Rare Plant and Vegetation Surveys of Lewis and Clark and Ike Kinswa State Parks

Pacific Biodiversity Institute

Rare Plant and Vegetation Survey of Lewis and Clark and Ike Kinswa State Parks

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Introduction

Under contract with the Washington State Parks and Recreation Commission both Lewis and Clark and Ike Kinswa State Parks, located in Lewis County, were surveyed and mapped according to vegetation communities by Pacific Biodiversity Institute (PBI). Vegetation data was collected for all the mapped vegetation types. Ike Kinswa State Park was also surveyed for rare plant occurrences. Lewis and Clark State Park was not intentionally surveyed for rare plant occurrences during the 2006 fieldwork dealt within this report. PBI surveyed Lewis and Clark State Park for rare plant occurrences in 2004 and provided a final report for the 2004 field work to the Washington State Parks and Recreation Commission early the following year (Morrison et al, 2005). This report summarizes the activities and findings of the contracted work for 2006.

Survey Routes

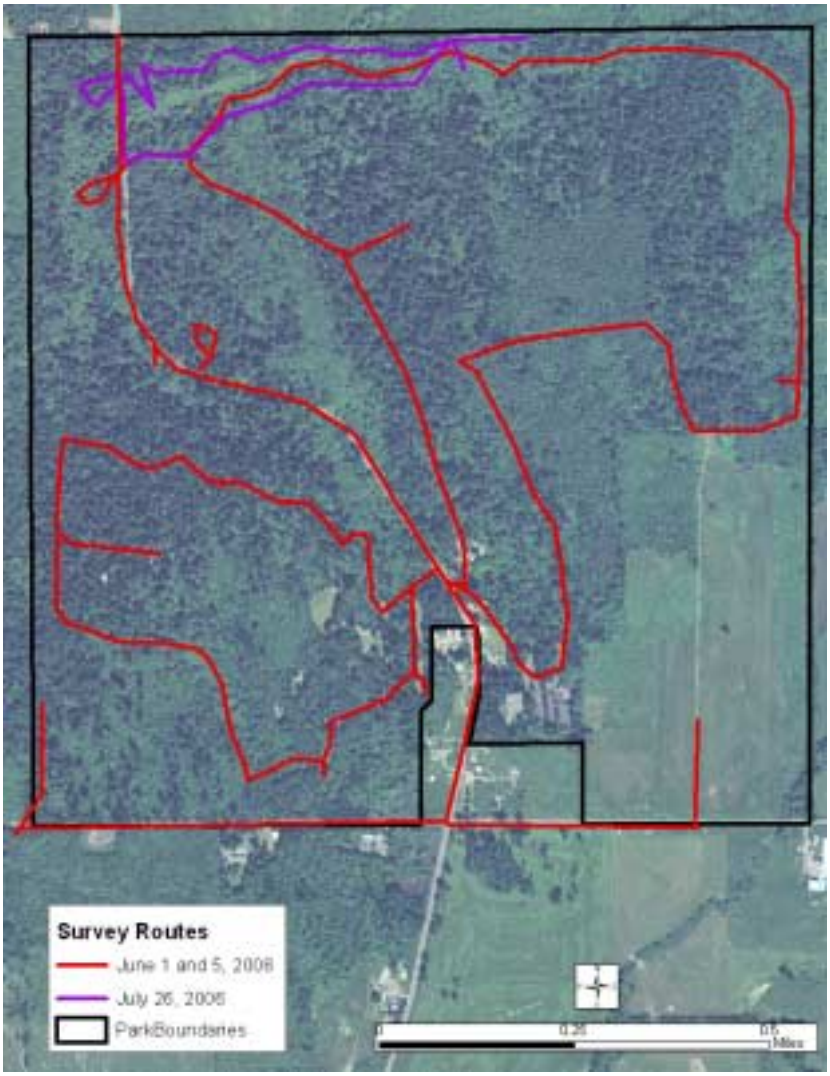

Figure 1. Survey routes for the vegetation community mapping and surveys conducted by PBI in 2006 for Lewis and Clark State Park.

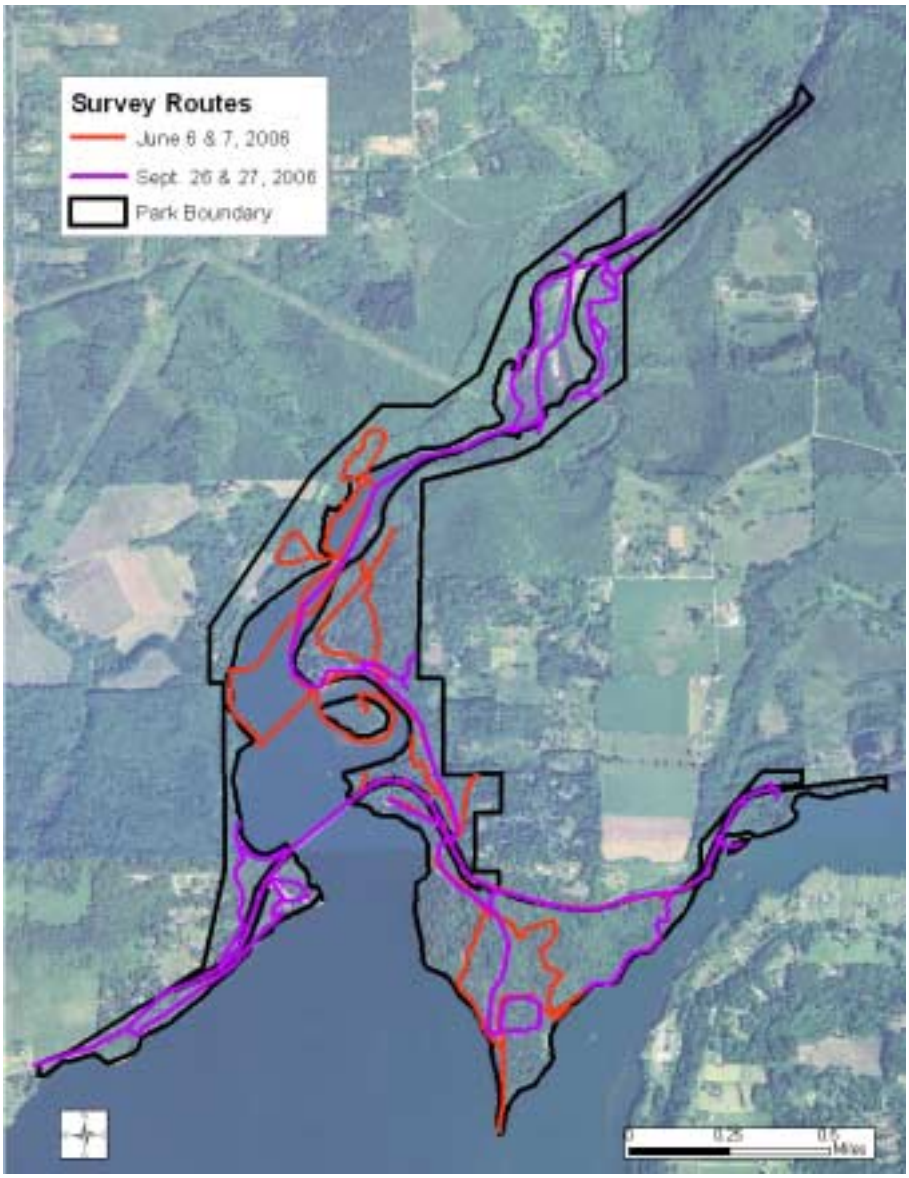

Figure 2. Survey routes for the vegetation community mapping and rare and endangered plant surveys conducted by PBI in 2006 for Ike Kinswa State Park.

Vegetation Communities

Methods

Vegetation communities within Lewis and Clark and Ike Kinswa State Parks were delineated and classified using a combination of field survey and remote sensing techniques. We relied on descriptions from the Washington State Department of Natural Resources (WADNR) late-seral forested plant associations of the Puget Lowland (Chappell 2004), and freshwater wetland vegetation (Kunze 1994). In some cases, the WADNR descriptions were not adequate in describing existing vegetation associations. In these cases, alternative vegetation communities or plant associations were created by PBI or found in alternative reference material.

Remote sensing techniques consisted of manually delineating plant associations or mosaics of plant associations in a digital environment. We reviewed orthorectified aerial photography from the 1990s and recent ASTER and LANDSAT Thematic Mapper satellite images for discernable vegetation or landform patterns. We also used high resolution true color ortho-rectified aerial photography obtained from Washington Department of Natural Resources through Washington Department of Fish and Wildlife. Topographic maps, and digital elevation models (DEMs) were also employed to assist the process of vegetation community delineation. The final vegetation polygons were created by hand in a GIS by ocular assessment.

Field surveys consisted of visiting sites located within the vegetation polygons created during the remote sensing process. At representative sites within a polygon, vegetation data and site descriptions were recorded in a fashion consistent with the "plant community polygon" format provided by the Washington State Parks and Recreation Commission. Further refinements and editing of the drafted vegetation polygon layers were done by hand on hardcopy maps in the field, and later edited digitally in a GIS.

Results

We mapped and surveyed 23 vegetation community polygons, comprised of 14 vegetation community types, within Lewis and Clark State Park. We also mapped and surveyed 47 vegetation community polygons, comprised of 11 vegetation community types, within Ike Kinswa State Park. Vegetation community polygons are either stand-alone plant associations or mosaics of multiple plant associations. Tables 1 and 2 list the plant associations and/or cover types found in Lewis and Clark and Ike Kinswa State Parks. See Appendix B for interpretation of "Status" codes. Figures 3 - 8 illustrate the location of the vegetation community polygons. Note that Figures 4 and 6 only show the primary plant associations in each polygon (PA1 in the database). A printout of the complete set of data we collected for each polygon is attached in Appendix D. The ecological condition of each polygon was evaluated according to a simple ranking system described in Appendix C.

Table 1. Vegetation Community Types Encountered in Lewis and Clark State Park.

Abbreviation	Association Name	English Name	Reference	Status
ALRU2/LYAM3 c.t.	*Alnus rubra / Lysichitum americanum* community type	red alder / skunk cabbage community type	Kunze 1994	G3G4
ALRU2/POMU	*Alnus rubra / Polystichum munitum*	red alder / sword fern	Chappell 2004	G4S4
ALRU2/RUSP c.t.	*Alnus rubra / Rubus spectabilis* community type	red alder / salmonberry community type	Kunze 1994	G4G5
FERO-SERI	*Festuca roemeri - Sericocarpus rigidus*	Roemer's fescue - Columbian whitetop aster	Chappell 2004	G1S1
FRLA/CAOB3 c.t.	*Fraxinus latifolia / Carex obnupta* community type	Oregon ash / slough sedge community type	Kunze 1994	G4
PSME-TSHE/GASH/POMU	*Pseudotsuga menziesii - Tsuga heterophylla / Gaultheria shallon / Polystichum munitum*	Douglas-fir - western hemlock / salal / sword fern	Chappell 2004	G4G5S4
PSME-TSHE/MANE2/POMU	*Pseudotsuga menziesii - Tsuga heterophylla / Mahonia nervosa / Polystichum munitum*	Douglas-fir - western hemlock / dwarf Oregongrape / sword fern	Chappell 2004	G4S3
SPDO c.t.	*Spiraea douglasii* community type	rose spirea community type	Kunze 1994	G5
THPL-TSHE/LYAM3 c.t.	*Thuja plicata – Tsuga heterophylla / Lysichitum americanum* community type	Western red-cedar – western hemlock / skunk cabbage community type	Kunze 1994	G3
THPL-TSHE/OPHO/POMU	*Thuja plicata – Tsuga heterophylla / Oploplanax horridus / Polystichum munitum*	Western red-cedar – western hemlock / devil's club / sword fern	Chappell 2004	G4S4
TSHE-PSME/POMU-DREX2	*Tsuga heterophylla - Pseudotsuga menziesii / Polystichum munitum - Dryopteris expansa*	western hemlock - Douglas-fir / sword fern - spreading woodfern	Chappell 2004	G3S3
Mixed Shrub Undescribed			Chappell 2004	
Non-native grass fields - mowed			PBI	
developed				

Table 2. Vegetation Community Types Encountered in Ike Kinswa State Park.

Abbreviation	Association Name	English Name	Reference	Status
ACMA3-ALRU2/POMU-TEGR2	*Acer macrophyllum – Alnus rubra / Polystichum munitum - Tellima grandiflora*	Bigleaf maple – red alder / sword fern – fringecup	Chappell 2004	G2G3
ALRU2/POMU	*Alnus rubra / Polystichum munitum*	red alder / sword fern	Chappell 2004	G4S4
ALRU2/RUSP c.t.	*Alnus rubra / Rubus spectabilis* community type	red alder / salmonberry community type	Kunze 1994	G4G5
JUEF c.t.	*Juncus effusus* community type	common rush community type	Kunze 1994	G5
PHAR3 WETLAND	*Phalaris arundinacea* wetland	reed canarygrass wetland	PBI	
PSME-TSHE/GASH/POMU	*Pseudotsuga menziesii - Tsuga heterophylla / Gaultheria shallon / Polystichum munitum*	Douglas-fir - western hemlock / salal / sword fern	Chappell 2004	G4G5S4
PSME-TSHE/MANE2/POMU	*Pseudotsuga menziesii - Tsuga heterophylla / Mahonia nervosa / Polystichum munitum*	Douglas-fir - western hemlock / dwarf Oregongrape / sword fern	Chappell 2004	G4S3
TSHE-PSME/POMU-DREX2	*Tsuga heterophylla - Pseudotsuga menziesii / Polystichum munitum - Dryopteris expansa*	western hemlock - Douglas-fir / sword fern - spreading woodfern	Chappell 2004	G3S3
STEEP ERODING BANK			PBI	
developed				
Water				

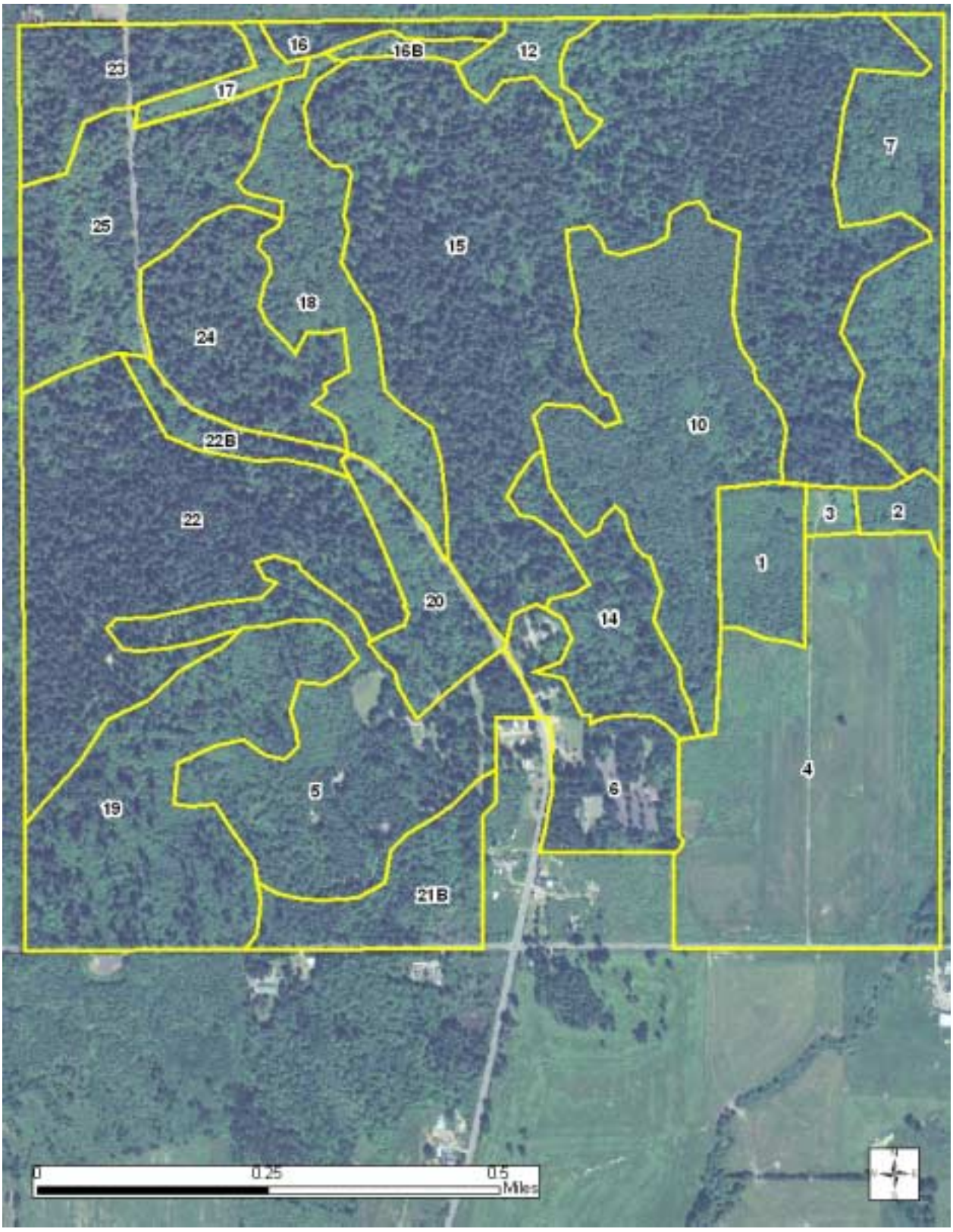

Figure 3. Layout of the vegetation community polygons in Lewis and Clark State Park, overlaying a high-resolution color aerial photograph.

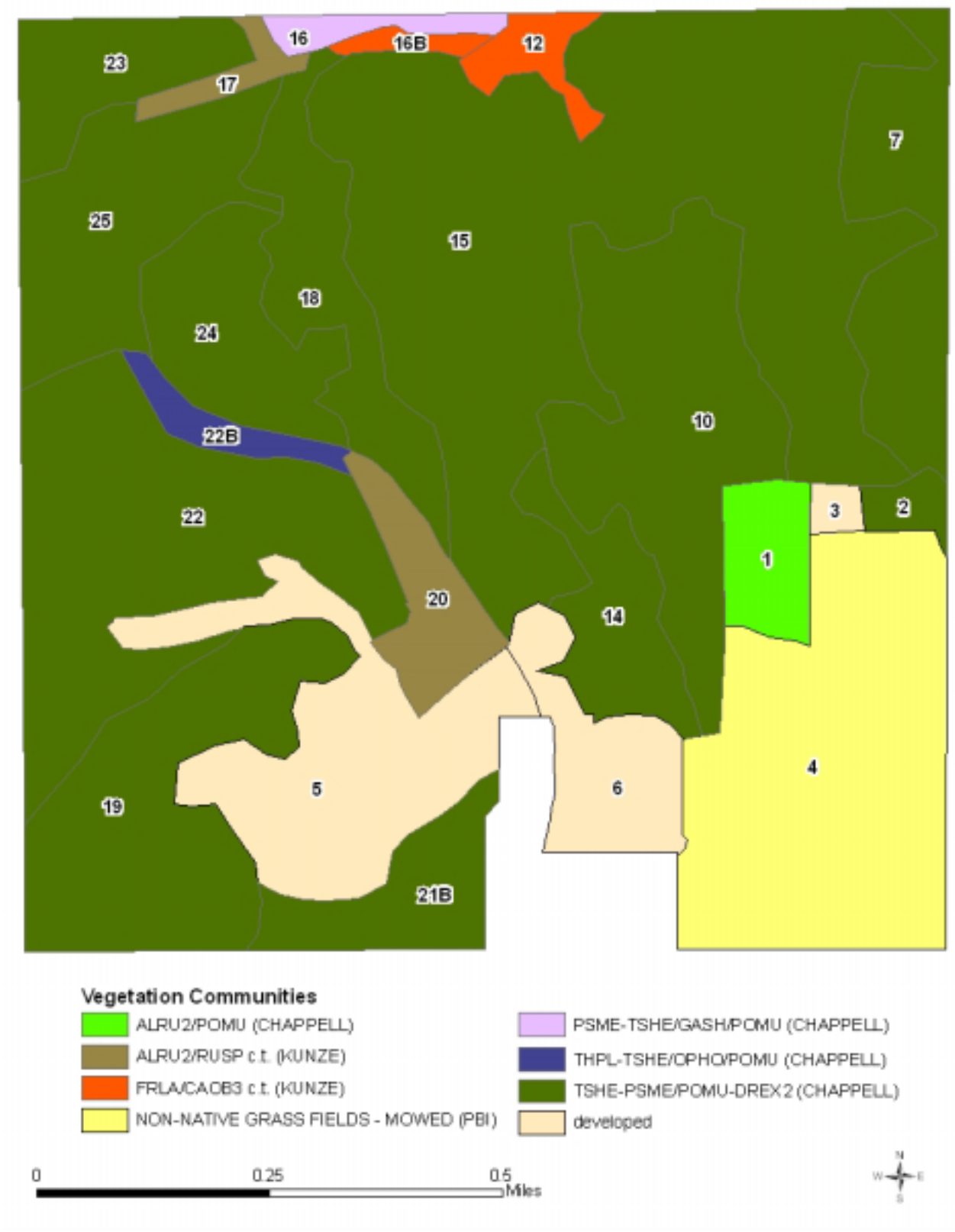

Figure 4. The primary vegetation community types within Lewis and Clark State Park.

