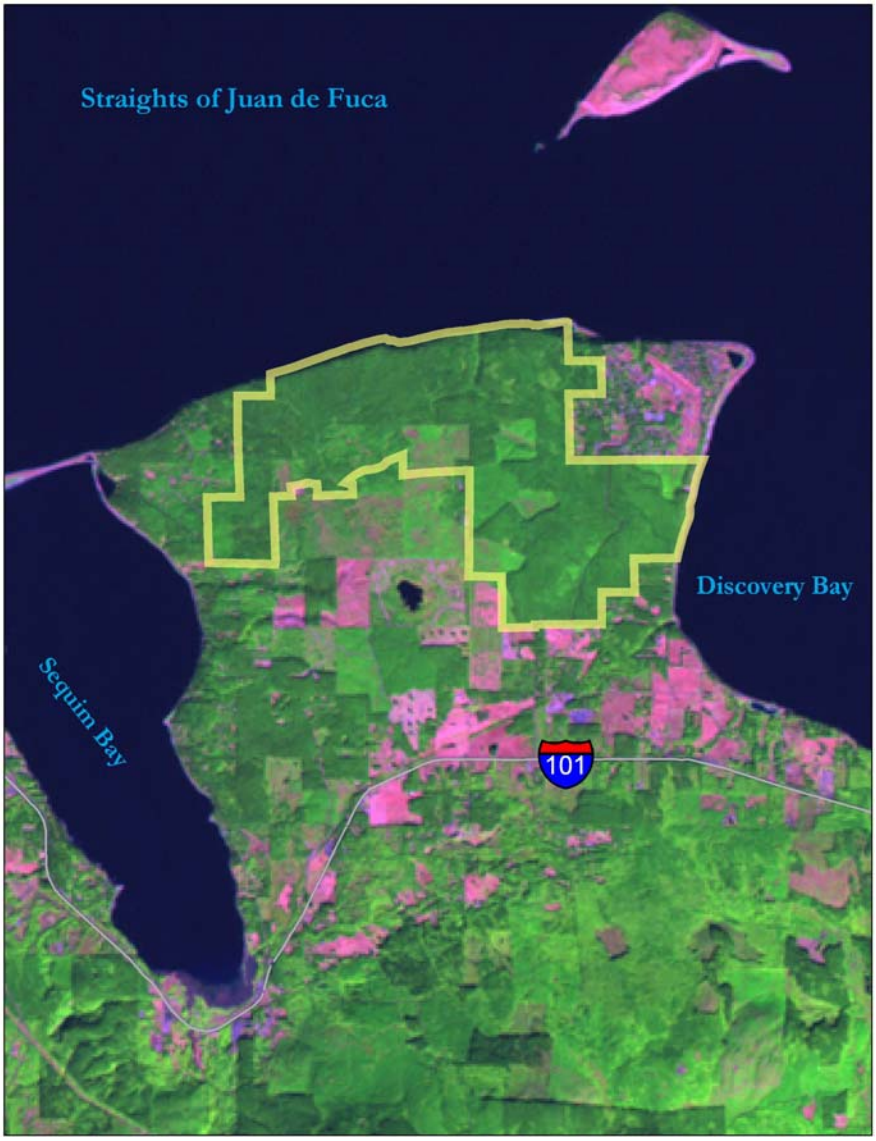
Rare Plant Survey of Washington State Park's Parcel on the Miller Peninsula



Pacific Biodiversity Institute

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Introduction

At the request of the Washington State Parks and Recreation Commission, an almost 3000 acre parcel of forest and shoreline located on the Miller Peninsula was surveyed for rare plant occurrences by Pacific Biodiversity Institute (PBI). This report summarizes the activities and findings of the contracted work.

The Miller Peninsula lies in the rainshadow of the Olympic Mountains on the northern shore of the Olympic Peninsula facing the Straights of Juan de Fuca. Most of the forests within the State Park's parcel are dominated by 50 -100 year old Douglas-fir (*Pseudotsuga menziesii*) trees with other conifer species and some hard wood trees mixed in. The majority of the parcel's forests are in a mid-succesional seral stage – a result of intensive logging practices in the last century. The upland portion of the parcel (which is the vast majority of the area) has very flat and gentle topography and lacks inland waterbodies and streams. Most of the current habitat diversity in the upland areas is related to the residual effects of logging and road construction, with prominent clear-cuts and weedy openings providing interruptions in the homogenous forest cover.

