      0

**Veg Community3:**

**Notes:**      more open PIPO-QUGA forest on steeper slope



## Polygon Number 29

ParkName:

Survey Intensity 1  
Observer PM  
Date 8/5/2008  
Total Vegetation 4  
Trees Total 3  
Dominant Trees QUQA, PIPO, ALIN  
emergent 1  
maincanopy 3  
subcanopy 2  
Shrubs Total 3  
Dominant Shrubs TODI, CLLI, TORA, CEIN  
> 1.5' tall 3  
< 1.5' tall 2  
Graminoids Total 3  
Dominant Graminoids annual grasses bromus  
Graminoids Perennial 2  
Graminoids Annual 3  
Forbs Total 3  
Dominant Forbs PLPA  
Forbs Perennial 3  
Forbs Annual 3  
Ferns Total 0  
Ferns Evergreen 0  
Ferns Deciduous 0  
ExoticsTotal 0  
Exotics Perennial 0  
Exotics Annual 0  
Water 0  
Rock Outcrop 5  
Gravel 30  
Logging  
Fire: 0  
Stand Age 6  
Agriculture 0  
Livestock 3  
Development 6  
Wildlife 0  
Recreation Severity 1  
Recreation Type 4  
Hydrology 2

KRT

### Exotic Species

Noxious Exotic Plants  
LIDAD, HYPE, CIIN, DIFU2  
Other Exotic Plants  
VETH

Water: 0  
Rock: 5  
Talus: 2  
Gravel: 30  
Bare Ground: 15  
Moss Lichen: 1  
Litter: 47

### Vegetation Types

Vegetation Types	Percent	Pattern	Rank
Existing Veg1: DEVELOPED TRAIL / RAIL BED	100	Matrix	D
Veg Community1: developed			
Existing Veg2:	0		
Veg Community3:			
Existing Veg3:	0		
Veg Community3:			

Notes: DEVELOPED SECTION OF TRAIL; LOTS OF EXOTICS & HEGR; ALSO LUSU-RARE PLANTS; LONG SECTION OF TRAIL

<b>Polygon Number</b>	<b>2A</b>	<b>ParkName:</b>
Survey Intensity	2	<b>KRT</b>
Observer	PM	
Date	8/6/2008	
Total Vegetation	4	
Trees Total	0	
Dominant Trees		
emergent	0	
maincanopy	2	
subcanopy	1	
Shrubs Total	2	
Dominant Shrubs	SAEX, SABE2, ROWO, CRDO	
> 1.5' tall	2	
< 1.5' tall	0	
Graminoids Total	4	
Dominant Graminoids	POBU, Annual bromus, BRTE, PHAR	
Graminoids Perennial	3	
Graminoids Annual	4	
Forbs Total	3	
Dominant Forbs	ERIN, CECY, MESA, CIIN, RUCR, TRDU, ERCOC8, ERELS, PHHA	
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	0	
Gravel	40	
Logging	1	
Fire:	0	
Stand Age	1	
Agriculture	0	
Livestock	3	
Development	6 TRAIL, RAILBED	
Wildlife	0	
Recreation Severity	1	
Recreation Type	4	
Hydrology	2	

### Exotic Species

**Noxious Exotic Plants**  
 CIIN, CIAR4, CIVU, COAR4  
**Other Exotic Plants**  
 MESA, POBU, CECY

<b>Water:</b>	0
<b>Rock:</b>	0
<b>Talus:</b>	0
<b>Gravel:</b>	40
<b>Bare Ground:</b>	20
<b>Moss Lichen:</b>	0
<b>Litter:</b>	40

### Vegetation Types

	Percent	Pattern	Rank
<b>Existing Veg1:</b> DEVELOPED TRAIL / RAIL BED	100	Matrix	D
<b>Veg Community1:</b> developed			
<b>Existing Veg2:</b>	0		
<b>Veg Community3:</b>			
<b>Existing Veg3:</b>	0		
<b>Veg Community3:</b>			