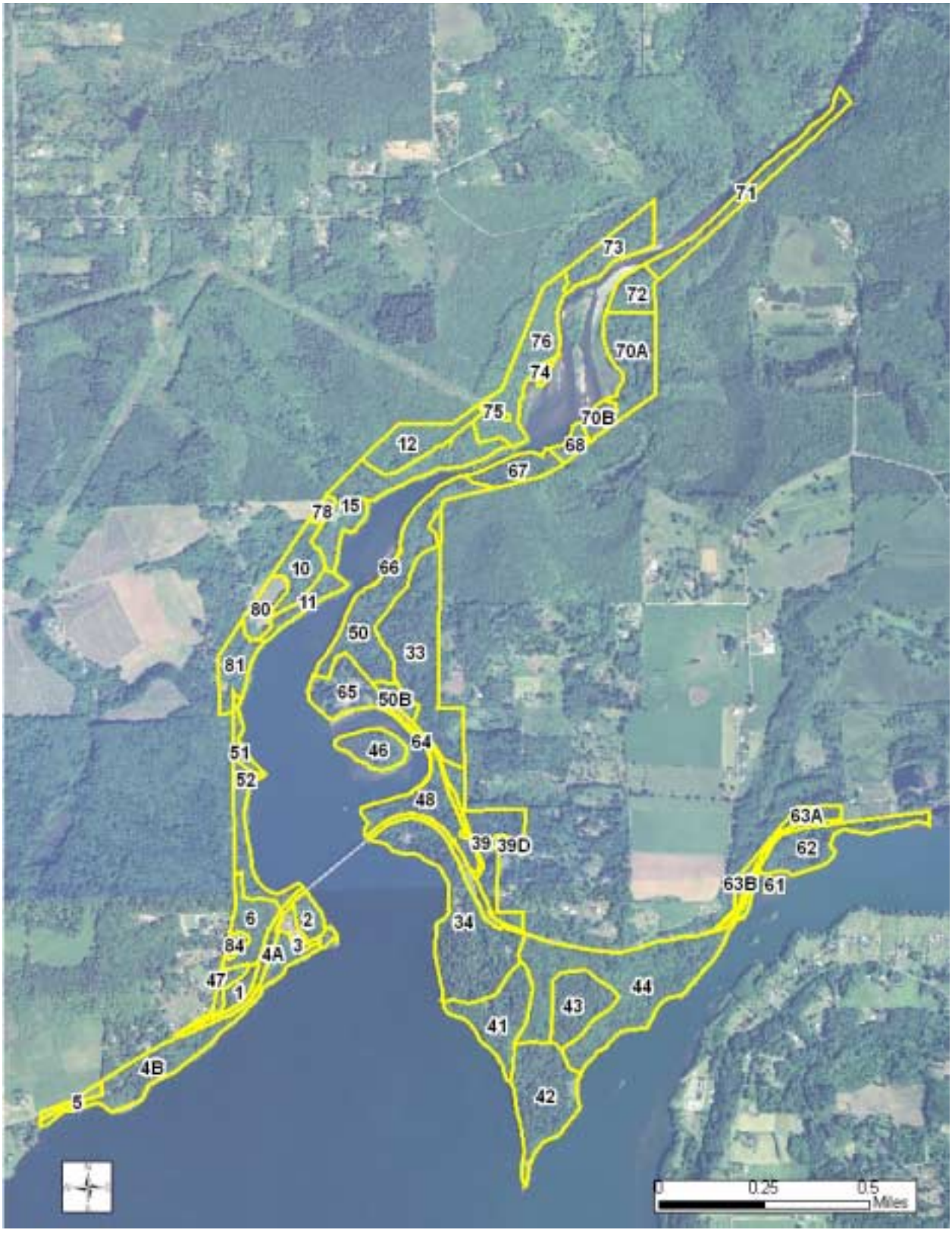

Figure 5. Layout of the vegetation community polygons in Ike Kinswa State Park, overlaying a high-resolution color aerial photograph.

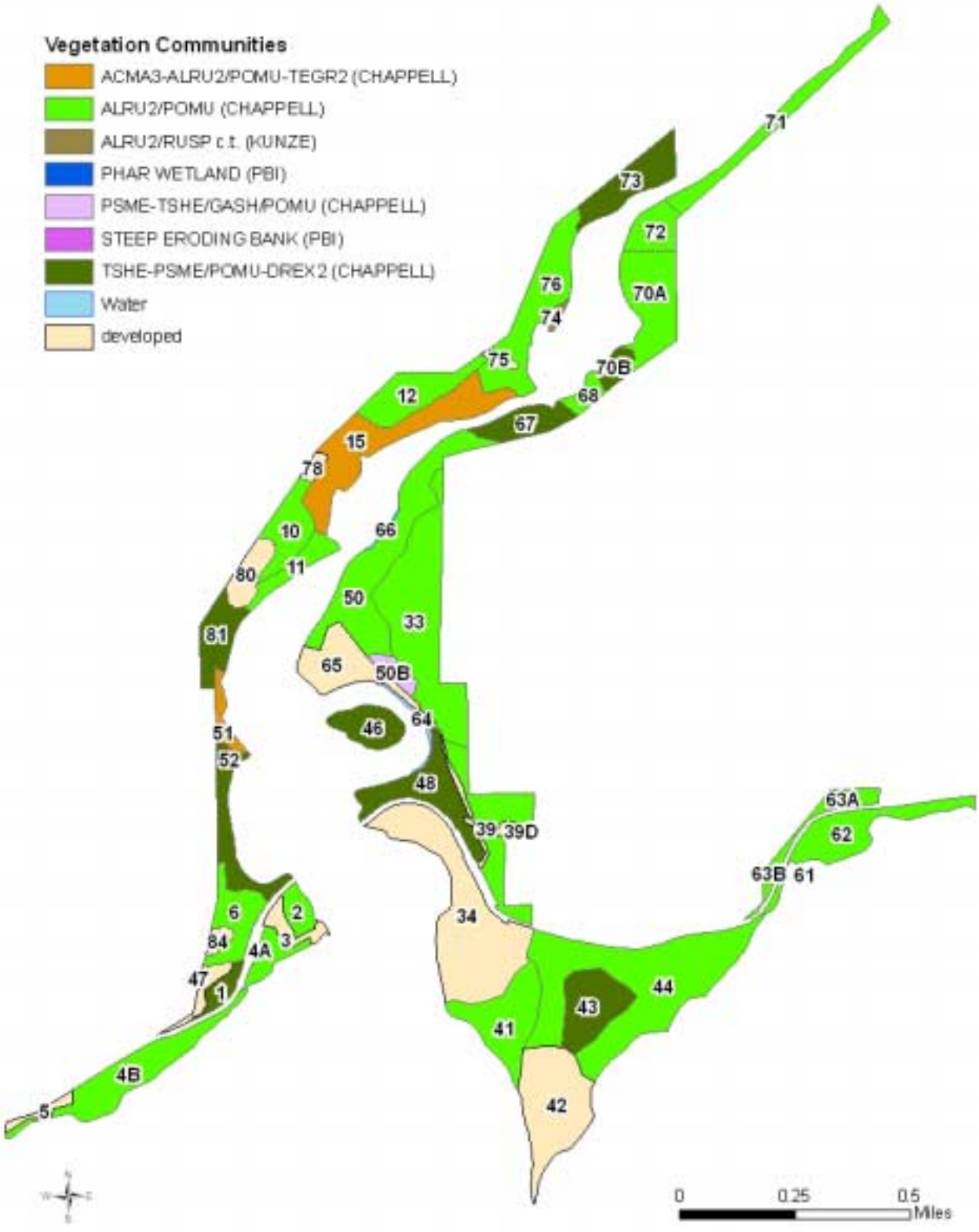

Figure 6. The primary vegetation community types within Ike Kinswa State Park.

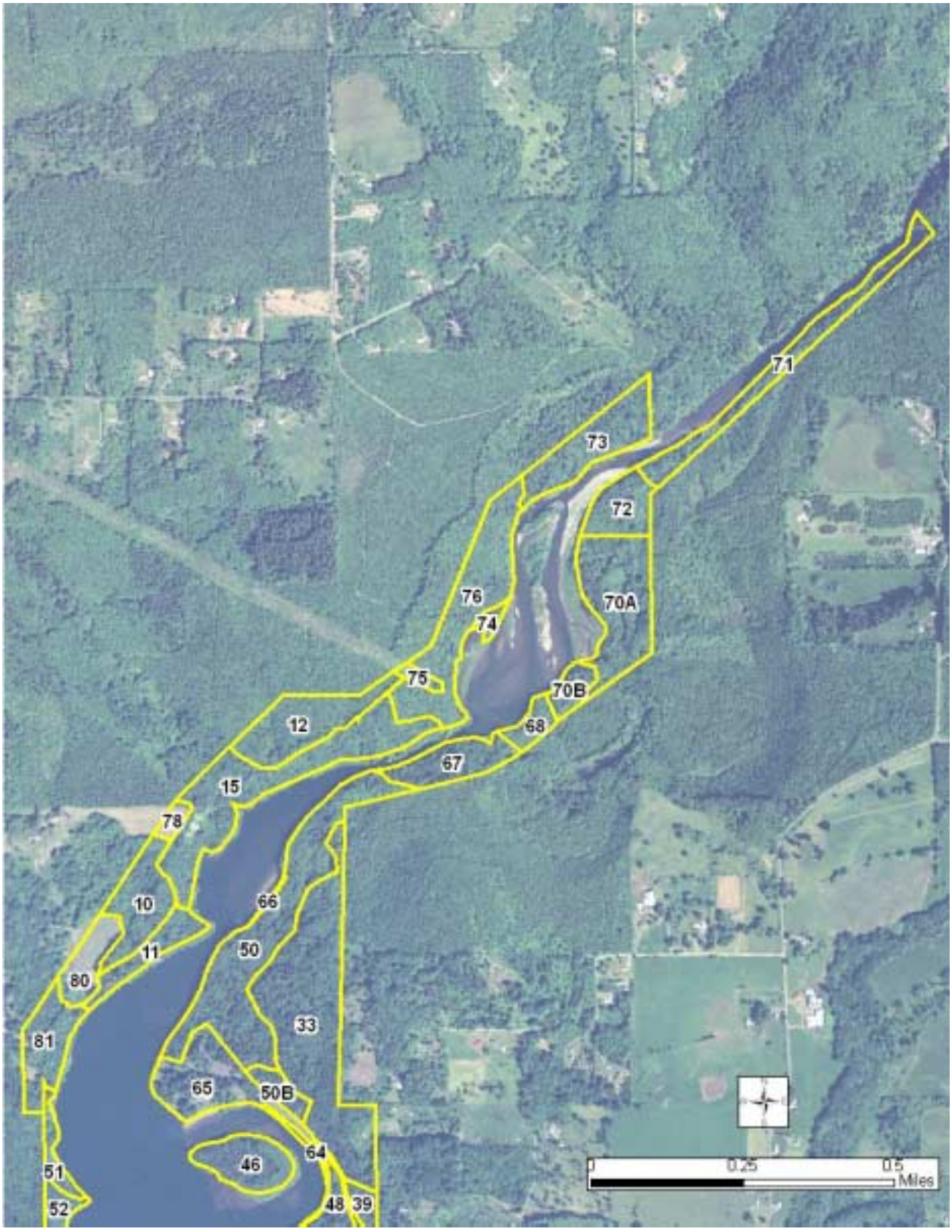

Figure 7. Layout of the vegetation community polygons in the northern portion of Ike Kinswa State Park.

Figure 8. Layout of the vegetation community polygons in the southern portion of Ike Kinswa State Park.

Examples of Vegetation Community Types

Acer macrophyllum – Alnus Rubra / Polystichum munitum - Tellima grandiflora forest (ACMA3-ALRU2/POMU-TEGR2)

This association occurs in Ike Kinswa State Park. It is a common plant association along steep slopes with loose unconsolidated substrates that are subject to moderate frequency slides and slope movement. Previous logging may have removed much of the conifer component from the patches where this plant association occurs, but continuous slope instability seems to be contributing to a maintained canopy dominance of big-leaf maple (*Acer macrophyllum*) and red alder (*Alnus rubra*).

Alnus rubra / Lysichitum americanum community type(ALRU2/LYAM3 c.t.)

This plant association occurs in Lewis and Clark State Park. This wetland community type occurs in a mosaic pattern with the ALRU2/RUSP c.t. and SPDO c.t. associations. It seems to occur on the wettest sites in the old beaver pond wetlands along the north boundary of the park, where soils are highly saturated and/or standing water remains throughout much of the year.

Alnus rubra / Polystichum munitum forest (ALRU2/POMU)

The ALRU2/POMU plant association is very common on old clearcut sites in the Puget Trough. Its prevalence in both state parks illustrates the historical logging practices that took place on the land prior to establishment of the parks. In some patches of this community, conifer regeneration appears to be slowly taking place, while in other areas, no conifer regeneration is apparent.

Alnus rubra / Rubus spectabilis community type (ALRU2/RUSP c.t.)

This plant association occurs in some of the wider flatter drainages of both parks. ALRU2/RUSP c.t. is a wetland community typically associated with seasonally flooded or saturated soils. Like ALRU2/POMU, it is common in previously logged areas, and is quite common in the Puget Trough Lowlands.

Festuca roemeri - Sericocarpus rigidus (FERO-SERI)

(Photo credit – Chris Chappell)

This is a highly endangered plant association native to the southern Puget Trough lowlands, which occurs in Lewis and Clark State Park. Florence Caplow, of the WA DNR Natural Heritage Program, provides a good description of this prairie and its condition in the park in *Southwestern Washington Prairies: using GIS to find rare plant habitat in historic prairies* (Caplow and Miller, 2004). Much of the native vegetation of the FERO-SERI association has been lost to invasive plants, especially grasses including non-native *Festuca rubra* and *Holcus lanatus*. Current activities such as mowing and horseback riding should be evaluated for their impacts on native vegetation, and restoration activities such as prescribed burning and native seed planting might be beneficial to preserving or even expanding the range of this plant association within the park.

Fraxinus latifolia / Carex obnupta community type (FRLA/CAOB3 c.t.)

FRLA/CAOB3 c.t. occurs in Lewis and Clark State Park among the wetlands along the north boundary of the park. The forest canopy is dominated by Oregon ash (*Fraxinus latifolia*) while the understory has a mixed shrub component with slough sedge (*Carex obnupta*) growing in dense patches underneath. This community seems to occur mostly within the gradient zone between the upland conifer forests and the other deciduous wetland types.

Juncus effusus community type (JUEF c.t.)

This plant association occurs in Ike Kinswa State park, on the small island along the far eastern edge of the park. The island contains patches of JUEF c.t. mixed in with large clumps of exotic plants such as *Rubus discolor* and *Phalaris arundinacea*. The JUEF c.t. patches tend to be on the lowest parts of the island continuing out into the shallowest adjacent parts of the lake off shore. *Juncus effusus* and *Scirpus cyperinus* create a complete graminoid cover with *Galium trifidum* and *Lotus corniculatus* intertwined with the graminoid bunches. As the lake levels of Silver Lake fluctuate throughout the year, much of this plant community is probably underwater at the highest water mark.

Mixed Shrub Undescribed

This generalized association describes areas where previous land use and/or disturbances have brought about the establishment of a shrub-dominated patch with little to no overstory trees. Patches attributed as this association occur in Lewis and Clark State Park around the large mowed field where the FERO-SERI association is found. It is assumed that the absence of aboriginal fires in the landscape is allowing a thick shrub cover (in this case of *Rosa nutkana* and *Cytisus scoparius*) to become established over otherwise undisturbed or minimally disturbed portions of the old prairie. Apparently, nitrogen fixation by *Cytisus scoparius* is helping to enrich the soils, which aids in the invasion and establishment of other non-native herbaceous vegetation.

Non-native grass fields – mowed

What used to be mostly the FERO-SERI prairie in the southeast corner of Lewis and Clark State Park is now a non-native grass field maintained via motorized mowers. Most of the open grassland in the park, which was once part of the Lacamas Prairie, was at one time plowed and/or ditched. These activities allow non-native species to become established and eventually dominate over the old prairie. Although the vegetation structure of this system has been more or less retained through motorized mowing, the original species composition and disturbance mechanisms which controlled plant composition and structure are now lost.

Phalaris arundinacea wetland (PHAR3 WETLAND)

Many wetlands in the lower Puget Trough have had their native vegetation completely displaced by infestations of reed canary grass (*Phalaris arundinacea*). Areas where soil and vegetation disturbances have occurred via grazing and/or heavy machinery use, or even hydrologic changes such as raised or lowered water table depths and shoreline alterations are at high risk of being infested by reed canary grass. Once established, this invasive species can quickly spread out via rhizomatous growth and shade out all other graminoid and herbaceous vegetation, resulting in almost complete monocultures of the invasive grass. Infested patches of reed canary grass occur in both Lewis and Clark and Ike Kinswa State Park. However, only Ike Kinswa contained sufficiently large patches, warranting us to describe it as a vegetation community in the park. These PHAR3 wetland patches occur along the shoreline of the lake, especially on the small island along the far eastern boundary of the park.

Pseudotsuga menziesii - Tsuga heterophylla / Gaultheria shallon / Polystichum munitum forest (PSME-TSHE/GASH/POMU)

This plant association occurs in both parks, although it is not as common within the parks as some of the other forested plant associations. It is possible that historic logging has greatly diminished the extent of this association throughout both of the parks, although in Lewis and Clark State Park it is more likely that logging replaced late-successional patches of TSHE-PSME/POMU/DREX2 or PSME-TSHE/MANE2/POMU. Exotic species establishment within patches of this association seems to be quite low relative to other forest patches.

Pseudotsuga menziesii - Tsuga heterophylla / Mahonia nervosa / Polystichum munitum forest (PSME-TSHE/MANE2/POMU)

PSME-TSHE/MANE2/POMU forest patches occur within both parks, though these patches are both few and small within Ike Kinswa State Park. It is possible that this plant association was once more extensive within the park previous to the logging activity that converted much of the park's forests to the ALRU2/POMU association. In Lewis and Clark State Park, there are many large patches of this association in late-successional phases. Almost no exotic species were found to occur within this plant association in Lewis and Clark State Park.

Spiraea douglasii community type (SPDO c.t.)

The SPDO community type is a wetland plant association where there is very little tree overstory and the shrub layer is dominated by rose spirea (*Spiraea douglasii*). This association occurs within Lewis and Clark State Park, along the north boundary of the park where there is a large wetland complex. This plant association mosaics with the ALRU/LYAM c.t. and ALRU/RUSP c.t. associations within the wetland complex.

Steep Eroding Bank

This community occurs along the steep unconsolidated slopes along the western side of Ike Kinwa State Park. Chronic slope failure prohibits establishment of the dominant matrix plant associations such as ACMA3-ALRU2/POMU/TEGR2, ALRU2/POMU, or TSHE-PSME/POMU-DREX2. The steep eroding banks are covered by early successional species, many of which are non-native graminoids and herbs, which specialize in pioneering disturbed sites.

