

Existing Ecological Conditions: Lots 12-16, DL 320 GP2 NWD Plan 1560, Township of Langley, British Columbia

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Introduction

The Township of Langley (TOL) solicited “requests for offers” for the purchase of three contiguous forested properties adjacent to 252nd St. and 84th Ave. and five contiguous 5 acre (ac.) properties east of 257A St. and north of Gray Pit in northeast Langley (TOL RFO 12-1). The deadline for submissions was June 29, 2012. Local residents and concerned citizens who opposed the sale based on the properties’ ecological and cultural values, banded together under the acronym WOLF (Watchers of Langley Forests) to protest their sale. In response to their protestations and those of others, the Township rescinded the sale of the three properties adjacent to 252th St. but not the five properties adjacent to Gray Pit (Table 1, Figure 1). The five remaining properties adjacent to Gray Pit are the subject of continued efforts by WOLF to stop their sale.

Glenn Ryder provided significant historical wildlife data from 1955 (Ryder 1955) for WOLF that covered the three western properties and extended eastward to 256th St. While those data provide important information for the general area and are an excellent account of wildlife present before extensive development in the area, they do not specifically address the five parcels that remain for sale. Strix Environmental Consulting’s reports on Gray Pit (Strix 1999 and 2000) provide limited information because they focussed on the Gray Pit extraction area and small sections of the south forest edge.

In an effort to provide recent information specific to the subject properties, Phil Henderson and Glenn Ryder conducted a brief survey on September 20, 2012 of the lots referred to in TOL's RFO 12-1, namely Lots 12-16, DL 320 GP2 NWD Plan 1560. Henderson and Ryder's intentions were to "determine its existing conditions" as outlined under *Examination of the Site* in TOL's RFO 12-1 and provide objective, up to date information on plants, animals and ecology for all interested parties, notably WOLF and the Township of Langley. This information is intended to inform decisions regarding the future of the properties.