**Notes:** SURROUNDING COUNTRY IS WHEATLANDS, TRAIL IS LEVEL WITH SUROUNDINGS, VERY DENSE CIIN IN MANY PLACES

# Polygon Number      2B      ParkName:

Survey Intensity      2      KRT  
 Observer      PM  
 Date      8/6/2008  
 Total Vegetation      4  
 Trees Total      2  
 Dominant Trees      PIPO  
   emergent      0  
   maincanopy      2  
   subcanopy      2  
 Shrubs Total      2  
 Dominant Shrubs      CRDO, SABE2, ROWO, RICE, HODI  
   > 1.5' tall      2  
   < 1.5' tall      1  
 Graminoids Total      3  
 Dominant Graminoids      POBU, PSSPS, BRTE,  
 Graminoids Perennial      3  
 Graminoids Annual      2  
 Forbs Total      3  
 Dominant Forbs      LOMAT detlerd, GRIN  
 Forbs Perennial      3  
 Forbs Annual      2  
 Ferns Total      0  
 Ferns Evergreen      0  
 Ferns Deciduous      0  
 ExoticsTotal      2  
 Exotics Perennial      2  
 Exotics Annual      1  
 Water      0  
 Rock Outcrop      2

## Exotic Species

**Noxious Exotic Plants**  
 CIIN, HYPE, CIVU  
**Other Exotic Plants**  
 POBU, BRTE, CECY, TRDU

**Water:**      0  
**Rock:**      2  
**Talus:**      3  
**Gravel:**      40  
**Bare Ground:**      15  
**Moss Lichen:**      10  
**Litter:**      30

Gravel      40  
 Logging  
 Fire:      0  
 Stand Age      1  
 Agriculture      0  
 Livestock      1  
 Development      6  
 Wildlife      0  
 Recreation Severity      1  
 Recreation Type      4  
 Hydrology      2

## Vegetation Types

	Percent	Pattern	Rank
Existing Veg1:      DEVELOPED TRAIL / RAIL BED	100		D
Veg Community1:      developed			
Existing Veg2:	0		
Veg Community3:			
Existing Veg3:	0		
Veg Community3:			

Notes:      LUCE, ERNI2, EPAN, GRIN, SAKA

## Polygon Number 2C

ParkName:

KRT

Survey Intensity	1	
Observer	PM	
Date	8/6/2008	
Total Vegetation	4	
Trees Total	2	
Dominant Trees	PIPO	
emergent	0	
maincanopy	2	
subcanopy	2	
Shrubs Total	3	
Dominant Shrubs	CRDO, SABE2, HODI, PHLE4, SAEX, COCO, SACE	
> 1.5' tall	3	
< 1.5' tall	2	
Graminoids Total	3	
Dominant Graminoids	POBU, PSSPS, FEID	
Graminoids Perennial	3	
Graminoids Annual	2	
Forbs Total	3	
Dominant Forbs	LOMAT, LODI, PEROR, GRIN, LOCO, ERCOC8, EREL5, BASA3,	
Forbs Perennial	3	
Forbs Annual	2	
Ferns Total	1	
Ferns Evergreen	1	
Ferns Deciduous	0	
ExoticsTotal	3	
Exotics Perennial	2	
Exotics Annual	2	
Water	1	
Rock Outcrop	3	
Gravel	40	
Logging	1	
Fire:	0	
Stand Age	1	
Agriculture	0	
Livestock	1	
Development	6	
Wildlife	3	
Recreation Severity	2	
Recreation Type	4	
Hydrology	2	

### Exotic Species

#### Noxious Exotic Plants

HYPE

#### Other Exotic Plants

BRTE, POBU

Water:	1
Rock:	3
Talus:	5
Gravel:	40
Bare Ground:	15
Moss Lichen:	5
Litter:	31

## Vegetation Types

Existing Veg1:	DEVELOPED TRAIL / RAIL BED	Percent	Pattern	Rank
Veg Community1:	developed	100		D
Existing Veg2:		0		
Veg Community3:				
Existing Veg3:		0		
Veg Community3:				
Notes:	upper section of canyon running E-W			