Thuja plicata – Tsuga heterophylla / Lysichitum americanum community type (THPL-TSHE/LYAM3 c.t.)

THPL-TSHE/LYAM3 c.t. is a wetland community that occurs in Lewis and Clark State Park. The patches of this community encountered in the park contain old-growth western red-cedar (*Thuja plicata*) with an open but mixed shrub understory. *Lysichitum americanum* pervades the herbaceous layer, occurring in dense clumps where the wetland soils are most saturated.

Thuja plicata – Tsuga heterophylla / Oploplanax horridus / Polystichum munitum forest (THPL-TSHE/OPHO/POMU)

Only a few patches of this community occur within Lewis and Clark State Park. They occur along the stream on the west side of Jackson highway north of the campgrounds and ranger station. Logging and canopy disturbances from the building and maintenance of the Jackson Highway have opened up the canopy along this section of the stream, allowing in more sunlight than what used to probably occur. A thick shrub cover of salmonberry (*Rubus spectabilis*) is now dominating the canopy gaps, which used to probably be less salmonberry and more *Oploplanax horridus*.

Tsuga heterophylla - Pseudotsuga menziesii / Polystichum munitum - Dryopteris expansa forest (TSHE-PSME/POMU-DREX2)

This is the most common conifer dominated plant association in both parks. Much of the renowned old-growth forests within Lewis and Clark State Park are THSE-PSME/POMU-DREX2, and both *Euonymus occidentalis* and *Cimicifuga elata* (two listed rare plants occurring within Lewis and Clark State Park) occur within this plant association. The range of this plant association within both parks has been drastically diminished due to past logging and development. In Ike Kinswa State Park, no old-growth patches of THSE-PSME/POMU-DREX2 exist, though some relatively exotic species free patches occur which are nearing more mature phases of forest succession.

Rare Plant Surveys

Only Ike Kinswa State Park was surveyed for rare plant occurrences during the 2006 field surveys. The majority of this section discusses the methods and results of that contracted work, however some circumstantial information regarding rare plant occurrences in Lewis and Clark State Park is provided as well.

Methods

We visited Ike Kinswa State Park multiple times during the 2006 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. When a plant from the DNR NHP list was located, we used the standard DNR NHP rare plant sighting form to complete field descriptions for the observation.

Specific dates of field surveys for each park can be found in Appendix A of this report. 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 habitats of the park where we felt rare plants were more likely to occur more intensively. 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 for the park (Figure 2).

Results

Rare Plants

We did not locate any vascular plants currently listed in the WA DNR NHP rare plant list within Ike Kinswa Park. No previous state or federally listed vascular plants had been documented within the park prior to our 2006 surveys.

Vascular Plant List for Ike Kinswa State Park

A total of 207 vascular plant species were identified during the 2006 surveys at Ike Kinswa State Park. Of these, 73 of the plant species are non-native, accounting for 35% of the total.

Key to Vascular Plant Species List

"Code": Four-letter plant code as shown on the USDA PLANTS database.

"Alien?": species that are not native to the park are indicated with an "a"

"Common Name / Accepted Synonym": The species list uses Hitchcock and Cronquist, *Flora of the Pacific Northwest* as the taxonomic authority, as this is still the standard reference for our area. Updated nomenclature or general common names are shown in this column when they exist.

Table 3. Vascular Plant List for Ike Kinswa State Park

num	Code	Scientific Name	Common Name/Accepted Synonym	Family	alien?
1	ACCI	Acer circinatum Pursh	vine maple	Aceraceae	
2	ACMA3	Acer macrophyllum Pursh	bigleaf maple	Aceraceae	
3	ACMI2	Achillea millefolium L.	yarrow	Asteraceae	
4	ACTR	Achlys triphylla (Sm.) DC.	sweet after death	Berberidaceae	
5	ACRU2	Actaea rubra (Ait.) Willd.	red baneberry	Ranunculaceae	
6	ADPE	Adiantum pedatum L.	maidenhair fern	Pteridaceae	
7	AGAL3	Agrostis alba auct. non L. [misapplied]	>>Agrostis gigantea	Poaceae	a
8	AGEX	Agrostis exarata Trin.	spike bentgrass	Poaceae	
9	AGTE	Agrostis tenuis Sibthorp	>>Agrostis capillaris	Poaceae	a
10	AICA	Aira caryophyllea L.	silver hairgrass	Poaceae	a
11	ALOC	Alchemilla occidentalis Nutt.	>>Aphanes arvensis	Rosaceae	a
12	ALRU2	Alnus rubra Bong.	red alder	Betulaceae	
13	AMAL2	Amelanchier alnifolia (Nutt.) Nutt. ex M. Roemer	Saskatoon serviceberry	Rosaceae	
14	ANMA	Anaphalis margaritacea (L.) Benth.	western pearly everlasting	Asteraceae	
15	ANAR3	Angelica arguta Nutt.	Lyall's angelica	Apiaceae	
16	ANOD	Anthoxanthum odoratum L.	sweet vernalgrass	Poaceae	a
17	AQFO	Aquilegia formosa Fisch. ex DC.	western columbine	Ranunculaceae	
18	ARME	Arbutus menziesii Pursh	madrone	Ericaceae	
19	ARMA18	Arenaria macrophylla Hook.	>>Moehringia macrophylla	Caryophyllaceae	
20	AREL3	Arrhenatherum elatius (L.) Beauv. ex J.& K. Presl	tall oatgrass	Poaceae	a
21	ARSU4	Artemisia suksdorfii Piper	coastal wormwood	Asteraceae	
22	ARSYA	Aruncus sylvester Kostel. ex Maxim. ssp. acuminatus (Rydb.) Jepson	>>Aruncus dioicus var. acuminatus	Rosaceae	
23	ATFI	Athyrium filix-femina (L.) Roth	common ladyfern	Dryopteridaceae	
24	BEPE2	Bellis perennis L.	lawn daisy	Asteraceae	a
25	BLSP	Blechnum spicant (L.) Sm.	deer fern	Blechnaceae	
26	BOOF	Borago officinalis L.	common borage	Boraginaceae	a
27	BRMO2	Bromus mollis auct. non L. [misapplied]	>>Bromus hordeaceus ssp. hordeaceus	Poaceae	a
28	BRPA3	Bromus pacificus Shear	Pacific brome	Poaceae	
29	BRVU	Bromus vulgaris (Hook.) Shear	Columbia brome	Poaceae	
30	CASC7	Campanula scouleri Hook. ex A. DC.	pale bellflower	Campanulaceae	
31	CAAN5	Cardamine angulata Hook.	seaside bittercress	Brassicaceae	
32	CAOL	Cardamine oligosperma Nutt.	little western bittercress	Brassicaceae	
33	CACR4	Carex crawfordii Fern.	Crawford's sedge	Cyperaceae	

34	CACU5	Carex cusickii Mackenzie ex Piper & Beattie	Cusick's sedge	Cyperaceae	
35	CADE9	Carex deweyana Schwein.	Dewey sedge	Cyperaceae	
36	CAHE7	Carex hendersonii Bailey	Henderson's sedge	Cyperaceae	
37	CALE8	Carex lenticularis Michx.	lakeshore sedge	Cyperaceae	
38	CAOB3	Carex obnupta Bailey	slough sedge	Cyperaceae	
39	CAVE6	Carex vesicaria L.	blister sedge	Cyperaceae	
40	CEGL2	Cerastium glomeratum Thuill.	sticky chickweed	Caryophyllaceae	a
41	CHLE80	Chrysanthemum leucanthemum L.	>>Leucanthemum vulgare	Asteraceae	a
42	CIAL	Circaea alpina L.	small enchanter's nightshade	Onagraceae	
43	CIAR4	Cirsium arvense (L.) Scop.	Canada thistle	Asteraceae	a
44	COHE2	Collomia heterophylla Dougl. ex Hook.	variableleaf collomia	Polemoniaceae	
45	COCA5	Conyza canadensis (L.) Cronq.	Canadian horseweed	Asteraceae	a
46	CONU4	Cornus nuttallii Audubon ex Torr. & Gray	Pacific dogwood	Cornaceae	
47	COST4	Cornus stolonifera Michx.	>>Cornus sericea ssp. sericea	Cornaceae	
48	COSC4	Corydalis scouleri Hook.	Scouler's fumewort	Fumariaceae	
49	COCO6	Corylus cornuta Marsh.	California hazelnut	Betulaceae	
50	CRCA3	Crepis capillaris (L.) Wallr.	smooth hawksbeard	Asteraceae	a
51	CYSC4	Cytisus scoparius (L.) Link	scotchbroom	Fabaceae	a
52	DAGL	Dactylis glomerata L.	orchardgrass	Poaceae	a
53	DACA6	Daucus carota L.	Queen Anne's lace	Apiaceae	a
54	DEDA	Deschampsia danthonioides (Trin.) Munro	annual hairgrass	Poaceae	
55	DIAR	Dianthus armeria L.	Deptford pink	Caryophyllaceae	a
56	DIFO	Dicentra formosa (Haw.) Walp.	Pacific bleeding heart	Fumariaceae	
57	DIPU	Digitalis purpurea L.	purple foxglove	Scrophulariaceae	a
58	DISM2	Disporum smithii (Hook.) Piper	>>Prosartes smithii	Liliaceae	
59	DREX2	Dryopteris expansa (K. Presl) Fraser-Jenkins & Jermy	spreading woodfern	Dryopteridaceae	
60	ELGL	Elymus glaucus Buckl.	blue wildrye	Poaceae	
61	EPAN2	Epilobium angustifolium L.	>>Chamerion angustifolium ssp. angustifolium	Onagraceae	
62	EPCIW	Epilobium ciliatum Raf. ssp. watsonii (Barbey) Hoch & Raven	fringed willowherb	Onagraceae	
63	EQAR	Equisetum arvense L.	field horsetail	Equisetaceae	
64	ERPH	Erigeron philadelphicus L.	Philadelphia fleabane	Asteraceae	a
65	ERSP4	Erigeron speciosus (Lindl.) DC.	aspen fleabane	Asteraceae	
66	FEAR3	Festuca arundinacea Schreb.	>>Schedonorus phoenix	Poaceae	a
67	FEID	Festuca idahoensis Elmer	Idaho fescue	Poaceae	
68	FEOC	Festuca occidentalis Hook.	western fescue	Poaceae	
69	FERU2	Festuca rubra L.	red fescue	Poaceae	
70	FRVE	Fragaria vesca L.	woodland strawberry	Rosaceae	
71	FRLA	Fraxinus latifolia Benth.	Oregon ash	Oleaceae	
72	GAAP2	Galium aparine L.	stickywilly	Rubiaceae	a
73	GAMO	Galium mollugo L.	false baby's breath	Rubiaceae	a
74	GATR2	Galium trifidum L.	threepetal bedstraw	Rubiaceae	
75	GATR3	Galium triflorum Michx.	fragrant bedstraw	Rubiaceae	
76	GASH	Gaultheria shallon Pursh	salal	Ericaceae	
77	GECO	Geranium columbinum L.	longstalk cranesbill	Geraniaceae	a
78	GEMO	Geranium molle L.	dovefoot geranium	Geraniaceae	a
79	GERO	Geranium robertianum L.	Robert geranium	Geraniaceae	a
80	GEMA4	Geum macrophyllum Willd.	largeleaf avens	Rosaceae	
81	GLHE2	Glechoma hederacea L.	ground ivy	Lamiaceae	a

82	GLEL	Glyceria elata (Nash ex Rydb.) M.E. Jones	>>Glyceria striata	Poaceae	
83	GNPU2	Gnaphalium purpureum L.	>>Gamochaeta purpurea	Asteraceae	
84	GOOB2	Goodyera oblongifolia Raf.	western rattlesnake plantain	Orchidaceae	
85	HEHE	Hedera helix L.	English ivy	Araliaceae	a
86	HEMI7	Heuchera micrantha Dougl. ex Lindl.	crevice alumroot	Saxifragaceae	
87	HOLA	Holcus lanatus L.	common velvetgrass	Poaceae	a
88	HODI	Holodiscus discolor (Pursh) Maxim.	Indian plum	Rosaceae	
89	HYTE	Hydrophyllum tenuipes Heller	Pacific waterleaf	Hydrophyllaceae	
90	HYPE	Hypericum perforatum L.	common St. Johnswort	Clusiaceae	a
91	HYRA3	Hypochaeris radicata L.	hairy cat's ear	Asteraceae	a
92	ILAQ80	Ilex aquifolium L.	English holly	Aquifoliaceae	a
93	IMCA	Impatiens capensis Meerb.	jewelweed	Balsaminaceae	a
94	IRPS	Iris pseudacorus L.	paleyellow iris	Iridaceae	a
95	JUAC	Juncus acuminatus Michx.	tapertip rush	Juncaceae	
96	JUEF	Juncus effusus L.	common rush	Juncaceae	
97	JUTE	Juncus tenuis Willd.	poverty rush	Juncaceae	
98	LAMU	Lactuca muralis (L.) Fresen.	>>Mycelis muralis	Asteraceae	a
99	LASE	Lactuca serriola L.	prickly lettuce	Asteraceae	a
100	LAPU2	Lamium purpureum L.	purple deadnettle	Lamiaceae	a
101	LACO3	Lapsana communis L.	common nipplewort	Asteraceae	a
102	LANE3	Lathyrus nevadensis S. Wats.	Sierra pea	Fabaceae	
103	LIBO3	Linnaea borealis L.	twinflower	Ericaceae	
104	LOPE	Lolium perenne L.	perennial ryegrass	Poaceae	a
105	LOCI3	Lonicera ciliosa (Pursh) Poir. ex DC.	orange honeysuckle	Caprifoliaceae	
106	LOCO6	Lotus corniculatus L.	bird's-foot trefoil	Fabaceae	a
107	LOMI	Lotus micranthus Benth.	desert deervetch	Fabaceae	
108	LUPA4	Luzula parviflora (Ehrh.) Desv.	smallflowered woodrush	Juncaceae	
109	LYCO	Lychnis coronaria (L.) Desr.	rose campion	Caryophyllaceae	a
110	LYAM3	Lysichiton americanus Hultén & St. John	American skunkcabbage	Araceae	
111	MANE2	Mahonia nervosa (Pursh) Nutt.	Cascade barberry	Berberidaceae	
112	MADI	Maianthemum dilatatum (Wood) A. Nels. & J.F. Macbr.	false lily of the valley	Liliaceae	
113	MAMA11	Matricaria matricarioides auct. non (Less.) Porter [misapplied]	>>Matricaria discoidea	Asteraceae	a
114	MELU	Medicago lupulina L.	black medick	Fabaceae	a
115	MESA	Medicago sativa L.	alfalfa	Fabaceae	a
116	MEAR3	Melica aristata Thurb. ex Boland.	bearded melicgrass	Poaceae	
117	MESU	Melica subulata (Griseb.) Scribn.	Alaska oniongrass	Poaceae	
118	MEPIC2	Mentha piperita L. ssp. citrata (Ehrh.) Briq.	>>Mentha aquatica	Lamiaceae	a
119	MIGU	Mimulus guttatus DC.	seep monkeyflower	Scrophulariaceae	
120	MOPA5	Montia parviflora (Dougl. ex Hook.) T.J. Howell	>>Claytonia parviflora ssp. parviflora	Portulacaceae	
121	MOSI2	Montia sibirica (L.) T.J. Howell	>>Claytonia sibirica var. sibirica	Portulacaceae	
122	MYDI	Myosotis discolor Pers.	changing forget-me-not	Boraginaceae	a
123	MYLA	Myosotis laxa Lehm.	bay forget-me-not	Boraginaceae	
124	NEPA	Nemophila parviflora Dougl. ex Benth.	smallflower nemophila	Hydrophyllaceae	
125	OECE	Oemleria cerasiformis (Torr. & Gray ex Hook. & Arn.) Landon	Indian plum	Rosaceae	
126	OESA	Oenanthe sarmentosa K. Presl ex DC.	water parsely	Apiaceae	
127	OPHO	Oplopanax horridus Miq.	devilsclub	Araliaceae	
128	OSCH	Osmorhiza chilensis Hook. & Arn.	>>Osmorhiza berteroi	Apiaceae	
129	OXTR	Oxalis trilliifolia Hook.	threeleaf woodsorrel	Oxalidaceae	

130	PEPA31	Petasites palmatus (Ait.) Gray	>>Petasites frigidus var. palmatus	Asteraceae	
131	PHNE2	Phacelia nemoralis Greene	shade phacelia	Hydrophyllaceae	
132	PHAR3	Phalaris arundinacea L.	reed canarygrass	Poaceae	a
133	PHCA11	Physocarpus capitatus (Pursh) Kuntze	Pacific ninebark	Rosaceae	
134	PISI	Picea sitchensis (Bong.) Carr.	Sitka spruce	Pinaceae	
135	PITR	Pityrogramma triangularis (Kaulfuss) Maxon	>>Pentagramma triangularis ssp. triangularis	Pteridaceae	
136	PLLA	Plantago lanceolata L.	narrowleaf plantain	Plantaginaceae	
137	PLMA2	Plantago major L.	common plantain	Plantaginaceae	
138	POAN	Poa annua L.	annual bluegrass	Poaceae	a
139	POBU	Poa bulbosa L.	bulbous bluegrass	Poaceae	a
140	POPA2	Poa palustris L.	fowl bluegrass	Poaceae	
141	POPR	Poa pratensis L.	Kentucky bluegrass	Poaceae	a
142	POTR2	Poa trivialis L.	rough bluegrass	Poaceae	a
143	POHY	Polygonum hydropiper L.	marshpepper knotweed	Polygonaceae	a
144	POHY2	Polygonum hydropiperoides Michx.	swamp smartweed	Polygonaceae	
145	POSA4	Polygonum sachalinense F. Schmidt ex Maxim.	giant knotweed	Polygonaceae	a
146	POGL8	Polypodium glycyrrhiza D.C. Eat.	licorice fern	Polypodiaceae	
147	POMU	Polystichum munitum (Kaulfuss) K. Presl	swordfern	Polypodiaceae	
148	POBAT	Populus balsamifera L. ssp. trichocarpa (Torr. & Gray ex Hook.) Brayshaw	black cottonwood	Salicaceae	
149	PRVU	Prunella vulgaris L.	common selfheal	Lamiaceae	
150	PREM	Prunus emarginata (Dougl. ex Hook.) D. Dietr.	bitter cherry	Rosaceae	
151	PSME	Pseudotsuga menziesii (Mirbel) Franco	Douglas-fir	Pinaceae	
152	PTAQ	Pteridium aquilinum (L.) Kuhn	bracken fern	Dennstaedtiaceae	
153	PYFU	Pyrus fusca Raf.	>>Malus fusca	Rosaceae	
154	RARE3	Ranunculus repens L.	creeping buttercup	Ranunculaceae	a
155	RAUN	Ranunculus uncinatus D. Don ex G. Don	woodland buttercup	Ranunculaceae	a
156	RHPU	Rhamnus purshiana DC.	>>Frangula purshiana	Rhamnaceae	
157	RIBR	Ribes bracteosum Dougl. ex Hook.	stink currant	Grossulariaceae	
158	RIDI	Ribes divaricatum Dougl.	spreading gooseberry	Grossulariaceae	
159	ROGY	Rosa gymnocarpa Nutt.	dwarf rose	Rosaceae	
160	RUDI2	Rubus discolor Weihe & Nees	>>Rubus armeniacus	Rosaceae	a
161	RULA	Rubus laciniatus Willd.	cutleaf blackberry	Rosaceae	a
162	RUPA	Rubus parviflorus Nutt.	thimbleberry	Rosaceae	
163	RUSP	Rubus spectabilis Pursh	salmonberry	Rosaceae	
164	RUUR	Rubus ursinus Cham. & Schlecht.	California blackberry	Rosaceae	
165	RUAC3	Rumex acetosella L.	common sheep sorrel	Polygonaceae	
166	RUOB	Rumex obtusifolius L.	bitter dock	Polygonaceae	a
167	SASC	Salix scouleriana Barratt ex Hook.	Scouler's willow	Salicaceae	
168	SASI2	Salix sitchensis Sanson ex Bong.	Sitka willow	Salicaceae	
169	SARA2	Sambucus racemosa L.	red elderberry	Caprifoliaceae	
170	SADO5	Satureja douglasii (Benth.) Briq.	>>Clinopodium douglasii	Lamiaceae	
171	SCCY	Scirpus cyperinus (L.) Kunth	woolgrass	Cyperaceae	
172	SCAN2	Scleranthus annuus L.	German knotgrass	Caryophyllaceae	a
173	SCLA2	Scutellaria lateriflora L.	blue skullcap	Lamiaceae	
174	SESP	Sedum spathulifolium Hook.	broadleaf stonecrop	Crassulaceae	
175	SEJA	Senecio jacobaea L.	stinking willie	Asteraceae	a
176	SEVU	Senecio vulgaris L.	old-man-in-the-Spring	Asteraceae	a
177	SMRA*	Smilacina racemosa (L) Desf.	>>Maianthemum racemosum ssp. amplexicaule	Liliaceae	