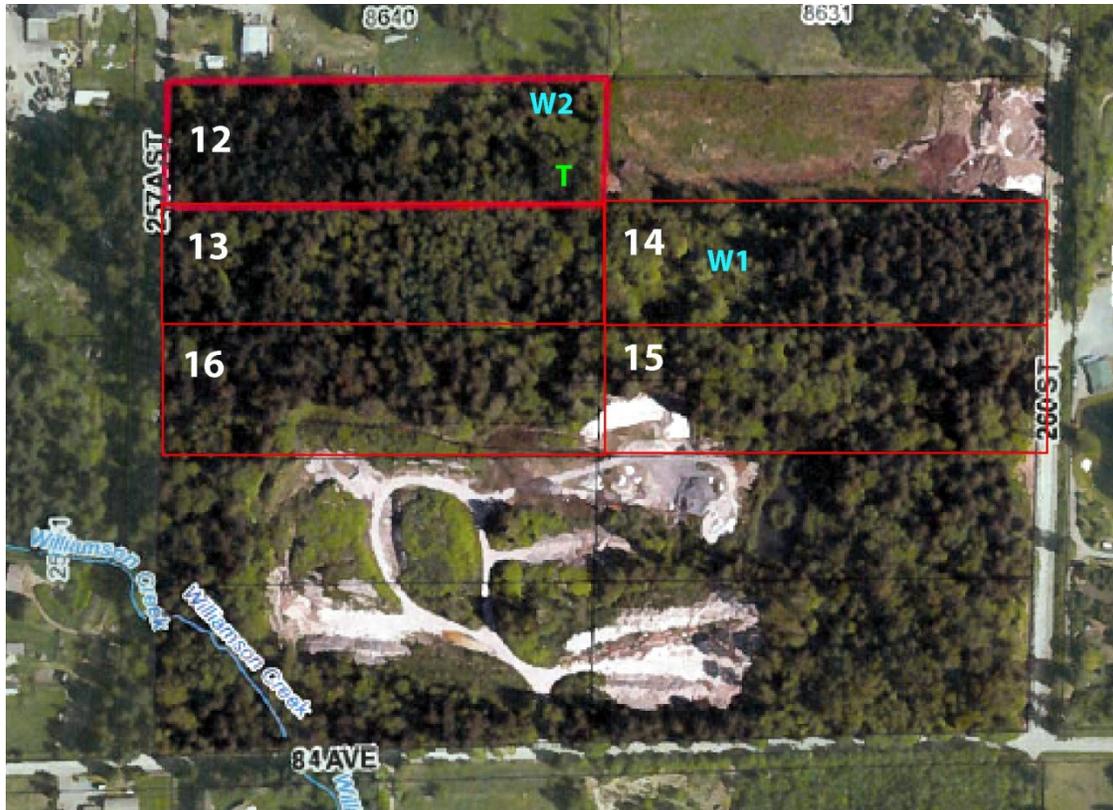


Figure 1. Aerial photo showing the five subject properties. W1 and W2 are wetlands. T is the large Black Cottonwood. (Modified from the TOL's RFO 12-1.)

Survey Methods

Two observers gathered information during a four hour walk-through survey on September 20, 2012. They recorded information using notes, photographs and a GPS unit while walking along trails, off trails and exploring areas and features of specific interest. The surveyors worked together for the most part, but separated while exploring certain areas and features within the wetlands and the east forests. Notes and observations were exchanged during the field work and afterwards when all information was compiled for this report.

Results

Site Description

With the exception of the south edges of Lots 15 and 16 which have been partially cleared for Gray Pit, the five parcels are comprised of mature second growth forest and remnant wetlands that together form a large “natural area” surrounded by agricultural and rural residential development (Figure 1, 2). The eastern lots (14 and 15) are generally wetter than the western lots (12, 13 and 16) and this is reflected in the vegetation. The exception is the north edge of Lot 12 and a small wetland in the northeast corner of Lot 12, shown in Figure 1 as W2. The western one-third of Lot 14 is a shrubby swamp with a few scattered trees (W1 in Figure 1). Small depressions and channels scattered throughout Lots 14 and 15 support wetland plants and communities. Depressions formed from the removal of the root masses of wind-felled trees are common and provide important habitats for wetland species. These scattered “microsites” are important contributors to overall biodiversity.

Small, shallow wetlands have formed in the excavated area at the north edge of Gray Pit (the south edge of Lot 16) but these were not examined closely.

Table 1. Summaries of the properties described in TOL’s RFO 12-01.

Legal Description (from RFO 12-01)	General Characteristics	Size (ac.)
Lot 12 DL 320 GP2 NWD Plan 1560	mature second growth forest; large Western Redcedar, north portion; huge Black Cottonwood specimen; small wetland in northeast	5
Lot 13 DL 320 GP2 NWD Plan 1560	mature second growth forest; drier forest with Douglas-fir	5
Lot 14 DL 320 GP2 NWD Plan 1560	mature second growth forest; large wetland in west half; Western Redcedar, Western Hemlock, Sitka Spruce	5
Lot 15 DL 320 GP2 NWD Plan 1560	mature second growth forest; small wet depressions, Western Redcedar, Western Hemlock, Bigleaf Maple	5
Lot 16 DL 320 GP2 NWD Plan 1560	mature second growth forest; drier forest, Douglas-fir	5
		25

The wetlands in Lots 12 and 14 (W2 and W1 in Figure 1) are probably remnant floodplain associations from before the establishment of local dykes. Groundwater remains sufficiently high to sustain at least some elements of these floodplain communities and the forested communities to the south in Lots 14 and 15.

Lots 14 and 15 support large Western Redcedars and Western Hemlocks of approximately 1 m dbh¹ and a few Sitka Spruce and Bigleaf Maples of approximately 0.5 m dbh. No Douglas-firs were noted in this area but they are present in the western properties (mainly Lots 13 and 16) which are somewhat higher and better-drained. The density and type of understory vegetation (shrubs, herbs and other small plants) vary considerably throughout the properties with differences in topography, moisture and canopy cover. In general, the eastern properties support more moisture-loving plants (Western Redcedar, Skunk Cabbage) than the western properties (Douglas-fir, Sword Fern).

¹ diameter at breast height = 1.3 m above ground

Ecosystem Classification

Classification of forests in British Columbia follows the Biogeoclimatic Ecosystem Classification (BEC) system which is based on climate, soils, vegetation and other site features (Green and Klinka 1994). Determining the classification is not always straightforward because communities may exist in a transitional state as a result of human and natural disturbances that affect hydrology, soils, light, etc.