# Polygon Number      2D      ParkName:

Survey Intensity	2	KRT
Observer	PM	
Date	8/5/2008	
Total Vegetation	4	
Trees Total	3	
Dominant Trees	PIPO, QUGA, PSME, ACMA3, ALIN	
emergent	1	
maincanopy	3	
subcanopy	2	
Shrubs Total	3	
Dominant Shrubs	CEIN, COCO, PHLE4, RHRA, RUUR, HODI	
> 1.5' tall	3	
< 1.5' tall	1	
Graminoids Total	2	
Dominant Graminoids	BRTE, CAGE, PSSPS, POBU	
Graminoids Perennial	2	
Graminoids Annual	2	
Forbs Total	2	
Dominant Forbs	APAN2, VETH, LONU, FRALC, PACO, LOGR	
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	1	
Gravel	30	
Logging	1	
Fire:	0	
Stand Age	2	
Agriculture	0	
Livestock	3	
Development	4	
Wildlife	3	
Recreation Severity	1	
Recreation Type	4	
Hydrology	2	

## Exotic Species

**Noxious Exotic Plants**  
 HYPE, VETH, CEDI3, VEB  
**Other Exotic Plants**  
 POBU, BRTE

<b>Water:</b>	0
<b>Rock:</b>	1
<b>Talus:</b>	3
<b>Gravel:</b>	30
<b>Bare Ground:</b>	10
<b>Moss Lichen:</b>	1
<b>Litter:</b>	45

## Vegetation Types

	Percent	Pattern	Rank
Existing Veg1:	DEVELOPED TRAIL / RAIL BED	100	Matrix
Veg Community1:	developed		D
Existing Veg2:			
Veg Community3:			
Existing Veg3:			
Veg Community3:			

Notes: mid section of upper canyon, that runs N to S

# Polygon Number      2E      ParkName:

Survey Intensity	2	KRT
Observer	PM	
Date	8/5/2008	
Total Vegetation	4	
Trees Total	3	
Dominant Trees	PIPO, QUGA, PSME, ACMA3, ALIN	
emergent	1	
maincanopy	3	
subcanopy	2	
Shrubs Total	3	
Dominant Shrubs	CEIN, COCO, PHLE4, RHRA, RUUR, HODI	
> 1.5' tall	3	
< 1.5' tall	1	
Graminoids Total	2	
Dominant Graminoids	BRTE, CAGE, PSSPS, POBU	
Graminoids Perennial	2	
Graminoids Annual	2	
Forbs Total	2	
Dominant Forbs	APAN2, VETH, LONU, FRALC, PACO, LOGR	
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	1	
Gravel	30	
Logging	1	
Fire:	0	
Stand Age	2	
Agriculture	0	
Livestock	2	
Development	4	
Wildlife	3	
Recreation Severity	1	
Recreation Type	4	
Hydrology	2	

## Exotic Species

**Noxious Exotic Plants**  
 HYPE, VETH, CEDI3, VEDA  
**Other Exotic Plants**  
 POBU, BRTE

<b>Water:</b>	0
<b>Rock:</b>	1
<b>Talus:</b>	3
<b>Gravel:</b>	30
<b>Bare Ground:</b>	10
<b>Moss Lichen:</b>	1
<b>Litter:</b>	45

## Vegetation Types

Existing Veg1:	DEVELOPED TRAIL / RAIL BED	Percent	Pattern	Rank
<b>Veg Community1:</b>	developed	100	Matrix	D
Existing Veg2:				
<b>Veg Community3:</b>				
Existing Veg3:				
<b>Veg Community3:</b>				
<b>Notes:</b>	lower section of canyon			

## Polygon Number 30

ParkName:

Survey Intensity 2  
Observer PM  
Date 8/5/2008  
Total Vegetation 4  
Trees Total 4  
Dominant Trees QUGA, PIPO  
emergent 1  
maincanopy 4  
subcanopy 3  
Shrubs Total 3  
Dominant Shrubs TODI, SYAL, PHLE4  
> 1.5' tall 3  
< 1.5' tall 2  
Graminoids Total 3  
Dominant Graminoids Bromus, PSSPS, POBU  
Graminoids Perennial 2  
Graminoids Annual 4  
Forbs Total 2  
Dominant Forbs LOMAT  
Forbs Perennial 2  
Forbs Annual 0  
Ferns Total 0  
Ferns Evergreen 0  
Ferns Deciduous 0  
ExoticsTotal 0  
Exotics Perennial 0  
Exotics Annual 0  
Water 0  
Rock Outcrop 0  
Gravel 5  
Logging 1  
Fire: 0  
Stand Age 2  
Agriculture 0  
Livestock 0  
Development 0  
Wildlife 3  
Recreation Severity 3  
Recreation Type 3  
Hydrology 1

