Rare Plant and Vegetation Survey of Wenatchee Confluence State Park

Pacific Biodiversity Institute

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George Wooten
georgewooten@pacificbio.org

and

Peter H. Morrison
pm@pacificbio.org

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

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Executive Summary

Pacific Biodiversity Institute (PBI) conducted a rare plant and vegetation survey of Wenatchee Confluence State Park for the Washington State Parks and Recreation Commission (WSPRC). Wenatchee Confluence State Park covers 231.08 acres in Chelan County. The park is situated within the northern city limits of Wenatchee along the Columbia River, where it is impounded by the Rock Island Dam. Wenatchee Confluence State Park is a popular camping area and has heavy use by bicyclists and walkers. Trails are both paved and gravel.

Wenatchee Confluence State Park was mapped into 22 polygons covered by eight primary plant communities or mapped as developed, disturbed or water. Existing plant communities were characterized within each polygon. Several of the primary plant communities are globally rare, however restoration opportunities are limited in a practical sense to the existing natural area where there is already a wetland and a wildlife restoration project underway.

There were no occurrences of rare plants listed by the State of Washington found in Wenatchee Confluence State Park.

We found 13 species of noxious weeds at Wenatchee Confluence State Park. Five of these were Class B noxious weeds and eight were Class C weeds. The most widespread noxious weed found in wet areas was reed canary grass (*Phalaris arundinacea*). The most widespread noxious weed found in dry areas was diffuse knapweed (*Centaurea diffusa*). Two aquatic noxious weeds were found including pale yellow iris (*Iris pseudacorus*) and Eurasian watermilfoil (*Myriophyllum spicatum*). The latter species and reed canary grass are becoming established in a habitat restoration area. If this continues it will seriously diminish the value of these wetlands to wildlife.

About 40% of Wenatchee Confluence State Park is developed. The ecological condition of non-developed plant communities in the park varied from poor to good. We made recommendations for restoration within the area where a wetland creation and wildlife habitat enhancement project is already underway. The recommendations focused on creation or maintenance of a beneficial hydrologic regime.

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Introduction

Wenatchee Confluence State Park occupies 231 acres in Chelan County within the northern part of the city of Wenatchee. The park is bordered by the Columbia River above its impoundment by Rock Island Dam. The Wenatchee River goes through the center of the park under a footbridge to join the Columbia River system. Wenatchee Confluence State Park lies in the rain shadow of the North Cascades. The area receives about 9 inches of precipitation annually. Soils are an alluvial mixture of sand and rocks from upstream sources.

The park has a long paved trail system that is used extensively by bicyclists, walkers and joggers. A wetland complex south of the Wenatchee River is restricted to pedestrian travel. This are provides a natural area for waterfowl and other wildlife. Most of the wetlands in this complex have been created by excavation, rather than by natural processes. There are also extensive wetlands created by the inundation of the confluence area by reservoir created by Rock Island Dam. These are also artificial wetlands, but offer habitat to a diversity of wildlife.

Survey Conditions and Survey Routes

Wenatchee Confluence State Park was initially visited by one botanist/ecologist on April 28. A follow-up visit was conducted by two botanist/ecologists on September 19. The survey routes are shown in Figure 1. The park was easily accessible on foot, except for the wetland areas, which were generally inaccessible due to flooding and dense vegetation. They were sampled from the edges and viewed from nearby locations.

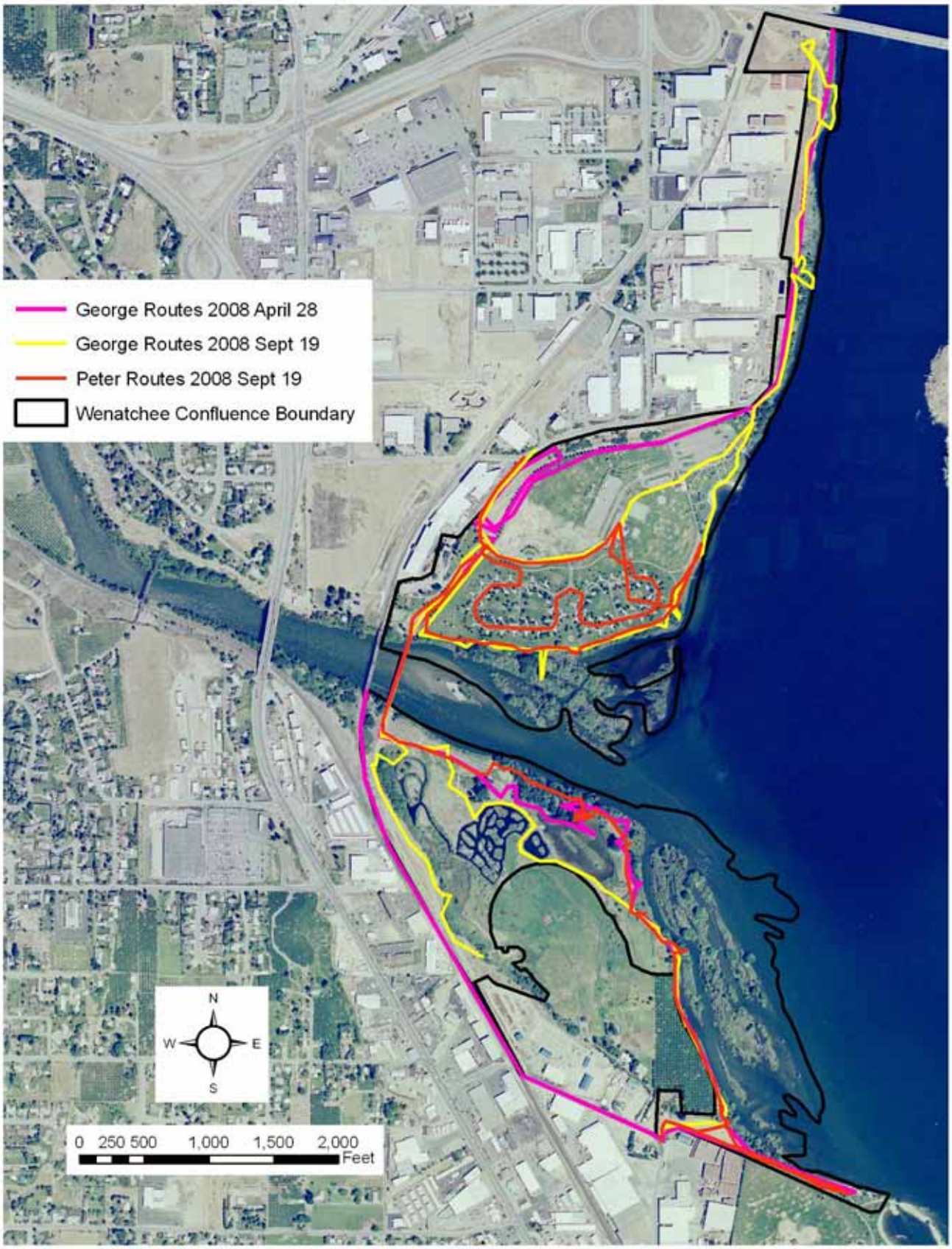

Figure 1. Field Survey Schedule and Routes.

Vegetation Communities

Methods

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

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

Plant community data was recorded on a form initially developed by WSPRC (Appendix A). Recorded data included a wide variety of information about the vegetation composition, environmental characteristics, disturbance history and other notes for each polygon. Each polygon was rated for its overall ecological condition. Vegetation community and land cover classifications were assigned using information and keys from standard literature sources cited in the Reference section of this document (Bourgeron and Engelking 1994, Clausnitzer and Zamora 1987, Crawford 1999, Crawford 2003, Daubenmire 1970, Kagan et al 2000, Kovalchik and Clausnitzer 2004, Lillybridge et al 1995, NatureServe 2008).

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

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

Historical Vegetation

The historical vegetation at Wenatchee Confluence State Park has been modified by development, by plant invasion and by the damming of the Columbia River. Today, the Wenatchee-Columbia confluence is elevated to its present location within the park, it is also displaced several hundred feet from its former location, which is now underwater. Parts of this riverine community remain functionally similar; however, most of the vegetation along the river and lake is now dominated by non-native species.

The uplands at Wenatchee Confluence State Park historically received about nine inches per year of precipitation. This amount of rainfall is only enough to support shrub-steppe communities and a few scattered ponderosa pines. The shrub-steppe communities were probably dominated by big sagebrush (*Artemisia tridentata*; ARTR2) and rubber rabbitbrush (*Ericameria nauseosa*; ERNA10). Today these areas are primarily lawns, roads and buildings, with few native species remaining.

The lower elevation wetland and riparian communities at Wenatchee Confluence State Park would have been dominated by cottonwood (*Populus balsamifera* ssp. *trichocarpa*; POBAT) and narrowleaf willow (*Salix exigua*; SAEX). Both of these species are still represented in these communities, but their former dominance has been lessened by the invasion of non-native trees and shrubs, notably mulberry (*Morus albus*; MOAL) and Himalayan blackberry (*Rubus armeniacus*; RUAR9). Historically, the Columbia River would have provided a disturbance regime to maintain these communities. Disturbances would have included browsing by beavers, however these were trapped out in the early 1800s. Both willows and cottonwood tolerate moderate flooding and readily sprout when pruned.

Today there is a complex of created wetlands just south of the Wenatchee River at Wenatchee Confluence State Park. These wetlands lack many of the historic hydrologic processes that formerly maintained a functional ecological system; hence their presence is largely aesthetic. Historically, ecological processes would have been dependent on seasonal flooding; braiding of the water channels, presence of large woody debris, silt and cobble deposition, physical soil properties, chemical soil properties, and the activities of key species such as beavers and waterfowl.

Uplands may have been maintained by periodic low-severity wildlfires. Fire was started both by lightning and by the native Indians, who used fire to improve forage for wildlife and cultural plants (Boyd, 1999). Under historic fire regimes, annual species and grasslands would have been more predominant than they are today. Due to the urban nature of this park, restoration of fire to this area was not considered practical.

Results

Vegetation Community Mapping

A total of 22 vegetation community polygons were mapped and surveyed in Wenatchee Confluence State Park (Figure 2). These polygons were categorized into 8 plant associations along with cover types for disturbed areas, developed areas and water (Table 1). Table 2 gives additional reference information about the plant associations. The communities were assigned to either a primary, secondary or tertiary community. Primary community types are the dominant or matrix vegetation community within a polygon, whereas secondary and tertiary community types are less abundant vegetation community types that occur within the same polygon and were not conducive to being mapped as a separate polygon due to the size, shape, or pattern of the community patches within the polygon.

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

Table 1. Plant communities observed in Wenatchee Confluence State Park.