The study area (Figure 1, 2) falls within the CWHxm1 (Coastal Western Hemlock Eastern Very Dry Maritime) biogeoclimatic subzone which covers a large portion of the lower mainland south of the Fraser River (BCMOF 1994). Within the CWHxm1, ecosystems are further classified into *site series*. Wetlands are classified using the BC wetland classification system (MacKenzie and Moran 2004). Some wetland associations are ecologically equivalent to the wetter BEC classifications.

Species, community site series and wetland classes have been assigned conservation status ranks by the BC Ministry of Environment's Conservation Data Centre (CDC 2012): Red (extirpated², endangered or threatened), Blue (special concern) or Yellow (not at risk). Provincial conservation status is also presented by assigning them an "S" value that corresponds to their conservation status: S1 (critically imperiled), S2 (imperiled), S3 (vulnerable) and S4 (apparently secure). See Appendix for more detailed information.

Most of the ecological communities or site series within the CWHxm1 BEC subzone are on the provincial Red or Blue lists because of limited occurrence, limited geographic extent, intensive and extensive past human development and current development pressure.

This study used vegetation data from the September 20, 2012 visit supplemented by data from previous reports (Strix 1999 and 2000) to determine the classification of the forests and wetlands (Figures 1 and 2).

Forests

Based on vegetation plot sample data, the eastern forests of Lots 14 and 15 and the north edge of Lot 12 most closely match the CWHxm1/12 (Coastal Western Hemlock Very Dry Maritime Western Redcedar - Sitka Spruce / Skunk Cabbage) ecological community. They also contain features that align them with the high bench floodplain community CWHxm1/08 (Sitka Spruce / Salmonberry Very Dry Maritime) suggesting that these forests are remnant floodplain forests or possibly transitional floodplain forests present on the southern extent of the historic floodplain (Figure 2). The remaining, western portion of this east forest which grades into the west forest parcels matches the CWHxm1/07 (Western Redcedar / Three-leaved Foamflower Very Dry Maritime) community.

The forests of the western portion of the study area, comprising Lots 12, 13 and 16, most closely fit CWHxm1/07 (Western Redcedar / Three-leaved Foamflower Very Dry Maritime). Douglas-fir is present in this western portion.

² locally extinct; i.e. extinct from a known area of occurrence but present elsewhere in its range

Wetlands

The wetland W1 is an open canopy swamp with only a few scattered trees, some large-diameter felled trees and a diverse assemblage of shrubs, ferns and herbs. Salmonberry is the dominant shrub, Red-osier Dogwood is also abundant and Coastal Red Elderberry occurs as a minor component. Pacific Crab Apple is present near the north edge of the wetland. Its presence suggests a possible transitional wetland between the Fraser River Floodplain and the upland ecosystems before dykes were established to prevent flooding. The herb layer is dominated by very large specimens of Lady Fern (~25% cover) and Skunk Cabbage (~40% cover).

Although this wetland has similarities to the floodplain wetland association Fm50 (Cottonwood – Red Alder - Salmonberry), it more closely fits the swamp association Ws53 (Western Redcedar – Sword Fern – Skunk Cabbage). Note that the BEC site series equivalent to Ws53 is CWHxm1/12, the classification used to describe the east forests of the study area. Despite this, Ws53 is applied to the open swamp wetland and CWHxm1/12 is applied to the forested area to reflect differences in species composition, structure, soils and hydrology.

Wetland W2 extends northward from Lot 12. The portion located in Lot 12 is much smaller than W1. W2 differs from W1 by having a shrub layer dominated by Black Twinberry and Salmonberry, compared to Salmonberry and Red-osier Dogwood in W1. W2 is also probably Ws53 but the differences suggest a greater affinity with a floodplain community (Fm50) as do the plants at the north edge of W2.

Both wetlands have a minor component of Coastal Red Elderberry and a high percent cover of Lady Fern and Skunk Cabbage. Species forming the minor component of the herb layer are similar in both wetlands: Enchanter's Nightshade and Piggy Back Plant. Both wetlands have a considerable portion of muddy substrate devoid of vegetation, indicating shaded areas of substantial moisture and probable periodic inundation.