A considerable amount of shoreline adds some ecosystem diversity to the Miller Peninsula State Park's Parcel. The parcel contains long beachfronts bordering both Discovery Bay and the Straights of Juan de Fuca. Constant slope failure on the steep sandy banks directly above the shoreline maintains a dynamic set of habitats for the establishment of pioneering plant species, especially opportunistic herbs and grasses. A small brackish water lagoon and mixed rocky/sandy beach also add some habitat diversity.

Methods

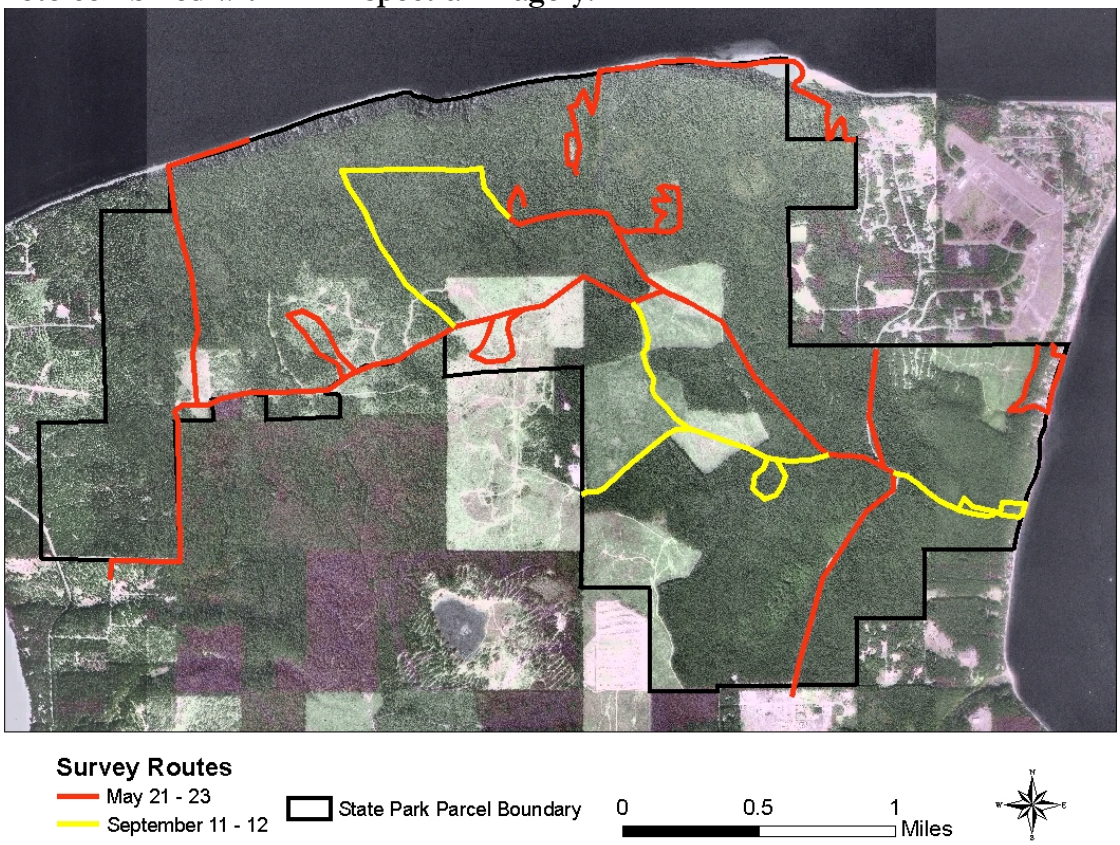
The rare plant inventory was specifically a field based exercise in which PBI staff visited the project area equipped with reference literature, rare and sensitive plant lists for the greater area, maps showing possible rare and sensitive plant locations from previous surveys (none existed within the State Park parcel's boundary), and a portable plant identification lab. Rare and sensitive plants were looked for in habitat conditions previously identified as being the most likely for them to occur (i.e. wetlands, lagoons). So as to not miss a rare or sensitive plant not currently listed on Miller Peninsula, all vascular plant species encountered during the inventory were identified if possible, either on site in the field or at base camp in the portable laboratory, or back at PBI headquarters in Winthrop, WA.