KRT

### Exotic Species

#### Noxious Exotic Plants

#### Other Exotic Plants

POBU, BRTE

Water: 0  
Rock: 0  
Talus: 0  
Gravel: 5  
Bare Ground: 15  
Moss Lichen: 0  
Litter: 80

## Vegetation Types

Percent	Pattern	Rank
100	Matrix	G
0		
0		

Existing Veg1: QUGA-PIPO/TODI/grasses

Veg Community1: PIPO-QUGA/SYAL-TODI

Existing Veg2: 0

Veg Community3:

Existing Veg3: 0

Veg Community3:

Notes:

# Polygon Number 31

ParkName:

KRT

Survey Intensity 2  
Observer PM  
Date 8/5/2008  
Total Vegetation 5  
Trees Total 5  
Dominant Trees ALIN, QUGA, PIPO  
emergent 0  
maincanopy 5  
subcanopy 3  
Shrubs Total 3  
Dominant Shrubs TODI, CLLI  
> 1.5' tall 3  
< 1.5' tall 3  
Graminoids Total 2  
Dominant Graminoids PHAR, annual bromus  
Graminoids Perennial 2  
Graminoids Annual 2  
Forbs Total 2  
Dominant Forbs EQAR, VETH  
Forbs Perennial 2  
Forbs Annual 2  
Ferns Total 0  
Ferns Evergreen 0  
Ferns Deciduous 0  
ExoticsTotal 2  
Exotics Perennial 2  
Exotics Annual 2  
Water 1  
Rock Outcrop 0  
Gravel 3  
Logging 1  
Fire: 0  
Stand Age 2  
Agriculture 0  
Livestock 0  
Development 6 RAILBED  
Wildlife 3  
Recreation Severity 3  
Recreation Type 3  
Hydrology 2

## Exotic Species

### Noxious Exotic Plants

### Other Exotic Plants

VETH

Water: 1  
Rock: 0  
Talus: 1  
Gravel: 3  
Bare Ground: 5  
Moss Lichen: 2  
Litter: 89

## Vegetation Types

Percent Pattern Rank

Existing Veg1: ALIN RIPARIAN

85 Matrix G

Veg Community1: ALIN

Existing Veg2: QUGA-PIPO FOREST

15 Small patch G

Veg Community3:

Existing Veg3:

0

Veg Community3:

Notes:

# Polygon Number 33

ParkName:

Survey Intensity 1  
Observer PM  
Date 8/5/2008  
Total Vegetation 4  
Trees Total 3  
Dominant Trees ACMA3, PIPO, QUGA  
emergent 0  
maincanopy 3  
subcanopy 3  
Shrubs Total 3  
Dominant Shrubs CLLI, TODI, SYAL, PHLE4  
> 1.5' tall 0  
< 1.5' tall 0  
Graminoids Total 0  
Dominant Graminoids PSSP6, FERU, POBU, BRTE  
Graminoids Perennial 0  
Graminoids Annual 0  
Forbs Total 2  
Dominant Forbs VETH  
Forbs Perennial 2  
Forbs Annual 0  
Ferns Total 0  
Ferns Evergreen 0  
Ferns Deciduous 0  
ExoticsTotal 0  
Exotics Perennial 0  
Exotics Annual 0  
Water 0  
Rock Outcrop 5  
Gravel 30  
Logging  
Fire: 0  
Stand Age 2  
Agriculture 0  
Livestock 0  
Development 6  
Wildlife 0  
Recreation Severity 1  
Recreation Type 4  
Hydrology 2