Ecological Communities of Conservation Concern

Table 2 lists the conservation status of the forest and wetland ecological communities found in the five study properties. Details on the conservation ranks of these ecological communities are presented in Appendix 1. All of the ecological communities are either Red-listed (provincially endangered or threatened) and S2 (provincially imperiled), or Blue-listed (of special concern) and S3 (provincially of special concern).

The wet forests of Lots 14 and 15 and the north edge of Lot 12 are CWHxm1/12 (Western Redcedar / Sword fern - Skunk cabbage) and the wetlands of Lots 14 and 12 are Ws53 (Western Redcedar / Sword fern - Skunk cabbage swamp). These two units are considered ecological equivalents and are Blue-listed communities of special concern. This means that they will likely become Red-listed and S2 if the threats that affect their number, extent and location are not removed or reversed.

The drier forests of Lots 13, 16 and a portion of 12 are the CWHxm1/07 (Western Redcedar / Three-leaved Foamflower) ecological community which is Red-listed (threatened or endangered) and S2 (provincially imperiled). If the threats to this community are not removed across its range, it will likely become extirpated or extinct within the CWHxm1.

Table 2. Forest and wetland classification using standard British Columbia classification systems.

The shaded rows show potential remnant or residual floodplain classifications which probably represent the ecological units of the past, when lots 12, 14 and 15 were influenced by seasonal inundation before flood control (MFLNRO 2011).

Scientific Name	English Name	Biogeoclimatic Units	BEC Equivalency	Conservation Ranks			Location and status on Site (Lot # or Wetland #)
				Global Status	Prov Status	BC List	
<i>Thuja plicata</i> / <i>Tiarella trifoliata</i> Very Dry Maritime	western redcedar / three-leaved foamflower Very Dry Maritime	CWHxm1/07		G3	S2	Red	mainly 13 and 16 and south portion of 12
<i>Picea sitchensis</i> / <i>Rubus spectabilis</i> Very Dry Maritime	Sitka Spruce / Salmonberry Very Dry Maritime	CWHxm1/08		G3	S2	Red	14, 15 (potential, transitional, remnant)
<i>Populus trichocarpa</i> - <i>Alnus rubra</i> / <i>Rubus spectabilis</i>	Black Cottonwood - Red Alder / Salmonberry	CWHxm1/09	Fm50	GNR	S3	Blue	W2 (possible historic classification)
<i>Thuja plicata</i> - <i>Picea sitchensis</i> / <i>Lysichiton americanus</i>	Western Redcedar - Sitka Spruce / Skunk Cabbage	CWHxm1/12		G3?	S3?	Blue	14, 15, N end of 12
<i>Thuja plicata</i> / <i>Polystichum munitum</i> - <i>Lysichiton americanus</i>	Western Redcedar / Sword fern - Skunk Cabbage	Ws53	CWHxm1/12	GNR	S3?	Blue	W1, W2

Species of Conservation Concern

No rare or endangered plant species were recorded during the September 20, 2012 survey.

The empty shell of a Blue-listed Pacific Sideband snail was found in the Western Redcedar forest near the north edge of Lot 12.

Possible Red-legged Frog tadpoles, which are Blue-listed, were observed in the pit area wetland but not confirmed.

