

Rare Plant and Vegetation Survey of Maryhill State Park





Rare Plant and Vegetation Survey of Maryhill State Park

Peter H. Morrison

pm@pacificbio.org

and

Hans M. Smith IV

hans@pacificbio.org

November 2008

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

Recommended Citation

Morrison, P.H. and H.M. Smith IV, 2008. Rare Plant and Vegetation Survey of Maryhill State Park. Pacific Biodiversity Institute, Winthrop, Washington. 41 p.

Acknowledgements

Juliet Rhodes, Diana Hackenburg, and Alexis Monetta assisted with data entry and validation. The photographs in this report were taken by Peter Morrison.

Project Funding

This project was funded by the Washington State Parks and Recreation Commission.

Executive Summary

Pacific Biodiversity Institute conducted a rare plant and vegetation community survey of Maryhill State Park for the Washington State Parks and Recreation Commission during the 2008 field season. Maryhill State Park covers about 97 acres. The park is located along the north side of the Columbia River, immediately east of the bridge to Biggs, Oregon.

A total of 17 vegetation community polygons consisting of 6 general land cover types were mapped and surveyed in Maryhill State Park. The park has a history of intensive human disturbance and development; hence, no significant native plant communities exist in the park. All existing patches of semi-natural vegetation are dominated by non-native plants and have been heavily disturbed and altered by human activities.

No rare plants listed by the State of Washington were found in Maryhill State Park. Noxious weeds and exotic plants are widespread in the undeveloped portions of the park.

The ecological condition of Maryhill State Park varied from completely developed to poor condition. There are many restoration opportunities at Maryhill, but few would be a high priority from a statewide perspective.

Table of Contents

Introduction	6
Survey Conditions and Survey Routes	6
Vegetation Community Surveys	7
Methods.....	7
Results.....	8
Historical Vegetation	8
Vegetation Community Mapping.....	8
Vegetation Community and Land Cover Types.....	10
Rare Plant Surveys	13
Methods.....	13
Results	13
Vascular Plant List for Maryhill State Park	14
Discussion and Recommendations	16
Noxious Weeds	16
Ecological Condition.....	18
Restoration Opportunities	19
Other Recommendations.....	19
GIS Products Produced	19
References	20
Appendix A – Ecological Condition Ranking System	21
Appendix B – Vegetation Survey Data Methods and Codes	22
Appendix C – Vegetation Survey Polygon Data	25

Introduction

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

Maryhill State Park is a 97 acre property located along the Columbia River in Klickitat County, Washington. It is a highly developed park with a history of intense human disturbance. There are no areas left in a natural, pristine condition within the park boundary. The water-table of the park landscape, and associated vegetation has been significantly altered by the impoundment of water behind the Dalles Dam in the Columbia River. The conversion of surrounding lands to agriculture, and the adjacent highway and railroad activities and development have also impacted the park site. The primary use of the park is as a campground used primarily by travelers.

Survey Conditions and Survey Routes

The project area was surveyed by two botanist/ecologists on April 13, 2008 and by one botanist/ecologist on August 3, 2008. Our routes from these surveys are illustrated in Figure 1. Most of the park was accessible by maintained roads and trails.

The western portion of the park appears to not be controlled and managed by the park and there is a sign restricting this portion of the park to Native American tribal people from selected tribes. The sign denotes this area as the Maryhill Treaty Fishing Access Site, US Dept. of Interior Bureau of Indian Affairs and lists the following tribes: Nez Pierce, Umatilla, Warm Springs, and Yakama. Also, an area on the northeastern part of the park appears to be private land and is part of a commercial orchard. This area also does not appear to be under park control. These two areas were not surveyed.



Figure 1. Field Survey Schedule and Routes.

Vegetation Community Surveys

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 manually 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 community 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.

Parks were visited at least two times during the 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. The second visit added more species to the plant list during different times of the season.

We assigned a vegetation community type (usually an established plant association name) and other vegetation attributes to each vegetation polygon. Field work concluded with an ecological assessment of the polygons delineated within the parks assigning each vegetation community within a polygon to an ecological condition rank (Appendix A).

Since all the polygons at Maryhill State Park represented developed or highly disturbed areas, we did not assign any natural plant community description or plant association to the polygons. We only described the general vegetation condition and land cover associated with the polygon. Individual species occurring within the polygons were recorded as part of the vegetation database associated with the polygon.

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 easily 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 the WSPRC (Appendix B). 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.

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

Results

Historical Vegetation

The historical vegetation of Maryhill State Park is Columbia Basin shrub-steppe and/or grassland habitat. No accurate historic vegetation maps exist for the park area, but a historic vegetation map produced by Northwest Habitat Institute (Kiilsgaard and Barrett 1999) was consulted and corresponds to our observations. The park vegetation was substantially altered by flooding and resulting higher water tables created by the Dalles Dam on the Columbia River. The Dalles Dam was constructed in 1960. The vegetation prior to dam construction was probably dry shrub-steppe. We examined Landsat MSS satellite imagery from 1972, 1986 and 1992 and it appears that much of the irrigated and subirrigated area within the park was wet as far back as 1972. However, an increase in irrigated area was observed between 1986 and 1992.

Vegetation Community Mapping

A total of 17 polygons covered by 6 general land cover types were mapped and visited in Maryhill State Park (Figures 2 and 3, Table 1). The park has a long history of human disturbance and development. There are no native plant communities present that have not been heavily disturbed and altered by past human activities.



Figure 2. Map of Maryhill State Park showing vegetation community polygons overlaid onto an aerial photo of the park.

Table 1. Plant communities and land cover observed in Maryhill State Park

Plant Association or Land Cover (code; reference)	Plant Communities or Land Cover Observed
Artificial pond / wetland	Artificial pond / wetland
Columbia River	Columbia River
Disturbed/exotic forest	Disturbed/exotic forest
Disturbed/exotic forest and wetland	Disturbed/exotic forest and wetland
Orchard	Private commercial orchard
Developed	Developed area, campgrounds, facilities, etc.