Survey Conditions and Routes

Much of the upland areas within the State Park's parcel (a vast majority of the parcel's 3000 acres) are readily accessible by the vast network of roads and trails that exist. Off trail travel within the upland forests is mildly difficult due to heavy shrub cover and downed wood and debris in some areas. Off trail travel in the clear-cuts and weedy openings proved difficult due to the large amounts of slash and shrubby re-growth that is occasionally impenetrable in some areas. The most difficult habitats to access and survey were the erosional slopes above the shoreline. These steep sandy hillsides can be very unstable, adding an element of hazard to traveling on the terrain. Also, the steepness of the slopes coupled with the loose nature of the substrate made walking across these areas very slow and cumbersome.

Our survey routes reflect our desire to cover a large proportion of the parcel's area during field sessions, with a balance of more intensively surveying stronger likelihood areas or habitats of the State Park's property where rare plants might occur. Survey routes for the rare plant inventory and rare plant locations were recorded either by hand on a hardcopy topographic map, or as GPS waypoints and trackpoints, all of which were later compiled into a single GIS data layer (map 1).

Map 1. 2004 rare plant survey routes overlaying a one-meter resolution digital ortho-photo combined with ETM spectral imagery.



Survey Results

Though almost 200 species of plants were observed and identified by PBI staff during the 2004 site visits, no state or federally listed species were found within the Miller Peninsula State Park's parcel. Over 24% of the plants identified are considered alien and/or exotic plants for this region. The list of species identified during this project is attached to the end of this report.

Discussion of Habitats and Conditions

It is not known if any rare or endangered plants previously existed within the State Park's parcel, but it is possible that any historical populations may have been adversely affected by the area's recent land use activities including logging and development. As is unfortunately true with much of the lowland conifer forests on the Olympic Peninsula, the late-successional old growth conifer forests that once covered almost the entire Miller Peninsula were clear-cut and/or developed leaving the majority of the area's forests as young conifer stands in the stem exclusion or understory re-initiation successional phases, when species diversity is typically lowest. Many of the area's native forests have also been replaced by non-forested residual clear-cuts dominated by common shrubs and non-native and invasive herbs and grasses. These conditions account for a very large proportion of the State Park's parcel.

Photo of a residual clear-cut in the study area. The area is dominated by weedy grasses and herbs.

Secondary forests in the study area entering the stem exclusion successional phase.

Aerial view of a clear-cut surrounded by secondary forest on the Discovery Bay side of the State Park's parcel.

Given the extensive coverage of human disturbance on the Miller Peninsula it is not too surprising that rare or endangered plants were not encountered in this project. The State Park's parcel does, however, contain a small diversity of more natural ecosystem and habitat types, most notably including un-logged or less recently logged regions along the steep sandy banks above the parcel's long shore line, where logging and development were impractical or unsafe. Such areas are readily visible in the next photo taken on the Straight of Juan de Fuca side of the peninsula.

Areas not directly disturbed by recent logging and development within the Miller Peninsula State Park's parcel are mainly restricted to the eroding sandy hillsides above the extensive shoreline. Expansive secondary conifer forest dominates the upland.

Photos of the more natural habitat conditions on the eroding sandy banks above the Discovery Bay shore.

Because the north and east facing eroding sandy banks above marine shoreline contain the most undisturbed natural ecosystems in terms of human impact, these areas probably hold the greatest potential for possessing rare or endangered plant populations. Any future botanical surveys of the State Park's parcel on Miller Peninsula should focus on further documenting and categorizing the abundance of small herbs and grasses found on these eroding banks.

Aquatic or semi-aquatic ecosystems and habitats do occur within the State Park's parcel, but they are very limited in number and spatial extent. No upland perennial wetlands or streams exist within the parcel, but there are a few annual wetland areas dominated by *Carex obnuta* and *Spiraea douglasii*, as well as some dry creek beds within heavily forested ravines dominated by conifers and *Polysticum munitum*.

Conifer dominated dry creek ravine.

The parcel also includes a portion of a brackish water lagoon and surrounding rocky/sandy beach with significant amounts of *Elymus mollis* intermixed with rich deposits of coarse woody debris. No listed plants were found in this region though the habitat contains an abundance of plant species found nowhere else in the State Park's parcel.

Aerial view of the brackish water lagoon.