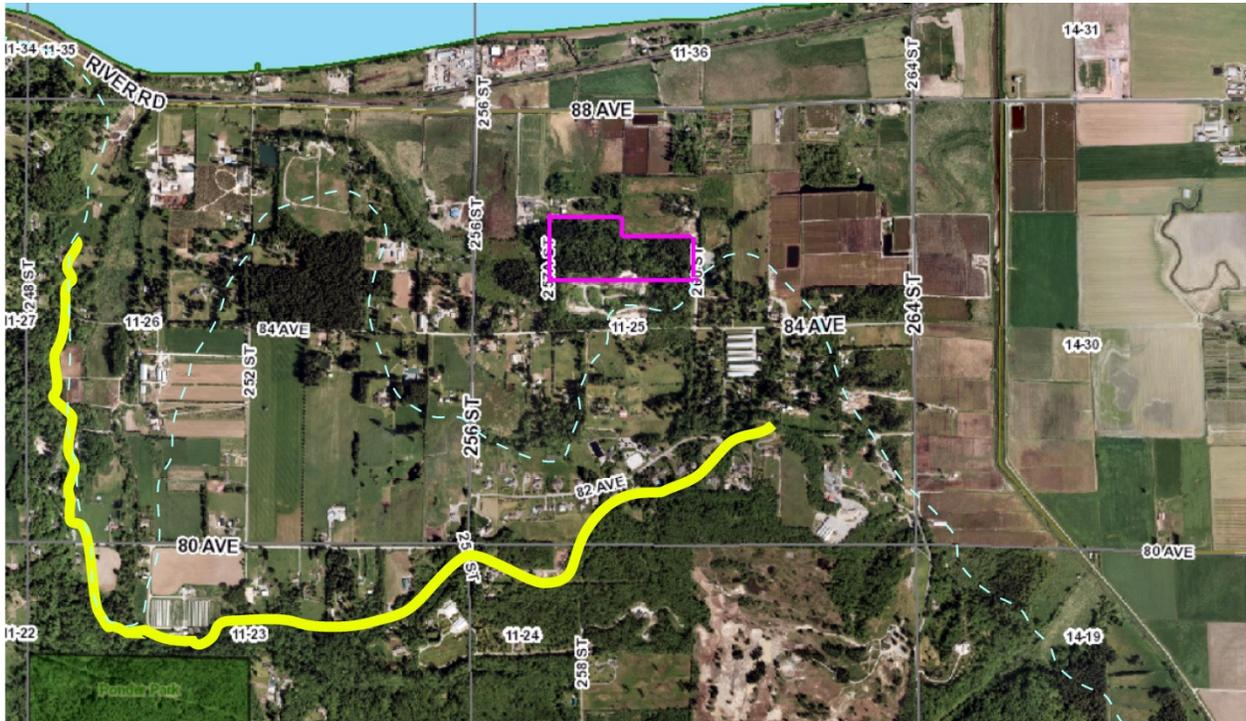


Figure 2. Altered aerial photograph of the lowlands surrounding the study properties (image source: Township of Langley GeoSource: October 2012). The study properties are outlined in pink; the approximate bottom of the forested escarpment is shown by the yellow line and the estimated southern extent of the historical floodplain is shown by the blue dashed line (MFLNRO 2011).

Study Limitations

The September survey was brief and did not cover all areas and features within the properties. More extensive surveys are required to better assess the distribution and extent of communities, the presence of additional communities and the presence of rare plants and animals. Surveys at different times of the year would provide a better indication of plants present and the use of the site by animals.

Discussion

As mentioned in Strix (1999) the five properties together represent one of the few remaining mature forests in the lowlands of north Langley. Figure 2 shows this graphically: the study properties outlined in pink constitute one of a few remaining forested blocks in the lowlands below the escarpment (yellow line) and within the historical floodplain (blue dashed line). The large forest to the west, along 84th Ave., is the area comprising the other TOL properties (referred to by some as McLellan Park) that was included in TOL's RFO 12-1 but which has now been excluded from sale and will be retained by the Township of Langley. Other nearby remnant natural areas are privately owned.

The forests of the escarpment to the south of these lowland forests have persisted due to their unsuitability for development. Those forests together with the remaining lowland forests form a network of diverse natural features, albeit interrupted by unsuitable and hostile habitats, that support many native plants and animals. This collective of natural features is the last refuge for animals and plants that occupy and define the ecological communities once common in the area.

The lowland forests of Lots 12-16 support species and communities that have adapted to and are supported by the specific conditions of moisture and periodic inundation. The veteran Black Cottonwood at the southeast corner of Lot 12 (Figure 1), with a dbh of approximately 1.75 m (estimated, not measured), is one of the largest in the Township of Langley. The moss *Hookeria lucens* is abundant in wet depressions created by the removal of the root masses from wind-felled trees in Lots 14 and 15. Spore-bearing capsules and filamentous reproductive structures on the leaves, both considered uncommon in this species (Schofield 1992 and Eckel 2010), are present on the specimens observed. The filamentous reproductive structures are usually associated with habitats that are submerged at some point during the year (Schofield 1992). The liverwort *Riccardia multifida* occurs on rotting logs and mud in some of the same areas as *Hookeria lucens*. It is typical of humid forests of the lowlands. Neither species has been observed previously in Langley by the authors. These organisms and the communities that comprise the remnant natural features are important biological legacies that will eventually be lost from Langley and the lower mainland unless relatively large natural areas are retained.