Plant Association, Vegetation Community or Land Cover (Codes)	Plant Communities and Land Cover Observed (Codes)
Cottonwood / red-osier dogwood (POBAT / COSE16)	POBAT/COSE16; POBAT/COSE16-SAEX/PHAR3; POBAT-MOAL/SAEX-COSE16/PHAR3; ULPU/SAEX-PRVI-COSE16
Cottonwood / narrowleaf willow (POBAT / SAEX)	POBAT/ROWO/PHAR3; POBAT/SAEX; POBAT/SAEX/PHAR3; ROWO/PHAR3-ELRE4; ROWO-SAEX/PHAR3-ACRE3
Cottonwood / Juncus arcticus ssp. littoralis (POBAT / JUARL)	POBAT/POPR
Narrowleaf willow (SAEX)	ACRE3-CIAR4 (impoundment); Cobble bar; SAEX; SAEX/PHAR3; SAEX/TYLA-PHAR3
Black hawthorn – Wood's rose (CRDO2-ROWO)	MOAL/PHAR3
Basin wildrye (LECI4)	ULPU/LECI4-PHAR3-ACRE3
Reed canary grass (PHAR3) (secondary plant association)	PHAR3
Cattail (TYLA)	TYLA
Developed	Developed campground areas
Disturbed	SECE-BASC5; ULPU/POBU; ULPU/POBU-ELIN3-CEDI3
Water (secondary community)	Water

Table 2. Plant association reference table for Wenatchee Confluence State Park. Global status is defined in Appendix C.

Code	Scientific Names	Authority	Global Status
POBAT / COSE16	Populus trichocarpa / Cornus sericea	Kovalchik and Clausnitzer 2004	G3 (vulnerable)
POBAT / SAEX	Populus balsamifera ssp. trichocarpa / Salix exigua	Crawford 2003; Kagan 2000	G1 (critically imperiled)
POBAT / JUARL	Populus balsamifera ssp. trichocarpa / Juncus arcticus ssp. littoralis	Crawford 2003	G5 (secure)
SAEX	Salix exigua	Bourgeron and Engelking 1994	G5 (secure)
CRDO2-ROWO	Crataegus douglasii - Rosa woodsii	Crawford 2003	G2 (globally imperiled)
LECI4	Leymus cinereus	Crawford 2003; Evans 1999	G1 (critically imperiled)
PHAR3	Phalaris arundinacea	Crawford 2003	G5 (secure)
TYLA	Typha latifolia	Crawford 2003	G5 (secure)

Each vegetation community polygon has at least one primary vegetation community/land cover class assigned to it, and up to 2 additional classes. Figure 3 shows a map depicting the primary vegetation community/land cover class for each polygon within the park. Appendix D describes the attributes described for each polygon mapped within the project area.

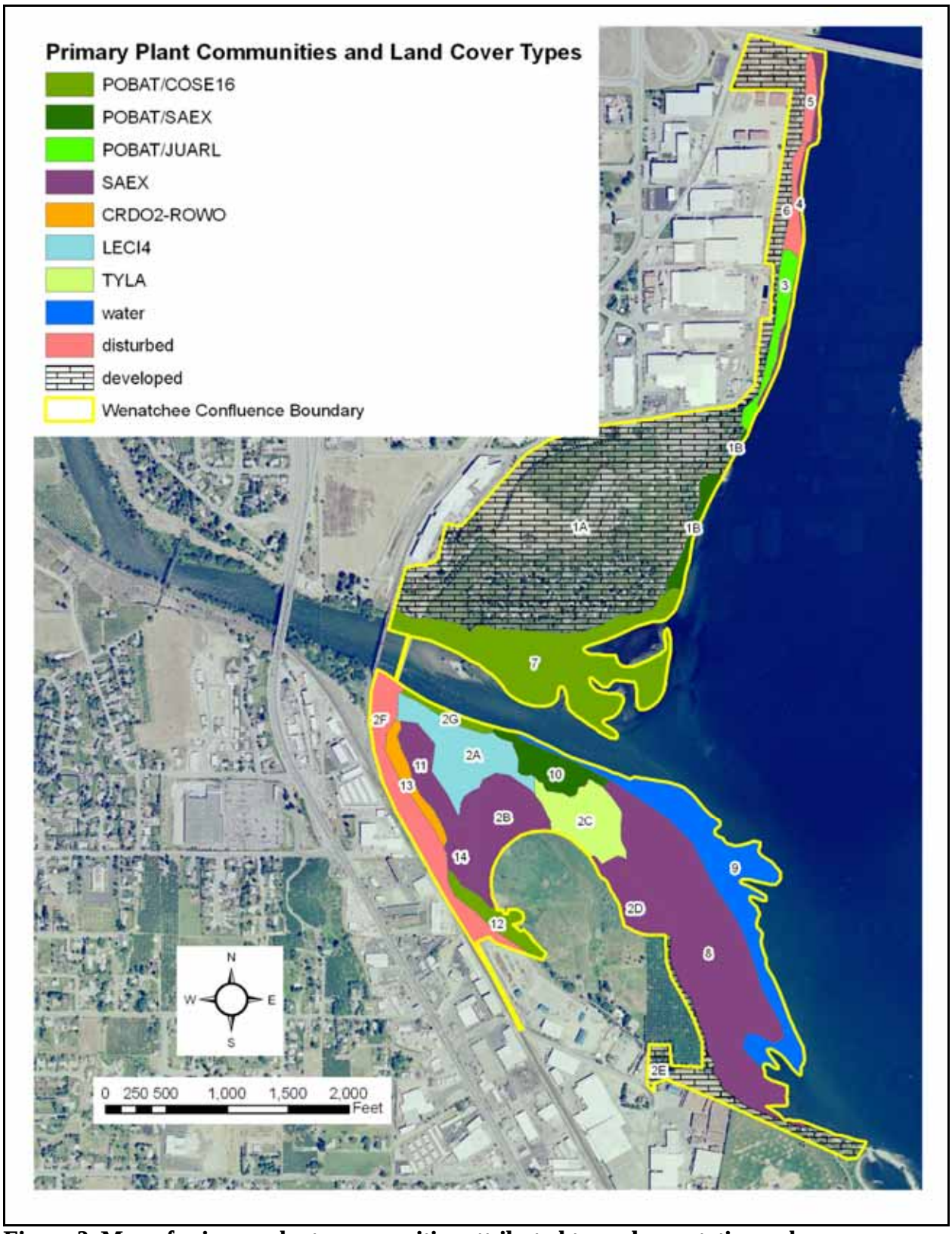

Figure 3. Map of primary plant communities attributed to each vegetation polygon.

Vegetation Community and Land Cover Types

Cottonwood / red-osier dogwood (POBAT / COSE16) G3

Figure 4. An example of the cottonwood / red-osier dogwood plant association at Wenatchee Confluence State Park.

At Wenatchee Confluence State Park, the cottonwood / red-osier dogwood plant association occurs in seasonally flooded sloughs along the Wenatchee River (Figure 4). This plant association is a wetland/riparian community with an overstory of cottonwood (*Populus balsamifera* ssp. *trichocarpa*; POBAT) and with an understory dominated by red-osier dogwood (*Cornus sericea*; COSE16). This plant association was described by Kovalchik and Clausnitzer (2004). It has a rank of G3, implying that it is vulnerable globally.

The cottonwood / red-osier dogwood plant association is similar to the cottonwood / narrowleaf willow (*Salix exigua*; SAEX) plant association, but it tends to have a higher diversity in the understory. These communities have been seriously compromised by non-native tree and shrub invasion. Other commonly observed species in this plant association include mulberry (*Morus albus*; MOAL), Canada thistle (*Cirsium arvense*; CIAR4) and reed canary grass (*Phalaris arundinacea*; PHAR3), none of which are native.

Cottonwood / narrowleaf willow (POBAT / SAEX) G1

Figure 5. An example of the cottonwood / narrowleaf willow plant association at Wenatchee Confluence State Park.

In Wenatchee Confluence State Park the cottonwood / narrowleaf willow plant association occurs near the confluence of the Wenatchee River and the Columbia River reservoir (Figure 5). This plant association was described by Crawford (2003) as a vegetative type and by Kagan (2000). It is ranked G1, critically imperiled. Only a few examples of this type of association are known, and those that are known are mostly overrun with invasive species.

The cottonwood / narrowleaf willow plant association occurs in seasonally flooded and scoured sandy alluvial areas. Narrowleaf willow forms a continuous shrub canopy, while cottonwoods and other deciduous overstory trees make up an open upper canopy. At Wenatchee Confluence Lake State Park this community is being invaded by reed canary grass (*Phalaris arundinacea*; PHAR3), but narrowleaf willow appears capable of maintaining its presence along the water's edge where there is enough sunlight.

The cottonwood / narrowleaf willow plant association is adjacent to a number of other cottonwood plant communities that appear to differ in soil moisture and age of the stand. The cottonwood / narrowleaf willow plant association has the wettest soil of all of these, and usually borders open water. There were two polygons identified with this plant association as the primary type. One of these occurs in a narrow strip in the north part of the park; the other occurs south of the mouth of the Wenatchee River. Only the latter polygon is large enough to maintain a functional ecosystem. In this polygon, the cottonwoods have matured to form a dense overstory. This is probably a natural successional process that will increase the ecological value of the stand over time. However, this may benefit late seral species such as redosier dogwood (*Cornus sericea*) and western poison ivy (*Toxicodendron rydbergii*) at the expense of the narrowleaf willow.

Cottonwood / Baltic rush (POBAT/JUARL) (G5)

Figure 6 (left). An example of the cottonwood / Baltic rush plant association at Wenatchee Confluence State Park. The understory of Baltic rush has been converted to a lawn dominated by Kentucky bluegrass. Figure 7 (right). An example of the cottonwood / Baltic rush plant association being invaded by bulbous bluegrass.

The cottonwood / Baltic rush plant association occurs adjacent to wetlands in areas above the high water mark. Figure 6 shows a lawn and picnic area that may have once been a cottonwood / Baltic rush community. Normally, this plant community has an open overstory of cottonwood and an understory of Baltic rush and other graminoids. This plant association was described as a vegetative type by Crawford (2003). It is ranked G5 (secure).

The cottonwood / Baltic rush community is often adjacent to the cottonwood / red-osier plant community (POBAT / COSE16), which prefers moister soils. The red-osier dogwoods are growing at the edge of the picnic area along the shore of the Columbia River reservoir.

The cottonwood / Baltic rush plant association can tolerate drying out of the upper soil profile in the summer. However, Baltic rush is a heliophile that will not persist under a closed canopy. These conditions make this community susceptible to invasion. Figure 7 shows the condition of the same community photographed in the opposite direction from that of Figure 6, where there is no mowing or irrigation. Although cottonwood and Baltic rush can persist in this stand, the invasive species bulbous bluegrass (*Poa bulbosa*; POBU) is able to gain a foothold.