The brackish water lagoon and surrounding rocky/sandy beach with coarse woody debris deposits intermixing a healthy population of *Elymus mollis.*

Barring further expansive logging and development in the study area, much of the parcel's forests are poised to mature into healthy lowland old-growth conifer forests typical of the Olympic rain-shadow region. Most of the conifer dominated mid-successional forests that have maintained a closed canopy have little to no invasive or exotic plants in their interior. The beaches and eroding sandy slopes have minor exotic species presence.

Areas along paths and roads within the forests do have a higher frequency of exotic species presence. The forest edges along open roads, and areas that are residual clear-cuts or weedy openings contain dramatic infestations of invasive species. Controlling invasive and alien plants in these areas may be impossible given the current extent of their establishment and the expansive distribution of these types of disturbed conditions. Encouraging the development of a closed canopy forest cover in these areas through intensive tree planting may be a slow but successful weed control strategy, though a considerable amount of effort would have to be made to ensure young seedlings and saplings become adequately established so they could out-compete the existing weed plants for essential nutrients and sunlight. Limiting future human disturbance of the forest canopy in non-weed infested areas will be essential in limiting the further expansion of invasive and exotic plant distributions.

Vascular Plant List for Miller Peninsula State Park's Parcel

Scientific Name	Common Name	Family	Code	Type	Alien?
Abies amabilis	Pacific silver fir	Pinaceae	ABAM	t	
Abies grandis	grand fir	Pinaceae	ABGR	t	
Abronia latifolia	yellow sand verbena	Nyctaginaceae	ABLA2	p	
Acer glabrum v. douglasii	Douglas maple	Aceraceae	ACGLD4	s	
Acer macrophyllum	bigleaf maple	Aceraceae	ACMA3	t	
Achillea millefolium	common yarrow	Compositae	ACMI2	p	
Adenocaulon bicolor	pathfinder	Compositae	ADBI	p	
Agrostis alba	redtop	Gramineae	AGAL3	g	a
Aira caryophyllea	silver hairgrass	Gramineae	AICA	g	a
Aira praecox	little hairgrass	Gramineae	AIPR	g	a
Allium acuminatum	Hooker onion	Liliaceae	ALAC4	p	
Alnus rubra	red alder	Betulaceae	ALRU2		
Alnus sinuata	Sitka alder	Betulaceae	ALSI		
Ambrosia chamissonis	silver burweed	Compositae	AMCH4	p	
Amelanchier alnifolia	serviceberry	Rosaceae	AMAL2	s	
Anaphalis margaritacea	pearly everlasting	Compositae	ANMA	p	
Anthoxanthum odoratum	sweet vernalgrass	Gramineae	ANOD5	g	a
Arbutus menziesii	Pacific madrone	Ericaceae	ARME	t	
Arctostaphylos columbiana	hairy manzanita	Ericaceae	ARCO3	s	
Armeria maritima	thrift	Plumbaginaceae	ARMA6	p	
Artemisia suksdorfii	coast mugwort	Compositae	ARSU	p	
Aruncus sylvester	goatsbeard	Rosaceae	ARSY	s	
Athyrium filix-femina	lady-fern	Polypodiaceae	ATFI	f	
Atriplex patula		Chenopodiaceae		p	
Bellis perennis	english daisy	Compositae	BEPE2	p	a
Berberis aquifolium	Tall Oregongrape	Berberidaceae	BEAQ	s	
Berberis nervosa	Cascade Oregongrape	Berberidaceae	BENE	s	
Bromus commutatus	hairy brome	Gramineae	BRCO4	g	a
Bromus mollis	soft brome	Gramineae	BRMO2	g	a
Bromus pacificus	Pacific brome	Gramineae	BRPA3	g	
Bromus rigidus	ripgut brome	Gramineae	BRRI*	g	a
Bromus sitchensis	Alaska brome	Gramineae	BRSI	g	
Bromus tectorum	cheatgrass	Gramineae	BRTE	g	a
Cakile edentula	american searocket	Cruciferae	CAED	p	a
Callitriche verna	spring water-starwort	Callitrichaceae	CAVE2	p	
Cardamine pensylvanica	Pennsylvania bittercress	Cruciferae	CAPE	a	
Carex athrostachya	slenderbeaked sedge	Cyperaceae	CAAT3	g	
Carex deweyana	Dewey's sedge	Cyperaceae	CADE9	g	
Carex hendersonii	Henderson's sedge	Cyperaceae	CAHE7	g	
Carex lenticularis	lakeshore sedge	Cyperaceae	CALE	g	
Carex obnupta	slough sedge	Cyperaceae	CAOB3	g	
Carex pachystachya	thick-headed sedge	Cyperaceae	CAPA14	g	
Carex utriculata	beaked sedge	Cyperaceae	CAUT	g	
Castilleja hispida	harsh paintbrush	Scrophulariaceae	CAHI9	p	
Castilleja miniata v. dixonii	scarlet paintbrush	Scrophulariaceae	CAMID	p	
Centaurium umbellatum	european centaury	Gentianaceae		a	a
Cerastium arvense	field chickweed	Caryophyllaceae	CEAR4	p	