Simply retaining the lands does not guarantee the survival and persistence of important ecological features. Public access affects the ecological values of natural spaces, usually adversely, and must be considered carefully (Miller 2001; Frid and Dill 2002).

References Cited

- BCMOF (B.C. Ministry of Forests). 1994. Biogeoclimatic units of the Vancouver Forest Region. Map sheet 6 of 6. Fraser Valley – Lillooet River. Province of B.C. Ministry of Forests. Research Branch. Scale 1:250,00.
- CDC (Conservation Data Centre). 2012. BC Species and Ecosystems Explorer. B.C. Minist. of Environ. Victoria, B.C. Available: <http://a100.gov.bc.ca/pub/eswp/> (accessed October, 2012).
- Eckel, P.M. 2010. Hookeriaceae in Bryophyte Flora of North America, Provisional Publication. Date: March 16, 2010. Edit Level: R. Version: 1. Missouri Botanical Garden. BFNA Web site: <http://www.mobot.org/plantscience/BFNA/bfnamenu.htm>.
- Frid, A. and L. M. Dill. 2002. Human-caused disturbance stimuli as a form of predation risk. *Conservation Ecology* 6(1): 11.
- Green, R.N. and K. Klinka. 1994. A field guide to site identification and interpretation for the Vancouver Forest Region. BC Ministry of Forests.
- MacKenzie, W.H. and J.R. Moran. 2004. Wetlands of British Columbia: a guide to identification. Res. Br., B.C. Min. For., Victoria, B.C. Land Manage. Handb. No. 52.
- Miller, S.G., R.L. Knight, and C. K. Miller. 2001. Wildlife responses to pedestrians and dogs. *Wildlife Society Bulletin* 29:129–132
- MFLNRO. 2011. Fraser freshet master plan. Ministry of Forests, Lands and Natural Resource Operations (South Coast Region). June 1, 2011. File: fraser_freshet_masterplan
- Ryder, G. 1955. Notes by Glenn Ryder, B.C. Wildlife Patrol and Researcher Naturalist. Thursday, April 21, 1955 and Friday, May 27, 1955; Friday, June 24, 1955; and Tuesday, August 30, 1955. Area: Glen Valley, north Langley, B.C.
- Schofield, W. B. 1992. Some Common Mosses of British Columbia. Royal British Columbia Museum, Victoria, B.C., Canada.
- Strix. 1999. Environmental impact assessment: northeast gravel pit, Township of Langley. Prepared for the Township of Langley by Strix Environmental Consulting. May 27, 1999.
- Strix. 2000. Environmental impact assessment for the revised gravel extraction proposal at the Gray Pit, Northeast Langley. Prepared for Township of Langley by Strix Environmental Consulting. October 16, 2000.

Appendix 1. Conservation Ranking (CDC 2012).

Conservation Ranking Notes:

G= global rank; S = provincial rank

2 = imperiled; 3 = special concern, vulnerable to extirpation or extinction; NR = not ranked

RED: Indigenous species, or subspecies that have, or are candidates for, Extirpated, Endangered, or Threatened status in British Columbia. Ecological communities that are Extirpated, Endangered, or Threatened in British Columbia. Not all red-listed taxa will necessarily become formally designated. Placing elements on these lists flags them as being at risk and requiring investigation.

BLUE: Indigenous species or subspecies considered to be of Special Concern (formerly Vulnerable) in British Columbia. Ecological communities that are considered to be of Special Concern in British Columbia. Blue-listed elements are at risk, but are not Extirpated, Endangered or Threatened.

YELLOW: Species and ecological communities that are apparently secure and not at risk of extinction. Yellow-listed species may have red- or blue-listed subspecies.

Appendix 2.

Plants and animals observed September 20, 2012. Not all species observed were recorded.