Figure 3 shows a map of Maryhill State Park classified into the primary land cover types attributed to each polygon. 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 C lists the attributes for each polygon in the project area.



Figure 3. Land cover types attributed to each vegetation polygon

Vegetation Community and Land Cover Types

Artificial pond / wetland

There are two ponds that were created by dredging in the park, near the edge of the Columbia River. These ponds are rather scummy by late summer, but have some weedy wetland vegetation along the edge. They are not high quality wetlands.



Figure 4. Photograph of artificial pond in the park.

Columbia River

Small polygons that represent inundation from impounded water along the Columbia River are within the park boundary.

Developed Area

Most of the park is developed as a campground, parking lot, other visitor facilities, swimming beaches, and ranger facilities. Small patches of undeveloped, yet highly disturbed land are also contained in Polygon 1, which encompasses the main developed areas. These patches were not mapped, as they are significantly less than the minimum mapping unit.



Figure 5. Photograph of the campground.

Disturbed/exotic forest

There is a small strip of forest with exotic trees and high levels of human disturbance between the campground and the Columbia River (polygon 15). This polygon also contains a high use beach area. This area is in poor ecological condition.

Disturbed/exotic forest and wetland

Three polygons characterized by small patches of disturbed/exotic forested wetlands or forest/wetland mixes are located in the park. These areas are in poor ecological condition. They are the most “wild” parts of the park landscape, however they are dominated by exotic plants such as tree of heaven, white mulberry and reed canarygrass.

Orchard

A portion of a commercial orchard lies within the GIS park boundary (Figure 3). If the GIS park boundary is correct, this private use of park lands may need attention.

Rare Plant Surveys

Methods

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

Field surveys were conducted on: April 13 and August 3. During the field surveys, we were equipped with reference literature; rare plant lists for the area, maps showing rare plant locations from previous surveys, and a portable plant identification lab. We looked for rare plants in habitats previously identified as being likely occurrence sites. So as not to miss a rare plant, all vascular plant species encountered during the inventory were identified on site, at base camp in the portable laboratory, or back at our office.

Survey routes were determined based on the desire to efficiently cover a large proportion of the park's area throughout the field season. We surveyed areas of the park more intensively where rare plants are more likely to occur. Survey routes for the rare plant inventory and rare plant locations were recorded either by hand, on a hardcopy topographic map, or as GPS waypoints and trackpoints, all of which were later compiled into a single GIS data layer, depicted in Figure 1 (page 6).

Results

No plant species listed as threatened, endangered or sensitive were encountered in the project area. Given the fact that the state park is highly developed and has a long history of human use and disturbance, it is highly unlikely that a rare plant population exists here.

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

The Washington DNR NHP program GIS data on rare plant locations does show a previous sighting location for *Lomatium laevigatum*, a state threatened plant, just north of the park boundary. All of the mapped population is north of the state highway and is outside of the park (Figure 6). It is quite possible that this species once occurred within the area now designated as park property, before human activity drastically altered and replaced the natural communities. It might be possible to re-establish a population of this rare plant within the park on one of the disturbed sites. This could be accomplished by removing non-native species and planting *Lomatium laevigatum* seeds.

Figure 6. Population of *Lomatium laevigatum* north of the park boundary.

Vascular Plant List for Maryhill State Park

95 vascular plant species were identified to at least genus within the project area during 2008 field surveys. Of these, 55 species are known exotic plants, meaning 58% of the park's plant diversity is non-native. Table 2 provides a list of all plant species identified during 2008 field surveys.

Table 2. Vascular Plant Species identified at Maryhill State Park

Symbol	Scientific Name with Author	National Common Name	Family	Noxious Weed Status	Exotic
ACMA3	<i>Acer macrophyllum</i> Pursh	bigleaf maple	Aceraceae		
AGCR	<i>Agropyron cristatum</i> (L.) Gaertn.	crested wheatgrass	Poaceae		yes
AIAL	<i>Ailanthus altissima</i> (Mill.) Swingle	tree of heaven	Simaroubaceae		yes
ALMA5	<i>Allium macrum</i> S. Watson	rock onion	Liliaceae		
AMFR	<i>Amorpha fruticosa</i> L.	desert false indigo	Fabaceae	B	yes
AMMEM2	<i>Amsinckia menziesii</i> (Lehm.) A. Nelson & J.F. Macbr. var. <i>menziesii</i>	Menzies' fiddleneck	Boraginaceae		
ANCA14	<i>Anthriscus caucalis</i> M. Bieb.	bur chervil	Apiaceae		yes
ARDR4	<i>Artemisia dracunculus</i> L.	tarragon	Asteraceae		
ARLU	<i>Artemisia ludoviciana</i> Nutt.	white sagebrush	Asteraceae		
ARTR2	<i>Artemisia tridentata</i> Nutt.	big sagebrush	Asteraceae		
ASFA	<i>Asclepias fascicularis</i> Decne.	Mexican whorled milkweed	Asclepiadaceae		
ASOF	<i>Asparagus officinalis</i> L.	garden asparagus	Liliaceae		yes
BRTE	<i>Bromus tectorum</i> L.	cheatgrass	Poaceae		yes
CANUN2	<i>Cardamine nuttallii</i> Greene var. <i>nuttallii</i>	palmate toothwort	Brassicaceae		
CADR	<i>Cardaria draba</i> (L.) Desv.	whitetop	Brassicaceae	C	yes
CEDI3	<i>Centaurea diffusa</i> Lam.	diffuse knapweed	Asteraceae	B	yes
CESO3	<i>Centaurea solstitialis</i> L.	yellow star-thistle	Asteraceae	B	yes
CESTM	<i>Centaurea stoebe</i> L. ssp. <i>micranthos</i> (Gugler) Hayek	spotted knapweed	Asteraceae	B	yes
CEDU2	<i>Cerastium dubium</i> (Bast.) Guépin	doubtful chickweed	Caryophyllaceae		yes
CEGL2	<i>Cerastium glomeratum</i> Thuill.	sticky chickweed	Caryophyllaceae		yes
CHAM	<i>Chenopodium ambrosioides</i> L.	Mexican tea	Chenopodiaceae		yes
CHBO2	<i>Chenopodium botrys</i> L.	Jerusalem oak goosefoot	Chenopodiaceae		yes
CHVI8	<i>Chrysothamnus viscidiflorus</i> (Hook.) Nutt.	yellow rabbitbrush	Asteraceae		
CIIN	<i>Cichorium intybus</i> L.	chicory	Asteraceae		yes
CIAR4	<i>Cirsium arvense</i> (L.) Scop.	Canada thistle	Asteraceae	C	yes
CIVU	<i>Cirsium vulgare</i> (Savi) Ten.	bull thistle	Asteraceae	C	yes
COCA5	<i>Conyza canadensis</i> (L.) Cronquist	Canadian horseweed	Asteraceae		
DAGL	<i>Dactylis glomerata</i> L.	orchardgrass	Poaceae		yes
DACA6	<i>Daucus carota</i> L.	Queen Anne's lace	Apiaceae	B	yes
DEIN5	<i>Descurainia incana</i> (Bernh. ex Fisch. & C.A. Mey.) Dorn	mountain tansymustard	Brassicaceae		