For the cottonwood / Baltic rush community to remain healthy would require cyclic changes in the water table and occasional flooding or beaver activity to bring in silt and thin out cottonwoods.

Narrowleaf willow (SAEX) G5

Figure 8. An example of the narrowleaf willow community at Wenatchee Confluence State Park.

At Wenatchee Confluence State Park, the narrowleaf willow community occurs along shorelines of the Wenatchee River and the Columbia River reservoir, as well as around created wetlands (Figure 8). This community was described by Bourgeron and Engelking (1994). It is ranked G5, secure.

The narrowleaf willow community occurs in seasonally flooded areas, adjacent to the lower limit of woody vegetation. This community is similar to the cottonwood / narrowleaf willow plant association except that it lacks a significant overstory of cottonwood. This community often has an understory of reed canary grass, (*Phalaris arundinacea*; PHAR3).

At Lake Wenatchee Confluence State Park, the narrowleaf willow community is recolonizing an area of created wetlands just south of the Wenatchee River, as shown in Figure 8. Despite having an inordinate number of invasive species, the narrowleaf willow has a competitive advantage in its colonial root system and dense canopy able to shade out competitors.

Black hawthorn / Woods' rose (CRDO2-ROWO) (G2)

At Wenatchee Confluence State Park, the black hawthorn / Woods' rose community occurs on mesic sites with higher water tables such as the trail system. This vegetation community is characterized by a understory of Wood's rose (*Rosa woodsii*; ROWO) and an overstory of black hawthorn (*Crataegus douglasii*; CRDO2). It was described by Crawford (2003) and it is ranked G2, globally imperiled. Crawford (2003) classified this as a vegetation community that may not represent the climax community rather than a plant association.

Unfortunately, the black hawthorn / Wood's rose community has been lost to invasive species at Wenatchee Confluence State Park. The polygon where this plant association was identified is now dominated by a monoclone of mulberry (*Morus albus*; MOAL), which is sterile underneath except where reed canary grass (Phalaris arundinacea; PHAR3) has invaded the edges.

It may be possible to restore this vegetation community since Wood's rose can become dominant if allowed to get sunlight and black hawthorn can increase if sufficient water is available.

Basin wildrye bottomland herbaceous vegetation (LECI4) (G1)

Figure 9. An example of the basin wildrye community (behind fence).

At Wenatchee Confluence State Park, the basin wildrye bottomland herbaceous community occurs in a meadow area at the entrance of a wildlife viewing area (Figure 9). It is characterized by mesic meadows dominated by basin wildrye (*Leymus cinereus*; LECI4). Basin wildrye has a strong preference for calcareous soils. This community was described by Crawford (2003) and by Evans (1989). It is ranked G1, critically imperiled.

The basin wildrye bottomland herbaceous community is not well understood. Therefore, it is difficult to tell how this community will change over time. It is possible that the basin wildrye vegetation was formerly more prevalent. The example of this vegetation community at Wenatchee Confluence State Park is in fair ecological condition. The area shown in Figure 10 also includes an area of created wetlands to the right of the photo that was heavily impacted by excavating equipment during construction. Earlier construction activities also included dropping riprap in the channel to the left of the photo. Following construction, the area may have been seeded to prevent erosion, judging from the abundance of intermediate wheatgrass (*Thinopyrum intermedium*; THIN6) which is frequently prescribed for restoration of bare soils. A number of noxious weeds and other invaders have also become established in this community, including Russian knapweed (*Acroptilon repens*; ACRE3), cheatgrass (*Bromus tectorum*; BRTE) and burningbush or Kochia (*Bassia scoparia*; BASC5). Wetter areas are being invaded by reed canary grass (*Phalaris arundinacea*; PHAR3).

Reed canary grass (PHAR3) G5

Figure 10. An example of the reed canary grass plant association at Wenatchee Confluence State Park.

At Wenatchee Confluence State Park, reed canary grass (*Phalaris arundinacea*; PHAR3) occurs in monoclone patches in areas with high water tables (Figure 10). This community was only found as a secondary plant association. Reed canary grass establishment is favored by the presence of deep, silty soils. This community is ranked G5, globally secure, but this is misleading, as reed canary grass is not considered a native to this area. There is some debate on the natural range of this species, but it is safe to say that its range is expanding. The distribution of reed canary grass as a natural community is complicated because of range expansion into wetlands and riparian areas, where it is displacing the local flora.

Cattails (TYLA) G5

Figure 11. An example of the cattail plant association at Wenatchee Confluence State Park.

At Wenatchee Confluence State Park, patches of cattails (*Typha latifolia*; TYLA) occur in areas with perennially wet soils with seasonal inundation (Figure 11). Crawford (2003) described a cattail community that is ranked G5, secure.

Cattails were observed at Wenatchee Confluence State Park near the confluence of the Wenatchee River and the Columbia River reservoir, and in the area of created wetlands south of the Wenatchee River. Cattails are a beneficial native community that should be encouraged to form more colonies within the park.

Other Land Cover Types

Wenatchee Confluence State Park has these other land cover types:

- Disturbed areas where human activities have greatly altered and disturbed the native vegetation. These areas are now often dominated by weeds.
- Developed areas with roads and campgrounds
- Water

Rare Plant Surveys

Methods

Wenatchee Confluence State Park was searched for rare plants two times by two people during the 2008 field season. 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 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).

There are no historic sightings of threatened, endangered or sensitive plants reported for the area. Field surveys were conducted on April 28 and September 19. 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 any rare plants, 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 need 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 were felt more likely to occur. This method is referred to as the intuitive-controlled method of rare plant surveys (Whiteaker 1998). These areas were the lakeshore, wetlands, and the stream at the west end of the park. Survey routes for the rare plant inventory and rare plant locations were recorded as GPS waypoints and trackpoints, all of which were later compiled into a single GIS data layer, depicted in Figure 1.

Results

Surveys confirmed that there were no threatened, endangered or sensitive plants in Wenatchee Confluence State Park.

Vascular Plant List for the 2008 Project Area

There were 127 vascular taxa identified to species during surveys of Wenatchee Confluence State Park (Table 3). An additional 5 species could only be identified to the rank of genus, bringing the total number of taxa in the park to 132. Another 6 specimens that could only be identified to the rank of genus were not counted as taxa. Table 3 also identifies 66 non-native species identified within the park, or approximately 50% of the total number of species observed.

Table 3. Vascular Plant Species of Wenatchee Confluence State Park. The column "Symbol" represents the plant code used on the USDA PLANTS database.

Symbol	Scientific Name with Author	National Common Name	Family	Exotic
ACPL	Acer platanoides L.	Norway maple	Aceraceae	yes
ACRE3	Acroptilon repens (L.) DC.	hardheads	Asteraceae	yes
ACSA2	Acer saccharinum L.	silver maple	Aceraceae	yes
AGCR	Agropyron cristatum (L.) Gaertn.	crested wheatgrass	Poaceae	yes
AIAL	Ailanthus altissima (Mill.) Swingle	tree of heaven	Simaroubaceae	yes
AMAL2	Amelanchier alnifolia (Nutt.) Nutt. ex M. Roem.	Saskatoon serviceberry	Rosaceae	
AMAR2	Ambrosia artemisiifolia L.	annual ragweed	Asteraceae	yes
APCA	Apocynum cannabinum L.	Indianhemp	Apocynaceae	
ARDR4	Artemisia dracunculus L.	tarragon	Asteraceae	
ARLU	Artemisia ludoviciana Nutt.	white sagebrush	Asteraceae	
ARMI2	Arctium minus Bernh.	lesser burdock	Asteraceae	yes
ARMI4	Artemisia michauxiana Besser	Michaux's wormwood	Asteraceae	
ARTR2	Artemisia tridentata Nutt.	big sagebrush	Asteraceae	
ARTR4	Artemisia tripartita Rydb.	threetip sagebrush	Asteraceae	
ASCLE	Asclepias L.	milkweed	Asclepiadaceae	
ASFA	Asclepias fascicularis Decne.	Mexican whorled milkweed	Asclepiadaceae	
ASOF	Asparagus officinalis L.	garden asparagus	Liliaceae	yes
ASPR	Asperugo procumbens L.	German-madwort	Boraginaceae	yes
ASSP	Asclepias speciosa Torr.	showy milkweed	Asclepiadaceae	
ATFI	Athyrium filix-femina (L.) Roth	common ladyfern	Dryopteridaceae	
BASA3	Balsamorhiza sagittata (Pursh) Nutt.	arrowleaf balsamroot	Asteraceae	
BASC5	Bassia scoparia (L.) A.J. Scott	burningbush	Chenopodiaceae	yes
BEPE3	Betula pendula Roth	European white birch	Betulaceae	yes
BRIN2	Bromus inermis Leyss.	smooth brome	Poaceae	yes
BRTE	Bromus tectorum L.	cheatgrass	Poaceae	yes
BRVU	Bromus vulgaris (Hook.) Shear	Columbia brome	Poaceae	
CABU2	Capsella bursa-pastoris (L.) Medik.	shepherd's purse	Brassicaceae	yes
CADR	Cardaria draba (L.) Desv.	whitetop	Brassicaceae	yes
CEDE4	Ceratophyllum demersum L.	coon's tail	Ceratophyllaceae	
CEDI3	Centaurea diffusa Lam.	diffuse knapweed	Asteraceae	yes
CHENO	Chenopodium L.	goosefoot	Chenopodiaceae	
CHTE2	Chorispora tenella (Pall.) DC.	crossflower	Brassicaceae	yes
CIAR4	Cirsium arvense (L.) Scop.	Canada thistle	Asteraceae	yes
CLLI2	Clematis ligusticifolia Nutt.	western white clematis	Ranunculaceae	
COAR4	Convolvulus arvensis L.	field bindweed	Convolvulaceae	yes
COSE16	Cornus sericea L.	redosier dogwood	Cornaceae	
COTIA	Coreopsis tinctoria Nutt. var. atkinsoniana (Douglas ex Lindl.) H.M. Parker ex E.B. Sm.	Atkinson's tickseed	Asteraceae	
CRDO2	Crataegus douglasii Lindl.	black hawthorn	Rosaceae	
DAGL	Dactylis glomerata L.	orchardgrass	Poaceae	yes