Scientific Name	English Name	Notes
Plants		
Trees		
<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	Coast Douglas-fir	
<i>Thuja plicata</i>	Western Redcedar	
<i>Tsuga heterophylla</i>	Western Hemlock	
<i>Acer macrophyllum</i>	Bigleaf Maple	
<i>Alnus rubra</i>	Red Alder	
<i>Betula papyrifera</i>	Paper Birch	few
<i>Malus fusca</i>	Pacific Crab Apple	swamp at north end Lot 14
<i>Populus trichocarpa</i>	Black Cottonwood	
<i>Prunus emarginata</i>	Bitter Cherry	
Shrubs		
<i>Acer circinatum</i>	Vine Maple	
<i>Cornus stolonifera</i>	Red-Osier Dogwood	swamp
<i>Corylus cornuta</i> var. <i>californica</i>	Beaked Hazelnut	
<i>Crataegus douglasii</i>	Black Hawthorn	
* <i>Ilex aquilifolium</i>	English Holly	exotic
<i>Lonicera ciliosa</i>	Western Trumpet	
<i>Lonicera involucrate</i>	Black Twinberry	
<i>Mahonia nervosa</i>	Dull Oregon-Grape	north side 84 th Ave.
<i>Menziesia ferrugine</i>	False Azalea	
<i>Oemleria cerasiformis</i>	Indian-Plum	
<i>Oplopanax horridus</i>	Devil's Club	
<i>Rhamnus purshiana</i>	Cascara	
<i>Ribes lacustre</i>	Black Gooseberry	
<i>Rosa gymnocarpa</i>	Baldhip Rose	
<i>Rubus armeniacus</i>	Himalayan Blackberry	
<i>Rubus laciniatus</i>	Cutleaf Evergreen Blackberry	
<i>Rubus leucodermis</i>	Black Raspberry	
<i>Rubus spectabilis</i>	Salmonberry	
<i>Rubus ursinus</i>	Trailing Blackberry	
<i>Sorbus</i> sp.	mountain-ash	
<i>Vaccinium ovalifolium</i>	Oval-leaved Blueberry	
<i>Vaccinium parvifolium</i>	Red Huckleberry	
Herbs		
<i>Achlys triphylla</i>	Vanilla-Leaf	
<i>Actaea rubra</i>	Baneberry	
<i>Alisma triviale</i>	American Water-Plantain	swamp
<i>Arceuthobium tsugense</i> ssp. <i>tsugense</i>	Hemlock Dwarf Mistletoe	
<i>Cardamine</i> sp.	bittercress	
<i>Circaea alpina</i>	Enchanter's-Nightshade	swamp
<i>Collomia heterophylla</i>	Vari-leaved Collomia	
<i>Dicentra formosa</i>	Pacific Bleeding Heart	

Scientific Name	English Name	Notes
<i>Digitalis purpurea</i>	Common Foxglove	
<i>Epilobium angustifolium</i>	Fireweed	
<i>Epilobium ciliatum</i>	Purple-leaved Willowherb	swamp
<i>Galiopsis tetrahit</i>	Hemp-Nettle	
<i>G. triflorum</i>	Sweet-scented Bedstraw	swamp and forest
<i>Geranium robertianum</i>	Robert's Geranium	
<i>Geum macrophyllum</i>	Large-leaved Avens	
<i>Goodyera oblongifolia</i>	Rattlesnake-Plantain	
* <i>Hedera helix</i>	English Ivy	exotic
<i>Impatiens glandulifera</i>	Policeman's Helmet	swamp
<i>Lycopus uniflorus</i>	Northern Water Horehound	swamp
<i>Lysichiton americanum</i>	Skunk Cabbage	swamp
<i>Maianthemum dilatatum</i>	false lily-of-the-valley	
<i>Mycelis muralis</i>	Wall Lettuce	
<i>Myosotis laxa</i>	small-flowered forget-me-not	swamp
<i>Oenanthe sarmentosa</i>	Pacific Water-Parsley	swamp
<i>Prunella vulgaris</i>	Self-Heal	
<i>Pyrola asarifolia</i>	Pink Wintergreen	woods along 84 th Ave.
* <i>Ranunculus repens</i>	Creeping Buttercup	exotic
<i>Ranunculus repens</i>	Creeping Buttercup	
<i>Scutellaria galericulata</i>	Marsh Skullcap	swamp
<i>Solanum dulcamara</i> var. <i>dulcamara</i>	European Bittersweet	swamp
<i>Stachys chamissonis</i> var. <i>cooleyae</i>	Hedge-Nettle (probably Cooley's)	swamp
<i>Taraxacum officinale</i>	Common Dandelion	pit area
<i>Tiarella trifoliata</i> var. <i>trifoliata</i>	Three-leaved Foamflower	
<i>Tolmiea menziesii</i>	Piggy-Back Plant	
<i>Trientalis borealis</i> ssp. <i>latifolia</i>	Broad-leaved Starflower	
<i>Trifolium repens</i>	White Clover	pit area
<i>Urtica dioica</i>	Stinging Nettle	
<i>Veronica beccabunga</i> var. <i>americana</i>	American Speedwell	swamp
<i>Viola palustris</i>	Marsh Violet	swamp
<i>Glyceria</i> sp.	manna grass	
<i>Phalaris arundinacea</i>	Reed Canarygrass	swamp
<i>Typha latifolia</i>	Common Cattail	pit wetlands
<i>Athyrium filix-femina</i>	Lady Fern	
<i>Blechnum spicant</i>	Deer Fern	
<i>Dryopteris expansa</i>	Spiny Wood Fern	
<i>Gymnocarpium dryopteris</i>	Oak Fern	
<i>Polypodium glycyrrhize</i>	Licorice Fern	
<i>Polystichum munitum</i>	Sword Fern	
<i>Pteridium aquilinum</i>	Bracken Fern	
Mosses		
<i>Brachythecium rutabulum</i>		W1
<i>Buckiella undulata</i>		
<i>Claopodium crispifolium</i>		
<i>Eurhynchium oreganum</i>		