178	SMST	Smilacina stellata (L.) Desf.	>>Maianthemum stellatum	Liliaceae	
179	SODU	Solanum dulcamara L.	climbing nightshade	Solanaceae	a
180	SOOL	Sonchus oleraceus L.	common sowthistle	Asteraceae	a
181	STCO14	Stachys cooleyae Heller	>>Stachys chamissonis var. cooleyae	Lamiaceae	
182	STCR2	Stellaria crispa Cham. & Schlecht.	curled starwort	Caryophyllaceae	
183	STME2	Stellaria media (L.) Vill.	common chickweed	Caryophyllaceae	a
184	SYAL	Symphoricarpos albus (L.) Blake	common snowberry	Caprifoliaceae	
185	SYOF	Symphytum officinale L.	common comfrey	Boraginaceae	a
186	TAOF	Taraxacum officinale G.H. Weber ex Wiggers	dandelion	Asteraceae	a
187	TEGR2	Tellima grandiflora (Pursh) Dougl. ex Lindl.	bigflower tellima	Saxifragaceae	
188	THPL	Thuja plicata Donn ex D. Don	western red cedar	Cupressaceae	
189	TITR	Tiarella trifoliata L.	threeleaf foamflower	Saxifragaceae	
190	TOME	Tolmiea menziesii (Pursh) Torr. & Gray	youth on age	Saxifragaceae	
191	TRLA6	Trientalis latifolia Hook.	>>Trientalis borealis ssp. latifolia	Primulaceae	
192	TRAR4	Trifolium arvense L.	rabbitfoot clover	Fabaceae	a
193	TRRE3	Trifolium repens L.	white clover	Fabaceae	a
194	TROV2	Trillium ovatum Pursh	Pacific trillium	Liliaceae	
195	TSHE	Tsuga heterophylla (Raf.) Sarg.	western hemlock	Pinaceae	
196	URDI	Urtica dioica L.	nettle	Urticaceae	
197	VAPA	Vaccinium parvifolium Sm.	red huckleberry	Ericaceae	
198	VASI	Valeriana sitchensis Bong.	Sitka valerian	Valerianaceae	
199	VAHE	Vancouveria hexandra (Hook.) Morr. & Dcne.	white insideout flower	Berberidaceae	
200	VETH	Verbascum thapsus L.	common mullein	Scrophulariaceae	a
201	VEAM2	Veronica americana Schwein. ex Benth.	American speedwell	Scrophulariaceae	
202	VESE	Veronica serpyllifolia L.	thymeleaf speedwell	Scrophulariaceae	a
203	VISA	Vicia sativa L.	garden vetch	Fabaceae	a
204	VIMA	Vinca major L.	bigleaf periwinkle	Apocynaceae	a
205	VIGL	Viola glabella Nutt.	pioneer violet	Violaceae	
206	VISE3	Viola sempervirens Greene	evergreen violet	Violaceae	
207	VUBR	Vulpia bromoides (L.) S.F. Gray	brome fescue	Poaceae	a

Supplemental Rare Plant Information for Lewis and Clark State Park

During our 2006 vegetation community mapping and field surveys of Lewis and Clark State Park, we came across a specimen of tall bugbane (*Cimicifuga elata*) that was not documented in our 2004 rare plant inventory report. *Cimicifuga elata* had been located in Lewis and Clark State Park prior to our 2004 surveys, but we were unable to locate any specimens within the park in 2004. Figures 9 and 10 illustrate the location and condition of the specimens of *Cimicifuga elata* located by happenstance during our 2006 vegetation community surveys. A copy of a completed DNR NHP rare plant sighting form is attached as Appendix E to this report. See Appendix B for definitions of "Status" codes.

Species	**Common Name**	**Status**
Cimicifuga elata	Tall Bugbane	G3 S3 S SC

Figure 9. Photos of tall bugbane (*Cimicifuga elata*)

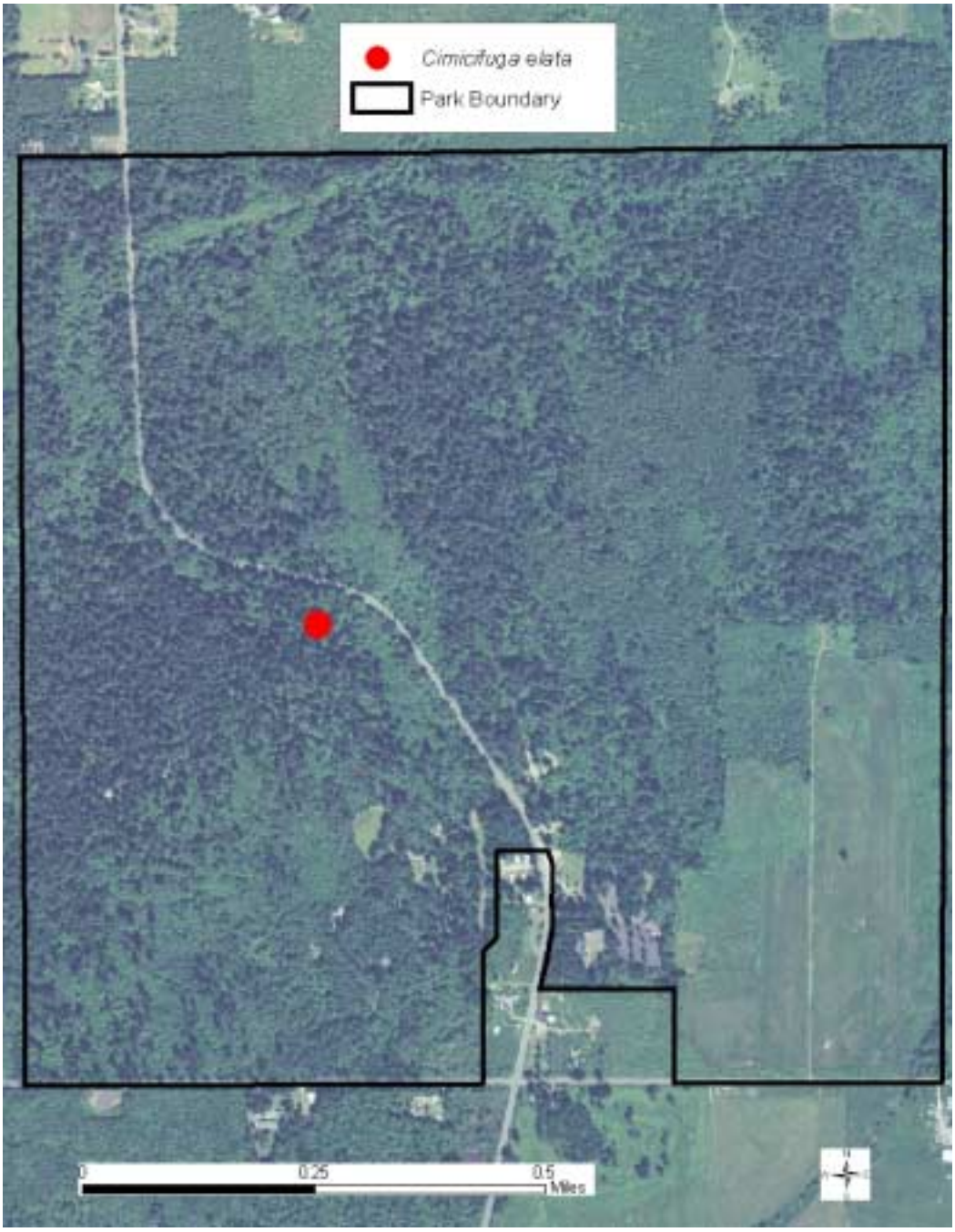

Figure 10. Map illustrating the location of tall bugbane (*Cimicifuga elata*).

Ecological Condition of Lewis and Clark and Ike Kinswa State Parks

Lewis and Clark State Park

Lewis and Clark State Park is known to possess some of the last remaining intact lowland virgin conifer forests in the southern Puget Trough region. It also possesses some of the last remaining southern Puget Trough native prairie. Three separate rare plant species are documented to exist within and depend upon these remnant ecosystems. Numerous wildlife species actively use the park as habitat for foraging and nesting. In the forested campgrounds of the park, visitors can enjoy camping right next to critically imperiled western wahoo shrubs (*Euonymus occidentalis*).

Although the park provides habitat conditions critical to native plants and animals, considerable human caused disturbances around the boundary of the park and even within park have degraded the park's ecological condition and threaten to replace the native ecosystems with weedy modified vegetation communities. Figure 11 illustrates the contrasts of conditions between the park's interior compared to the surrounding landscape. Consideration should be given to park expansion through the purchase of mature forests that exist on several sides of the park. Some rare plant populations found during our 2004 surveys extended beyond the park boundary on the west. Expansion of the park to include a buffer of mature forests would help protect the outstanding old growth forests in the park.

Figure 11. A view of the vegetation conditions of the greater landscape surrounding Lewis and Clark State Park.

Logging, conversion of forest or prairie to agricultural and/or grazing land, forest and/or shrubland encroachment on native prairie, road development and maintenance, off-road recreation, and intensive recreation use such as off-trail hiking and equestrian use are all past and present human disturbances affecting the native vegetation communities within the park. Disrupted hydrologic functioning due to culverts and raised road beds, as well as the removal of beavers from the park may be altering the native wetland communities, some of which now possess large infestations of reed canarygrass (*Phalaris minor*). Prior development and vegetation disturbances in some areas of the park have allowed large patches of Himalayan blackberry (*Rubus discolor*) to become established (Figure 12). The native prairie remnants within the southeast corner of the park are at high risk of being completely inundated by surrounding exotic grasses and herbs, not to mention weedy shrubs and vines. Historic logging has converted a large portion of the park's forest to early/mid seral conifer and in some cases deciduous stands that lack the species diversity and canopy complexity of the virgin old-growth forests.

Figure 12. Infestations of exotic grasses and Himalayan blackberry within Lewis and Clark State Park.

Given the issues facing native vegetation communities within the park, it may be worthwhile for restoration programs to be implemented in regions of the park where the ecological condition has only been moderately compromised, in order to create a better buffer between the best ecological condition old-growth forests and the highly disturbed weed infested areas which can act as vectors to the spread of exotic and noxious species. Activities such as replanting disturbed areas with native trees and shrubs, cutting back patches of exotic vegetation, and performing silvicultural treatments on dense secondary forests to quicken forest succession may help to improve overall ecological conditions in the park.

Ike Kinswa State Park

Ike Kinswa State Park has had a history of intensive land uses for resource extraction and power supply purposes. In 1963 the Mayfield Dam created Mayfield Lake along the portion of the Cowlitz River that Ike Kinswa State Park is located. The creation of the artificial lake resulted in many artificial wetlands in and along the park's boundary which today provide habitat for birds and sport fish. Many of these wetlands have pervasive exotic species infestations, especially of reed canary grass (*Phalaris arundinacea*) and in some cases jewelweed (*Impatiens capensis*). Much of the artificial shoreline provides habitat for exotic plant species, and areas where the shoreline has had substantial disturbances and/or development are experiencing severe exotic species infestation (Figures 13 and 14).

Figure 13. Complete understory cover of jewelweed (*Impatiens capensis*) on the forested island near the day-use area of Ike Kinswa State park.

Figure 14. Infestation of reed canary grass and Himalayan blackberry along the eastern shore of Ike Kinswa State Park.

Intensive logging throughout the park has changed much of the park's forests from coniferous to deciduous stands. The pervasiveness of the ALRU2/POMU plant association is testament to the scale of logging that occurred historically in what is now Ike Kinswa State Park. Road development, clear cut logging on adjacent lands, power line transmission corridor installation and maintenance, and campground/day-use areas development have contributed to diminishing the ecological condition of the remaining forests within Ike Kinswa State Park by providing vectors of spread for exotic plants, removing and/or killing native vegetation, and dissecting what could be large patches of native vegetation into smaller patches with low interior to edge ratios. There are not many large patches of contiguous vegetation communities with substantial interior conditions relative to the amount of patch edge within the park. Part of this is because the geometry of the boundary of the park creates narrow areas of park ownership against a matrix of private land ownership where the land is still being aggressively developed or exploited for resource extraction, leaving the park with small slivers of vegetation communities to manage (Figure 15). The park may want to consider acquiring adjacent lands of potential similar vegetation types in order to increase the amount of interior conditions of forest patches and provide a larger buffer of protection for the park's current forests from future edge disturbances such as development or logging.

Figure 15. Overview of the landscape conditions surrounding Ike Kinswa State park.

GIS Products Produced

Associated with this report are polygon layers created by PBI depicting the vegetation community types mapped in Lewis and Clark and Ike Kinswa State Parks. The datasets have been converted into ESRI shapefile format and provided to the Washington State Parks and Recreation Commission. Shapefiles depicting rare plant locations have been provided as well. 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 – Field Survey Schedule

Lewis and Clark State Park

June 1 and 5, 2006

Field Staff: Hans Smith

July 26, 2006

Field Staff: Hans Smith

Ike Kinswa State Park

June 6 and 7, 2006

Field Staff: Hans Smith

September 26 and 27, 2006

Field Staff: Hans Smith

Appendix B – Description of Rare Element Status Codes

Global Rank (GRank)

Global Rank characterizes the relative rarity or endangerment of the element world-wide. Two codes (e.g. G1G2) represent an intermediate rank.

G1 = Critically imperiled globally (5 or fewer occurrences).
G2 = Imperiled globally (6 to 20 occurrences).
G3 = Either very rare and local throughout its range or found locally in a restricted range (21 to 100 occurrences).
G4 = Apparently secure globally.
G5 = Demonstrably secure globally.
GH = Of historical occurrence throughout its range.
GU = Possibly in peril range-wide but status uncertain.
GX = Believed to be extinct throughout former range.
GNR = Not yet ranked.
Tn = Rarity of an infraspecific taxon. Numbers and codes similar to those for Gn ranks above.
Q = Questionable.

State Rank (SRank)

State Rank characterizes the relative rarity or endangerment within the state of Washington. Two codes (e.g. S1S2) represents an intermediate rank.

S1 = Critically imperiled (5 or fewer occurrences).
S2 = Imperiled (6 to 20 occurrences), very vulnerable to extirpation.
S3 = Rare or uncommon (21 to 100 occurrences).
S4 = Apparently secure, with many occurrences.
S5 = Demonstrably secure in state.
SA = Accidental in state.
SE = An exotic established in state.
SH = Historical occurrences only but still expected to occur.
SN = Regularly occurring, usually migratory, nonbreeding animals.
SU = Unrankable; need more information.
SX = Apparently extirpated from the state.
SP = Likely to occur or to have occurred but without documentation.
SZ = Not of conservation concern (not SE or SA).
SNR = Not yet ranked.
"B" and "N" qualifiers are used to indicate breeding and nonbreeding status, respectively, of migrant species whose nonbreeding status (rank) may be quite different from their breeding status in the state (e.g. S1B,S4N for a very rare breeder that is a common winter resident).

State Status (StStat)

State Status of plant species is determined by the Washington Natural Heritage Program. Factors considered include abundance, occurrence patterns, vulnerability, threats, existing protection, and taxonomic distinctness. Values include:

E = Endangered. In danger of becoming extinct or extirpated from Washington.
T = Threatened. Likely to become Endangered in Washington.
S = Sensitive. Vulnerable or declining and could become Endangered or Threatened in the state.
X = Possibly extinct or Extirpated from Washington.
P1 = Priority 1. Rare nonvascular plant but with insufficient information to assign another rank.
P2 = Priority 2. Nonvascular plant of concern but with insufficient information to assign another rank.
R1 = Review group 1. Of potential concern but needs more field work to assign another rank.
R2 = Review group 2. Of potential concern but with unresolved taxonomic questions.
W = Watch. More abundant and/or less threatened than previously thought.

Federal Status

Federal Status under the U.S. Endangered Species Act (USESA) as published in the Federal Register:

LE = Listed Endangered. In danger of extinction.
LT = Listed Threatened. Likely to become endangered.
PE = Proposed Endangered.
PT = Proposed Threatened.
C = Candidate species. Sufficient information exists to support listing as Endangered or Threatened.
SC = Species of Concern. An unofficial status, the species appears to be in jeopardy, but insufficient information to support listing.
NL = Not Listed. Used when two portions of a taxon have different federal status.

Appendix C – 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:

Condition Rank 1. This condition class represents areas that have been altered to the point where the ecological condition often deviates dramatically from baseline conditions found in areas where stressors are much less prevalent. Areas characterized by Condition Class 1 often have high amounts of bare ground and/or non-native plant cover. The structure is often significantly altered from baseline conditions. Often one or more of the structural layers (trees, shrubs, herbs, grasses, mosses & lichens, biotic crust) may be significantly altered or even missing from the community. The composition of native vegetation is skewed toward species that can survive despite regular disturbance. Species diversity of native plants is usually low and native grass species are usually absent or in very low abundance (for a given community type). Evidence of accelerated erosion and soil compaction may be present. Hydrologic alteration may also be present. Significant direct evidence of various stress factors is usually abundant. Rare plant and animal species generally do not occur in this condition class.

Condition Rank 2. This condition class represents areas that show a fairly broad range of stress ranging from high to moderately low impact from a variety of stressors. Areas characterized by Condition Class 2 usually have moderate levels of non-native plant cover. The structure of the natural community present in Condition Class 2 areas is often relatively intact when compared to baseline conditions. Usually all structural layers are present, but form and stature may be altered from baseline conditions. Soil surface conditions are often intermediate between those in Condition Class 1 and Condition Class 3. Species diversity of native plants is often moderate for that community. Non-native species are usually present, but not as common or abundant as in Condition Class 1. Native grass species are often present, but usually in low abundance for that community type. Diversity of native grass species is relatively low when compared to baseline conditions. Evidence of accelerated erosion and soil compaction may be present in isolated areas, but is not dramatic or widespread. Hydrologic alteration is absent. Direct signs of stressors may be present, but not widespread or abundant. Rare plant and animal species may be found in this condition class, but are not common. Rare species that are found in this condition class are relatively tolerant of the stressors that are present.

Condition Rank 3. This condition class represents areas that show the least stress in the project area and are the closest to representing baseline conditions. Areas characterized by Condition Class 3 have little evidence of non-native plant invasion. The composition and

structure of native vegetation in this condition class correspond to the natural ranges of variation characteristic to this habitat type. Old-growth conditions may exist. Species diversity of native plants is often high relative to the community under consideration. Native grass species are usually present and often fairly abundant for the community type. Species diversity of native grass species is also often high. Soil compaction, accelerated erosion and hydrologic alteration are absent. Direct signs of stressors are usually absent. Certain rare species may only exist within this condition class and rare species are generally more common than in the lower condition classes.

Appendix D – Vegetation Survey Data

Legend:

Site = name of locality of map project

Polygon = number you put on map

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

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

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

VEGETATION COVER
This is canopy cover, i.e. the space between leaves/branches is included in "cover". 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.

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

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
Bareground = 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 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

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.