Symbol	Scientific Name with Author	National Common Name	Family	Exotic
DEPI	Descurainia pinnata (Walter) Britton	western tansymustard	Brassicaceae	
DESO2	Descurainia sophia (L.) Webb ex Prantl	herb sophia	Brassicaceae	yes
ELAN	Elaeagnus angustifolia L.	Russian olive	Elaeagnaceae	yes
ELIN3	Eleusine indica (L.) Gaertn.	Indian goosegrass	Poaceae	yes
ELODE	Elodea Michx.	waterweed	Hydrocharitaceae	
ELRE4	Elymus repens (L.) Gould	quackgrass	Poaceae	yes
ELYMU	Elymus L.	wildrye	Poaceae	
EPMI	Epilobium minutum Lindl. ex Lehm.	chaparral willowherb	Onagraceae	
EQAR	Equisetum arvense L.	field horsetail	Equisetaceae	
EQLA	Equisetum laevigatum A. Braun	smooth horsetail	Equisetaceae	
EQUIS	Equisetum L.	horsetail	Equisetaceae	
ERCI6	Erodium cicutarium (L.) L'Hér. ex Aiton	redstem stork's bill	Geraniaceae	yes
ERCO12	Eriogonum compositum Douglas ex Benth.	arrowleaf buckwheat	Polygonaceae	
ERNA10	Ericameria nauseosa (Pall. ex Pursh) G.L. Nesom & Baird	rubber rabbitbrush	Asteraceae	
ERNI2	Eriogonum niveum Douglas ex Benth.	snow buckwheat	Polygonaceae	
EUOC4	Euthamia occidentalis Nutt.	western goldentop	Asteraceae	
FRAXI	Fraxinus L.	ash	Oleaceae	yes
GAAR	Gaillardia aristata Pursh	common gaillardia	Asteraceae	
GLTR	Gleditsia triacanthos L.	honeylocust	Fabaceae	yes
HEPE	Helianthus petiolaris Nutt.	prairie sunflower	Asteraceae	yes
HOJU	Hordeum jubatum L.	foxtail barley	Poaceae	
HOUM	Holosteum umbellatum L.	jagged chickweed	Caryophyllaceae	yes
HYPE	Hypericum perforatum L.	common St. Johnswort	Clusiaceae	yes
IRPS	Iris pseudacorus L.	paleyellow iris	Iridaceae	yes
JUARL	Juncus arcticus Willd. ssp. littoralis (Engelm.) Hultén	mountain rush	Juncaceae	
JUDU2	Juncus dudleyi Wiegand	Dudley's rush	Juncaceae	
JUNCU	Juncus L.	rush	Juncaceae	
LASE	Lactuca serriola L.	prickly lettuce	Asteraceae	yes
LECI4	Leymus cinereus (Scribn. & Merr.) A. Löve	basin wildrye	Poaceae	
LELA2	Lepidium latifolium L.	broadleaved pepperweed	Brassicaceae	yes
LEMI3	Lemna minor L.	common duckweed	Lemnaceae	
LEPE2	Lepidium perfoliatum L.	clasping pepperweed	Brassicaceae	yes
LOGR	Lomatium grayi (J.M. Coult. & Rose) J.M. Coult. & Rose	Gray's biscuitroot	Apiaceae	
LOMA3	Lomatium macrocarpum (Nutt. ex Torr. & A. Gray) J.M. Coult. & Rose	bigseed biscuitroot	Apiaceae	
LOPE	Lolium perenne L.	perennial ryegrass	Poaceae	yes
MAAQ2	Mahonia aquifolium (Pursh) Nutt.	hollyleaved barberry	Berberidaceae	
MANE	Malva neglecta Wallr.	common mallow	Malvaceae	yes
MAPU	Malus pumila Mill.	paradise apple	Rosaceae	yes
MEAR4	Mentha arvensis L.	wild mint	Lamiaceae	
MEOF	Melilotus officinalis (L.) Lam.	yellow sweetclover	Fabaceae	yes
MESA	Medicago sativa L.	alfalfa	Fabaceae	yes
MOAL	Morus alba L.	white mulberry	Moraceae	yes
MYOSO	Myosotis L.	forget-me-not	Boraginaceae	
MYSP2	Myriophyllum spicatum L.	Eurasian watermilfoil	Haloragaceae	yes
OPFR	Opuntia fragilis (Nutt.) Haw.	brittle pricklypear	Cactaceae	
OXCO	Oxalis corniculata L.	creeping woodsorrel	Oxalidaceae	yes
PARTH3	Parthenocissus Planch.	creeper	Vitaceae	yes
PHAR3	Phalaris arundinacea L.	reed canarygrass	Poaceae	yes

Symbol	Scientific Name with Author	National Common Name	Family	Exotic
PHLE4	Philadelphus lewisii Pursh	Lewis' mock orange	Hydrangeaceae	
PIPO	Pinus ponderosa C. Lawson	ponderosa pine	Pinaceae	
PLLA	Plantago lanceolata L.	narrowleaf plantain	Plantaginaceae	yes
PLMA2	Plantago major L.	common plantain	Plantaginaceae	yes
POAL7	Populus alba L.	white poplar	Salicaceae	yes
POAV	Polygonum aviculare L.	prostrate knotweed	Polygonaceae	yes
POBAT	Populus balsamifera L. ssp. trichocarpa (Torr. & A. Gray ex Hook.) Brayshaw	black cottonwood	Salicaceae	
POBU	Poa bulbosa L.	bulbous bluegrass	Poaceae	yes
POPR	Poa pratensis L.	Kentucky bluegrass	Poaceae	yes
PORI3	Potentilla rivalis Nutt.	brook cinquefoil	Rosaceae	
PREM	Prunus emarginata (Douglas ex Hook.) D. Dietr.	bitter cherry	Rosaceae	
PRUNU	Prunus L.	plum	Rosaceae	
PRVI	Prunus virginiana L.	chokecherry	Rosaceae	
PYCO	Pyrus communis L.	common pear	Rosaceae	yes
RIAU	Ribes aureum Pursh	golden currant	Grossulariaceae	
RONU	Rosa nutkana C. Presl	Nootka rose	Rosaceae	
ROPS	Robinia pseudoacacia L.	black locust	Fabaceae	yes
ROWO	Rosa woodsii Lindl.	Woods' rose	Rosaceae	
RUAR9	Rubus armeniacus Focke	Himalayan blackberry	Rosaceae	yes
SAEX	Salix exigua Nutt.	narrowleaf willow	Salicaceae	
SAKA	Salsola kali L.	Russian thistle	Chenopodiaceae	yes
SALIX	Salix L.	willow	Salicaceae	
SALU	Salix lucida Muhl.	shining willow	Salicaceae	
SANIC5	Sambucus nigra L. ssp. cerulea (Raf.) R. Bolli	blue elderberry	Caprifoliaceae	
SECE	Secale cereale L.	cereal rye	Poaceae	yes
SEPU8	Setaria pumila (Poir.) Roem. & Schult.	yellow foxtail	Poaceae	yes
SIAL2	Sisymbrium altissimum L.	tall tumblemustard	Brassicaceae	yes
SILO3	Sisymbrium loeselii L.	small tumbleweed mustard	Brassicaceae	yes
SOCA6	Solidago canadensis L.	Canada goldenrod	Asteraceae	
SODU	Solanum dulcamara L.	climbing nightshade	Solanaceae	yes
SPCR	Sporobolus cryptandrus (Torr.) A. Gray	sand dropseed	Poaceae	
SPDO	Spiraea douglasii Hook.	rose spirea	Rosaceae	
SYFO2	Symphyotrichum foliaceum (Lindl. ex DC.) G.L. Nesom	alpine leafybract aster	Asteraceae	
SYLAH	Symphyotrichum lanceolatum (Willd.) G.L. Nesom ssp. hesperium (A. Gray) G.L. Nesom	white panicle aster	Asteraceae	
SYSPI	Symphyotrichum spathulatum (Lindl.) G.L. Nesom var. intermedium (A. Gray) G.L. Nesom	larger western mountain aster	Asteraceae	
TAOF	Taraxacum officinale F.H. Wigg.	common dandelion	Asteraceae	yes
TAVU	Tanacetum vulgare L.	common tansy	Asteraceae	yes
THIN6	Thinopyrum intermedium (Host) Barkworth & D.R. Dewey	intermediate wheatgrass	Poaceae	yes
THPL	Thuja plicata Donn ex D. Don	western redcedar	Cupressaceae	
TORY	Toxicodendron rydbergii (Small ex Rydb.) Greene	western poison ivy	Anacardiaceae	
TRDU	Tragopogon dubius Scop.	yellow salsify	Asteraceae	yes
TRRE3	Trifolium repens L.	white clover	Fabaceae	yes
TYLA	Typha latifolia L.	broadleaf cattail	Typhaceae	
ULPU	Ulmus pumila L.	Siberian elm	Ulmaceae	yes
URDI	Urtica dioica L.	stinging nettle	Urticaceae	

Symbol	Scientific Name with Author	National Common Name	Family	Exotic
UTMA	Utricularia macrorhiza Leconte	common bladderwort	Lentibulariaceae	
VEAM2	Veronica americana Schwein. ex Benth.	American speedwell	Scrophulariaceae	
VEHA2	Verbena hastata L.	swamp verbena	Verbenaceae	
VETH	Verbascum thapsus L.	common mullein	Scrophulariaceae	yes
VICIA	Vicia L.	vetch	Fabaceae	

Discussion and Recommendations

Noxious Weeds

A list 13 species of noxious weeds found at Wenatchee Confluence State Park is presented in Table 4. The noxious weeds that were observed within each polygon are recorded in the corresponding record in the vegetation database for the park, which is included in this report as Appendix D.

During our surveys of Wenatchee Confluence State Park, we found 13 species of noxious weeds. We found five Class B noxious weeds and eight Class C weeds. The most widespread noxious weed found in wet areas was reed canary grass (*Phalaris arundinacea*). The most widespread noxious weed found in dry areas was diffuse knapweed (*Centaurea diffusa*). Two aquatic noxious weeds were found including pale yellow iris (*Iris pseudacorus*) and Eurasian watermilfoil (*Myriophyllum spicatum*). The latter species and reed canary grass are becoming established in a habitat restoration area. If this continues it will seriously diminish the value of these wetlands to wildlife.

Table 4. State listed noxious weeds at Wenatchee Confluence State Park.

Symbol	Scientific Name with Author	National Common Name	State Weed Status
ACRE3	*Acroptilon repens* (L.) DC.	hardheads	B
BASC5	*Bassia scoparia* (L.) A.J. Scott	burningbush	B
CADR	*Cardaria draba* (L.) Desv.	whitetop	C
CEDI3	*Centaurea diffusa* Lam.	diffuse knapweed	B
CIAR4	*Cirsium arvense* (L.) Scop.	Canada thistle	C
COAR4	*Convolvulus arvensis* L.	field bindweed	C
HYPE	*Hypericum perforatum* L.	common St. Johnswort	C
IRPS	*Iris pseudacorus* L.	paleyellow iris	C
LELA2	*Lepidium latifolium* L.	broadleaved pepperweed	B
MYSP2	*Myriophyllum spicatum* L.	Eurasian watermilfoil	B
PHAR3	*Phalaris arundinacea* L.	reed canarygrass	C
SECE	*Secale cereale* L.	cereal rye	C
TAVU	*Tanacetum vulgare* L.	common tansy	C

Ecological Condition

The ecological condition of Wenatchee Confluence State Park was based on the rating descriptions (see Appendix B for definitions). A map of the overall ecological condition is presented in Figure 12.