Cerastium viscosum	sticky chickweed	Caryophyllaceae	CEVI3	a	a
Chenopodium album	lambsquarters	Chenopodiaceae	CHAL7	a	a
Chimaphila umbellata	pipsissewa	Ericaceae	CHUM	p	
Chrysanthemum leucanthemum	oxeye daisy	Compositae	CHLE80	p	a
Cinna latifolia	woodreed	Gramineae	CILA2	g	
Circaea alpina	enchanter's nightshade	Onagraceae	CIAL	p	
Cirsium arvense	Canada thistle	Compositae	CIAR4	p	a
Cirsium vulgare	bull thistle	Compositae	CIVU	b	a
Clarkia amoena	farewell-to-spring	Onagraceae	CLAM	a	
Collomia grandiflora	large-flowered collomia	Polemoniaceae	COGR4	p	
Collomia heterophylla	varied-leaved collomia	Polemoniaceae	COHE2	a	
Corallorhiza maculata	spotted coralroot	Orchidaceae	COMA4	p	
Cynosurus cristatus	dog's tail grass	Poaceae		g	a
Cytisus scoparius	Scot's broom	Leguminosae	CYSC4	s	a
Dactylis glomerata	orchardgrass	Gramineae	DAGL	g	a
Deschampsia caespitosa	tufted hairgrass	Gramineae	DECA	g	
Digitalis purpurea	foxglove	Scrophulariaceae	DIPU	a	a
Distichlis stricta	alkali saltgrass	Gramineae	DIST3	p	
Draba verna	spring whitlowgrass	Cruciferae	DRVE2	a	
Elymus glaucus	blue wild rye	Gramineae (Poaceae)	ELGL	p	
Elymus mollis	American dunegrass	Gramineae	ELMO9	g	
Epilobium angustifolium	fireweed	Onagraceae	EPAN2	p	
Epilobium paniculatum	autumn willowweed	Onagraceae	EPPA2	a	
Equisetum arvense	field horsetail	Equisetaceae	EQAR	p	
Equisetum telmateia	giant horsetail	Equisetaceae	EQTE	p	
Erodium cicutarium	storks-bill, filaree	Geraniaceae	ERCI6	a	a
Euphorbia peplus	pretty spurge	Euphorbiaceae	EUPE6	a	a
Euphrasia officinalis	hairy eyebright	Scrophulariaceae		p	a
Festuca bromoides	six-weeks fescue	Gramineae	FEBR.	a	
Festuca rubra	red fescue	Gramineae	FERU	g	
Fragaria virginiana	wild strawberry	Rosaceae	FRVI	p	
Fritillaria lanceolata	checker lily	Liliaceae	FRLA2	p	
Galium aparine	cleavers	Rubiaceae	GAAP2	a	a
Galium triflorum	fragrant bedstraw	Rubiaceae	GATR3	p	
Gaultheria shallon	salal	Ericaceae	GASH	s	
Geranium robertianum	Robert geranium	Geraniaceae	GERO	a	a
Glyceria elata	tall mannagrass	Gramineae	GLEL	g	
Gnaphalium uliginosum	marsh cudweed	Compositae	GNUL	a	a
Goodyera oblongifolia	rattlesnake plantain	Orchidaceae	GOOB2	p	
Grindelia integrifolia	low gumweed	Compositae	GRIN	p	
Habenaria unalascensis	Alaska rein-orchid	Orchidaceae	HAUN	p	
Hieracium sp	hawkweed	Compositae	HIERA	p	
Holcus lanatus	common velvetgrass	Gramineae	HOLA	g	a
Holodiscus discolor	oceanspray	Rosaceae	HODI	s	
Hypocharis radicata	hairy cat's-ear	Compositae	HYRA3	a	a
Ilex aquifolium	English holly	Aquifoliaceae	ILAQ80	s	a
Juncus balticus	Baltic rush	Juncaceae	JUBA	g	
Juncus effusus	common rush	Juncaceae	JUEF	g	
Juncus ensifolius	dagger-leaved rush	Juncaceae	JUEN	p	
Lactuca muralis	wall lettuce	Compositae	LAMU	a	a