KRT

## Exotic Species

### Noxious Exotic Plants

### Other Exotic Plants

Water: 0  
Rock: 5  
Talus: 2  
Gravel: 30  
Bare Ground: 15  
Moss Lichen: 1  
Litter: 47

## Vegetation Types

Vegetation Types	Percent	Pattern	Rank
Existing Veg1: DEVELOPED TRAIL / RAIL BED	100		D
Veg Community1: developed			
Existing Veg2:	0		
Veg Community3:			
Existing Veg3:	0		
Veg Community3:			
Notes: DEVELOPED SECTION OF TRAIL			



## Polygon Number 34

ParkName:

Survey Intensity 2  
 Observer PM  
 Date 8/5/2008  
 Total Vegetation 4  
 Trees Total 3  
 Dominant Trees PIPO, QUGA  
 emergent 0  
 maincanopy 3  
 subcanopy 2  
 Shrubs Total 3  
 Dominant Shrubs TODI, SYAL, PHLE4  
 > 1.5' tall 0  
 < 1.5' tall 0  
 Graminoids Total 0  
 Dominant Graminoids PSSP6, FERU, POBU, BRTE  
 Graminoids Perennial 0  
 Graminoids Annual 0  
 Forbs Total 2  
 Dominant Forbs LOSU  
 Forbs Perennial 0  
 Forbs Annual 0  
 Ferns Total 0  
 Ferns Evergreen 0  
 Ferns Deciduous 0  
 ExoticsTotal 0  
 Exotics Perennial 0  
 Exotics Annual 0  
 Water 0  
 Rock Outcrop 5  
 Gravel 10  
 Logging 1  
 Fire: 0  
 Stand Age 2  
 Agriculture 0  
 Livestock 0  
 Development 0  
 Wildlife 3  
 Recreation Severity 3  
 Recreation Type 3  
 Hydrology 1

KRT

### Exotic Species

#### Noxious Exotic Plants

#### Other Exotic Plants

Water: 0  
 Rock: 5  
 Talus: 2  
 Gravel: 10  
 Bare Ground: 20  
 Moss Lichen: 2  
 Litter: 61

## Vegetation Types

Percent	Pattern	Rank
100	Matrix	G

Existing Veg1: QUGA-PIPO/open steep grassland

Veg Community1: PIPO-QUGA/SYAL-TODI

Existing Veg2: 0

Veg Community3:

Existing Veg3: 0

Veg Community3:

Notes: MORE OPEN AND STEEP THEN POLY 35 - LESS FOREST

# **Polygon Number      35**

**ParkName:**

**KRT**

Survey Intensity      2  
Observer      PM  
Date      8/5/2008  
Total Vegetation      4  
Trees Total      3  
Dominant Trees      QUGA, PIPO, ACMA3  
emergent      0  
maincanopy      3  
subcanopy      3  
Shrubs Total      3  
Dominant Shrubs      TODI, SYAL, PHLE4  
> 1.5' tall      3  
< 1.5' tall      2  
Graminoids Total      3  
Dominant Graminoids      Annual Bromus, PSSPS, POBU  
Graminoids Perennial      3  
Graminoids Annual      4  
Forbs Total      3  
Dominant Forbs      LOMAT  
Forbs Perennial      2  
Forbs Annual      2  
Ferns Total      0  
Ferns Evergreen      0  
Ferns Deciduous      0  
ExoticsTotal      0  
Exotics Perennial      0  
Exotics Annual      0  
Water      0  
Rock Outcrop      2  
Gravel      3  
Logging      1  
Fire:      0  
Stand Age      2  
Agriculture      0  
Livestock      0  
Development      0  
Wildlife      3  
Recreation Severity      3  
Recreation Type      3  
Hydrology      1

## **Exotic Species**

### **Noxious Exotic Plants**

### **Other Exotic Plants**

**Water:**      0  
**Rock:**      2  
**Talus:**      0  
**Gravel:**      3  
**Bare Ground:**      10  
**Moss Lichen:**      1  
**Litter:**      84