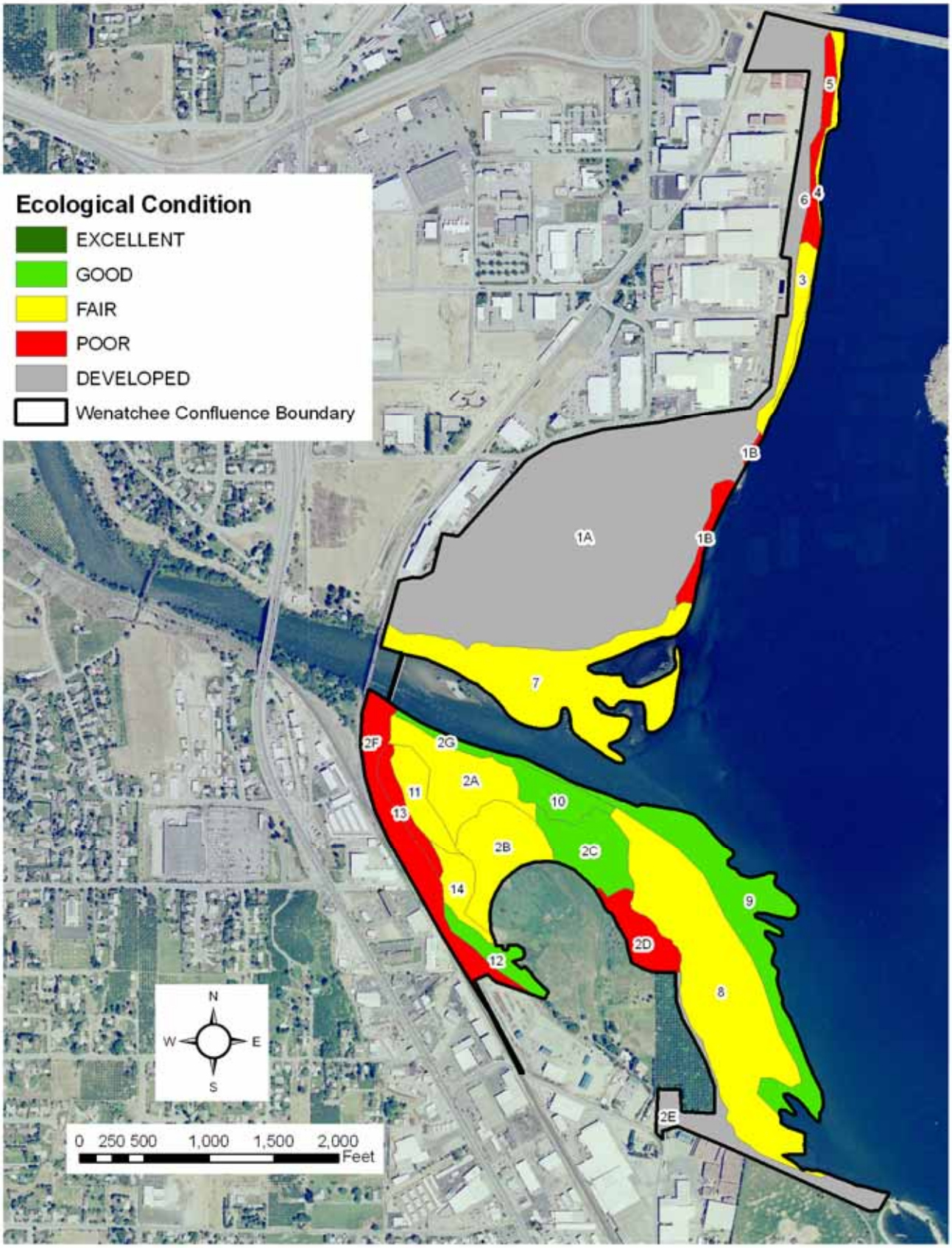

Figure 12. Ecological condition assessed for vegetation polygons at Wenatchee Confluence State Park.

The ecological condition of undeveloped lands at Wenatchee Confluence State Park was primarily in fair condition. A few areas were ranked as Poor or Good, but none was marked as Excellent. About 40% of the park was ranked as Developed. The polygons that were rated in Poor ecological condition were weed-invested dry trails or wet shorelines. The areas ranked in Good condition were primarily wetland complexes (sloughs, sand bars and shrubby deciduous vegetation) or in one case (polygon 12), a narrow cottonwood / red-osier dogwood stand at the base of a slope.

The percentage of non-native taxa was approximately 50% of 132 taxa. Non-native taxa contribute a large part to the low ecological condition rankings.

Restoration Opportunities

There are restoration opportunities at Wenatchee Confluence State Park. The park has already created an area for wildlife viewing that includes a set of created wetlands. There are also a large number of potential supporters for restoration activities amongst the park's visitors. This was evident from seeing numerous smiling hikers and bikers using the created wetlands area. This park lies within an urban environment. This is also a challenging area to undertake restoration in because of its high number of noxious weeds (13 species) and high percentage of non-native species (50%).

The basin wildrye bottomland herbaceous community is a potential target for restoration activities. This community, when it is in good ecological condition is very rare and given a G1 global conservation rank. The community that exists in the park is only rated as Fair ecological condition because of many past disturbances at the site, extensive exotic plant presence and current human activity. Restoration of this community could be accomplished primarily be elimination of exotics and control of off-trail human travel. Return of a natural fire regime would also be beneficial for this community, by maintaining early seral species that maintain stand vigor. If fire cannot be returned, perhaps a surrogate such as wildlife grazing or even beaver reintroduction could be considered as a potential tool.

If any other restoration efforts are undertaken at Wenatchee Confluence State Park, they should focus on wetlands, which make up a large area of the park. As described in the section on historic ecological conditions, the hydrologic regime must be considered in designing a restoration program.

Historically, hydrologic processes maintained ecological functions. These processes include seasonal flooding; braiding of the water channels, presence of large woody debris, silt and cobble deposition, physical soil properties, chemical soil properties, and the activities of key species such as beavers and waterfowl. A plan for beaver reintroduction would help insure that if beaver do return here, they develop their dams in a manner compatible with the park's objectives, and in a way that is likely to lead to a successful colony. New information about successful beaver reintroduction methodology is available through biologists John Rohrer and Kent Woodruff with the Methow Ranger District of the Okanogan National Forest.

Figure 13 and Figure 14 illustrate the different way these processes are operating. The wetlands in Figure 13 are in good ecological condition, whereas the one in Figure 14 is not, and is trending toward becoming a monoclone of noxious weeds.

Figure 13 (left). Wenatchee Confluence Park wetland ranked in good ecological condition (with minor invasive species present). This is in the southeast part of polygon 7, looking east.
Figure 14 (right). A created wetland in the Park in poor ecological condition, dominated by more than 70% non-native species and noxious weeds. This is in polygon 2B.

In the functional wetland community of Figure 13, seasonal flooding brings in silt and woody debris every year to renew the soil texture and chemistry, whereas the created wetland relies solely on groundwater for recharge, and thus it is essentially stagnant and devoid of woody debris. The wetland in Figure 13 is part of an active channel that can be used by wildlife, whereas the sloughs in Figure 14 cannot be reached by aquatic species such as fish. Flooding disturbance helps suppress dominants in Figure 13, but in Figure 14, dominant species have taken over and prevent further development of the community. For park visitors to continue to enjoy wildlife viewing, the created wetlands need to accommodate beneficial hydrologic functions in an improved design. Restoration could include addition of woody debris and connecting channels with seasonal flooding sources that will increase oxygen levels and allow movement of silt and woody debris through the system.

Restoration activities could include planting or increasing beneficial species that are already present in the park. Desirable species include cottonwood (*Populus balsamifera* ssp. *trichocarpa*; POBAT), black hawthorn (*Crataegus douglasii*; CRDO2), Wood's rose (*Rosa woodsii*; ROWO), and basin wildrye (*Leymus cinereus*; LECI4). Along with planting activities, specific undesirable noxious weeds can be targeted for a long-term control program. Two of the worst invasive species in the park are reed canarygrass (*Phalaris arundinacea*; PHAR3) and mulberry (*Morus albus*; MOAL). The latter is not classified as a noxious weed, but it behaves as if it were. The latter could be controlled by cutting down large stands and replanting sites with desirable species such as cottonwood. Reed canarygrass may eventually respond to creation of an overstory canopy such as cottonwood, and it can be targeted for competition by encouraging resilient native species such as cattails.

Other Recommendations

The ownership of the southern tip of the park should be investigated and the GIS boundary layer corrected if needed. While the GIS boundary shows a narrow extension of the park along the Wenatchee River as it meets the Columbia on the southeastern corner of the park, signs in the park indicate that one is leaving state park property before one enters this area (Figure 15).

Figure 15. Sign at the southeastern corner of the park that contradicts the GIS boundary file.

GIS Products Produced

Associated with this report are polygon layers created by PBI depicting the vegetation community types and associated data mapped within Wenatchee Confluence 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.

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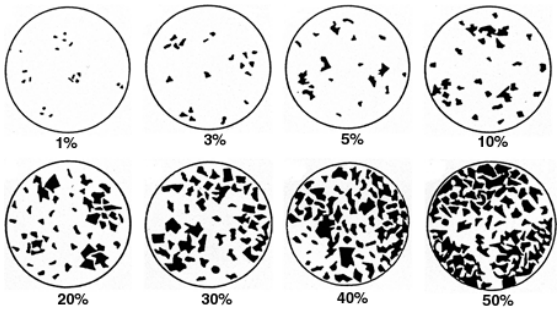
Appendix A – Vegetation Survey Codes and Instructions

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.

SOIL SURFACE 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.

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

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

- **Excellent Ecological Condition**

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

- **Fair 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 higher 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 influence 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.

- **Developed**

Developed portions of the park property: campgrounds, offices, facilities, infrastructure, etc.

- **Ownership Issue**

Areas within the GIS boundary of the park that appear to be owned or controlled by another entity other than WSPRC.