Vegetation Polygon Data – Lewis and Clark State Park

Polygon Number	**1**
Survey Intensity	2
Observer	HS
Date	6/1/2006
Specific Location	SE corner of park.
Total Vegetation	6
Trees Total	6
Dominant Trees	ALRU2, THPL
emergent	0
maincanopy	6
subcanopy	1
Shrubs Total	5
Dominant Shrubs	RUSP, RUUR, COCO6
> 1.5' tall	5
< 1.5' tall	3
Graminoids Total	2
Dominant Graminoids	
Graminoids Perennial	2
Graminoids Annual	0
Forbs Total	3
Dominant Forbs	
Forbs Perennial	3
Forbs Annual	1
Ferns Total	4
Ferns Evergreen	4
Ferns Deciduous	2
ExoticsTotal	0
Exotics Perennial	0
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	5
Litter	95
Logging	3
Stand Age	1
Agriculture	0
Livestock	0
Development	0
Wildlife	0
Recreation Severity	0
Recreation Type	0
Hydrology	1

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

		Percent	Pattern	Rank
1.	ALRU2/POMU (CHAPPELL)	100	Matrix	2
2.		0		0
3.		0		0

Notes:

Polygon Number	**10**
Survey Intensity	1
Observer	HS
Date	6/1/2006
Specific Location	Big young forest patch in E section of park.
Total Vegetation	6
Trees Total	5
Dominant Trees	PSME, THPL, ALRU2, ACMA3, TSHE
emergent	2
maincanopy	5
subcanopy	2
Shrubs Total	4
Dominant Shrubs	RUSP, ACCI
> 1.5' tall	4
< 1.5' tall	1
Graminoids Total	2
Dominant Graminoids	
Graminoids Perennial	2
Graminoids Annual	0
Forbs Total	0
Dominant Forbs	
Forbs Perennial	0
Forbs Annual	0
Ferns Total	5
Ferns Evergreen	5
Ferns Deciduous	2
ExoticsTotal	0
Exotics Perennial	0
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	10
Litter	90
Logging	3
Stand Age	2
Agriculture	0
Livestock	0
Development	3
Wildlife	7
Recreation Severity	3
Recreation Type	4
Hydrology	1

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. TSHE-PSME/POMU-DREX2 (CHAPPELL)	92	Matrix	2
2. ALRU2/POMU (CHAPPELL)	8	Small	2
3.	0		0

Notes: wildlife is birds

Polygon Number	**12**
Survey Intensity	1
Observer	HS
Date	7/26/2006
Specific Location	N border of park
Total Vegetation	6
Trees Total	5
Dominant Trees	FRLA, ALRU2, THPL, PSME
emergent	2
maincanopy	5
subcanopy	2
Shrubs Total	5
Dominant Shrubs	RUSP, RUUR, PYFU
> 1.5' tall	5
< 1.5' tall	3
Graminoids Total	4
Dominant Graminoids	CAOB3
Graminoids Perennial	4
Graminoids Annual	0
Forbs Total	2
Dominant Forbs	
Forbs Perennial	2
Forbs Annual	1
Ferns Total	3
Ferns Evergreen	3
Ferns Deciduous	1
ExoticsTotal	0
Exotics Perennial	0
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	3
Litter	97
Logging	2
Stand Age	3
Agriculture	0
Livestock	0
Development	3
Wildlife	3
Recreation Severity	3
Recreation Type	4
Hydrology	1

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. FRLA/CAOB3 c.t. (KUNZE)	70	Matrix	3
2. TSHE-PSME/POMU-DREX2 (CHAPPELL)	20	Small	2
3. ALRU2/POMU (CHAPPELL)	10	Small	2

Notes: Ferns: POMU

Polygon Number	**14**
Survey Intensity	1
Observer	HS
Date	6/1/2006
Specific Location	E of state park office.
Total Vegetation	6
Trees Total	6
Dominant Trees	PSME, THPL, ACMA3
emergent	3
maincanopy	5
subcanopy	2
Shrubs Total	4
Dominant Shrubs	MANE2, GASH, COCO6, ACCI
> 1.5' tall	4
< 1.5' tall	2
Graminoids Total	1
Dominant Graminoids	
Graminoids Perennial	1
Graminoids Annual	0
Forbs Total	2
Dominant Forbs	POMU
Forbs Perennial	2
Forbs Annual	1
Ferns Total	4
Ferns Evergreen	4
Ferns Deciduous	2
ExoticsTotal	0
Exotics Perennial	0
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	12
Litter	88
Logging	2
Stand Age	6
Agriculture	0
Livestock	0
Development	3
Wildlife	7
Recreation Severity	3
Recreation Type	4
Hydrology	2

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. TSHE-PSME/POMU-DREX2 (CHAPPELL)	80	Matrix	3
2. PSME-TSHE/GASH/POMU (CHAPPELL)	10	Small	3
3. ALRU2/POMU (CHAPPELL)	10	Small	3

Notes: wildlife is birds

Polygon Number	**15**
Survey Intensity	1
Observer	HS
Date	6/5/2006
Specific Location	Largest polygon in middle of park.
Total Vegetation	6
Trees Total	5
Dominant Trees	TSHE, THPL, ACMA3, ABGR, TSHE
emergent	3
maincanopy	4
subcanopy	3
Shrubs Total	5
Dominant Shrubs	RUSP, ACCI, MANE2
> 1.5' tall	5
< 1.5' tall	3
Graminoids Total	1
Dominant Graminoids	
Graminoids Perennial	1
Graminoids Annual	0
Forbs Total	2
Dominant Forbs	POMU
Forbs Perennial	2
Forbs Annual	1
Ferns Total	5
Ferns Evergreen	5
Ferns Deciduous	3
ExoticsTotal	1
Exotics Perennial	1
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	15
Litter	85
Logging	2
Stand Age	6
Agriculture	0
Livestock	0
Development	3
Wildlife	7
Recreation Severity	3
Recreation Type	4
Hydrology	1

Exotic Species

Primary Exotic
ILAQ80
Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. TSHE-PSME/POMU-DREX2 (CHAPPELL)	80	Matrix	3
2. PSME-TSHE/MANE2/POMU (CHAPPELL)	12	Small	3
3. ALRU2/POMU (CHAPPELL)	8	Small	3

Notes: wildlife is birds

Polygon Number	**16**
Survey Intensity	1
Observer	HS
Date	7/26/2006
Specific Location	N border of park.
Total Vegetation	6
Trees Total	6
Dominant Trees	PSME, THPL
emergent	3
maincanopy	5
subcanopy	3
Shrubs Total	5
Dominant Shrubs	GASH, MANE2
> 1.5' tall	5
< 1.5' tall	3
Graminoids Total	1
Dominant Graminoids	
Graminoids Perennial	1
Graminoids Annual	0
Forbs Total	1
Dominant Forbs	
Forbs Perennial	1
Forbs Annual	0
Ferns Total	3
Ferns Evergreen	3
Ferns Deciduous	1
ExoticsTotal	1
Exotics Perennial	1
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	5
Litter	95
Logging	2
Stand Age	3
Agriculture	0
Livestock	0
Development	0
Wildlife	3
Recreation Severity	0
Recreation Type	0
Hydrology	1

Exotic Species

Primary Exotic
ILAQ80
Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. PSME-TSHE/GASH/POMU (CHAPPELL)	80	Matrix	2
2. PSME-TSHE/MANE2/POMU (CHAPPELL)	10	Small	2
3. FRLA/CAOB3 c.t. (KUNZE)	10	Small	2

Notes: Ferns: POMU

Polygon Number	**16B**
Survey Intensity	1
Observer	HS
Date	7/26/2006
Specific Location	N BORDER OF PARK
Total Vegetation	6
Trees Total	4
Dominant Trees	FRLA, ALRU2, THPL
emergent	2
maincanopy	4
subcanopy	1
Shrubs Total	5
Dominant Shrubs	RUSP, COST4
> 1.5' tall	5
< 1.5' tall	2
Graminoids Total	3
Dominant Graminoids	CAOB3
Graminoids Perennial	3
Graminoids Annual	0
Forbs Total	4
Dominant Forbs	LYAM3
Forbs Perennial	4
Forbs Annual	1
Ferns Total	2
Ferns Evergreen	2
Ferns Deciduous	1
ExoticsTotal	1
Exotics Perennial	1
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	2
Litter	98
Logging	2
Stand Age	2
Agriculture	0
Livestock	0
Development	3
Wildlife	7
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Primary Exotic
PHAR3
Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. FRLA/CAOB3 c.t. (KUNZE)	70	Matrix	2
2. ALRU2/POMU (CHAPPELL)	15	Small	2
3. ALRU2/LYAM3 c.t. (KUNZE)	15	Small	2

Notes: wildlife is birds, beaver

Polygon Number	**17**
Survey Intensity	1
Observer	HS
Date	6/5/2006
Specific Location	N section of park, wetland
Total Vegetation	5
Trees Total	5
Dominant Trees	ALRU2, THPL, FRLA
emergent	1
maincanopy	5
subcanopy	2
Shrubs Total	5
Dominant Shrubs	SPDO, RUSP, PHCA11, SARA
> 1.5' tall	5
< 1.5' tall	1
Graminoids Total	3
Dominant Graminoids	
Graminoids Perennial	3
Graminoids Annual	0
Forbs Total	4
Dominant Forbs	LYAM3, OESA, Callitriche sp.
Forbs Perennial	4
Forbs Annual	1
Ferns Total	2
Ferns Evergreen	1
Ferns Deciduous	2
ExoticsTotal	2
Exotics Perennial	2
Exotics Annual	0
Water	10
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	2
Litter	88
Logging	0
Stand Age	2
Agriculture	0
Livestock	0
Development	0
Wildlife	7
Recreation Severity	0
Recreation Type	0
Hydrology	2

Exotic Species

Primary Exotic
PHAR3
Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. ALRU2/RUSP c.t. (KUNZE)	65	Matrix	2
2. SPDO c.t. (KUNZE)	20	Small	2
3. ALRU2/LYAM3 c.t. (KUNZE)	15	Small	2

Notes: wildlife is birds, frogs

Polygon Number	**18**
Survey Intensity	1
Observer	HS
Date	6/5/2006
Specific Location	Heavily logged area, center of park.
Total Vegetation	6
Trees Total	5
Dominant Trees	ALRU2, PSME
emergent	1
maincanopy	5
subcanopy	2
Shrubs Total	5
Dominant Shrubs	RUSP, SARA2, COCO6, MANE2
> 1.5' tall	5
< 1.5' tall	3
Graminoids Total	1
Dominant Graminoids	
Graminoids Perennial	1
Graminoids Annual	0
Forbs Total	2
Dominant Forbs	POMU
Forbs Perennial	2
Forbs Annual	1
Ferns Total	5
Ferns Evergreen	5
Ferns Deciduous	2
ExoticsTotal	0
Exotics Perennial	0
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	5
Litter	95
Logging	3
Stand Age	1
Agriculture	0
Livestock	0
Development	6
Wildlife	7
Recreation Severity	3
Recreation Type	4
Hydrology	1

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. TSHE-PSME/POMU-DREX2 (CHAPPELL)	60	Matrix	2
2. ALRU2/POMU (CHAPPELL)	40	Large	2
3.	0		0

Notes: wildlife is birds

Polygon Number	**19**
Survey Intensity	1
Observer	HS
Date	6/5/2006
Specific Location	SW corner of park.
Total Vegetation	6
Trees Total	6
Dominant Trees	PSME, THPL, ABGR, ACMA3, ALRU2, TSHE
emergent	3
maincanopy	5
subcanopy	3
Shrubs Total	5
Dominant Shrubs	GASH, MANE2, COCO6, VAPA
> 1.5' tall	5
< 1.5' tall	3
Graminoids Total	1
Dominant Graminoids	
Graminoids Perennial	1
Graminoids Annual	0
Forbs Total	2
Dominant Forbs	POMU
Forbs Perennial	2
Forbs Annual	1
Ferns Total	5
Ferns Evergreen	5
Ferns Deciduous	2
ExoticsTotal	0
Exotics Perennial	0
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	20
Litter	80
Logging	2
Stand Age	6
Agriculture	0
Livestock	0
Development	3
Wildlife	7
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. TSHE-PSME/POMU-DREX2 (CHAPPELL)	45	Matrix	2
2. ALRU2/POMU (CHAPPELL)	35	Large	2
3. PSME-TSHE/MANE2/POMU (CHAPPELL)	20	Small	2

Notes: wildlife is birds

Polygon Number	**2**
Survey Intensity	1
Observer	HS
Date	6/1/2006
Specific Location	SE section of park, N of fields.
Total Vegetation	6
Trees Total	6
Dominant Trees	PSME, ALRU2
emergent	0
maincanopy	6
subcanopy	0
Shrubs Total	5
Dominant Shrubs	RUUR, RUSP, COCO6
> 1.5' tall	4
< 1.5' tall	3
Graminoids Total	1
Dominant Graminoids	
Graminoids Perennial	1
Graminoids Annual	0
Forbs Total	1
Dominant Forbs	
Forbs Perennial	1
Forbs Annual	0
Ferns Total	4
Ferns Evergreen	4
Ferns Deciduous	1
ExoticsTotal	0
Exotics Perennial	0
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	4
Litter	96
Logging	3
Stand Age	1
Agriculture	0
Livestock	0
Development	0
Wildlife	0
Recreation Severity	0
Recreation Type	0
Hydrology	1

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. TSHE-PSME/POMU-DREX2 (CHAPPELL)	60	Matrix	2
2. ALRU2/POMU (CHAPPELL)	40	Large	2
3.	0		0

Notes:

Polygon Number	**20**
Survey Intensity	1
Observer	HS
Date	6/5/2006
Specific Location	N/NE of campground.
Total Vegetation	6
Trees Total	5
Dominant Trees	THPL, ALRU2, PSME
emergent	3
maincanopy	5
subcanopy	2
Shrubs Total	5
Dominant Shrubs	RUSP, ACCI
> 1.5' tall	5
< 1.5' tall	2
Graminoids Total	1
Dominant Graminoids	
Graminoids Perennial	1
Graminoids Annual	0
Forbs Total	3
Dominant Forbs	TOME, HYTE, VAHE, POMU, ATFI
Forbs Perennial	3
Forbs Annual	2
Ferns Total	4
Ferns Evergreen	4
Ferns Deciduous	3
ExoticsTotal	0
Exotics Perennial	0
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	20
Litter	80
Logging	2
Stand Age	5
Agriculture	0
Livestock	0
Development	3
Wildlife	7
Recreation Severity	3
Recreation Type	3
Hydrology	2

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. ALRU2/RUSP c.t. (KUNZE)	55	Matrix	2
2. TSHE-PSME/POMU-DREX2 (CHAPPELL)	35	Matrix	2
3. ALRU2/POMU (CHAPPELL)	10	Small	2

Notes: wildlife is birds

Polygon Number	**21B**
Survey Intensity	1
Observer	HS
Date	6/5/2006
Specific Location	S of campground.
Total Vegetation	6
Trees Total	6
Dominant Trees	PSME, ALRU2, THPL, FRLA, ACMA3
emergent	2
maincanopy	5
subcanopy	3
Shrubs Total	5
Dominant Shrubs	ACCI, RUSP, GASH
> 1.5' tall	5
< 1.5' tall	2
Graminoids Total	1
Dominant Graminoids	
Graminoids Perennial	1
Graminoids Annual	0
Forbs Total	3
Dominant Forbs	MADI, MOSI2, POMU, ATFI
Forbs Perennial	3
Forbs Annual	1
Ferns Total	4
Ferns Evergreen	4
Ferns Deciduous	3
ExoticsTotal	0
Exotics Perennial	0
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	10
Litter	90
Logging	3
Stand Age	2
Agriculture	0
Livestock	0
Development	0
Wildlife	7
Recreation Severity	3
Recreation Type	3
Hydrology	2

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. TSHE-PSME/POMU-DREX2 (CHAPPELL)	40	Large	2
2. ALRU2/POMU (CHAPPELL)	40	Large	2
3. ALRU2/RUSP c.t. (KUNZE)	20	Large	2

Notes: wildlife is birds

Polygon Number	**22**
Survey Intensity	1
Observer	HS
Date	6/5/2006
Specific Location	Old growth forest, W side of park.
Total Vegetation	6
Trees Total	6
Dominant Trees	PSME, THPL, TSHE, ABGR
emergent	3
maincanopy	5
subcanopy	2
Shrubs Total	5
Dominant Shrubs	GASH, MANE2, RUSP
> 1.5' tall	4
< 1.5' tall	3
Graminoids Total	1
Dominant Graminoids	
Graminoids Perennial	1
Graminoids Annual	0
Forbs Total	2
Dominant Forbs	POMU
Forbs Perennial	2
Forbs Annual	0
Ferns Total	5
Ferns Evergreen	5
Ferns Deciduous	2
ExoticsTotal	0
Exotics Perennial	0
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	15
Litter	85
Logging	1
Stand Age	3
Agriculture	0
Livestock	0
Development	6
Wildlife	7
Recreation Severity	3
Recreation Type	4
Hydrology	1

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. TSHE-PSME/POMU-DREX2 (CHAPPELL)	90	Matrix	3
2. PSME-TSHE/MANE2/POMU (CHAPPELL)	10	Small	3
3.	0		0

Notes: wildlife is birds

Polygon Number	**22B**
Survey Intensity	1
Observer	HS
Date	6/5/2006
Specific Location	Along W side of main road, center of park.
Total Vegetation	6
Trees Total	5
Dominant Trees	THPL, ALRU2
emergent	3
maincanopy	5
subcanopy	2
Shrubs Total	5
Dominant Shrubs	RUSP, ACCI, OPHO
> 1.5' tall	5
< 1.5' tall	1
Graminoids Total	2
Dominant Graminoids	
Graminoids Perennial	2
Graminoids Annual	1
Forbs Total	3
Dominant Forbs	LYAM3, ATFI, POMU
Forbs Perennial	3
Forbs Annual	1
Ferns Total	4
Ferns Evergreen	3
Ferns Deciduous	3
ExoticsTotal	1
Exotics Perennial	1
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	5
Litter	95
Logging	0
Stand Age	4
Agriculture	0
Livestock	0
Development	0
Wildlife	7
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Primary Exotic
ILAQ80
Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. THPL-TSHE/OPHO/POMU (CHAPPELL)	60	Matrix	3
2. THPL-TSHE/LYAM3 c.t. (KUNZE)	20	Large	3
3. ALRU2/RUSP c.t. (KUNZE)	20	Large	3

Notes: wildlife is birds

Polygon Number	**23**
Survey Intensity	1
Observer	HS
Date	7/26/2006
Specific Location	NW corner of park.
Total Vegetation	6
Trees Total	5
Dominant Trees	PSME, ABGR, THPL, ACMA3
emergent	3
maincanopy	5
subcanopy	2
Shrubs Total	4
Dominant Shrubs	ACCI, COCO6, MANE2
> 1.5' tall	4
< 1.5' tall	3
Graminoids Total	1
Dominant Graminoids	
Graminoids Perennial	1
Graminoids Annual	0
Forbs Total	2
Dominant Forbs	
Forbs Perennial	2
Forbs Annual	0
Ferns Total	5
Ferns Evergreen	5
Ferns Deciduous	2
ExoticsTotal	1
Exotics Perennial	1
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	2
Litter	98
Logging	2
Stand Age	3
Agriculture	0
Livestock	0
Development	6
Wildlife	3
Recreation Severity	2
Recreation Type	4
Hydrology	1

Exotic Species

Primary Exotic
ILAQ80
Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. TSHE-PSME/POMU-DREX2 (CHAPPELL)	80	Matrix	2
2. PSME-TSHE/MANE2/POMU (CHAPPELL)	20	Small	2
3.	0		0

Notes: Ferns: POMU. Off-road tracks in E portion of polygon.