Lathyrus japonicus	beach pea	Leguminosae	LAJA	p	
Lemna minor	duckweed	Lemnaceae	LEMI3	a	
Lepidium virginicum	tall peppergrass	Cruciferae	LEVI3	a	
Linanthus bicolor	bicolored linanthus	Caryophyllaceae	LIBI	a	
Linnaea borealis	twinflower	Scrophulariaceae	LIBO3	p	
Lomatium nudicaule	barestem lomatium	Umbelliferaceae	LONU	p	
Lonicera ciliosa	orange honeysuckle	Caprifoliaceae	LOCI3	s	
Lonicera hispidula	hairy honeysuckle	Caprifoliaceae	LOHI2	s	
Lotus micranthus	small-flowered deervetch	Leguminosae	LOMI	a	
Lupinus arboreus	tree lupine	Leguminosae	LUAR	p	
Lupinus littoralis	seashore lupine	Leguminosae	LULI2	s	
Luzula parviflora	small-flowered woodrush	Juncaceae	LUPA	g	
Madia sativa	Chilie tarweed	Compositae	MASA	a	
Maianthemum dilatatum	may-lily	Liliaceae	MADI	p	
Medicago lupulina	black medic	Leguminosae	MELU	p	a
Melica hartfordii	Hartford's melic	Gramineae	MEHA2	g	
Mitella ovalis	oval-leaved mitella	Saxifragaceae	MIOV	p	
Montia parvifolia	littleleaf montia	Caryophyllaceae	MOPA5	p	
Montia perfoliata	miner's lettuce	Caryophyllaceae	MOPE	a	
Montia sibirica	Siberian miner's lettuce	Caryophyllaceae	MOSI2	a	
Myosotis discolor	yellow and blue forgetmenot	Boraginaceae	MYDI	a	
Nemophila parviflora	small-flowered nemophila	Hydrophyllaceae	NEPA	a	
Oenanthe sarmentosa	water-parsley	Umbelliferaceae	OESA	p	
Osmorhiza chilensis	mountain sweet-cicely	Umbelliferaceae	OSCH	p	
Petasites frigidus v. plamatus	sweet coltsfoot	Compositae	PEFRP	p	
Plantago lanceolata	narrowleaf plantain	Plantaginaceae	PLLA	p	a
Plantago major	common plantain	Plantaginaceae	PLMA2	p	a
Plantago maritima	seaside plantain	Plantaginaceae	PLMA	p	
Plectritis congesta	rosy plectritis	Valarianiaceae	PLCO4	a	
Poa annua	annual bluegrass	Gramineae	POAN	ag	a
Polygonum majus	wiry knotweed	Polygonaceae	POMA9	p	
Polystichum munitum	sword-fern	Polypodiaceae	POMU	f	
Populus trichocarpa	black cottonwood	Salicaceae	POTR15	t	
Potamogeton pectinatus	fennel-leaved pondweed	Potamogetonaceae	POPE6	p	
Potamogeton pusillis	small pondweed	Potamogetonaceae	POPU7	p	
Potentilla gracilis	slender cinquefoil	Rosaceae	POGR9	p	
Prunella vulgaris	self-heal	Labiatae	PRVU	p	
Pseudotsuga menziesii	Douglas fir	Pinaceae	PSME	t	
Pteridium aquilinum	bracken fern	Polypodiaceae	PTAQ	f	
Pterospora andromedea	pinedrops	Ericaceae	PTAN2	p	
Pyrus fusca	pacific crabapple	Rosaceae	PYFU	s	
Ranunculus occidentalis	western buttercup	Ranunculaceae	RAOC	p	
Ranunculus repens v. repens	creeping buttercup	Ranunculaceae	RARER	p	a
Ranunculus uncinatus	woodland buttercup	Ranunculaceae	RAUN	p	
Rhododendron macrophyllum	western rhododendron	Ericaceae	RHMA3	s	
Ribes divericatum	coast black gooseberry	Grossulariaceae	RIDI	s	
Ribes lacustre	swamp current	Grossulariaceae	RILA	s	
Ribes sanguineum	red-flowered current	Grossulariaceae	RISA2	s	
Rosa gymnocarpa	baldhip rose	Rosaceae	ROGY	s	
Rosa nutkana	Nootka rose	Rosaceae	RONU	s	