Appendix C – Definitions of Vegetation Community Conservation Status

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 Data

Polygon Number 10

ParkName:
Wenatchee Confluence

Survey Intensity	1
Observer	PM
Date	9/15/2008
Total Vegetation	6
Trees Total	4
Dominant Trees	POBAT
emergent	1
maincanopy	4
subcanopy	2
Shrubs Total	5
Dominant Shrubs	ROWO, RIAU, SAEX, COSE16, TORY
> 1.5' tall	5
< 1.5' tall	2
Graminoids Total	3
Dominant Graminoids	PHAR3
Graminoids Perennial	3
Graminoids Annual	0
Forbs Total	2
Dominant Forbs	LASE, ASCLE, VETH
Forbs Perennial	2
Forbs Annual	0
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	2
Exotics Perennial	2
Exotics Annual	0
Water	1
Rock Outcrop	0
Gravel	3
Logging	0
Fire:	0
Stand Age	2
Agriculture	0
Livestock	0
Development	3
Wildlife	0
Recreation Severity	3
Recreation Type	4
Hydrology	2 (water table

Exotic Species

Noxious Exotic Plants
VETH
Other Exotic Plants
PHAR3, LASE

Water:	1
Rock:	0
Talus:	0
Gravel:	3
Bare Ground:	1
Moss Lichen:	0
Litter:	95

Vegetation Types

		Percent	Pattern	Rank
Existing Veg1:	POBAT/ROWO/PHAR3	100	Matrix	GOOD
Veg Community1:	POBAT/SAEX			
Existing Veg2:		0		
Veg Community3:				
Existing Veg3:		0		
Veg Community3:				

Notes: Mature cottonwood forest with ROWO/PHAR3 understory.

Polygon Number 11

ParkName:
Wenatchee Confluence

Survey Intensity	1
Observer	GW
Date	9/15/2008
Total Vegetation	5
Trees Total	3
Dominant Trees	POBAT, MOAL, ULPU
emergent	0
maincanopy	2
subcanopy	2
Shrubs Total	3
Dominant Shrubs	SAEX, COSE16, RIAU, ELAN
> 1.5' tall	3
< 1.5' tall	0
Graminoids Total	4
Dominant Graminoids	PHAR3, THIN6
Graminoids Perennial	4
Graminoids Annual	1
Forbs Total	4
Dominant Forbs	ASSP, APCA, CIAR4, VEAM2, TYLA, ACRE3, ASOF, CADR,
Forbs Perennial	4
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	5
Exotics Perennial	5
Exotics Annual	1
Water	10
Rock Outcrop	0
Gravel	0
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	6 (created
Wildlife	2
Recreation Severity	3
Recreation Type	3
Hydrology	2

Exotic Species

Noxious Exotic Plants
CIAR4, PHAR3, ACRE3, CADR
Other Exotic Plants
ASOF, THIN6, VETH

Water:	10
Rock:	0
Talus:	0
Gravel:	0
Bare Ground:	5
Moss Lichen:	0
Litter:	85

Vegetation Types

		Percent	Pattern	Rank
Existing Veg1:	SAEX/TYLA-PHAR3	60	Matrix	FAIR
Veg Community1:	SAEX			
Existing Veg2:	ACRE3-CIAR4 (impoundment)	40	Large patch	POOR
Veg Community3:	SAEX			
Existing Veg3:		0		
Veg Community3:				

Notes: Weedy sets of dry wet ponds.

Polygon Number 12

ParkName:
Wenatchee Confluence

Survey Intensity	1
Observer	GW
Date	9/15/2008
Total Vegetation	6
Trees Total	3
Dominant Trees	PRUNU, ULPU
emergent	0
maincanopy	2
subcanopy	2
Shrubs Total	5
Dominant Shrubs	SAEX, ROWO, COSE16, PRVI, RUAR9, RIAU
> 1.5' tall	5
< 1.5' tall	0
Graminoids Total	1
Dominant Graminoids	PHAR3
Graminoids Perennial	1
Graminoids Annual	0
Forbs Total	0
Dominant Forbs	
Forbs Perennial	0
Forbs Annual	0
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	3
Exotics Perennial	3
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	1
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	0
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants
ULPU, RUAR9

Water:	0
Rock:	0
Talus:	0
Gravel:	1
Bare Ground:	3
Moss Lichen:	0
Litter:	96

Vegetation Types

		Percent	Pattern	Rank
Existing Veg1:	ULPU/SAEX-PRVI-COSE16	100	Matrix	GOOD
Veg Community1:	POBAT/COSE16			
Existing Veg2:		0		
Veg Community3:				
Existing Veg3:		0		
Veg Community3:				

Notes: Shrub field along bank.

Polygon Number 13

ParkName:
Wenatchee Confluence

Survey Intensity	1
Observer	GW
Date	9/15/2008
Total Vegetation	6
Trees Total	5
Dominant Trees	MOAL, POBAT
emergent	0
maincanopy	4
subcanopy	3
Shrubs Total	3
Dominant Shrubs	RIAU, ELAN, CLLI2, ROWO, PRVI, PHLE4, CRDO2
> 1.5' tall	3
< 1.5' tall	0
Graminoids Total	5
Dominant Graminoids	PHAR3, THIN6
Graminoids Perennial	5
Graminoids Annual	2
Forbs Total	1
Dominant Forbs	BASC5, LASE,
Forbs Perennial	1
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	6
Exotics Perennial	6
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	6 (heavily used
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants
PHAR3
Other Exotic Plants
BASC5, MOAL

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

Vegetation Types

		Percent	Pattern	Rank
Existing Veg1:	MOAL/PHAR3	100	Matrix	POOR
Veg Community1:	CRDO2-ROWO			
Existing Veg2:		0		
Veg Community3:				
Existing Veg3:		0		
Veg Community3:				

Notes: Stand on bank of old RR tracks.

Polygon Number 14

ParkName:
Wenatchee Confluence

Survey Intensity	3
Observer	GW
Date	9/15/2008
Total Vegetation	6
Trees Total	0
Dominant Trees	
emergent	0
maincanopy	0
subcanopy	0
Shrubs Total	3
Dominant Shrubs	SAEX, ELAN, COSE16
> 1.5' tall	3
< 1.5' tall	0
Graminoids Total	3
Dominant Graminoids	PHAR3
Graminoids Perennial	3
Graminoids Annual	0
Forbs Total	5
Dominant Forbs	TYLA
Forbs Perennial	5
Forbs Annual	0
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	3
Exotics Perennial	3
Exotics Annual	0
Water	2
Rock Outcrop	0
Gravel	0
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	5
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Noxious Exotic Plants
PHAR3
Other Exotic Plants

Water:	2
Rock:	0
Talus:	0
Gravel:	0
Bare Ground:	0
Moss Lichen:	0
Litter:	98

Vegetation Types

		Percent	Pattern	Rank
Existing Veg1:	SAEX/TYLA-PHAR3	100	Matrix	FAIR
Veg Community1:	SAEX			
Existing Veg2:		0		
Veg Community3:				
Existing Veg3:		0		
Veg Community3:				

Notes: Wetland; inaccessible - too dense from above.

Polygon Number 15

ParkName:
Wenatchee Confluence

Survey Intensity	1
Observer	PM
Date	9/15/2008
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	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	6 (bridge, dam)
Wildlife	0
Recreation Severity	3
Recreation Type	5 (boating)
Hydrology	2

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:	developed	100	Matrix	DEVELO
Veg Community1:	developed			
Existing Veg2:		0		
Veg Community3:				
Existing Veg3:		0		
Veg Community3:				

Notes:

Polygon Number 1A

ParkName:
Wenatchee Confluence

Survey Intensity	1
Observer	PM
Date	9/15/2008
Total Vegetation	5
Trees Total	3
Dominant Trees	EXOTIC TREES
emergent	0
maincanopy	3
subcanopy	0
Shrubs Total	1
Dominant Shrubs	
> 1.5' tall	1
< 1.5' tall	1
Graminoids Total	5
Dominant Graminoids	lawns
Graminoids Perennial	5
Graminoids Annual	2
Forbs Total	3
Dominant Forbs	weeds
Forbs Perennial	2
Forbs Annual	2
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	6
Exotics Perennial	5
Exotics Annual	3
Water	0
Rock Outcrop	15
Gravel	5
Logging	0
Fire:	0
Stand Age	1
Agriculture	0
Livestock	0
Development	6
Wildlife	0
Recreation Severity	1
Recreation Type	4
Hydrology	2

Exotic Species

Noxious Exotic Plants
ACRE3, COAR4
Other Exotic Plants
POPR, BASC5, LASE, TRDU

Water:	0
Rock:	15
Talus:	0
Gravel:	5
Bare Ground:	10
Moss Lichen:	0
Litter:	70

Vegetation Types

		Percent	Pattern	Rank
Existing Veg1:	developed	100	Matrix	DEVELO
Veg Community1:	developed			
Existing Veg2:		0		
Veg Community3:				
Existing Veg3:		0		
Veg Community3:				

Notes: 15% ROCK=15% ASPHALT; Developed campground, picnic, sports fields, parking, facilities.

Polygon Number 1B

ParkName:
Wenatchee Confluence

Survey Intensity	1
Observer	PM
Date	9/15/2008
Total Vegetation	4
Trees Total	2
Dominant Trees	POBAT
emergent	2
maincanopy	2
subcanopy	1
Shrubs Total	3
Dominant Shrubs	ROWO, SAEX, RUAR9
> 1.5' tall	3
< 1.5' tall	2
Graminoids Total	2
Dominant Graminoids	POPR, PHAR3
Graminoids Perennial	2
Graminoids Annual	0
Forbs Total	3
Dominant Forbs	ACRE3, ASCLE, CADR
Forbs Perennial	3
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	3
Exotics Perennial	3
Exotics Annual	1
Water	40
Rock Outcrop	0
Gravel	1
Logging	0
Fire:	0
Stand Age	1
Agriculture	0
Livestock	0
Development	6
Wildlife	0
Recreation Severity	2
Recreation Type	4
Hydrology	2

Exotic Species

Noxious Exotic Plants
ACRE3, CADR
Other Exotic Plants
POPR, PHAR3, RUAR9

Water:	40
Rock:	0
Talus:	0
Gravel:	1
Bare Ground:	1
Moss Lichen:	0
Litter:	58

Vegetation Types

		Percent	Pattern	Rank
Existing Veg1:	ROWO-SAEX/PHAR3-ACRE3	60	Matrix	POOR
Veg Community1:	POBAT/SAEX			
Existing Veg2:	water	40	Large patch	POOR
Veg Community3:	water			
Existing Veg3:		0		
Veg Community3:				

Notes: Narrow strip along river with dense shrub fields and little POBAT.