Polygon Number	**24**
Survey Intensity	1
Observer	HS
Date	6/5/2006
Specific Location	N/NE of main road, center of park.
Total Vegetation	6
Trees Total	6
Dominant Trees	PSME, THPL, ACMA3
emergent	3
maincanopy	5
subcanopy	3
Shrubs Total	5
Dominant Shrubs	MANE2, ACCI, COCO6
> 1.5' tall	4
< 1.5' tall	3
Graminoids Total	1
Dominant Graminoids	
Graminoids Perennial	1
Graminoids Annual	0
Forbs Total	2
Dominant Forbs	
Forbs Perennial	2
Forbs Annual	1
Ferns Total	5
Ferns Evergreen	5
Ferns Deciduous	2
ExoticsTotal	0
Exotics Perennial	0
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	20
Litter	80
Logging	2
Stand Age	3
Agriculture	0
Livestock	0
Development	2
Wildlife	7
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. TSHE-PSME/POMU-DREX2 (CHAPPELL)	60	Matrix	3
2. PSME-TSHE/MANE2/POMU (CHAPPELL)	35	Large	3
3. ALRU2/POMU (CHAPPELL)	5	Small	2

Notes: wildlife is birds

Polygon Number	**25**
Survey Intensity	1
Observer	HS
Date	6/5/2006
Specific Location	NW corner of park.
Total Vegetation	6
Trees Total	6
Dominant Trees	THPL, PSME, ALRU2
emergent	2
maincanopy	5
subcanopy	3
Shrubs Total	5
Dominant Shrubs	MANE2, RUSP, ACCI
> 1.5' tall	5
< 1.5' tall	3
Graminoids Total	2
Dominant Graminoids	
Graminoids Perennial	2
Graminoids Annual	0
Forbs Total	3
Dominant Forbs	LYAM3, URDI, MADI, POMU, ATFI
Forbs Perennial	3
Forbs Annual	1
Ferns Total	5
Ferns Evergreen	4
Ferns Deciduous	3
ExoticsTotal	1
Exotics Perennial	1
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	10
Litter	90
Logging	2
Stand Age	3
Agriculture	0
Livestock	0
Development	6
Wildlife	7
Recreation Severity	3
Recreation Type	4
Hydrology	2

Exotic Species

Primary Exotic
ILAQ80
Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. TSHE-PSME/POMU-DREX2 (CHAPPELL)	80	Matrix	3
2. THPL-TSHE/LYAM3 c.t. (KUNZE)	15	Large	3
3. PSME-TSHE/MANE2/POMU (CHAPPELL)	5	Small	3

Notes: wildlife is birds

Polygon Number	**3**
Survey Intensity	1
Observer	HS
Date	7/26/2006
Specific Location	
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
Bare Ground	0
Moss Lichen	0
Litter	0
Logging	
Stand Age	
Agriculture	
Livestock	
Development	
Wildlife	
Recreation Severity	
Recreation Type	
Hydrology	

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. developed	100	Matrix	1
2.	0		0
3.	0		0

Notes:

Polygon Number	**4**
Survey Intensity	1
Observer	HS
Date	6/5/2006
Specific Location	Field, SE corner.
Total Vegetation	6
Trees Total	1
Dominant Trees	
emergent	0
maincanopy	1
subcanopy	0
Shrubs Total	3
Dominant Shrubs	RONU, PYFU, SPDO
> 1.5' tall	3
< 1.5' tall	1
Graminoids Total	5
Dominant Graminoids	PHAR3, ANOD, HOLA
Graminoids Perennial	5
Graminoids Annual	3
Forbs Total	4
Dominant Forbs	LOCO6, RAFL2, LUPO2
Forbs Perennial	4
Forbs Annual	2
Ferns Total	1
Ferns Evergreen	1
Ferns Deciduous	1
ExoticsTotal	5
Exotics Perennial	5
Exotics Annual	3
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	2
Litter	98
Logging	0
Stand Age	0
Agriculture	0
Livestock	6
Development	2
Wildlife	7
Recreation Severity	3
Recreation Type	4
Hydrology	1

Exotic Species

Primary Exotic
PHAR3
Secondary Exotic
POPR
Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. NON-NATIVE GRASS FIELDS - MOWED	70	Matrix	1
2. Mixed Shrub Undescribed (CHAPPELL)	20	other	1
3. FERO-SERI (CHAPPELL)	10	Small	1

Notes: wildlife is birds

Polygon Number	**5**
Survey Intensity	1
Observer	HS
Date	7/26/2006
Specific Location	
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
Bare Ground	0
Moss Lichen	0
Litter	0
Logging	
Stand Age	
Agriculture	
Livestock	
Development	
Wildlife	
Recreation Severity	
Recreation Type	
Hydrology	

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. developed	100	Matrix	1
2.	0		0
3.	0		0

Notes:

Polygon Number	**6**
Survey Intensity	1
Observer	HS
Date	7/26/2006
Specific Location	
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
Bare Ground	0
Moss Lichen	0
Litter	0
Logging	
Stand Age	
Agriculture	
Livestock	
Development	
Wildlife	
Recreation Severity	
Recreation Type	
Hydrology	

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. developed	100	Matrix	1
2.	0		0
3.	0		0

Notes:

Polygon Number	**7**
Survey Intensity	1
Observer	HS
Date	6/1/2006
Specific Location	E section of park along E border.
Total Vegetation	6
Trees Total	6
Dominant Trees	THPL, ACMA3, ALRU2, PSME
emergent	3
maincanopy	5
subcanopy	2
Shrubs Total	4
Dominant Shrubs	ACCI, RUSP
> 1.5' tall	4
< 1.5' tall	2
Graminoids Total	1
Dominant Graminoids	
Graminoids Perennial	1
Graminoids Annual	0
Forbs Total	2
Dominant Forbs	POMU
Forbs Perennial	2
Forbs Annual	0
Ferns Total	4
Ferns Evergreen	4
Ferns Deciduous	2
ExoticsTotal	1
Exotics Perennial	1
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	15
Litter	85
Logging	2
Stand Age	6
Agriculture	0
Livestock	0
Development	3
Wildlife	7
Recreation Severity	3
Recreation Type	4
Hydrology	1

Exotic Species

Primary Exotic
RULA
Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. TSHE-PSME/POMU-DREX2 (CHAPPELL)	80	Matrix	2
2. ALRU2/POMU (CHAPPELL)	20	Small	2
3.	0		0

Notes: wildlife is birds

Vegetation Polygon Data – Ike Kinswa State Park

Polygon Number	**1**
Survey Intensity	1
Observer	HS
Date	9/26/2006
Specific Location	Near boat launch
Total Vegetation	6
Trees Total	6
Dominant Trees	PSME, ALRU2, THPL, ACMA3
emergent	1
maincanopy	6
subcanopy	2
Shrubs Total	4
Dominant Shrubs	RUUR, RUSP, Prunus, SYAL
> 1.5' tall	3
< 1.5' tall	4
Graminoids Total	2
Dominant Graminoids	
Graminoids Perennial	2
Graminoids Annual	0
Forbs Total	2
Dominant Forbs	GAAP2, VAHE
Forbs Perennial	2
Forbs Annual	1
Ferns Total	5
Ferns Evergreen	5
Ferns Deciduous	1
ExoticsTotal	2
Exotics Perennial	2
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	2
Litter	98
Logging	3
Stand Age	2
Agriculture	0
Livestock	0
Development	0
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Primary Exotic
ILAQ80
Secondary Exotic
RULA
Noxious Exotic

Plant Associations

		Percent	Pattern	Rank
1.	TSHE-PSME/POMU-DREX2 (CHAPPELL)	100	Matrix	2
2.		0		0
3.		0		0

Notes:

Polygon Number	**10**
Survey Intensity	1
Observer	HS
Date	6/6/2006
Specific Location	W side, N of highway.
Total Vegetation	6
Trees Total	6
Dominant Trees	ACMA3, ALRU2, POTR15
emergent	3
maincanopy	5
subcanopy	1
Shrubs Total	5
Dominant Shrubs	RUSP, RUUR, ACCI
> 1.5' tall	5
< 1.5' tall	1
Graminoids Total	2
Dominant Graminoids	
Graminoids Perennial	2
Graminoids Annual	1
Forbs Total	4
Dominant Forbs	HYTE, POMU
Forbs Perennial	4
Forbs Annual	2
Ferns Total	4
Ferns Evergreen	4
Ferns Deciduous	2
ExoticsTotal	1
Exotics Perennial	1
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	3
Litter	97
Logging	3
Stand Age	1
Agriculture	0
Livestock	0
Development	0
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Primary Exotic
RULA
Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. ALRU2/POMU (CHAPPELL)	100	Matrix	2
2.	0		0
3.	0		0

Notes:

Polygon Number	**11**
Survey Intensity	1
Observer	HS
Date	6/6/2006
Specific Location	W side of park. (N of highway)
Total Vegetation	6
Trees Total	6
Dominant Trees	ACMA3, ALRU2, PSME, THPL
emergent	2
maincanopy	6
subcanopy	2
Shrubs Total	5
Dominant Shrubs	RUSP, COCO6, ACCI
> 1.5' tall	5
< 1.5' tall	2
Graminoids Total	2
Dominant Graminoids	
Graminoids Perennial	2
Graminoids Annual	1
Forbs Total	4
Dominant Forbs	HYTE, DIFO, Oxalis sp., POMU
Forbs Perennial	4
Forbs Annual	2
Ferns Total	5
Ferns Evergreen	5
Ferns Deciduous	2
ExoticsTotal	2
Exotics Perennial	1
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	2
Litter	98
Logging	3
Stand Age	2
Agriculture	0
Livestock	0
Development	0
Wildlife	3
Recreation Severity	0
Recreation Type	0
Hydrology	1

Exotic Species

Primary Exotic
RULA
Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. ALRU2/POMU (CHAPPELL)	47	Large	2
2. TSHE-PSME/POMU-DREX2 (CHAPPELL)	47	Large	2
3. ACMA3-ALRU2/POMU-TEGR2 (CHAPPELL)	6	Small	2

Notes:

Polygon Number	**12**
Survey Intensity	1
Observer	HS
Date	6/6/2006
Specific Location	NW corner of park.
Total Vegetation	6
Trees Total	5
Dominant Trees	PSME, ALRU2
emergent	0
maincanopy	5
subcanopy	0
Shrubs Total	5
Dominant Shrubs	ACCI, RUSP
> 1.5' tall	5
< 1.5' tall	0
Graminoids Total	1
Dominant Graminoids	
Graminoids Perennial	1
Graminoids Annual	0
Forbs Total	5
Dominant Forbs	MADI, DIFO, HYTE, POMU
Forbs Perennial	5
Forbs Annual	1
Ferns Total	3
Ferns Evergreen	3
Ferns Deciduous	1
ExoticsTotal	1
Exotics Perennial	1
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	20
Litter	80
Logging	3
Stand Age	1
Agriculture	0
Livestock	0
Development	0
Wildlife	0
Recreation Severity	0
Recreation Type	0
Hydrology	1

Exotic Species

Primary Exotic
RUDI2
Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. ALRU2/POMU (CHAPPELL)	80	Matrix	2
2. TSHE-PSME/POMU-DREX2 (CHAPPELL)	20	Small	2
3.	0		0

Notes:

Polygon Number	**15**
Survey Intensity	1
Observer	HS
Date	6/6/2006
Specific Location	NW section of park.
Total Vegetation	6
Trees Total	6
Dominant Trees	ACMA3, ALRU2, THPL, PSME, TSHE
emergent	2
maincanopy	6
subcanopy	3
Shrubs Total	5
Dominant Shrubs	RUSP, RUUR, HODI, MANE2
> 1.5' tall	5
< 1.5' tall	2
Graminoids Total	2
Dominant Graminoids	
Graminoids Perennial	2
Graminoids Annual	1
Forbs Total	4
Dominant Forbs	MOSI2, DIFO, HYTE, POMU
Forbs Perennial	4
Forbs Annual	2
Ferns Total	5
Ferns Evergreen	5
Ferns Deciduous	2
ExoticsTotal	1
Exotics Perennial	1
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	3
Bare Ground	3
Moss Lichen	5
Litter	89
Logging	3
Stand Age	2
Agriculture	0
Livestock	0
Development	0
Wildlife	3
Recreation Severity	0
Recreation Type	0
Hydrology	1

Exotic Species

Primary Exotic
RULA
Secondary Exotic
PHAR3
Noxious Exotic
POCU6

Plant Associations

	Percent	Pattern	Rank
1. ACMA3-ALRU2/POMU-TEGR2 (CHAPPELL)	65	Matrix	2
2. TSHE-PSME/POMU-DREX2 (CHAPPELL)	25	Large	2
3. ALRU2/POMU (CHAPPELL)	10	Small	2

Notes:

Polygon Number	**2**
Survey Intensity	1
Observer	HS
Date	9/26/2006
Specific Location	Next to boat launch.
Total Vegetation	6
Trees Total	5
Dominant Trees	ACMA3, ALRU2, THPL
emergent	2
maincanopy	5
subcanopy	2
Shrubs Total	5
Dominant Shrubs	SYAL, ACCI, MANE2, RUSP
> 1.5' tall	5
< 1.5' tall	2
Graminoids Total	2
Dominant Graminoids	CADE9
Graminoids Perennial	2
Graminoids Annual	0
Forbs Total	2
Dominant Forbs	URDI
Forbs Perennial	2
Forbs Annual	1
Ferns Total	4
Ferns Evergreen	4
Ferns Deciduous	1
ExoticsTotal	1
Exotics Perennial	1
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	7
Litter	93
Logging	3
Stand Age	2
Agriculture	0
Livestock	0
Development	0
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. ALRU2/POMU (CHAPPELL)	100	Matrix	2
2.	0		0
3.	0		0

Notes: Ferns: POMU

Polygon Number	**3**
Survey Intensity	1
Observer	HS
Date	9/26/2006
Specific Location	
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
Bare Ground	0
Moss Lichen	0
Litter	0
Logging	
Stand Age	
Agriculture	
Livestock	
Development	
Wildlife	
Recreation Severity	
Recreation Type	
Hydrology	

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. developed	100	Matrix	1
2.	0		0
3.	0		0

Notes:

Polygon Number	**33**
Survey Intensity	1
Observer	HS
Date	6/7/2006
Specific Location	NE corner of park
Total Vegetation	6
Trees Total	6
Dominant Trees	ACMA3, ALRU2, TSHE, PSME
emergent	1
maincanopy	6
subcanopy	1
Shrubs Total	5
Dominant Shrubs	RUSP, COCO6, OECE
> 1.5' tall	5
< 1.5' tall	1
Graminoids Total	2
Dominant Graminoids	
Graminoids Perennial	2
Graminoids Annual	0
Forbs Total	3
Dominant Forbs	HYTE, POMU
Forbs Perennial	3
Forbs Annual	1
Ferns Total	5
Ferns Evergreen	5
Ferns Deciduous	2
ExoticsTotal	0
Exotics Perennial	0
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	5
Litter	95
Logging	3
Stand Age	2
Agriculture	0
Livestock	0
Development	3
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. ALRU2/POMU (CHAPPELL)	100	Matrix	2
2.	0		0
3.	0		0

Notes:

Polygon Number	**34**
Survey Intensity	1
Observer	
Date	
Specific Location	
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
Bare Ground	0
Moss Lichen	0
Litter	0
Logging	
Stand Age	
Agriculture	
Livestock	
Development	
Wildlife	
Recreation Severity	
Recreation Type	
Hydrology	

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. developed	100	Matrix	1
2.	0		0
3.	0		0

Notes:

Polygon Number	**39**
Survey Intensity	1
Observer	HS
Date	6/7/2006
Specific Location	Uphill of park entrance.
Total Vegetation	6
Trees Total	6
Dominant Trees	ACMA3, ALRU2, TSHE, PSME
emergent	1
maincanopy	6
subcanopy	2
Shrubs Total	4
Dominant Shrubs	ACCI, HODI, MANE2, COCO6
> 1.5' tall	4
< 1.5' tall	2
Graminoids Total	2
Dominant Graminoids	
Graminoids Perennial	2
Graminoids Annual	0
Forbs Total	2
Dominant Forbs	POMU
Forbs Perennial	2
Forbs Annual	0
Ferns Total	5
Ferns Evergreen	5
Ferns Deciduous	1
ExoticsTotal	1
Exotics Perennial	1
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	5
Litter	95
Logging	3
Stand Age	2
Agriculture	0
Livestock	0
Development	2
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Primary Exotic	
RUDI2	
Secondary Exotic	
RARE3	
Noxious Exotic	

Plant Associations

	Percent	Pattern	Rank
1. ALRU2/POMU (CHAPPELL)	100	Matrix	2
2.	0		0
3.	0		0

Notes:

Polygon Number	**39D**
Survey Intensity	1
Observer	
Date	
Specific Location	
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
Bare Ground	0
Moss Lichen	0
Litter	0
Logging	
Stand Age	
Agriculture	
Livestock	
Development	
Wildlife	
Recreation Severity	
Recreation Type	
Hydrology	

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. developed	100	Matrix	1
2.	0		0
3.	0		0

Notes:

Polygon Number	**41**
Survey Intensity	1
Observer	HS
Date	6/7/2006
Specific Location	Between campground loops, SE section.
Total Vegetation	6
Trees Total	5
Dominant Trees	ALRU2, PSME, ACMA3, TSHE, THPL
emergent	2
maincanopy	5
subcanopy	3
Shrubs Total	5
Dominant Shrubs	ACCI, MANE2, COCO6, SYAL
> 1.5' tall	5
< 1.5' tall	3
Graminoids Total	1
Dominant Graminoids	
Graminoids Perennial	1
Graminoids Annual	1
Forbs Total	3
Dominant Forbs	VAHE, MADI, CIAL, POMU
Forbs Perennial	3
Forbs Annual	1
Ferns Total	5
Ferns Evergreen	5
Ferns Deciduous	2
ExoticsTotal	1
Exotics Perennial	1
Exotics Annual	1
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	10
Litter	90
Logging	3
Stand Age	2
Agriculture	0
Livestock	0
Development	6
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Primary Exotic	
RUDI2	
Secondary Exotic	
DAGL	
Noxious Exotic	

Plant Associations

	Percent	Pattern	Rank
1. ALRU2/POMU (CHAPPELL)	50	Matrix	2
2. TSHE-PSME/POMU-DREX2 (CHAPPELL)	40	Large	2
3. PSME-TSHE/MANE2/POMU (CHAPPELL)	10	Small	2

Notes: WEEDS ON WATERS EDGE.

Polygon Number	**42**
Survey Intensity	1
Observer	
Date	
Specific Location	
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
Bare Ground	0
Moss Lichen	0
Litter	0
Logging	
Stand Age	
Agriculture	
Livestock	
Development	
Wildlife	
Recreation Severity	
Recreation Type	
Hydrology	

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. developed	100	Matrix	1
2.	0		0
3.	0		0

Notes:

Polygon Number	**43**
Survey Intensity	1
Observer	HS
Date	6/7/2006
Specific Location	N of S campground.
Total Vegetation	6
Trees Total	6
Dominant Trees	PSME, ALRU2, TSHE
emergent	1
maincanopy	6
subcanopy	1
Shrubs Total	5
Dominant Shrubs	GASH, COCO6, HODI
> 1.5' tall	5
< 1.5' tall	3
Graminoids Total	1
Dominant Graminoids	
Graminoids Perennial	1
Graminoids Annual	0
Forbs Total	2
Dominant Forbs	POMU
Forbs Perennial	2
Forbs Annual	1
Ferns Total	5
Ferns Evergreen	5
Ferns Deciduous	2
ExoticsTotal	1
Exotics Perennial	1
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	15
Litter	85
Logging	3
Stand Age	2
Agriculture	0
Livestock	0
Development	0
Wildlife	3
Recreation Severity	3
Recreation Type	1
Hydrology	1

Exotic Species

Primary Exotic
ILAQ80
Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. TSHE-PSME/POMU-DREX2 (CHAPPELL)	45	Matrix	2
2. PSME-TSHE/GASH/POMU (CHAPPELL)	35	Large	2
3. PSME-TSHE/MANE2/POMU (CHAPPELL)	20	Small	2

Notes:

Polygon Number	**44**
Survey Intensity	1
Observer	HS
Date	6/7/2006
Specific Location	Around S campground
Total Vegetation	6
Trees Total	6
Dominant Trees	ALRU2, THPL, TSHE, ACMA3, PSME
emergent	2
maincanopy	6
subcanopy	2
Shrubs Total	5
Dominant Shrubs	RUSP, RUUR, ACCI, COCO6
> 1.5' tall	5
< 1.5' tall	3
Graminoids Total	3
Dominant Graminoids	MESU
Graminoids Perennial	3
Graminoids Annual	1
Forbs Total	4
Dominant Forbs	DIFO, URDI, HYTE, POMU
Forbs Perennial	4
Forbs Annual	2
Ferns Total	4
Ferns Evergreen	4
Ferns Deciduous	2
ExoticsTotal	2
Exotics Perennial	2
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	8
Litter	92
Logging	3
Stand Age	2
Agriculture	0
Livestock	0
Development	3
Wildlife	2
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Primary Exotic
RUDI2
Secondary Exotic
ILAQ80
Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. ALRU2/POMU (CHAPPELL)	65	Matrix	1
2. TSHE-PSME/POMU-DREX2 (CHAPPELL)	30	Large	2
3. PSME-TSHE/GASH/POMU (CHAPPELL)	5	Small	2

Notes: BAD RUDI2 INFESTATION.