## **Vegetation Types**

Percent	Pattern	Rank
100	Matrix	G

**Existing Veg1:**      QUGA-PIPO/grasses  
**Veg Community1:**      PIPO-QUGA/SYAL-TODI

**Existing Veg2:**      0

**Veg Community3:**

**Existing Veg3:**      0

**Veg Community3:**

**Notes:**

# **Polygon Number      36**

**ParkName:**

**Survey Intensity**      1  
**Observer**      PM  
**Date**      8/5/2008  
**Total Vegetation**      4  
**Trees Total**      3  
**Dominant Trees**      ACMA3, ALIN, QUGA, PIPO  
**emergent**      2  
**maincanopy**      3  
**subcanopy**      2  
**Shrubs Total**      3  
**Dominant Shrubs**      TODI, COCO, RUDI, CEIN  
**> 1.5' tall**      3  
**< 1.5' tall**      3  
**Graminoids Total**      2  
**Dominant Graminoids**      POBU, BRTE, annual bromus  
**Graminoids Perennial**      2  
**Graminoids Annual**      2  
**Forbs Total**      2  
**Dominant Forbs**      SAOF, DACA  
**Forbs Perennial**      2  
**Forbs Annual**      2  
**Ferns Total**      0  
**Ferns Evergreen**      0  
**Ferns Deciduous**      0  
**ExoticsTotal**      3  
**Exotics Perennial**      2  
**Exotics Annual**      2  
**Water**      0  
**Rock Outcrop**      3  
  
**Gravel**      35  
  
**Logging**      1  
**Fire:**      0  
**Stand Age**      2  
**Agriculture**      0  
**Livestock**      0  
**Development**      6  
**Wildlife**      3  
**Recreation Severity**      1  
**Recreation Type**      4  
**Hydrology**      2

**KRT**

## **Exotic Species**

### **Noxious Exotic Plants**

CEDI3

### **Other Exotic Plants**

SAOF, POBU, BRTE

**Water:**      0  
  
**Rock:**      3  
**Talus:**      5  
**Gravel:**      35  
**Bare Ground:**      10  
**Moss Lichen:**      2  
**Litter:**      45

## **Vegetation Types**

	Percent	Pattern	Rank
<b>Existing Veg1:</b> DEVELOPED TRAIL / RAIL BED	50	Matrix	D
<b>Veg Community1:</b> developed			
<b>Existing Veg2:</b> QUGA-PIPO FOREST	30	Large patch	G
<b>Veg Community3:</b>			
<b>Existing Veg3:</b> ACMA3-ALIN WETTER FOREST	20	Large patch	G
<b>Veg Community3:</b>			