Rubus laciniatus	evergreen blackberry	Rosaceae	RULA	s	a
Rubus leucodermis	black raspberry	Rosaceae	RULE	s	
Rubus parviflorus	thimbleberry	Rosaceae	RUPA	s	
Rubus spectabilis	salmonberry	Rosaceae	RUSP	s	
Rubus ursinus	trailing blackberry	Rosaceae	RUUR	s	
Rumex acetosella	sheep sorrel	Polygonaceae	RUAC3	a	a
Salicornia virginica	Pickleweed	Chenopodiaceae	SAVI	p	
Salix lasiandra	pacific willow	Salicaceae	SALA5	s	
Salix scouleriana	Scouler's willow	Salicaceae	SASC	t	
Sambucus racemosa	red elderberry	Caprifoliaceae	SARA2	s	
Sanicula crassicaulis	Pacific sanicle	Umbelliferaceae	SACR2	p	
Satureja douglasii	yerba buena	Labiatae	SADO5	p	
Scirpus microcarpus	panicled bulrush	Cyperaceae	SCMI2	p	
Senecio jacobaea	tansy ragwort	Compositae	SEJA	a	a
Senecio triangularis	arrowleaf groundsel	Compositae	SETR	p	
Shepherdia canadensis	buffaloberry, soopolallie	Elaeagnaceae	SHCA	s	
Silene gallica	French silene	Caryophyllaceae	SIGA	a	a
Smilacina racemosa	western solomon's seal	Liliaceae	SMRA	p	
Solanum dulcamara	bittersweet nightshade	Solanaceae	SODU	p	a
Sorbus aucuparia	european mountain-ash	Rosaceae	SOAU	s	a
Spiraea douglasii	hardhack	Rosaceae	SPDO	s	
Stachys cooleyae	cooley's hedge-nettle	Labiatae	STCO14	p	
Stellaria calycantha	northern starwort	Caryophyllaceae	STCA	a	
Stellaria crispa	crisped starwort	Caryophyllaceae	STCR2	p	
Stellaria media	chickweed	Caryophyllaceae	STME2	a	a
Stellaria nitens	shining chickweed	Caryophyllaceae	STNI	a	
Symphoricarpos albus	common snowberry	Caprifoliaceae	SYAL	s	
Taraxacum officinale	common dandelion	Compositae	TAOF	b	a
Tellima grandiflora	fringecup	Saxifragaceae	TEGR2	p	
Thuja plicata	western redcedar	Cupressaceae	THPL	t	
Tiarella trifoliata	foamflower	Saxifragaceae	TITR	p	
Tolmiea menziesii	youth-on-age	Saxifragaceae	TOME	p	
Trientalis latifolia	western starflower	Primulaceae	TRLA6	p	
Trifolium dubium	least hop clover	Leguminosae	TRDU2	a	
Trifolium pratense	red clover	Leguminosae	TRPR2	p	a
Trifolium repens	white clover	Leguminosae	TRRE3	p	a
Triglochin maritimum	sea arrow-grass	Juncaginaceae	TRMA4	p	
Trillium ovatum	white trillium	Liliaceae	TROV	p	
Trisetum cernuum	nodding trisetum	Gramineae	TRCE2	g	
Tsuga heterophylla	Pacific hemlock	Pinaceae	TSHE	t	
Typha latifolia	common cattail	Typhaceae	TYLA	p	
Urtica dioica	stinging nettle	Urticaceae	URDI	p	
Vaccinium ovatum	evergreen blueberry	Ericaceae	VAOV2	s	
Veronica americana	American brooklime	Scrophulariaceae	VEAM2	p	
Veronica arvensis	field speedwell	Scrophulariaceae	VEAR	a	a
Vicia gigantea	Giant Vetch	Leguminosae	VIGI	p	
Vicia hirsuta	Hairy Vetch	Leguminosae	VIHI	p	
Vicia sativa	common vetch	Leguminosae	VISA	p	a

Appendix A - Field Survey Dates and Personnel

May 21 – 23, 2004:

Hans Smith
Dana Visalli
Dane Springmeyer

September 11-12, 2004.

Hans Smith