Polygon Number	**46**
Survey Intensity	1
Observer	HS
Date	6/6/2006
Specific Location	Island
Total Vegetation	6
Trees Total	6
Dominant Trees	PSME, ALRU2, TSHE
emergent	1
maincanopy	6
subcanopy	2
Shrubs Total	5
Dominant Shrubs	RUSP, ACCI, COCO6
> 1.5' tall	5
< 1.5' tall	2
Graminoids Total	1
Dominant Graminoids	
Graminoids Perennial	1
Graminoids Annual	0
Forbs Total	4
Dominant Forbs	DIFO, MOSI2, POMU
Forbs Perennial	4
Forbs Annual	2
Ferns Total	4
Ferns Evergreen	4
Ferns Deciduous	2
ExoticsTotal	3
Exotics Perennial	3
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	20
Litter	80
Logging	3
Stand Age	1
Agriculture	0
Livestock	0
Development	0
Wildlife	0
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Primary Exotic
???
Secondary Exotic
ILAQ80
Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. TSHE-PSME/POMU-DREX2 (CHAPPELL)	70	Matrix	2
2. ALRU2/POMU (CHAPPELL)	20	Large	1
3. PSME-TSHE/GASH/POMU (CHAPPELL)	10	Small	2

Notes:

Polygon Number	**47**
Survey Intensity	1
Observer	
Date	
Specific Location	
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
Bare Ground	0
Moss Lichen	0
Litter	0
Logging	
Stand Age	
Agriculture	
Livestock	
Development	
Wildlife	
Recreation Severity	
Recreation Type	
Hydrology	

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. developed	100	Matrix	1
2.	0		0
3.	0		0

Notes:

Polygon Number	**48**
Survey Intensity	1
Observer	HS
Date	6/7/2006
Specific Location	N of highway, N of entrance.
Total Vegetation	6
Trees Total	5
Dominant Trees	PSME, ACMA3, TSHE, THPL, ALRU2
emergent	3
maincanopy	5
subcanopy	2
Shrubs Total	5
Dominant Shrubs	SYAL, ACCI, COCO6
> 1.5' tall	5
< 1.5' tall	2
Graminoids Total	2
Dominant Graminoids	
Graminoids Perennial	2
Graminoids Annual	0
Forbs Total	3
Dominant Forbs	CIAL, GAAP2, OXTR, POMU
Forbs Perennial	3
Forbs Annual	1
Ferns Total	5
Ferns Evergreen	5
Ferns Deciduous	2
ExoticsTotal	1
Exotics Perennial	1
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	15
Litter	85
Logging	3
Stand Age	2
Agriculture	0
Livestock	0
Development	6
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Primary Exotic
PHAR3
Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. TSHE-PSME/POMU-DREX2 (CHAPPELL)	85	Matrix	2
2. PSME-TSHE/GASH/POMU (CHAPPELL)	15	Small	2
3.	0		0

Notes:

Polygon Number	**4A**
Survey Intensity	1
Observer	HS
Date	9/26/2006
Specific Location	Along S side of highway, W part of park
Total Vegetation	6
Trees Total	5
Dominant Trees	ALRU2, ACMA3, THPL, PSME, TSHE
emergent	2
maincanopy	5
subcanopy	2
Shrubs Total	5
Dominant Shrubs	RUUR, ACCI, RUSP, SYAL, RUDI2
> 1.5' tall	5
< 1.5' tall	4
Graminoids Total	3
Dominant Graminoids	BRVU, ELGL, PHAR3
Graminoids Perennial	3
Graminoids Annual	1
Forbs Total	2
Dominant Forbs	URDI
Forbs Perennial	2
Forbs Annual	1
Ferns Total	3
Ferns Evergreen	3
Ferns Deciduous	2
ExoticsTotal	3
Exotics Perennial	3
Exotics Annual	1
Water	0
Rock Outcrop	0
Gravel	2
Bare Ground	0
Moss Lichen	4
Litter	94
Logging	3
Stand Age	2
Agriculture	0
Livestock	0
Development	6
Wildlife	3
Recreation Severity	2
Recreation Type	3
Hydrology	1

Exotic Species

Primary Exotic
RUDI2
Secondary Exotic
PHAR3
Noxious Exotic
HEHE

Plant Associations

	Percent	Pattern	Rank
1. ALRU2/POMU (CHAPPELL)	85	Matrix	1
2. TSHE-PSME/POMU-DREX2 (CHAPPELL)	10	Small	2
3. PSME-TSHE/GASH/POMU (CHAPPELL)	5	other	1

Notes: Ferns: POMU

Polygon Number	**4B**
Survey Intensity	1
Observer	HS
Date	9/26/2006
Specific Location	Far SW polygon
Total Vegetation	6
Trees Total	5
Dominant Trees	ACMA3, THPL, ALRU2, PSME, POTR15, TSHE
emergent	3
maincanopy	5
subcanopy	2
Shrubs Total	5
Dominant Shrubs	RUUR, ACCI, MANE2, GASH, SYAL, RUPA
> 1.5' tall	5
< 1.5' tall	4
Graminoids Total	3
Dominant Graminoids	ELGL, CADE9, BRPA3
Graminoids Perennial	3
Graminoids Annual	1
Forbs Total	2
Dominant Forbs	
Forbs Perennial	2
Forbs Annual	1
Ferns Total	4
Ferns Evergreen	4
Ferns Deciduous	2
ExoticsTotal	3
Exotics Perennial	3
Exotics Annual	1
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	5
Litter	95
Logging	3
Stand Age	2
Agriculture	0
Livestock	0
Development	6
Wildlife	3
Recreation Severity	2
Recreation Type	3
Hydrology	1

Exotic Species

Primary Exotic
RUDI2
Secondary Exotic
HEHE
Noxious Exotic
PHAR3

Plant Associations

	Percent	Pattern	Rank
1. ALRU2/POMU (CHAPPELL)	70	Matrix	2
2. PSME-TSHE/GASH/POMU (CHAPPELL)	30	Large	2
3.	0		0

Notes: Ferns: POMU

Polygon Number	**5**
Survey Intensity	1
Observer	
Date	
Specific Location	
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
Bare Ground	0
Moss Lichen	0
Litter	0
Logging	
Stand Age	
Agriculture	
Livestock	
Development	
Wildlife	
Recreation Severity	
Recreation Type	
Hydrology	

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. developed	100	Matrix	1
2.	0		0
3.	0		0

Notes:

Polygon Number	**50**
Survey Intensity	1
Observer	HS
Date	6/7/2006
Specific Location	NE corner of park.
Total Vegetation	6
Trees Total	6
Dominant Trees	ALRU2, ACMA3, POTR15, TSHE, PSME
emergent	1
maincanopy	6
subcanopy	2
Shrubs Total	5
Dominant Shrubs	ACCI, RUPA, RUSP
> 1.5' tall	5
< 1.5' tall	3
Graminoids Total	2
Dominant Graminoids	
Graminoids Perennial	2
Graminoids Annual	0
Forbs Total	4
Dominant Forbs	HYTE, MADI, POMU
Forbs Perennial	4
Forbs Annual	2
Ferns Total	4
Ferns Evergreen	4
Ferns Deciduous	2
ExoticsTotal	1
Exotics Perennial	1
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	5
Litter	95
Logging	3
Stand Age	2
Agriculture	0
Livestock	0
Development	3
Wildlife	3
Recreation Severity	3
Recreation Type	4
Hydrology	1

Exotic Species

Primary Exotic	
PHAR3	
Secondary Exotic	
RARE3	
Noxious Exotic	

Plant Associations

	Percent	Pattern	Rank
1. ALRU2/POMU (CHAPPELL)	70	Matrix	2
2. TSHE-PSME/POMU-DREX2 (CHAPPELL)	25	Large	2
3. ALRU2/RUSP c.t. (KUNZE)	5	Small	2

Notes:

Polygon Number	**50B**
Survey Intensity	1
Observer	HS
Date	6/7/2006
Specific Location	E of day-use area, above road.
Total Vegetation	6
Trees Total	6
Dominant Trees	PSME, ACMA3, TSHE
emergent	2
maincanopy	6
subcanopy	2
Shrubs Total	6
Dominant Shrubs	ACCI, MANE2, GASH, COCO6
> 1.5' tall	5
< 1.5' tall	4
Graminoids Total	1
Dominant Graminoids	
Graminoids Perennial	1
Graminoids Annual	0
Forbs Total	2
Dominant Forbs	
Forbs Perennial	2
Forbs Annual	0
Ferns Total	4
Ferns Evergreen	4
Ferns Deciduous	2
ExoticsTotal	0
Exotics Perennial	0
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	15
Litter	85
Logging	3
Stand Age	1
Agriculture	0
Livestock	0
Development	3
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. PSME-TSHE/GASH/POMU (CHAPPELL)	100	Matrix	2
2.	0		0
3.	0		0

Notes:

Polygon Number	**51**
Survey Intensity	2
Observer	HS
Date	6/6/2006
Specific Location	W side of park (N of highway).
Total Vegetation	5
Trees Total	5
Dominant Trees	ACMA3, ALRU2, TSHE, PSME
emergent	2
maincanopy	5
subcanopy	2
Shrubs Total	4
Dominant Shrubs	RUSP, RUPA, ARSY
> 1.5' tall	4
< 1.5' tall	2
Graminoids Total	3
Dominant Graminoids	HOLA, DAGL
Graminoids Perennial	3
Graminoids Annual	1
Forbs Total	3
Dominant Forbs	HYTE, DIPU
Forbs Perennial	3
Forbs Annual	1
Ferns Total	2
Ferns Evergreen	1
Ferns Deciduous	2
ExoticsTotal	4
Exotics Perennial	4
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	8
Bare Ground	30
Moss Lichen	2
Litter	60
Logging	3
Stand Age	2
Agriculture	0
Livestock	0
Development	0
Wildlife	7
Recreation Severity	0
Recreation Type	0
Hydrology	1

Exotic Species

Primary Exotic
HOLA
Secondary Exotic
DAGL
Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. ACMA3-ALRU2/POMU-TEGR2 (CHAPPELL)	70	Matrix	2
2. STEEP ERODING BANK (PBI)	30	Large	2
3.	0		0

Notes: wildlife is birds

Polygon Number	**52**
Survey Intensity	1
Observer	HS
Date	9/26/2006
Specific Location	W side of park
Total Vegetation	6
Trees Total	5
Dominant Trees	THPL, ACMA3, ALRU2, TSHE
emergent	2
maincanopy	5
subcanopy	3
Shrubs Total	4
Dominant Shrubs	OECE, SARA2, RUSP
> 1.5' tall	4
< 1.5' tall	2
Graminoids Total	2
Dominant Graminoids	
Graminoids Perennial	2
Graminoids Annual	0
Forbs Total	2
Dominant Forbs	
Forbs Perennial	2
Forbs Annual	1
Ferns Total	5
Ferns Evergreen	5
Ferns Deciduous	2
ExoticsTotal	1
Exotics Perennial	1
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	4
Bare Ground	4
Moss Lichen	3
Litter	89
Logging	3
Stand Age	2
Agriculture	0
Livestock	0
Development	0
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Primary Exotic
ILAQ80
Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. TSHE-PSME/POMU-DREX2 (CHAPPELL)	60	Matrix	2
2. ACMA3-ALRU2/POMU-TEGR2 (CHAPPELL)	35	Large	2
3. PSME-TSHE/MANE2/POMU (CHAPPELL)	5	Small	2

Notes: Ferns: POMU

Polygon Number	**6**
Survey Intensity	1
Observer	HS
Date	9/26/2006
Specific Location	near boat launch
Total Vegetation	6
Trees Total	5
Dominant Trees	ALRU2, ACMA3, TSHE, POTR15
emergent	1
maincanopy	5
subcanopy	2
Shrubs Total	5
Dominant Shrubs	ACCI, RUSP, SYAL, MANE2, RUUR
> 1.5' tall	4
< 1.5' tall	4
Graminoids Total	3
Dominant Graminoids	ELGL, BRVU
Graminoids Perennial	3
Graminoids Annual	1
Forbs Total	3
Dominant Forbs	TOME, GAAP2, URDI
Forbs Perennial	3
Forbs Annual	1
Ferns Total	4
Ferns Evergreen	4
Ferns Deciduous	2
ExoticsTotal	3
Exotics Perennial	3
Exotics Annual	1
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	3
Litter	97
Logging	3
Stand Age	2
Agriculture	0
Livestock	0
Development	0
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Primary Exotic	
HEHE	
Secondary Exotic	
ILAQ80	
Noxious Exotic	
RUDI2	

Plant Associations

	Percent	Pattern	Rank
1. ALRU2/POMU (CHAPPELL)	85	Matrix	2
2. ALRU2/POMU (CHAPPELL)	15	Small	2
3.	0		0

Notes: Ferns: POMU

Polygon Number	**61**
Survey Intensity	2
Observer	HS
Date	9/27/2006
Specific Location	SE part of park
Total Vegetation	6
Trees Total	4
Dominant Trees	ALRU2
emergent	0
maincanopy	4
subcanopy	1
Shrubs Total	4
Dominant Shrubs	RULA, RUDI2, Salix, RUSP
> 1.5' tall	3
< 1.5' tall	3
Graminoids Total	5
Dominant Graminoids	JUEF, SCCY, PHAR3
Graminoids Perennial	5
Graminoids Annual	1
Forbs Total	4
Dominant Forbs	IMCA, LOCO6, GATR2
Forbs Perennial	4
Forbs Annual	2
Ferns Total	1
Ferns Evergreen	1
Ferns Deciduous	1
ExoticsTotal	5
Exotics Perennial	5
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	0
Litter	100
Logging	0
Stand Age	1
Agriculture	0
Livestock	0
Development	0
Wildlife	7
Recreation Severity	0
Recreation Type	0
Hydrology	1

Exotic Species

Primary Exotic
PHAR3
Secondary Exotic
RULA
Noxious Exotic
RUDI2

Plant Associations

	Percent	Pattern	Rank
1. PHAR3 WETLAND (PBI)	50	Matrix	1
2. JUEF c.t. (KUNZE)	40	Large	2
3. ALRU2/POMU (CHAPPELL)	10	Small	1

Notes: wildlife is birds

Polygon Number	**62**
Survey Intensity	1
Observer	HS
Date	9/27/2006
Specific Location	SE part of park.
Total Vegetation	6
Trees Total	5
Dominant Trees	ALRU2, POTR15
emergent	2
maincanopy	5
subcanopy	1
Shrubs Total	5
Dominant Shrubs	RUUR, RUDI2, OECE
> 1.5' tall	3
< 1.5' tall	5
Graminoids Total	4
Dominant Graminoids	PHAR3, BRPA3, DAGL
Graminoids Perennial	4
Graminoids Annual	1
Forbs Total	3
Dominant Forbs	URDI, GAAP2
Forbs Perennial	3
Forbs Annual	1
Ferns Total	3
Ferns Evergreen	1
Ferns Deciduous	3
ExoticsTotal	4
Exotics Perennial	4
Exotics Annual	1
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	3
Litter	97
Logging	3
Stand Age	1
Agriculture	0
Livestock	0
Development	2
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Primary Exotic
PHAR3
Secondary Exotic
RUDI2
Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. ALRU2/POMU (CHAPPELL)	60	Matrix	1
2. DEVELOPED	35	Large	1
3. ALRU2/RUSP c.t. (KUNZE)	5	Small	2

Notes: Ferns: POMU, PTAQ.

Polygon Number	**63A**
Survey Intensity	1
Observer	HS
Date	9/27/2006
Specific Location	SE part of park.
Total Vegetation	6
Trees Total	5
Dominant Trees	ALRU2, ACMA3, POTR15, PSME
emergent	3
maincanopy	5
subcanopy	2
Shrubs Total	5
Dominant Shrubs	RUSP, RUUR, RUDI2, OECE, ACCI, SYAL
> 1.5' tall	5
< 1.5' tall	4
Graminoids Total	3
Dominant Graminoids	PHAR3, BRPA3
Graminoids Perennial	3
Graminoids Annual	1
Forbs Total	2
Dominant Forbs	
Forbs Perennial	2
Forbs Annual	1
Ferns Total	4
Ferns Evergreen	4
Ferns Deciduous	3
ExoticsTotal	4
Exotics Perennial	4
Exotics Annual	1
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	2
Litter	98
Logging	3
Stand Age	2
Agriculture	0
Livestock	0
Development	0
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	2

Exotic Species

Primary Exotic
RUDI2
Secondary Exotic
RULA
Noxious Exotic
PHAR3

Plant Associations

	Percent	Pattern	Rank
1. ALRU2/POMU (CHAPPELL)	60	Matrix	2
2. ALRU2/RUSP c.t. (KUNZE)	40	Large	2
3.	0		0

Notes:

Polygon Number	**63B**
Survey Intensity	1
Observer	HS
Date	9/27/2006
Specific Location	SE part of park.
Total Vegetation	6
Trees Total	5
Dominant Trees	ACMA3, ALRU2, THPL, PSME
emergent	2
maincanopy	5
subcanopy	3
Shrubs Total	4
Dominant Shrubs	RUDI2, COST4, ACCI
> 1.5' tall	4
< 1.5' tall	3
Graminoids Total	4
Dominant Graminoids	PHAR3, DAGL, HOLA, ELGL
Graminoids Perennial	4
Graminoids Annual	1
Forbs Total	3
Dominant Forbs	DIPU, VETH, HEMI7
Forbs Perennial	3
Forbs Annual	1
Ferns Total	4
Ferns Evergreen	4
Ferns Deciduous	2
ExoticsTotal	4
Exotics Perennial	4
Exotics Annual	1
Water	0
Rock Outcrop	3
Gravel	0
Bare Ground	1
Moss Lichen	4
Litter	92
Logging	3
Stand Age	2
Agriculture	0
Livestock	0
Development	0
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Primary Exotic
RUDI2
Secondary Exotic
PHAR3
Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. ALRU2/POMU (CHAPPELL)	95	Matrix	1
2. TSHE-PSME/POMU-DREX2 (CHAPPELL)	5	Small	2
3.	0		0

Notes: Ferns: POMU

Polygon Number	**64**
Survey Intensity	2
Observer	
Date	
Specific Location	
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
Bare Ground	0
Moss Lichen	0
Litter	0
Logging	
Stand Age	
Agriculture	
Livestock	
Development	
Wildlife	
Recreation Severity	
Recreation Type	
Hydrology	

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

		Percent	Pattern	Rank
1.	Water	100	Matrix	3
2.		0		0
3.		0		0

Notes:

Polygon Number	**65**
Survey Intensity	1
Observer	
Date	
Specific Location	
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
Bare Ground	0
Moss Lichen	0
Litter	0
Logging	
Stand Age	
Agriculture	
Livestock	
Development	
Wildlife	
Recreation Severity	
Recreation Type	
Hydrology	

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. developed	100	Matrix	1
2.	0		0
3.	0		0

Notes:

Polygon Number	**66**
Survey Intensity	2
Observer	
Date	
Specific Location	
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
Bare Ground	0
Moss Lichen	0
Litter	0
Logging	
Stand Age	
Agriculture	
Livestock	
Development	
Wildlife	
Recreation Severity	
Recreation Type	
Hydrology	

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

		Percent	Pattern	Rank
1.	Water	100	Matrix	3
2.		0		0
3.		0		0

Notes:

Polygon Number	**67**
Survey Intensity	1
Observer	HS
Date	9/27/2006
Specific Location	
Total Vegetation	6
Trees Total	6
Dominant Trees	THPL, PSME, ACMA3, TSHE, ALRU2
emergent	3
maincanopy	5
subcanopy	3
Shrubs Total	5
Dominant Shrubs	RUSP, ACCI
> 1.5' tall	5
< 1.5' tall	2
Graminoids Total	1
Dominant Graminoids	
Graminoids Perennial	1
Graminoids Annual	0
Forbs Total	2
Dominant Forbs	
Forbs Perennial	2
Forbs Annual	1
Ferns Total	4
Ferns Evergreen	4
Ferns Deciduous	2
ExoticsTotal	1
Exotics Perennial	1
Exotics Annual	0
Water	0
Rock Outcrop	3
Gravel	0
Bare Ground	0
Moss Lichen	4
Litter	93
Logging	3
Stand Age	2
Agriculture	0
Livestock	0
Development	3
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. TSHE-PSME/POMU-DREX2 (CHAPPELL)	75	Matrix	2
2. ALRU2/POMU (CHAPPELL)	25	Large	2
3.	0		0