Symbol	Scientific Name with Author	National Common Name	Family	Noxious Weed Status	Exotic
DEPI	<i>Descurainia pinnata</i> (Walter) Britton	western tansymustard	Brassicaceae		
DRVE2	<i>Draba verna</i> L.	spring draba	Brassicaceae		yes
ELAN	<i>Elaeagnus angustifolia</i> L.	Russian olive	Elaeagnaceae		yes
ELPA3	<i>Eleocharis palustris</i> (L.) Roem. & Schult.	common spikerush	Cyperaceae		
ELGL	<i>Elymus glaucus</i> Buckley	blue wildrye	Poaceae		
EPMI	<i>Epilobium minutum</i> Lindl. ex Lehm.	chaparral willowherb	Onagraceae		
EQTE	<i>Equisetum telmateia</i> Ehrh.	giant horsetail	Equisetaceae		
ERNA10	<i>Ericameria nauseosa</i> (Pall. ex Pursh) G.L. Nesom & Baird	rubber rabbitbrush	Asteraceae		
ERNI2	<i>Eriogonum niveum</i> Douglas ex Benth.	snow buckwheat	Polygonaceae		
ERiop	<i>Eriophorum</i> L.	cottongrass	Cyperaceae		
ERCI6	<i>Erodium cicutarium</i> (L.) L'Hér. ex Aiton	redstem stork's bill	Geraniaceae		yes
ESCA2	<i>Eschscholzia californica</i> Cham.	California poppy	Papaveraceae		
GAAP2	<i>Galium aparine</i> L.	stickywilly	Rubiaceae		
GYPA	<i>Gypsophila paniculata</i> L.	baby's breath	Caryophyllaceae	C	yes
HEHE	<i>Hedera helix</i> L.	English ivy	Araliaceae	C	yes
HEVI4	<i>Heterotheca villosa</i> (Pursh) Shinners	hairy false goldenaster	Asteraceae		
JUARL	<i>Juncus arcticus</i> Willd. ssp. littoralis (Engelm.) Hultén	mountain rush	Juncaceae		
JUNCU	<i>Juncus</i> L.	rush	Juncaceae		
LASE	<i>Lactuca serriola</i> L.	prickly lettuce	Asteraceae		yes
LAAM	<i>Lamium amplexicaule</i> L.	henbit deadnettle	Lamiaceae		yes
LAMIU	<i>Lamium</i> L.	deadnettle	Lamiaceae		
LELA2	<i>Lepidium latifolium</i> L.	broadleaved pepperweed	Brassicaceae	B	yes
LEVI3	<i>Lepidium virginicum</i> L.	Virginia pepperweed	Brassicaceae		
LOTUS	<i>Lotus</i> L.	trefoil	Fabaceae		yes
MAAQ2	<i>Mahonia aquifolium</i> (Pursh) Nutt.	hollyleaved barberry	Berberidaceae		
MAPA5	<i>Malva parviflora</i> L.	cheeseweed mallow	Malvaceae		yes
MADI6	<i>Matricaria discoidea</i> DC.	disc mayweed	Asteraceae		yes
MESA	<i>Medicago sativa</i> L.	alfalfa	Fabaceae		yes
MEOF	<i>Melilotus officinalis</i> (L.) Lam.	yellow sweetclover	Fabaceae		yes
MOAL	<i>Morus alba</i> L.	white mulberry	Moraceae		yes
PHAR3	<i>Phalaris arundinacea</i> L.	reed canarygrass	Poaceae	C	yes
PICO	<i>Pinus contorta</i> Douglas ex Louden	lodgepole pine	Pinaceae		
PLLA	<i>Plantago lanceolata</i> L.	narrowleaf plantain	Plantaginaceae		yes
PLMA2	<i>Plantago major</i> L.	common plantain	Plantaginaceae		yes
POAN	<i>Poa annua</i> L.	annual bluegrass	Poaceae		yes
POBU	<i>Poa bulbosa</i> L.	bulbous bluegrass	Poaceae		yes