Polygon Number 2A

ParkName:
Wenatchee Confluence

Survey Intensity	2
Observer	GW
Date	9/15/2008
Total Vegetation	6
Trees Total	2
Dominant Trees	MAPU, ULPU, MOAL, GLTR
emergent	0
maincanopy	0
subcanopy	2
Shrubs Total	2
Dominant Shrubs	ELAN, ROWO
> 1.5' tall	2
< 1.5' tall	0
Graminoids Total	5
Dominant Graminoids	ELYMU, LECI4, AGROP, BRTE
Graminoids Perennial	5
Graminoids Annual	2
Forbs Total	3
Dominant Forbs	ERNA10, LASE, ASOF, BASC5, ASSP, APCA
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	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	3
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	2

Exotic Species

Noxious Exotic Plants
PHAR3, ACRE3, LELA2
Other Exotic Plants
LASE, ULPU, MAPU, BASC5

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

Vegetation Types

		Percent	Pattern	Rank
Existing Veg1:	ULPU/LECI4-PHAR3-ACRE3	100	Matrix	FAIR
Veg Community1:	LECI4			
Existing Veg2:		0		
Veg Community3:				
Existing Veg3:		0		
Veg Community3:				

Notes: Wildlife viewing trail - no bikes

Polygon Number 2B

ParkName:
Wenatchee Confluence

Survey Intensity	2
Observer	GW
Date	9/15/2008
Total Vegetation	5
Trees Total	1
Dominant Trees	MOAL
emergent	0
maincanopy	0
subcanopy	1
Shrubs Total	4
Dominant Shrubs	SAEX, ELAN, SALIX (introduced)
> 1.5' tall	4
< 1.5' tall	1
Graminoids Total	4
Dominant Graminoids	PHAR3
Graminoids Perennial	4
Graminoids Annual	1
Forbs Total	3
Dominant Forbs	UTMA, ASSP, CIAR4, LASE, TYLA, , CEDE4, MYSP2, ELODE, EQUIS
Forbs Perennial	3
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	4
Exotics Perennial	4
Exotics Annual	1
Water	15
Rock Outcrop	0
Gravel	0
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	6 (impoundments)
Wildlife	3
Recreation Severity	3
Recreation Type	3 (trails along
Hydrology	2

Exotic Species

Noxious Exotic Plants
CIAR4, MYSP2
Other Exotic Plants
LASE, VETH, THIN6, MOAL

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

Vegetation Types

		Percent	Pattern	Rank
Existing Veg1:	SAEX/PHAR3	100	Matrix	FAIR
Veg Community1:	SAEX			
Existing Veg2:		0		
Veg Community3:				
Existing Veg3:		0		
Veg Community3:				

Notes: Forbs are mostly aquatic. Center of south part or the park; created wetlands; no ULMU, MOAL, POBAT, ACRE; more SAEX, frogs (walk on water) - maybe introduced?

Polygon Number 2C

ParkName:
Wenatchee Confluence

Survey Intensity	2
Observer	PM
Date	9/15/2008
Total Vegetation	5
Trees Total	2
Dominant Trees	POBAT, SALU, ULPU
emergent	0
maincanopy	2
subcanopy	2
Shrubs Total	3
Dominant Shrubs	SAEX, ROWO
> 1.5' tall	3
< 1.5' tall	0
Graminoids Total	4
Dominant Graminoids	PHAR3, LECI4
Graminoids Perennial	4
Graminoids Annual	0
Forbs Total	4
Dominant Forbs	TYLA, CIAR4, ASCLE, LEMI3, ASOF, ASSP
Forbs Perennial	4
Forbs Annual	0
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	4
Exotics Perennial	4
Exotics Annual	0
Water	35
Rock Outcrop	0
Gravel	1
Logging	0
Fire:	0
Stand Age	1
Agriculture	0
Livestock	0
Development	6 (trails, area
Wildlife	6 (beaver)
Recreation Severity	2
Recreation Type	4
Hydrology	2 (dredged, water

Exotic Species

Noxious Exotic Plants
CIAR4
Other Exotic Plants
PHAR3, ASOF

Water:	35
Rock:	0
Talus:	0
Gravel:	1
Bare Ground:	1
Moss Lichen:	0
Litter:	63

Vegetation Types

		Percent	Pattern	Rank
Existing Veg1:	TYLA - water wetland	45	Matrix	GOOD
Veg Community1:	TYLA			
Existing Veg2:	PHAR3	40	Large patch	POOR
Veg Community3:	PHAR3			
Existing Veg3:	SAEX	15	Small patch	GOOD
Veg Community3:	SAEX			

Notes: Dredged, created wetlands and intervening land. Mostly TYLA and open water, but also lots of PHAR3.

Polygon Number 2D

ParkName:
Wenatchee Confluence

Survey Intensity	1
Observer	PM
Date	9/15/2008
Total Vegetation	6
Trees Total	2
Dominant Trees	POBAT, PYCO
emergent	1
maincanopy	1
subcanopy	2
Shrubs Total	3
Dominant Shrubs	SAEX, ROWO
> 1.5' tall	3
< 1.5' tall	2
Graminoids Total	5
Dominant Graminoids	PHAR3, ELRE4
Graminoids Perennial	5
Graminoids Annual	0
Forbs Total	3
Dominant Forbs	BASC5, CIAR4, VETH, LASE
Forbs Perennial	3
Forbs Annual	1
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	0
Fire:	0
Stand Age	1
Agriculture	6 (old orchard,
Livestock	0
Development	3
Wildlife	0
Recreation Severity	3
Recreation Type	4
Hydrology	2

Exotic Species

Noxious Exotic Plants
CIAR4, VETH
Other Exotic Plants
PHAR3, ELRE4, BASC5, LASE

Water:	0
Rock:	0
Talus:	0
Gravel:	2
Bare Ground:	3
Moss Lichen:	0
Litter:	95

Vegetation Types

		Percent	Pattern	Rank
Existing Veg1:	ROWO/PHAR3-ELRE4	80	Matrix	POOR
Veg Community1:	SAEX			
Existing Veg2:	POBAT/SAEX/PHAR3	20	Small patch	FAIR
Veg Community3:	POBAT/SAEX			
Existing Veg3:		0		
Veg Community3:				

Notes: Open, disturbed

Polygon Number 2E

ParkName:
Wenatchee Confluence

Survey Intensity	1
Observer	PM
Date	9/15/2008
Total Vegetation	5
Trees Total	2
Dominant Trees	POBAT, ACER, ULPU
emergent	0
maincanopy	2
subcanopy	1
Shrubs Total	3
Dominant Shrubs	SAEX, ROWO, PARTH3, RUAR9
> 1.5' tall	3
< 1.5' tall	1
Graminoids Total	5
Dominant Graminoids	PHAR3, BRTE, ELRE4, THIN6, POBU
Graminoids Perennial	5
Graminoids Annual	2
Forbs Total	3
Dominant Forbs	BASC5, COAR4, ASFA, ACRE3, CIAR4, TAOF
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	2
Gravel	15
Logging	0
Fire:	0
Stand Age	1
Agriculture	0
Livestock	0
Development	4 (trails, facilities)
Wildlife	0
Recreation Severity	2
Recreation Type	4
Hydrology	1

Exotic Species

Noxious Exotic Plants
ACRE3, COAR4, CEDI3
Other Exotic Plants
PHAR3

Water:	0
Rock:	2
Talus:	0
Gravel:	15
Bare Ground:	5
Moss Lichen:	0
Litter:	78

Vegetation Types

		Percent	Pattern	Rank
Existing Veg1:	developed	100	Matrix	DEVELO
Veg Community1:	developed			
Existing Veg2:		0		
Veg Community3:				
Existing Veg3:		0		
Veg Community3:				

Notes: 2% ROCK=2% ASPHALT; Trails, mowed field, disturbed area.

Polygon Number 2F

ParkName:
Wenatchee Confluence

Survey Intensity	1
Observer	GW
Date	9/15/2008
Total Vegetation	5
Trees Total	1
Dominant Trees	MOAL, ULPU
emergent	0
maincanopy	0
subcanopy	1
Shrubs Total	1
Dominant Shrubs	PREM, ERNA10, ARTR4, CLLI2
> 1.5' tall	0
< 1.5' tall	1
Graminoids Total	5
Dominant Graminoids	AGCR, LECI4, POBU, SPCR, SEPU8, SECE, BRTE, HOJU
Graminoids Perennial	4
Graminoids Annual	1
Forbs Total	3
Dominant Forbs	BASC5, LASE, POAV, VETH, SAKA
Forbs Perennial	1
Forbs Annual	3
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	5
Exotics Perennial	4
Exotics Annual	4
Water	0
Rock Outcrop	15
Gravel	10
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	6 (paved trail, RR,
Wildlife	3
Recreation Severity	2
Recreation Type	4
Hydrology	1

Exotic Species

Noxious Exotic Plants

Other Exotic Plants
BASC5, SECE, BRTE, LASE, VETH,

Water:	0
Rock:	15
Talus:	0
Gravel:	10
Bare Ground:	15
Moss Lichen:	0
Litter:	60

Vegetation Types

		Percent	Pattern	Rank
Existing Veg1:	SECE-BASC5	100	Matrix	POOR
Veg Community1:	disturbed			
Existing Veg2:		0		
Veg Community3:				
Existing Veg3:		0		
Veg Community3:				

Notes: Heavily used trail complex. Paved counted as rock.

Polygon Number 2G

ParkName:
Wenatchee Confluence

Survey Intensity	1
Observer	GW
Date	9/15/2008
Total Vegetation	4
Trees Total	3
Dominant Trees	POBAT
emergent	0
maincanopy	0
subcanopy	3
Shrubs Total	4
Dominant Shrubs	SAEX, ELAN, ROWO, COSE16
> 1.5' tall	4
< 1.5' tall	2
Graminoids Total	3
Dominant Graminoids	THIN6, PHAR3
Graminoids Perennial	3
Graminoids Annual	1
Forbs Total	3
Dominant Forbs	VETH, CADR, CIAR4, VICIA, TAVU
Forbs Perennial	3
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	4
Exotics Perennial	4
Exotics Annual	1
Water	40
Rock Outcrop	0
Gravel	0
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	6 (riprap)
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	2

Exotic Species

Noxious Exotic Plants
CADR, PHAR3, CIAR4
Other Exotic Plants
VETH, TAVU

Water:	40
Rock:	0
Talus:	15
Gravel:	0
Bare Ground:	5
Moss Lichen:	0
Litter:	40

Vegetation Types

		Percent	Pattern	Rank
Existing Veg1:	POBAT/SAEX-COSE16/PHAR3	100	Matrix	GOOD
Veg Community1:	POBAT/COSE16			
Existing Veg2:		0		
Veg Community3:				
Existing Veg3:		0		
Veg Community3:				