**Notes:**      UPPER MID SECTION OF TRAIL

# **Polygon Number      37**

**ParkName:**

**KRT**

Survey Intensity      2

Observer      PM

Date      8/5/2008

Total Vegetation      6

Trees Total      5

Dominant Trees      PSME, PIPO, QUGA

emergent      2

maincanopy      5

subcanopy      3

Shrubs Total      4

Dominant Shrubs      PHLE4, HODI, SYAL, RUUR, MAAQ2, TORA

> 1.5' tall      4

< 1.5' tall      2

Graminoids Total      2

Dominant Graminoids      CAGE

Graminoids Perennial      2

Graminoids Annual      0

Forbs Total      1

Dominant Forbs      APAN2

Forbs Perennial      1

Forbs Annual      0

Ferns Total      0

Ferns Evergreen      0

Ferns Deciduous      0

ExoticsTotal      0

Exotics Perennial      0

Exotics Annual      0

Water      0

Rock Outcrop      2

Gravel      1

Logging      1

Fire:      0

Stand Age      2

Agriculture      0

Livestock      0

Development      6 FENCE

Wildlife      3

Recreation Severity      3

Recreation Type      3

Hydrology      2

## **Exotic Species**

## **Noxious Exotic Plants**

## **Other Exotic Plants**

**Water:**      0

**Rock:**      2

**Talus:**      3

**Gravel:**      1

**Bare Ground:**      5

**Moss Lichen:**      3

**Litter:**      86

## **Vegetation Types**

**Percent      Pattern      Rank**

**Existing Veg1:**      PSME-QUGA-PIPO/PHLE-HODI-SYAL-RUUR

100

Matrix

G

**Veg Community1:**      PSME-QUGA/SYAL

**Existing Veg2:**      0

**Veg Community3:**

**Existing Veg3:**      0

**Veg Community3:**

**Notes:**

# **Polygon Number      39**

**ParkName:**

**KRT**

Survey Intensity      1  
Observer      PM  
Date      8/5/2008  
Total Vegetation      4  
Trees Total      1  
Dominant Trees      PIPO  
emergent      0  
maincanopy      1  
subcanopy      0  
Shrubs Total      2  
Dominant Shrubs      HODI, TORA, SYAL, PHLE4  
> 1.5' tall      0  
< 1.5' tall      0  
Graminoids Total      0  
Dominant Graminoids      PSSP6, FERU, POBU, BRTE  
Graminoids Perennial      0  
Graminoids Annual      0  
Forbs Total      2  
Dominant Forbs      LOMAT,  
Forbs Perennial      2  
Forbs Annual      0  
Ferns Total      0  
Ferns Evergreen      0  
Ferns Deciduous      0  
ExoticsTotal      0  
Exotics Perennial      0  
Exotics Annual      0  
Water      0  
Rock Outcrop      0  
Gravel      0  
Logging      0  
Fire:      0  
Stand Age      2  
Agriculture      0  
Livestock      0  
Development      6  
Wildlife      0  
Recreation Severity      1  
Recreation Type      4  
Hydrology      2

## **Exotic Species**

### **Noxious Exotic Plants**

### **Other Exotic Plants**

**Water:**      0  
**Rock:**      0  
**Talus:**      0  
**Gravel:**      0  
**Bare Ground:**      0  
**Moss Lichen:**      0  
**Litter:**      0

## **Vegetation Types**

**Percent      Pattern      Rank**

**Existing Veg1:**      DEVELOPED TRAIL / RAIL BED      100      D

**Veg Community1:**      developed

**Existing Veg2:**      0

**Veg Community3:**

**Existing Veg3:**      0

**Veg Community3:**

**Notes:**

# Polygon Number 41 ParkName:

Survey Intensity 2  
 Observer PM  
 Date 8/5/2008  
 Total Vegetation 6  
 Trees Total 5  
 Dominant Trees ACMA3, ALIN, POBAT, PIPO  
 emergent 0  
 maincanopy 5  
 subcanopy 3  
 Shrubs Total 5  
 Dominant Shrubs PHLE4, ROWO, SALIX, RUPA, HODI, SYAL  
 > 1.5' tall 5  
 < 1.5' tall 2  
 Graminoids Total 1  
 Dominant Graminoids CAGE  
 Graminoids Perennial 1  
 Graminoids Annual 0  
 Forbs Total 1  
 Dominant Forbs TRDU, APAN, TYLA  
 Forbs Perennial 1  
 Forbs Annual 1  
 Ferns Total 1  
 Ferns Evergreen 1  
 Ferns Deciduous 1  
 ExoticsTotal 1  
 Exotics Perennial 1  
 Exotics Annual 0  
 Water 0  
 Rock Outcrop 0  
 Gravel 1  
 Logging 1  
 Fire: 0  
 Stand Age 2  
 Agriculture 0  
 Livestock 0  
 Development FARMED FROM  
 Wildlife 3  
 Recreation Severity 3  
 Recreation Type 3  
 Hydrology 2

KRT

## Exotic Species

### Noxious Exotic Plants

HYPE

### Other Exotic Plants

Water: 0  
 Rock: 0  
 Talus: 0  
 Gravel: 1  
 Bare Ground: 1  
 Moss Lichen: 0  
 Litter: 98

## Vegetation Types

Vegetation Types	Percent	Pattern	Rank
Existing Veg1: ACMA3-ALIN-POBAT/mixed shrub wet area	100	Matrix	G

Veg Community1: ACMA3-POBAT/ALIN

Existing Veg2: 0

Veg Community3:

Existing Veg3: 0

Veg Community3:

Notes: FOSESTED SHRUBBY WETLAND CREATED BY DAM EFFECT OF RAILROAD BERM