Symbol	Scientific Name with Author	National Common Name	Family	Noxious Weed Status	Exotic
POPR	<i>Poa pratensis</i> L.	Kentucky bluegrass	Poaceae		yes
POAL7	<i>Populus alba</i> L.	white poplar	Salicaceae		yes
POBAT	<i>Populus balsamifera</i> L. ssp. <i>trichocarpa</i> (Torr. & A. Gray ex Hook.) Brayshaw	black cottonwood	Salicaceae		
PRDO	<i>Prunus domestica</i> L.	European plum	Rosaceae		yes
PUTR2	<i>Purshia tridentata</i> (Pursh) DC.	antelope bitterbrush	Rosaceae		
QUGA4	<i>Quercus garryana</i> Douglas ex Hook.	Oregon white oak	Fagaceae		
RHGL	<i>Rhus glabra</i> L.	smooth sumac	Anacardiaceae		
ROPS	<i>Robinia pseudoacacia</i> L.	black locust	Fabaceae		yes
RUAR9	<i>Rubus armeniacus</i> Focke	Himalayan blackberry	Rosaceae		yes
RULA	<i>Rubus laciniatus</i> Willd.	cutleaf blackberry	Rosaceae		yes
RUCR	<i>Rumex crispus</i> L.	curly dock	Polygonaceae		yes
SAEX	<i>Salix exigua</i> Nutt.	narrowleaf willow	Salicaceae		
SALIX	<i>Salix</i> L.	willow	Salicaceae		
SAKA	<i>Salsola kali</i> L.	Russian thistle	Chenopodiaceae		yes
SCAC3	<i>Schoenoplectus acutus</i> (Muhl. ex Bigelow) A. Löve & D. Löve	hardstem bulrush	Cyperaceae		
SCIRP	<i>Scirpus</i> L.	bulrush	Cyperaceae		
SCAN2	<i>Scleranthus annuus</i> L.	German knotgrass	Caryophyllaceae		yes
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		
SIAL2	<i>Sisymbrium altissimum</i> L.	tall tumbled mustard	Brassicaceae		yes
SOCA6	<i>Solidago canadensis</i> L.	Canada goldenrod	Asteraceae		
STME2	<i>Stellaria media</i> (L.) Vill.	common chickweed	Caryophyllaceae		yes
TAOF	<i>Taraxacum officinale</i> F.H. Wigg.	common dandelion	Asteraceae		yes
TRDU	<i>Tragopogon dubius</i> Scop.	yellow salsify	Asteraceae		yes
TRRE3	<i>Trifolium repens</i> L.	white clover	Fabaceae		yes
TYLA	<i>Typha latifolia</i> L.	broadleaf cattail	Typhaceae		
VEAR	<i>Veronica arvensis</i> L.	corn speedwell	Scrophulariaceae		yes
VICIA	<i>Vicia</i> L.	vetch	Fabaceae		yes
VUMY	<i>Vulpia myuros</i> (L.) C.C. Gmel.	rat-tail fescue	Poaceae		yes

Discussion and Recommendations

Noxious Weeds

There are significant patches of noxious weeds in the park. The largest patches were mapped during field surveys (Figure 7). Smaller populations also occur within the park. The noxious weeds that we observed

in each polygon are recorded in the corresponding attribute item in the polygon attributes table, a report of which has been provided as Appendix C.



Figure 7. Major noxious weed patches within the park.

A list of the noxious weeds of Washington State is presented in Table 3. We found five Class B weeds and five Class C weeds.

Some of the disturbed/exotic forests in the park have a large component of tree of heaven (*Ailanthus altissima* (Mill.) Swingle). This tree is highly invasive and should be listed as a noxious weed in Washington. It is listed as noxious in California. It should be controlled and replaced by a native tree species.

Table 3. State listed noxious weeds at Maryhill State Park

Symbol	Scientific Name with Author	National Common Name	State Weed Status
AMFR	Amorpha fruticosa L.	desert false indigo	B
CEDI3	Centaurea diffusa Lam.	diffuse knapweed	B
CESO3	Centaurea solstitialis L.	yellow star-thistle	B
CESTM	Centaurea stoebe L. ssp. micranthos (Gugler) Hayek	spotted knapweed	B
DACA6	Daucus carota L.	Queen Anne's lace	B
CIAR4	Cirsium arvense (L.) Scop.	Canada thistle	C
CIVU	Cirsium vulgare (Savi) Ten.	bull thistle	C
GYP A	Gypsophila paniculata L.	baby's breath	C
HEHE	Hedera helix L.	English ivy	C
PHAR3	Phalaris arundinacea L.	reed canarygrass	C

Ecological Condition

The ecological conditions of all vegetation community polygons within Maryhill State Park are either developed or poor (see Appendix A for definitions). A map of the overall ecological condition is presented in Figure 8. No high quality natural vegetation patches of any significant size exist in the park.

Most of the vegetation in the park is non-native vegetation. Although we did not record all the non-native species we found in the developed portion of the park, we did find 55 non-native species or 58% of the park flora that is non-native. This is a very high percentage of non-native flora compared to other parks we have surveyed in Washington State, illustrating the point that this park is in overall poor ecological condition.



Figure 8. Ecological condition ranks of vegetation polygons.

Restoration Opportunities

There are many areas illustrated in Figure 8 where restoration activities could enhance the park's ecosystems. Most of the wetlands become very smelly and scummy by late summer and are currently not appealing places for park visitors. These artificial wetlands could be improved to provide a more aesthetic environment. Intensive restoration efforts could also provide some ecological benefits.

Although restoration opportunities exist at Maryhill State Park, this park would not be a high priority for allocation of funding for restoration from a statewide priority basis. So much of the park is developed already and there is no significant natural habitat in the park. Restoration within the park would not greatly enhance biodiversity values or ecological values in the larger landscape. Restoration activities would not provide connectivity between patches of high value habitat. Control of noxious weeds would help prevent them from spreading into the larger landscape.

Other Recommendations

Two areas within the GIS boundary of the park appear to be not managed or controlled by WSPRC. Perhaps the park boundary needs to be redrawn and area estimates of the park adjusted. Coordination with the county assessor is advised as the State may be losing tax revenue due to improper attribution of land ownership.

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 Maryhill State Park. 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.

References

- Beck, K. and J. Arnett. 2001. State Parks Vegetation Surveys: April, May, and June 2001. 25 p.
- Bourgeron, P. S., and L. D. Engelking, editors. 1994. A preliminary vegetation classification of the western United States. Unpublished report. The Nature Conservancy, Western Heritage Task Force, Boulder, CO. 175 pp. plus appendix.
- Crawford, Rex C. 2003. A riparian vegetation classification of the Columbia Basin, Washington. 2003. Washington Natural Heritage Program, Washington Department of Natural Resources, Olympia, WA 98504-7016. Published in coordination with Bureau of Land Management, Spokane District and The Nature Conservancy.
- Crawford, R.C. 1999. Preliminary key to shrub-steppe plant associations in Washington State. Washington Natural Heritage Program, Washington Department of Natural Resources, Olympia, WA.
- Daubenmire, R. F. 1970. Steppe vegetation of Washington. Washington State University Agricultural Experiment Station Technical Bulletin No. 62. 131 pp.
- Hitchcock, C.L. and A. Cronquist. 1973. Flora of the Pacific Northwest: An Illustrated Manual University of Washington Press, Seattle.
- Hitchcock, C.L., Cronquist, A., Ownbey, M., and J. W. Thompson. 1955. Vascular Plants of the Pacific Northwest. University of Washington Press, Seattle.
- Kagan, J. S., J. A. Christy, M. P. Murray, and J. A. Titus. 2000. Classification of native vegetation of Oregon. Oregon Natural Heritage Program, Portland. 63 pp.
- Kiilsgaard, Chris and Charley Barrett. 1999. Washington Historic Wildlife-Habitat Types. Digital raster data. Northwest Habitat Institute, Corvallis, OR. <http://www.nwhi.org>.
- Morrison, P.H. and H.M. Smith IV, 2007. Rare Plant and Vegetation Survey of Bottle Beach, Grayland Beach, Twin Harbors, Westhaven and Westport Light State Parks. Pacific Biodiversity Institute, Winthrop, Washington. 149 p.
- WANHP [Washington Natural Heritage Program]. No date. Unpublished data files. Washington Natural Heritage Program, Department of Natural Resources, Olympia, WA.
- Western Ecology Working Group of NatureServe. No date. International Ecological Classification Standard: International Vegetation Classification -Terrestrial Vegetation. NatureServe, Boulder, CO.

Appendix A – Ecological Condition Ranking System

Ecological Condition Ranks

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

The 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 is absent. Many rare plant and animal species may only exist within this condition class.

■ Good Ecological Condition

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

■ Marginal Ecological Condition

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

■ Poor Ecological Condition

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

Appendix B – Vegetation Survey Data Methods and Codes

Legend:

Site = name of locality of map project

Polygon = number you put on map

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

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

Survey intensity

1 = walked or could see most of polygon (high confidence in survey data)

2 = walked or could see part of polygon interior (moderate confidence)

3 = walked perimeter or could see part of polygon interior (low confidence)

4 = photo interpretation or other remote survey

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

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

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

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

SOIL SURFACE estimate to nearest % the following, the sum of the categories adds to 100%

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

Gravel/cobble = large fragments between sand and boulder

Bare ground = exposed mineral soil

Mosses/lichens = nonvascular plant cover on soil

Litter = includes logs, branches, and basal area of plants

Describe in comments if there is wide variation in any category; note % standing water if it is persistent or characteristic of site.

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

Logging

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

Stand Age

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

Agriculture

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

Livestock

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

Development

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

Wildlife

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

Recreation Use Severity

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

Recreation Use Primary Type

- 1 = wheeled
- 2 = hoofed
- 3 = pedestrian
- 4 = combination of above
- 5 = other

Hydrology

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

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

Condition Rank of PA in key or estimate

% of Polygon = your estimate

Pattern = how PA is distributed in polygon

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

Exotic = primary species observed; secondary species observed.

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

Appendix C – Vegetation Survey Polygon Data

Polygon Number 1A

Survey Intensity 1
 Observer PM
 Date 8/3/2008
 Total Vegetation 0
 Trees Total 0
 Dominant Trees
 emergent 0
 maincanopy 0
 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 0
 Dominant Forbs
 Forbs Perennial 0
 Forbs Annual 0
 Ferns Total 0
 Ferns Evergreen 0
 Ferns Deciduous 0
 Exotics Total 5
 Exotics Perennial 5
 Exotics Annual 3
 Water 0
 Rock Outcrop 0
 Gravel 0
 Logging
 Fire:
 Stand Age
 Agriculture
 Livestock
 Development
 Wildlife
 Recreation Severity
 Recreation Type
 Hydrology

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

Existing Veg1: developed

Percent	Pattern	Rank
100	Matrix	DEVELO

Notes:

Polygon Number 1B

Survey Intensity 1
 Observer PM
 Date 8/3/2008
 Total Vegetation 0
 Trees Total 0
 Dominant Trees
 emergent 0
 maincanopy 0
 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 0
 Dominant Forbs
 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 0
 Gravel 0
 Logging
 Fire:
 Stand Age
 Agriculture
 Livestock
 Development
 Wildlife
 Recreation Severity
 Recreation Type
 Hydrology

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

Existing Veg1:	Percent	Pattern	Rank
Northwest Tribal Fisheries - not	100	Matrix	DEVELO
Notes:			

Polygon Number 2

Survey Intensity 2
 Observer PM
 Date 8/3/2008
 Total Vegetation 0
 Trees Total 0
 Dominant Trees
 emergent 0
 maincanopy 0
 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 0
 Dominant Forbs
 Forbs Perennial 0
 Forbs Annual 0
 Ferns Total 0
 Ferns Evergreen 0
 Ferns Deciduous 0
 ExoticsTotal 0
 Exotics Perennial 0
 Exotics Annual 0
 Water 100
 Rock Outcrop 0
 Gravel 0
 Logging
 Fire:
 Stand Age
 Agriculture
 Livestock
 Development
 Wildlife
 Recreation Severity
 Recreation Type
 Hydrology

Exotic Species

Noxious Exotic Plants

Other Exotic Plants

Water: 100
 Rock: 0
 Talus: 0
 Gravel: 0
 Bare Ground: 0
 Moss Lichen: 0
 Litter: 0

Vegetation Types

	Percent	Pattern	Rank
Existing Veg1: Columbia River	100	Matrix	POOR

Notes:

Polygon Number 3

Survey Intensity 2
 Observer PM
 Date 8/3/2008
 Total Vegetation 0
 Trees Total 0
 Dominant Trees
 emergent 0
 maincanopy 0
 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 0
 Dominant Forbs
 Forbs Perennial 0
 Forbs Annual 0
 Ferns Total 0
 Ferns Evergreen 0
 Ferns Deciduous 0
 ExoticsTotal 0
 Exotics Perennial 0
 Exotics Annual 0
 Water 100
 Rock Outcrop 0
 Gravel 0
 Logging
 Fire:
 Stand Age
 Agriculture
 Livestock
 Development
 Wildlife
 Recreation Severity
 Recreation Type
 Hydrology

Exotic Species

Noxious Exotic Plants

Other Exotic Plants

Water: 100
 Rock: 0
 Talus: 0
 Gravel: 0
 Bare Ground: 0
 Moss Lichen: 0
 Litter: 0

Vegetation Types

	Percent	Pattern	Rank
Existing Veg1: Columbia River	100	Matrix	POOR

Notes:

Polygon Number 4

Survey Intensity 2
 Observer PM
 Date 8/3/2008
 Total Vegetation 0
 Trees Total 0
 Dominant Trees
 emergent 0
 maincanopy 0
 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 0
 Dominant Forbs
 Forbs Perennial 0
 Forbs Annual 0
 Ferns Total 0
 Ferns Evergreen 0
 Ferns Deciduous 0
 ExoticsTotal 0
 Exotics Perennial 0
 Exotics Annual 0
 Water 100
 Rock Outcrop 0
 Gravel 0
 Logging
 Fire:
 Stand Age
 Agriculture
 Livestock
 Development
 Wildlife
 Recreation Severity
 Recreation Type
 Hydrology

Exotic Species

Noxious Exotic Plants

Other Exotic Plants

Water: 100
 Rock: 0
 Talus: 0
 Gravel: 0
 Bare Ground: 0
 Moss Lichen: 0
 Litter: 0

Vegetation Types

	Percent	Pattern	Rank
Existing Veg1: Columbia River	100	Matrix	POOR
Notes:			

Polygon Number 5

Survey Intensity 2
 Observer PM
 Date 8/3/2008
 Total Vegetation 0
 Trees Total 0
 Dominant Trees
 emergent 0
 maincanopy 0
 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 0
 Dominant Forbs
 Forbs Perennial 0
 Forbs Annual 0
 Ferns Total 0
 Ferns Evergreen 0
 Ferns Deciduous 0
 ExoticsTotal 0
 Exotics Perennial 0
 Exotics Annual 0
 Water 100
 Rock Outcrop 0
 Gravel 0
 Logging
 Fire:
 Stand Age
 Agriculture
 Livestock
 Development
 Wildlife
 Recreation Severity
 Recreation Type
 Hydrology

Exotic Species

Noxious Exotic Plants

Other Exotic Plants

Water: 100
 Rock: 0
 Talus: 0
 Gravel: 0
 Bare Ground: 0
 Moss Lichen: 0
 Litter: 0

Vegetation Types

Existing Veg1: Columbia River
 Notes:

Percent	Pattern	Rank
100	Matrix	POOR

Polygon Number 6

Survey Intensity 2
 Observer PM
 Date 8/3/2008
 Total Vegetation 0
 Trees Total 0
 Dominant Trees
 emergent 0
 maincanopy 0
 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 0
 Dominant Forbs
 Forbs Perennial 0
 Forbs Annual 0
 Ferns Total 0
 Ferns Evergreen 0
 Ferns Deciduous 0
 ExoticsTotal 0
 Exotics Perennial 0
 Exotics Annual 0
 Water 100
 Rock Outcrop 0
 Gravel 0
 Logging
 Fire:
 Stand Age
 Agriculture
 Livestock
 Development
 Wildlife
 Recreation Severity
 Recreation Type
 Hydrology

Exotic Species

Noxious Exotic Plants

Other Exotic Plants

Water: 100
 Rock: 0
 Talus: 0
 Gravel: 0
 Bare Ground: 0
 Moss Lichen: 0
 Litter: 0

Vegetation Types

	Percent	Pattern	Rank
Existing Veg1: Columbia River	100	Matrix	POOR
Notes:			

Polygon Number 7

Survey Intensity 2
 Observer PM
 Date 8/3/2008
 Total Vegetation 0
 Trees Total 0
 Dominant Trees
 emergent 0
 maincanopy 0
 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 0
 Dominant Forbs
 Forbs Perennial 0
 Forbs Annual 0
 Ferns Total 0
 Ferns Evergreen 0
 Ferns Deciduous 0
 ExoticsTotal 0
 Exotics Perennial 0
 Exotics Annual 0
 Water 100
 Rock Outcrop 0
 Gravel 0
 Logging
 Fire:
 Stand Age
 Agriculture
 Livestock
 Development
 Wildlife
 Recreation Severity
 Recreation Type
 Hydrology

Exotic Species

Noxious Exotic Plants

Other Exotic Plants

Water: 100
 Rock: 0
 Talus: 0
 Gravel: 0
 Bare Ground: 0
 Moss Lichen: 0
 Litter: 0

Vegetation Types

	Percent	Pattern	Rank
Existing Veg1: Columbia River	100	Matrix	POOR

Notes:

Polygon Number 8

Survey Intensity	1
Observer	PM
Date	8/3/2008
Total Vegetation	4
Trees Total	3
Dominant Trees	POBAT, ROPS, MOAL
emergent	0
maincanopy	2
subcanopy	3
Shrubs Total	3
Dominant Shrubs	ELAN, SAEX, ERNA10, RUAR9
> 1.5' tall	3
< 1.5' tall	2
Graminoids Total	2
Dominant Graminoids	PHAR3, JUARL, ERIOP, SCIRP
Graminoids Perennial	2
Graminoids Annual	0
Forbs Total	2
Dominant Forbs	TYLA, ASFA, ARDR4, VICIA
Forbs Perennial	2
Forbs Annual	0
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
Exotics Total	3
Exotics Perennial	3
Exotics Annual	0
Water	50
Rock Outcrop	0
Gravel	2
Logging	1
Fire:	0
Stand Age	1
Agriculture	0
Livestock	0
Development	Artificial ponds
Wildlife	0
Recreation Severity	3
Recreation Type	3
Hydrology	2

Exotic Species

Noxious Exotic Plants

CESTM, LELA2

Other Exotic Plants

ROPS, MEOF

Water:	50
Rock:	0
Talus:	0
Gravel:	2
Bare Ground:	5
Moss Lichen:	0
Litter:	43

Vegetation Types

	Percent	Pattern	Rank
Existing Veg1: artificial pond/wetland	100	Matrix	POOR

Notes: Scummy ponds with disturbed veg; not natural

Polygon Number 9

Survey Intensity	2
Observer	PM
Date	8/3/2008
Total Vegetation	4
Trees Total	4
Dominant Trees	POAL7, POBAT, ROPS, exotic trees
emergent	2
maincanopy	3
subcanopy	3
Shrubs Total	3
Dominant Shrubs	ELAN, SAEX, MOAL, RUAR9, SALIX, ERNA10
> 1.5' tall	3
< 1.5' tall	2
Graminoids Total	2
Dominant Graminoids	PHAR3, BRTE, POBU
Graminoids Perennial	2
Graminoids Annual	2
Forbs Total	3
Dominant Forbs	ASFA, VICIA, CESO3, COCA5, MEOF, GYPA, TYLA
Forbs Perennial	3
Forbs Annual	2
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	4
Exotics Perennial	4
Exotics Annual	2
Water	50
Rock Outcrop	0
Gravel	5
Logging	1
Fire:	0
Stand Age	2
Agriculture	0
Livestock	0
Development	0
Wildlife	0
Recreation Severity	3
Recreation Type	3
Hydrology	2

Exotic Species

Noxious Exotic Plants

CESO3, GYPA

Other Exotic Plants

PHAR3, MEOF, BRTE

Water:	50
Rock:	0
Talus:	0
Gravel:	5
Bare Ground:	5
Moss Lichen:	0
Litter:	40

Vegetation Types

	Percent	Pattern	Rank
Existing Veg1: artificial pond/wetland	100	Matrix	POOR
Notes: Scummy pond lots of algee, trash, smelly			

Polygon Number 10

Survey Intensity 2
 Observer PM
 Date 8/3/2008
 Total Vegetation 6
 Trees Total 5
 Dominant Trees POAL7, AIAL
 emergent 3
 maincanopy 4
 subcanopy 3
 Shrubs Total 3
 Dominant Shrubs RUAR9, MOAL
 > 1.5' tall 3
 < 1.5' tall 2
 Graminoids Total 3
 Dominant Graminoids AGCR, BRTE
 Graminoids Perennial 3
 Graminoids Annual 2
 Forbs Total 2
 Dominant Forbs SIAL2, VICIA, ASFA
 Forbs Perennial 2
 Forbs Annual 1
 Ferns Total 0
 Ferns Evergreen 0
 Ferns Deciduous 0
 ExoticsTotal 5
 Exotics Perennial 5
 Exotics Annual 2
 Water 2
 Rock Outcrop 0
 Gravel 1
 Logging
 Fire: 1
 Stand Age 0
 Agriculture 0
 Livestock 0
 Development 6
 Wildlife 3
 Recreation Severity 3
 Recreation Type 3
 Hydrology 2 (water table)

Exotic Species

Noxious Exotic Plants

AIAL

Other Exotic Plants

RUAR9

Water: 2
Rock: 0
Talus: 0
Gravel: 1
Bare Ground: 2
Moss Lichen: 0
Litter: 95

Vegetation Types

	Percent	Pattern	Rank
Existing Veg1: disturbed/exotic forest and wetland	100	Matrix	POOR
Notes: Disturbed wetland forest, very stinky area			

Polygon Number 11

Survey Intensity 2
 Observer PM
 Date 8/3/2008
 Total Vegetation 6
 Trees Total 5
 Dominant Trees POAL7, AIAL
 emergent 3
 maincanopy 4
 subcanopy 3
 Shrubs Total 3
 Dominant Shrubs RHGL, RUAR9
 > 1.5' tall 3
 < 1.5' tall 2
 Graminoids Total 3
 Dominant Graminoids AGCR
 Graminoids Perennial 3
 Graminoids Annual 2
 Forbs Total 2
 Dominant Forbs SIAL2, ASFA, VICIA
 Forbs Perennial 2
 Forbs Annual 1
 Ferns Total 0
 Ferns Evergreen 0
 Ferns Deciduous 0
 ExoticsTotal 5
 Exotics Perennial 5
 Exotics Annual 1
 Water 2
 Rock Outcrop 0
 Gravel 1
 Logging 1
 Fire: 0
 Stand Age 2
 Agriculture 0
 Livestock 0
 Development DISTURBED
 Wildlife 3
 Recreation Severity 3
 Recreation Type 3
 Hydrology 2

Exotic Species

Noxious Exotic Plants

AIAL

Other Exotic Plants

RUAR9

Water: 2
Rock: 0
Talus: 0
Gravel: 1
Bare Ground: 2
Moss Lichen: 0
Litter: 95

Vegetation Types

	Percent	Pattern	Rank
Existing Veg1: disturbed/exotic forest and wetland	100	Matrix	POOR
Notes: Disturbed wetland forest, VERY STINKY PLACE			

Polygon Number 12

Survey Intensity 1
 Observer PM
 Date 8/3/2008
 Total Vegetation 5
 Trees Total 5
 Dominant Trees POBAT, POAL7, ROPS
 emergent 2
 maincanopy 4
 subcanopy 3
 Shrubs Total 3
 Dominant Shrubs RHGL, RUAR9, SAEX
 > 1.5' tall 3
 < 1.5' tall 2
 Graminoids Total 3
 Dominant Graminoids AGCR, ELGL, BRTE, POBU, PHAR3
 Graminoids Perennial 3
 Graminoids Annual 1
 Forbs Total 4
 Dominant Forbs LELA2, TRDU, MEOF, COCA5, CIAR4
 Forbs Perennial 4
 Forbs Annual 2
 Ferns Total 0
 Ferns Evergreen 0
 Ferns Deciduous 0
 ExoticsTotal 5
 Exotics Perennial 5
 Exotics Annual 2
 Water 0
 Rock Outcrop 0
 Gravel 3
 Logging 1
 Fire: 0
 Stand Age 2
 Agriculture 0
 Livestock 0
 Development CAMPGROUND
 Wildlife 0
 Recreation Severity 1
 Recreation Type 3
 Hydrology 2

Exotic Species

Noxious Exotic Plants
 LELA2, CIAR4
Other Exotic Plants
 BRTE, POBU, PHAR3

Water: 0
Rock: 0
Talus: 0
Gravel: 3
Bare Ground: 3
Moss Lichen: 0
Litter: 94

Vegetation Types

	Percent	Pattern	Rank
Existing Veg1: disturbed/exotic forest and wetland	100	Matrix	POOR

Notes:

Polygon Number 13

Survey Intensity 2
 Observer PM
 Date 8/3/2008
 Total Vegetation 0
 Trees Total 0
 Dominant Trees orchard trees
 emergent 0
 maincanopy 0
 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 0
 Dominant Forbs
 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 0
 Gravel 0
 Logging
 Fire:
 Stand Age
 Agriculture
 Livestock
 Development
 Wildlife
 Recreation Severity
 Recreation Type
 Hydrology

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

Existing Veg1:	Percent	Pattern	Rank
orchard	100	Matrix	DEVELO

Notes: note: this looks like private land, orchard

Polygon Number 14

Survey Intensity	2
Observer	PM
Date	8/3/2008
Total Vegetation	6
Trees Total	5
Dominant Trees	POAL7, POBAT, ROPS, MOAL
emergent	3
maincanopy	4
subcanopy	3
Shrubs Total	3
Dominant Shrubs	SAEX, RUAR9
> 1.5' tall	3
< 1.5' tall	0
Graminoids Total	2
Dominant Graminoids	POPR
Graminoids Perennial	2
Graminoids Annual	0
Forbs Total	3
Dominant Forbs	LELA2, CIAR4, ASOF, ASFA, TAOF, MAPA5
Forbs Perennial	3
Forbs Annual	0
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	5
Exotics Perennial	5
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	2
Logging	1
Fire:	0
Stand Age	2
Agriculture	0
Livestock	0
Development	DISTUBED
Wildlife	0
Recreation Severity	2
Recreation Type	3
Hydrology	2

Exotic Species

Noxious Exotic Plants

LELA2, CIAR4

Other Exotic Plants

POPR, POAL7

Water:	0
Rock:	0
Talus:	1
Gravel:	2
Bare Ground:	2
Moss Lichen:	0
Litter:	95

Vegetation Types

	Percent	Pattern	Rank	
Existing Veg1:	disturbed/exotic forest and wetland	100	Matrix	POOR
Notes:				

Polygon Number 15

Survey Intensity 1
 Observer PM
 Date 8/3/2008
 Total Vegetation 5
 Trees Total 4
 Dominant Trees POBAT, exotic trees
 emergent 0
 maincanopy 4
 subcanopy 2
 Shrubs Total 3
 Dominant Shrubs RHGL, SAEX
 > 1.5' tall 3
 < 1.5' tall 2
 Graminoids Total 3
 Dominant Graminoids POBU, POPR, BRTE
 Graminoids Perennial 3
 Graminoids Annual 2
 Forbs Total 3
 Dominant Forbs MEOF, LELA2, GYPA
 Forbs Perennial 3
 Forbs Annual 2
 Ferns Total 0
 Ferns Evergreen 0
 Ferns Deciduous 0
 ExoticsTotal 5
 Exotics Perennial 5
 Exotics Annual 2
 Water 0
 Rock Outcrop 0
 Gravel 0
 Logging 1
 Fire: 0
 Stand Age 2
 Agriculture 0
 Livestock 0
 Development DISTURBED
 Wildlife 0
 Recreation Severity 1
 Recreation Type 3
 Hydrology 2

Exotic Species

Noxious Exotic Plants

LELA2, GYPA

Other Exotic Plants

POBU, BRTE

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

Vegetation Types

	Percent	Pattern	Rank
Existing Veg1: disturbed/exotic forest	100	Matrix	POOR

Notes:

Polygon Number 16

Survey Intensity 2
 Observer PM
 Date 8/3/2008
 Total Vegetation 0
 Trees Total 0
 Dominant Trees
 emergent 0
 maincanopy 0
 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 0
 Dominant Forbs
 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 0
 Gravel 0
 Logging
 Fire:
 Stand Age
 Agriculture
 Livestock
 Development
 Wildlife
 Recreation Severity
 Recreation Type
 Hydrology

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

Existing Veg1:	Percent	Pattern	Rank
Northwest Tribal Fisheries - not	100	Matrix	POOR
Notes:			