Scientific Name	English Name	Notes
<i>Eurhynchium praelonga</i>		Lot 14, 15
<i>Hookeria lucens</i>		Lot 14, 15
<i>Hylocomium splendens</i>		
<i>Isoetecium stolonifera</i>		
<i>Rhytidiadelphus loreus</i>		
<i>Rhytidiadelphus triquetrus</i>		
Liverworts		
<i>Cephalozia divaricata</i>		on Western Redcedar log, W1
<i>Chiloscyphus polyanthos</i>		Lot 15
<i>Pellia neesiana</i>		W2, mud
<i>Riccardia multifida</i>		Lot 14, decaying log, mud

Animals

Mammals

<i>Canis latrans</i>	Coyote	scat on a trail
<i>Procyon lotor</i>	Raccoon	claw marks on a Western Redcedar
<i>Felis concolor</i>	Cougar	claw marks on Western Redcedar
<i>Scapanus orarius</i>	Coast Mole	
<i>Neurotrichus gibbsii</i>	American Shrew Mole	one seen beneath refuse and burrows seen on trail, west forest
<i>Tamiasciurus douglasii</i>	Douglas's Squirrel	

Birds

<i>Accipiter cooperii</i>	Cooper's Hawk	lost feathers
<i>Buteo jamaicensis</i>	Red-tailed Hawk	lost feather
<i>Patagioenas fasciata</i>	Band-tailed Pigeon	small breast feathers seen
<i>Bubo virginianus</i>	Great-horned Owl	lost feathers beneath cedar trees
<i>Troglodytes pacificus</i>	Pacific Wren	nest in Western Hemlock branch
<i>Sphyrapicus ruber</i>	Red-breasted Sapsucker	sap wells in Western Hemlocks, Western Redcedars and Sitka Spruce
<i>Picoides pubescens</i>	Downy Woodpecker	lost wing feather
<i>Colaptes auratus</i>	Northern Flicker	
<i>Cyanocitta stelleri</i>	Steller's Jay	lost wing feather
<i>Corvus corax</i>	Common Raven	heard in area (1)
<i>Catharus ustulatus</i>	Swainson's Thrush	nests seen in forest shrubs
<i>Turdus migratorius</i>	American Robin	heard in area (4)
<i>Sturnus vulgaris</i>	European Starling	lost feathers from young birds
<i>Junco hyemalis</i>	Dark-eyed Junco	lost tail feathers

Amphibians

<i>Pseudoacris regilla</i>	Northern Pacific Treefrog	wetland in pit
<i>Rana aurora</i>	Red-legged Frog	possible tadpoles in wetland in pit
<i>Lithobates catesbeianus</i>	American Bullfrog	wetland in pit

Insects

<i>Nepytia canosaria</i>	False Hemlock Looper	moth
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