Notes: Ferns: POMU

Polygon Number	**68**
Survey Intensity	2
Observer	HS
Date	9/27/2006
Specific Location	
Total Vegetation	6
Trees Total	5
Dominant Trees	ALRU2, ACMA3
emergent	0
maincanopy	5
subcanopy	2
Shrubs Total	5
Dominant Shrubs	RUSP, ACCI, MANE2
> 1.5' tall	5
< 1.5' tall	2
Graminoids Total	3
Dominant Graminoids	DIFO
Graminoids Perennial	3
Graminoids Annual	0
Forbs Total	2
Dominant Forbs	TOME
Forbs Perennial	2
Forbs Annual	1
Ferns Total	3
Ferns Evergreen	3
Ferns Deciduous	2
ExoticsTotal	2
Exotics Perennial	2
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	3
Litter	97
Logging	3
Stand Age	1
Agriculture	0
Livestock	0
Development	6
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Primary Exotic
RUDI2
Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. ALRU2/POMU (CHAPPELL)	80	Matrix	2
2. DEVELOPED	20	Small	1
3.	0		0

Notes: Ferns: POMU, powerlines

Polygon Number	**70A**
Survey Intensity	1
Observer	HS
Date	9/27/2006
Specific Location	N part of park
Total Vegetation	6
Trees Total	5
Dominant Trees	ACMA3, ALRU2, THPL, PSME, TSHE
emergent	2
maincanopy	5
subcanopy	2
Shrubs Total	6
Dominant Shrubs	ACCI, RUSP, PHCA11, SARA2, COCO6
> 1.5' tall	5
< 1.5' tall	4
Graminoids Total	2
Dominant Graminoids	
Graminoids Perennial	2
Graminoids Annual	0
Forbs Total	3
Dominant Forbs	HYTE, DIFO, VAHE
Forbs Perennial	3
Forbs Annual	1
Ferns Total	4
Ferns Evergreen	4
Ferns Deciduous	3
ExoticsTotal	1
Exotics Perennial	1
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	6
Litter	94
Logging	3
Stand Age	2
Agriculture	0
Livestock	0
Development	3
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	2

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. ALRU2/POMU (CHAPPELL)	55	Matrix	2
2. ALRU2/RUSP c.t. (KUNZE)	25	Large	2
3. TSHE-PSME/POMU-DREX2 (CHAPPELL)	20	Large	2

Notes: Frens: POMU

Polygon Number	**70B**
Survey Intensity	1
Observer	HS
Date	9/27/2006
Specific Location	N part of park
Total Vegetation	6
Trees Total	5
Dominant Trees	PSME, ALRU2, ACMA3, THPL
emergent	1
maincanopy	5
subcanopy	1
Shrubs Total	5
Dominant Shrubs	ACCI, SARA2, COCO6, OECE
> 1.5' tall	5
< 1.5' tall	2
Graminoids Total	2
Dominant Graminoids	
Graminoids Perennial	2
Graminoids Annual	0
Forbs Total	3
Dominant Forbs	SMST
Forbs Perennial	3
Forbs Annual	1
Ferns Total	5
Ferns Evergreen	5
Ferns Deciduous	2
ExoticsTotal	1
Exotics Perennial	1
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	2
Litter	98
Logging	3
Stand Age	2
Agriculture	0
Livestock	0
Development	3
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

		Percent	Pattern	Rank
1.	TSHE-PSME/POMU-DREX2 (CHAPPELL)	100	Matrix	2
2.		0		0
3.		0		0

Notes: Ferns: POMU

Polygon Number	**71**
Survey Intensity	2
Observer	HS
Date	9/27/2006
Specific Location	N part of park
Total Vegetation	6
Trees Total	5
Dominant Trees	ACMA3, ALRU2, PSME, THPL
emergent	2
maincanopy	5
subcanopy	3
Shrubs Total	5
Dominant Shrubs	ACCI, RUSP, RUPA, COST4, OPHO
> 1.5' tall	5
< 1.5' tall	3
Graminoids Total	2
Dominant Graminoids	
Graminoids Perennial	2
Graminoids Annual	0
Forbs Total	2
Dominant Forbs	
Forbs Perennial	2
Forbs Annual	1
Ferns Total	4
Ferns Evergreen	4
Ferns Deciduous	2
ExoticsTotal	2
Exotics Perennial	2
Exotics Annual	1
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	3
Litter	97
Logging	2
Stand Age	3
Agriculture	0
Livestock	0
Development	0
Wildlife	3
Recreation Severity	0
Recreation Type	0
Hydrology	1

Exotic Species

Primary Exotic
POSA4
Secondary Exotic
PHAR3
Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. ALRU2/POMU (CHAPPELL)	40	Large	2
2. ACMA3-ALRU2/POMU-TEGR2 (CHAPPELL)	30	Large	2
3. TSHE-PSME/POMU-DREX2 (CHAPPELL)	30	Large	2

Notes: Ferns: POMU

Polygon Number	**72**
Survey Intensity	1
Observer	HS
Date	9/27/2006
Specific Location	N part of park
Total Vegetation	6
Trees Total	5
Dominant Trees	ALRU2, ACMA3, POTR15, THPL
emergent	2
maincanopy	5
subcanopy	3
Shrubs Total	6
Dominant Shrubs	RUSP, ACCI, COCO6
> 1.5' tall	6
< 1.5' tall	3
Graminoids Total	2
Dominant Graminoids	
Graminoids Perennial	2
Graminoids Annual	0
Forbs Total	2
Dominant Forbs	
Forbs Perennial	2
Forbs Annual	1
Ferns Total	4
Ferns Evergreen	4
Ferns Deciduous	2
ExoticsTotal	1
Exotics Perennial	1
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	3
Litter	97
Logging	3
Stand Age	2
Agriculture	0
Livestock	0
Development	3
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. ALRU2/POMU (CHAPPELL)	80	Matrix	2
2. TSHE-PSME/POMU-DREX2 (CHAPPELL)	20	Large	2
3.	0		0

Notes: Ferns: POMU

Polygon Number	**73**
Survey Intensity	2
Observer	HS
Date	9/27/2006
Specific Location	N part of park, W side of reservoir
Total Vegetation	6
Trees Total	6
Dominant Trees	ACMA3, ALRU2, PSME, THPL, TSHE
emergent	3
maincanopy	5
subcanopy	3
Shrubs Total	5
Dominant Shrubs	ACCI, RUSP, SARA2, VAPA
> 1.5' tall	5
< 1.5' tall	2
Graminoids Total	2
Dominant Graminoids	
Graminoids Perennial	2
Graminoids Annual	0
Forbs Total	3
Dominant Forbs	MADI, OXTR
Forbs Perennial	3
Forbs Annual	1
Ferns Total	5
Ferns Evergreen	5
Ferns Deciduous	1
ExoticsTotal	1
Exotics Perennial	1
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	5
Litter	95
Logging	3
Stand Age	2
Agriculture	0
Livestock	0
Development	0
Wildlife	3
Recreation Severity	0
Recreation Type	0
Hydrology	1

Exotic Species

Primary Exotic
PHAR3
Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. TSHE-PSME/POMU-DREX2 (CHAPPELL)	70	Matrix	2
2. ALRU2/POMU (CHAPPELL)	30	Large	2
3.	0		0

Notes: Ferns: POMU

Polygon Number	**74**
Survey Intensity	2
Observer	HS
Date	9/27/2006
Specific Location	N part of park, W of reservoir
Total Vegetation	6
Trees Total	5
Dominant Trees	ALRU2
emergent	1
maincanopy	5
subcanopy	1
Shrubs Total	5
Dominant Shrubs	COST4, PHCA11, RUSP
> 1.5' tall	5
< 1.5' tall	2
Graminoids Total	4
Dominant Graminoids	PHAR3
Graminoids Perennial	4
Graminoids Annual	1
Forbs Total	3
Dominant Forbs	TOME
Forbs Perennial	3
Forbs Annual	1
Ferns Total	2
Ferns Evergreen	2
Ferns Deciduous	2
ExoticsTotal	4
Exotics Perennial	4
Exotics Annual	1
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	0
Litter	100
Logging	0
Stand Age	2
Agriculture	0
Livestock	0
Development	0
Wildlife	3
Recreation Severity	0
Recreation Type	0
Hydrology	1

Exotic Species

Primary Exotic
PHAR3
Secondary Exotic
RULA
Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. ALRU2/RUSP c.t. (KUNZE)	100	Matrix	2
2.	0		0
3.	0		0

Notes:

Polygon Number	**75**
Survey Intensity	1
Observer	
Date	
Specific Location	
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
Bare Ground	0
Moss Lichen	0
Litter	0
Logging	
Stand Age	
Agriculture	
Livestock	
Development	
Wildlife	
Recreation Severity	
Recreation Type	
Hydrology	

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. developed	100	Matrix	1
2.	0		0
3.	0		0

Notes:

Polygon Number	**76**
Survey Intensity	2
Observer	HS
Date	9/27/2006
Specific Location	N part of park
Total Vegetation	6
Trees Total	6
Dominant Trees	ALRU2, PSME, TSHE, ACMA3, THPL
emergent	3
maincanopy	6
subcanopy	2
Shrubs Total	5
Dominant Shrubs	RUSP, ACCI
> 1.5' tall	5
< 1.5' tall	2
Graminoids Total	2
Dominant Graminoids	
Graminoids Perennial	2
Graminoids Annual	0
Forbs Total	2
Dominant Forbs	
Forbs Perennial	2
Forbs Annual	1
Ferns Total	4
Ferns Evergreen	4
Ferns Deciduous	2
ExoticsTotal	1
Exotics Perennial	1
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	4
Litter	96
Logging	3
Stand Age	2
Agriculture	0
Livestock	0
Development	0
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. ALRU2/POMU (CHAPPELL)	65	Matrix	2
2. TSHE-PSME/POMU-DREX2 (CHAPPELL)	25	Large	2
3. ACMA3-ALRU2/POMU-TEGR2 (CHAPPELL)	10	Small	2

Notes: Ferns: POMU

Polygon Number	**78**
Survey Intensity	1
Observer	
Date	
Specific Location	
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
Bare Ground	0
Moss Lichen	0
Litter	0
Logging	
Stand Age	
Agriculture	
Livestock	
Development	
Wildlife	
Recreation Severity	
Recreation Type	
Hydrology	

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. developed	100	Matrix	1
2.	0		0
3.	0		0

Notes:

Polygon Number	**80**
Survey Intensity	1
Observer	
Date	
Specific Location	
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
Bare Ground	0
Moss Lichen	0
Litter	0
Logging	
Stand Age	
Agriculture	
Livestock	
Development	
Wildlife	
Recreation Severity	
Recreation Type	
Hydrology	

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. developed	100	Matrix	1
2.	0		0
3.	0		0

Notes:

Polygon Number	**81**
Survey Intensity	2
Observer	HS
Date	9/27/2006
Specific Location	
Total Vegetation	6
Trees Total	6
Dominant Trees	ALRU2, PSME, THPL, ACMA3
emergent	2
maincanopy	6
subcanopy	2
Shrubs Total	4
Dominant Shrubs	RUSP, ACCI, SARA2
> 1.5' tall	4
< 1.5' tall	2
Graminoids Total	1
Dominant Graminoids	
Graminoids Perennial	1
Graminoids Annual	0
Forbs Total	2
Dominant Forbs	
Forbs Perennial	2
Forbs Annual	1
Ferns Total	5
Ferns Evergreen	5
Ferns Deciduous	2
ExoticsTotal	1
Exotics Perennial	1
Exotics Annual	0
Water	0
Rock Outcrop	0
Gravel	0
Bare Ground	0
Moss Lichen	3
Litter	97
Logging	3
Stand Age	2
Agriculture	0
Livestock	0
Development	1
Wildlife	3
Recreation Severity	3
Recreation Type	3
Hydrology	1

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. TSHE-PSME/POMU-DREX2 (CHAPPELL)	65	Matrix	2
2. ACMA3-ALRU2/POMU-TEGR2 (CHAPPELL)	35	Large	2
3.	0		0

Notes: Ferns: POMU

Polygon Number	**84**
Survey Intensity	1
Observer	
Date	
Specific Location	
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
Bare Ground	0
Moss Lichen	0
Litter	0
Logging	
Stand Age	
Agriculture	
Livestock	
Development	
Wildlife	
Recreation Severity	
Recreation Type	
Hydrology	

Exotic Species

Primary Exotic

Secondary Exotic

Noxious Exotic

Plant Associations

	Percent	Pattern	Rank
1. developed	100	Matrix	1
2.	0		0
3.	0		0

Notes:

Appendix E – Washington Natural Heritage Program Rare Plant Sighting Forms

Washington Natural Heritage Program Rare Plant Sighting Form:

Taxon Name: Cimicifuga elata
EO #:
Are you confident of the identification? yes no Explain:

Survey Site Name: Lewis and Clark State Park
Surveyor's Name/Phone/Email: Hans Smith, 509-996-2490, hans@pacificbio.org
Survey Date: 2006-06-05 (yr-mo-day)
County: Lewis
Quad Name: Jackson Prairie
Township: 12N Range: 1W Section(s): 16

Directions to site:

Mapping (see instructions): Attach a copy of the USGS 7.5 minute quad with the location and extent of the rare plant population clearly drawn. Do not reduce or enlarge the photocopy or printout of the map. If your map is a different scale (not recommended) please write the scale on the map.

Please answer the following:
1. I used GPS to map the population: No (skip to #2) Yes (complete #1 & #3)
Coordinates are in electronic file on diskette (preferred) Coordinates written below or attached. Description of what coordinates represent:

GPS accuracy: Uncorrected
GPS datum: NAD 83 Zone 10
GPS coordinates: 513993E 5152399N
2. I used a topographic map to map the population:
Yes (complete #2) no (provide detailed directions & description above, and skip to #3)
I am confident I have accurately located and mapped the population at map scale:
Yes (skip to #3) no, but I am confident the population is within the general area indicated on the map as follows:
On the same map, use a highlighter to identify the outer boundary of the area where the population could be, given the uncertainties about your exact location.
3. I used the following features on the map to identify my location (stream, shoreline, bridge, road, cliff, etc.
To the best of my knowledge, I mapped the entire extent of this population
yes no unknown If no or unknown, explain: Difficult access – could be more in other hard to reach areas.
Is a revisit needed? no yes - if yes, why?:
Ownership (if known): Washington State Parks

Population Size (# of individuals or ramets) or estimate: Approximately 5 individuals

Population (EO) Data (include population vigor, microhabitat, phenology, etc.): Plants occurring along Trail of the Deer, directly along trail. Most of the specimens were flowering. Signs of senescence on some of the leaves – smaller plants are being eaten by insects. Plants seem rooted in soil and duff tufted onto a nearby tree's root system.

Plant Association: TSHE-PSME/POMU/DREX2 (Chappell, 2004)

Associated Species (include % cover by layer and by individual species for dominants in each layer):
Lichen/moss layer: 8%

Herb layer: 80% VAHE, HYTE, ADBI, DISM, POMU, ATFI

Shrub layer(s): 15% RUSP, MANE2, EUOC

Tree layer: 95% THPL, ABGR, ACMA3, ACCI

General Description (include description of landscape, surrounding plant communities, land forms, land use, etc.): Along gently sloping, well drained terrain. Mature forest cover with some old-growth trees scattered. Directly along trail used for hiking/walking.

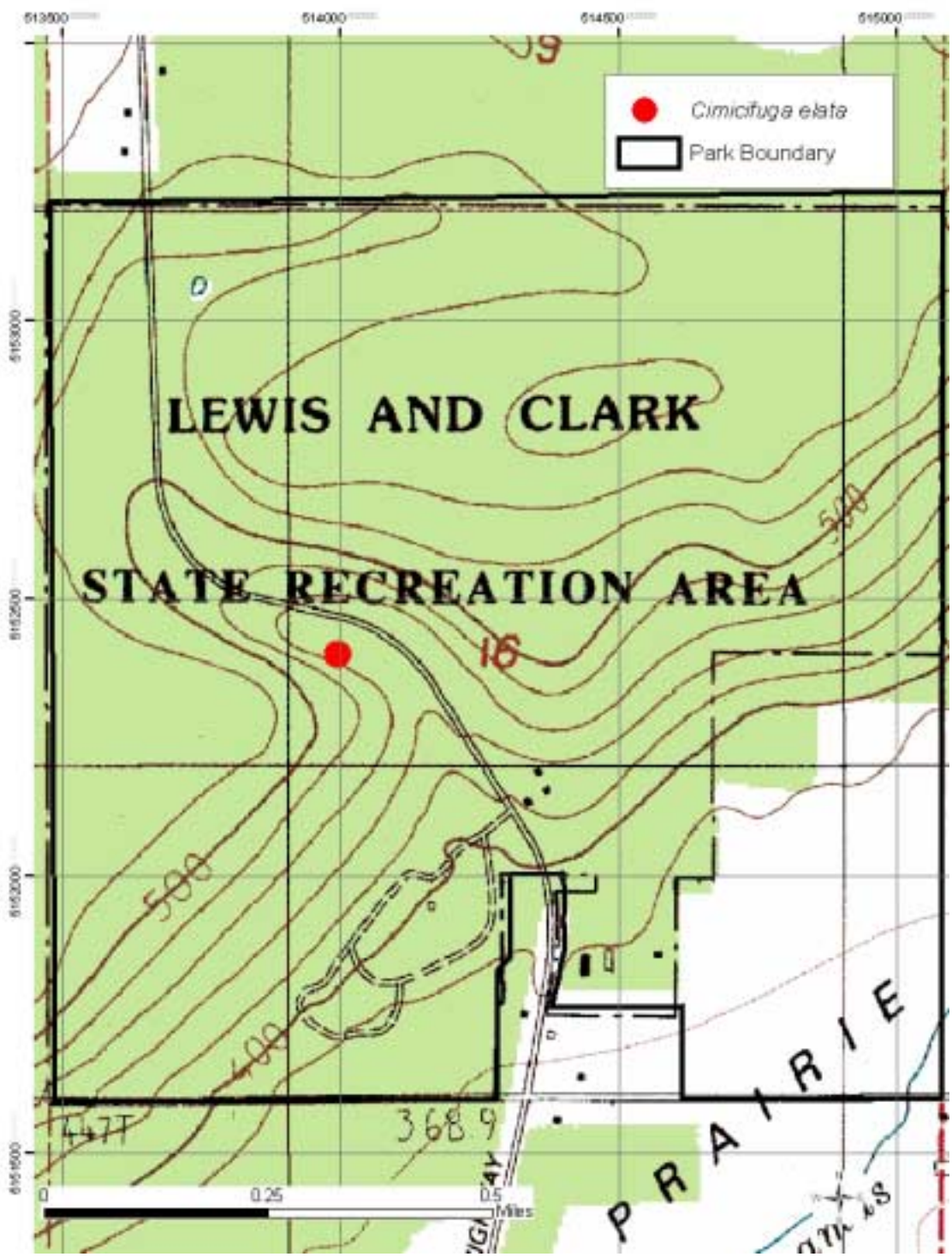
Elevation (ft.):427
Size (acres): 1/20 Aspect: 55 degrees Slope 3
Photo taken? yes no

Management Comments (exotics, roads, shape/size, position in landscape, hydrology, adjacent land use, cumulative effects, etc.): Trail proximity poses possible trampling or vegetation destruction threat. May need to relocate trail or fence the population to limit access.

Protection Comments (legal actions/steps/strategies needed to secure protection for the site): Site is already owned by WA State Parks.

Additional Comments (discrepancies, general observations, etc.): Several Euonymus occidentale specimens growing around the population.

Please mail completed form with map:
WASHINGTON NATURAL HERITAGE PROGRAM
DEPARTMENT OF NATURAL RESOURCES
PO BOX 47014, OLYMPIA WA 98504-7014



Cimicifuga elata site (red circle)