Notes: Riprap = Talus

Polygon Number 3

ParkName:
Wenatchee Confluence

Survey Intensity	1
Observer	GW
Date	9/15/2008
Total Vegetation	6
Trees Total	4
Dominant Trees	POBAT, ULPU, BEPE3, MOAL
emergent	2
maincanopy	3
subcanopy	2
Shrubs Total	3
Dominant Shrubs	ROWO, COSE16
> 1.5' tall	3
< 1.5' tall	1
Graminoids Total	5
Dominant Graminoids	POPR, BRIN2, JUARL
Graminoids Perennial	5
Graminoids Annual	1
Forbs Total	2
Dominant Forbs	TAOF, PLMA2, EQLA, APCA, MEAR4, EUOC4
Forbs Perennial	2
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	5
Exotics Perennial	5
Exotics Annual	1
Water	0
Rock Outcrop	0
Gravel	0
Logging	0
Fire:	0
Stand Age	2
Agriculture	0
Livestock	0
Development	6 (trail, picnicing)
Wildlife	3
Recreation Severity	3
Recreation Type	5 (hiking, biking)
Hydrology	2

Exotic Species

Noxious Exotic Plants

Other Exotic Plants
POPR

Water:	0
Rock:	0
Talus:	0
Gravel:	0
Bare Ground:	2
Moss Lichen:	0
Litter:	98

Vegetation Types

		Percent	Pattern	Rank
Existing Veg1:	POBAT/POPR	80	Matrix	FAIR
Veg Community1:	POBAT/JUARL			
Existing Veg2:	POBAT/COSE16	20	linear	GOOD
Veg Community3:	POBAT/COSE16			
Existing Veg3:		0		
Veg Community3:				

Notes: Cottonwood picnic area alongside mostly native shoreline

Polygon Number 4

ParkName:
Wenatchee Confluence

Survey Intensity	1
Observer	GW
Date	9/15/2008
Total Vegetation	2
Trees Total	2
Dominant Trees	
emergent	0
maincanopy	1
subcanopy	1
Shrubs Total	1
Dominant Shrubs	COSE16, TORY, SAEX, CRDO2
> 1.5' tall	0
< 1.5' tall	1
Graminoids Total	1
Dominant Graminoids	BRIN2, Unk
Graminoids Perennial	1
Graminoids Annual	0
Forbs Total	1
Dominant Forbs	IRPS, OXCO, COTIA, APCA, PLMA2, MEAR4, GAAR, VEHA2, MEOF
Forbs Perennial	1
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	1
Exotics Perennial	1
Exotics Annual	0
Water	70
Rock Outcrop	0
Gravel	5
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	6 (dam, reservoir)
Wildlife	3
Recreation Severity	3
Recreation Type	5 (boating)
Hydrology	2

Exotic Species

Noxious Exotic Plants
IRPS, CIAR4
Other Exotic Plants
HYPE

Water:	70
Rock:	0
Talus:	20
Gravel:	5
Bare Ground:	3
Moss Lichen:	0
Litter:	2

Vegetation Types

		Percent	Pattern	Rank
Existing Veg1:	cobble bar	100	Matrix	FAIR
Veg Community1:	SAEX			
Existing Veg2:		0		
Veg Community3:				
Existing Veg3:		0		
Veg Community3:				

Notes: Mostly under water. Big 12" cobbles; flooded by reservoir

Polygon Number 5

ParkName:
Wenatchee Confluence

Survey Intensity	1
Observer	GW
Date	9/15/2008
Total Vegetation	5
Trees Total	4
Dominant Trees	ULPU, Ukn
emergent	0
maincanopy	4
subcanopy	3
Shrubs Total	2
Dominant Shrubs	ERNA10, RUAR9
> 1.5' tall	2
< 1.5' tall	0
Graminoids Total	4
Dominant Graminoids	POBU, SPCR, BRTE, POPR
Graminoids Perennial	3
Graminoids Annual	3
Forbs Total	2
Dominant Forbs	SAKA, SILO3, TRDU, VETH
Forbs Perennial	1
Forbs Annual	2
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	5
Exotics Perennial	5
Exotics Annual	3
Water	0
Rock Outcrop	0
Gravel	2
Logging	0
Fire:	0
Stand Age	1
Agriculture	0
Livestock	0
Development	6 (paved trail,
Wildlife	3
Recreation Severity	2
Recreation Type	1 (bicycle)
Hydrology	2

Exotic Species

Noxious Exotic Plants
CEDI3
Other Exotic Plants
POBU, BRTE, POPR, RUAR9

Water:	0
Rock:	0
Talus:	2
Gravel:	2
Bare Ground:	5
Moss Lichen:	0
Litter:	91

Vegetation Types

		Percent	Pattern	Rank
Existing Veg1:	ULPU/POBU	100	Matrix	POOR
Veg Community1:	disturbed			
Existing Veg2:		0		
Veg Community3:				
Existing Veg3:		0		
Veg Community3:				

Notes: Bench above river

Polygon Number 6

ParkName:
Wenatchee Confluence

Survey Intensity	1
Observer	GW
Date	9/15/2008
Total Vegetation	5
Trees Total	3
Dominant Trees	PIPO, ULPU, THPL
emergent	0
maincanopy	3
subcanopy	1
Shrubs Total	1
Dominant Shrubs	ERNA10, PRVI, ARTR4, ROWO
> 1.5' tall	1
< 1.5' tall	1
Graminoids Total	4
Dominant Graminoids	ELIN3, SPCR, POBU, POPR, BRTE
Graminoids Perennial	4
Graminoids Annual	3
Forbs Total	3
Dominant Forbs	CEDI3, SAKA, LASE, SIAL2, TRDU, HEPE, BASC5
Forbs Perennial	3
Forbs Annual	1
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	5
Exotics Perennial	5
Exotics Annual	2
Water	0
Rock Outcrop	0
Gravel	5
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	6 (paved trail,
Wildlife	3
Recreation Severity	1
Recreation Type	5 (wheeled,
Hydrology	1

Exotic Species

Noxious Exotic Plants
CEDI3
Other Exotic Plants
BRTE, POBU, ELIN3, ULPU

Water:	0
Rock:	0
Talus:	0
Gravel:	5
Bare Ground:	25
Moss Lichen:	0
Litter:	70

Vegetation Types

		Percent	Pattern	Rank
Existing Veg1:	ULPU/POBU-ELIN3-CEDI3	100	Matrix	POOR
Veg Community1:	disturbed			
Existing Veg2:		0		
Veg Community3:				
Existing Veg3:		0		
Veg Community3:				

Notes: Interstate, RR, trail, industry, weeds, powerlines, chain link fence; shrubs recently cleared; kestrel

Polygon Number 7

ParkName:
Wenatchee Confluence

Survey Intensity	2
Observer	GW
Date	9/15/2008
Total Vegetation	5
Trees Total	4
Dominant Trees	MOAL, POBAT, ULPU, MAPU, FRAXI, ACPL, ACSA2, GLTR
emergent	1
maincanopy	4
subcanopy	3
Shrubs Total	4
Dominant Shrubs	ROWO, SAEX, RUAR9, RIAU, COSE16, PARTH3, CLLI2
> 1.5' tall	4
< 1.5' tall	1
Graminoids Total	4
Dominant Graminoids	PHAR3
Graminoids Perennial	4
Graminoids Annual	1
Forbs Total	4
Dominant Forbs	PHAR3, APCA, LASE, EUOC4, CIAR4, EQUIS, SODU, URDI,
Forbs Perennial	4
Forbs Annual	1
Ferns Total	1
Ferns Evergreen	0
Ferns Deciduous	1
ExoticsTotal	4
Exotics Perennial	4
Exotics Annual	1
Water	30
Rock Outcrop	0
Gravel	4
Logging	0
Fire:	0
Stand Age	0
Agriculture	0
Livestock	0
Development	0
Wildlife	2
Recreation Severity	3
Recreation Type	3
Hydrology	2

Exotic Species

Noxious Exotic Plants
ACRE3, CADR, CIAR4, PHAR3
Other Exotic Plants
LASE, MOAL, ARMI4

Water:	30
Rock:	0
Talus:	0
Gravel:	4
Bare Ground:	1
Moss Lichen:	0
Litter:	65

Vegetation Types

		Percent	Pattern	Rank
Existing Veg1:	POBAT-MOAL/COSE16-SAEX/PHAR3	80	Matrix	FAIR
Veg Community1:	POBAT/COSE16			
Existing Veg2:	water	15	Small patch	GOOD
Veg Community3:	water			
Existing Veg3:	POBAT/SAEX	5	linear	EXCELLE
Veg Community3:	POBAT/SAEX			

Notes: Islands and channels of open water.

Polygon Number 8

ParkName:
Wenatchee Confluence

Survey Intensity	3
Observer	PM
Date	9/15/2008
Total Vegetation	5
Trees Total	3
Dominant Trees	POBAT, FRAXI, MOAL, ROPS, ACSA2
emergent	2
maincanopy	3
subcanopy	2
Shrubs Total	5
Dominant Shrubs	SAEX, ROWO, COSE16, CLLI2, RUAR9
> 1.5' tall	5
< 1.5' tall	2
Graminoids Total	4
Dominant Graminoids	PHAR3
Graminoids Perennial	4
Graminoids Annual	0
Forbs Total	2
Dominant Forbs	ASFA, TYLA, URDI, SOCA6, CIAR4, MEAR4, IRPS
Forbs Perennial	2
Forbs Annual	0
Ferns Total	0
Ferns Evergreen	0
Ferns Deciduous	0
ExoticsTotal	4
Exotics Perennial	4
Exotics Annual	0
Water	30
Rock Outcrop	0
Gravel	1
Logging	0
Fire:	0
Stand Age	2
Agriculture	0
Livestock	0
Development	3
Wildlife	6
Recreation Severity	3
Recreation Type	4
Hydrology	2

Exotic Species

Noxious Exotic Plants
CIAR4, IRPS
Other Exotic Plants
PHAR3

Water:	30
Rock:	0
Talus:	0
Gravel:	1
Bare Ground:	1
Moss Lichen:	0
Litter:	68

Vegetation Types

		Percent	Pattern	Rank
Existing Veg1:	SAEX/PHAR3	60	Matrix	FAIR
Veg Community1:	SAEX			
Existing Veg2:	water	30		GOOD
Veg Community3:	water			
Existing Veg3:	POBAT/COSE16-SAEX/PHAR3	10	Small patch	GOOD
Veg Community3:	POBAT/COSE16			

Notes: Islands and channels of open water. Mostly covered with SAEX/PHAR3 but many patches of trees, including POBAT and lots of introduced trees.

Polygon Number 9

ParkName:
Wenatchee Confluence

Survey Intensity	1
Observer	PM
Date	9/15/2008
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

		Percent	Pattern	Rank
Existing Veg1:	water	100	Matrix	GOOD
Veg Community1:	water			
Existing Veg2:		0		
Veg Community3:				
Existing Veg3:		0		
Veg Community3:				

Notes: