

OCT. 2002

IDENTIFICATION OF SENSITIVE
ECOSYSTEMS AT MALTBY LAKE
PROPERTY, DISTRICT OF
SAANICH, B.C.



ENKON

THIS COPY PROPERTY OF
S.W. (WOODY) THOMSON
250-479-7743

**IDENTIFICATION OF SENSITIVE
ECOSYSTEMS AT MALTBY LAKE
PROPERTY, DISTRICT OF
SAANICH, B.C.**

Prepared for:

① Mr. Michael Holmes

→ (all property owners)
② J.W. Thomson
③ V.E. Holmes
④ R.E. Curton

Prepared By:

ENKON ENVIRONMENTAL LIMITED

Suite 309 - 703 Broughton Street

Victoria, B.C. V8W 1E2

Telephone: (250) 480-7103

Fax: (250) 480-7141

enkon@enkon.com

Susan Blundell RPBio

Project No.: 1161-002

October 2002

Table of Contents

1	INTRODUCTION	1-1
1.1	Background.....	1-1
1.2	Previous Studies.....	1-1
2	ENVIRONMENTAL INVENTORY SURVEYS	2-1
2.1	Methods.....	2-1
2.1.1	General.....	2-1
2.1.2	Office Study.....	2-1
2.1.3	Field Surveys.....	2-2
2.2	Results.....	2-7
2.2.1	Rare Plants and Plant Communities.....	2-7
2.2.2	Bylaw Protected Trees.....	2-9
2.2.3	Birds.....	2-10
2.2.4	Amphibians.....	2-14
2.2.5	Reptiles.....	2-15
2.2.6	Small Mammals.....	2-15
2.2.7	Accounts of Red, Blue and Yellow-listed Species.....	2-17
3	DEVELOPMENT REGULATIONS	3-1
3.1	Federal Regulations.....	3-1
3.1.1	Migratory Bird Act.....	3-1
3.1.2	Fisheries Act.....	3-1
3.2	Provincial Regulations.....	3-2
3.2.1	Activities In or About a Stream.....	3-2
3.2.2	Streamside Protection Regulation.....	3-3
3.2.3	Protection of Active Nests.....	3-3
3.2.4	Protection of Sensitive Ecosystems.....	3-4
3.3	Municipal Regulations.....	3-4
3.3.1	Environmentally Significant Areas Atlas.....	3-4
3.3.2	Removal of Soil Bylaw.....	3-4
3.3.3	Tree Protection Bylaw.....	3-5
3.3.4	Development Permit Area #24.....	3-6
4	RECOMMENDATIONS AND CONCLUSIONS	4-1
5	REFERENCES CITED OR REVIEWED	5-1

List of Tables

Table 1	Birds observed or heard during the June 13 th , 2002, breeding bird survey
Table 2	Number of species at each point count

List of Figures

Figure 1	Site Location
Figure 2	Sensitive Ecosystems
Figure 3	Rare Plant Survey
Figure 4	Bylaw Protected Trees
Figure 5	Point Counts, Transects and Bird Nests
Figure 6	Minnow Trapping
Figure 7	Small Mammal Trapping
Figure 8	Environmentally Sensitive Areas

Appendices

Appendix I	Conservation Data Centre Information
Appendix II	Rare Plant Survey
Appendix III	Photoplates

INTRODUCTION

1.1 Background

The owners of the Maltby Lake property (Figure 1) located in the District of Saanich, B.C. are considering subdividing the 168 acre (68 hectares) property into 10-acre (4.05 ha) parcels. Currently the property is divided into 5 lots. In August 2001, ENKON Environmental Ltd. (ENKON) completed an overview site assessment to determine the ecological features of the property, provide recommendations on a Bioinventory Terms of Reference and provide guidelines on the conditions of a subdivision if the District of Saanich were to approve a subdivision application. Following a review of the ENKON report (August 7, 2001) titled "Maltby Lake Property Environmental Overview" the owners of the Maltby Lake property requested that ENKON complete further work to identify environmentally sensitive areas on the property.

1.2 Previous Studies

ENKON Environmental Ltd. completed an overview survey in June 2001 which focused on vegetation communities and aquatic resources on the property.

Ongoing studies regarding herpetile populations of Maltby Lake by Ms. Pernema Price as part of her Masters of Science thesis at the University of Victoria.

Ms. Tanya Tripp completed play callback surveys on the property in the spring of 2002, focusing on western screech owls.

Students from the Camosun College Environmental Technology program have completed aquatic studies on Maltby Lake including water quality, benthic and zooplankton analysis

ENVIRONMENTAL INVENTORY SURVEYS

2.1 Methods

2.1.1 General

Environmentally sensitive areas on the Maltby Lake property were determined based on three criteria:

- The site meets the criteria of a Sensitive Ecosystem as outlined by the Ministry of Environment, Lands and Parks' (now Ministry of Water, Land and Air Protection) SEI classification;
- The site contains rare or endangered plant species or plant communities; or
- The site is wildlife habitat supporting rare vertebrate or invertebrate animal species (both aquatic and terrestrial).

2.1.2 Office Study

Prior to conducting a field investigation an office study was completed to compile available information on the Maltby Lake property. The following was reviewed:

- Aerial photographs;
- 1:20,000 scale Terrain Resource Inventory Mapping (TRIM);
- 1:20,000 scale Sensitive Ecosystem Inventory (SEI) Mapping.

ENKON reviewed existing vegetation, wildlife and aquatic resource information on Maltby Lake and the surrounding area. The information review included the following:

- vegetation plant communities/structural stage classification;
- aquatic resources (FISS database, Ministry of Water, Land and Air Protection fish and wildlife branch, and Fish Wizard);
- previous data and reports.

In addition, ENKON contacted the Ministry of Sustainable Resource Management's Conservation Data Centre to request an element occurrence report (EOR) which provides any records of rare vascular plant, plant community and rare vertebrates in the study area.

Based on information collected during this study, ENKON completed preliminary mapping of environmentally sensitive areas. These areas were subsequently confirmed in the field. A short list of suspected rare or endangered wildlife

Environmental Inventory Surveys

species that have a potential of occurring on the site was compiled prior to the field program.

2.1.3 Field Surveys

The field program consisted of the following components:

- Rare plant survey (May 14 and 15, 2002)
- Tree survey (June 27, 2002)
- Nocturnal raptor survey (April 10 & 11, 2002)
- Diurnal Bird Nest Surveys (May 16, 2002)
- Herpetile survey (April 12 & June 21, 2002)
- Small mammal survey (June 21, 2002).

2.1.3.1 Rare Plant Survey

A rare plant survey was completed by Adolf and Oluna Ceska on May 14 and 15, 2002. ENKON's preliminary site assessment conducted in June 2001 indicated that there are areas on the property that have a high likelihood of rare plant and rare plant community occurrence; in particular, rock outcrops, dry deciduous woodlands and wetlands. The rare plant field assessment focused on these areas. A short list of rare plant communities known to occur in the region was consulted to determine the likelihood of these occurring on the site. Details of the survey are presented in Appendix II and survey points are presented in Figure 3.

2.1.3.2 Tree Survey

The Maltby Lake site was surveyed on June 27, 2002 to identify those trees considered to be bylaw protected by the District of Saanich. The District of Saanich Tree Bylaw states that a protected tree shall mean:

- All Garry oak, arbutus, Pacific dogwood and Pacific yew
- Douglas-fir or western redcedar having a DBH greater than 60 cm
- Any tree having a DBH greater than 80 cm.

Trees or close clusters of trees were recorded and their positions were marked using a GPS (Figure 4). Prior to the June 27th survey which concentrated on the area surrounding Maltby Lake and its adjoining wetland, stands of Garry oak and arbutus located throughout the property were recorded.

2.1.3.3 Wildlife Surveys

All wildlife surveys were conducted as much as possible according to Resource Inventory Committee (RIC) standards. The standards used included:

- *RIC's Standard Inventory Methodologies for Components of British Columbia's Biodiversity: Raptors (Version 1.1)*; Sections 3.3.4, and 3.3.6;
- *Inventory Methods for Small Mammals: Shrews, Voles, Mice & Rats Standards for Components of British Columbia's Biodiversity*, No. 31 (1998);
- *RIC's Inventory Methods for Pond-breeding Amphibians and Painted Turtle Standards for Components of British Columbia's Biodiversity* No. 37 (Version 2.0); and
- Section 2 "Conducting Wildlife Inventory" in *Species Inventory Fundamentals* (No.1).

2.1.3.3.1 Raptor and Passerine Nest Searches

Foot Transects

Foot (transect) surveys were performed along the lake margins and at locations along the perimeter of the study boundary (Figure 5). Searches were conducted to identify any new and/or old raptor and passerine nests and in order to verify use of the site by raptors, herons and passerines. Based on visual observations and calls heard, the occurrences of breeding or roosting raptors, heron nests and other nests on the property were classified as "present" or "not detected."¹

ENKON's wildlife biologist investigated the occurrence of raptor and other bird species nests on the property. Any significant cavity trees which may be potential roost sites were also checked for bird (owl) presence. Raptor evidence and site use was evaluated by using direct observation, faecal wash, prey remains or any other sign of raptors or herons that may inhabit the area.

Diurnal Call Playback Surveys (Hawk Surveys)

Methodology for the diurnal call playback surveys for raptors followed procedures outlined in "Standard Inventory Methodologies for Components of British Columbia's Biodiversity: Raptors (Version 2.0) Section 3.0".

Twelve point counts were set up throughout the study area along the road and trail system (Figure 12). All points were spaced approximately 250 - 300 m apart so that all areas within the study site would be surveyed. Counting involved a five minute survey at each stop, standing and watching the surrounding area and

¹ ENKON's not having observed nests would not rule out the possibility of one or more nests being present on the site.

recording the numbers and species of birds seen (visuals) and heard (calls) within a radius of approximately 250 m surrounding the point.

A diurnal raptor (hawk) call playback survey was conducted at each point count station. These surveys were conducted on foot, although transportation from station to station for some was by car. Based on the habitat of the study site calls of potentially occurring diurnal raptors were played. Only the potentially breeding red-tailed Hawk (*Buteo jamaicensis*), Cooper's hawk (*Accipiter cooperii*) and American kestrel (*Falco sparverius*) were played at all the stations for a duration of one minute. Following each broadcast, the observer looked and listened for one minute for visual and/or vocal response of the target species.

Nocturnal Call Playback Survey (Owl Survey)

Two owl call playback surveys were performed on the property. This methodology followed procedures outlined in "Standard Inventory Methodologies for Components of British Columbia's Biodiversity: Raptors (Version 2.0) Section 3.0".

Twelve point counts were set up throughout the study area along the roads and trail system (Figure 5). A lower number of point counts for nocturnal species was used because the calls broadcast during the surveys resonated very well throughout the entire study area in the night. Counting involved a ten minute survey at each stop where calls of potentially occurring nocturnal raptors were played. Following the calls the biologist stood and watched the surrounding area and recorded the numbers and species of birds seen (visuals) and heard (calls) surrounding the point.

The call playback surveys were conducted from the point count stations. These surveys were conducted on foot, although transportation between some stations was by car. Calls of five target nocturnal raptor species potentially occurring in the study area were played at all the stations. Each species call was broadcast for one minute. Following each broadcast, the observer looked and listened for one minute for visual and/or vocal response of the target species. Following the playbacks of the five calls, the observer used a flashlight to see if any perching birds were present in the immediate area surrounding the point count center.

Target species songs and calls used at each PC station were played in the following order:

- Northern Pygmy Owl,
- Northern Saw-whet Owl,
- Western Screech Owl,
- Barred Owl, and
- Great-horned Owl.

2.1.3.3.2 Herpetifauna

Searches were performed along Maltby Lake, stream margins and wet pool areas to locate herpetifauna² (reptiles and amphibians). The surveys primarily targeted watercourses.

Herpetifaunal survey methodologies included:

- Gee-trapping in wetland pools,
- Pitfall trapping,
- Time-constrained searches, and
- Systematic surveys.

The amphibian surveys focused on identifying the presence/not-detected status of any frogs or amphibians, but special focus was on the blue listed red-legged frog (*Rana aurora*). Although the red-legged frog and its habitat characteristics were the focus of the survey, all incidental amphibian sightings were recorded.

Time-constrained reptile surveys were performed during the afternoon, during optimal reptile activity. Based on the habitat present in the study area reptile searches focused on potentially occurring species. These included the following:

- sharp-tailed snake (*Contia tenuis*), red-listed,
- painted turtle (*Chrysemys picta*) blue-listed, *now red-listed - Coastal population*
- Northwestern garter snake (*Thamnophi ordinoides*),
- common garter snake (*Thamnophis sirtalis*), and
- Northern alligator lizard (*Elgaria coerulea*).

24 hour Gee trapping

Gee trapping involved placing minnow traps (Gee-traps) baited with cat food in pools located in Maltby Lake, streams and wetland pools on the property for a minimum of 24 hours (Figure 6). This is an effective way of capturing larval, neotenic³ and adult water loving salamanders.

Pitfall Trapping

Using pitfalls (upturned "coke" bottles with the bottle bottom cut off) and drift fences, traps were placed parallel to the wetland to intercept frogs and salamanders (Figure 7). The caps of the bottles were removed for drainage to prevent flooding and drowning of captured animals.

² Amphibians and Reptiles

³ Neotenic: Attaining reproductive maturity while in the larval state by delayed somatic development. The larva fails to metamorphose into an adult form, resulting in a permanent, sexually mature larva (neotene).

Salamanders and frogs forage along wetland margins, upon encountering the drift fencing they follow the fencing to the pitfall trap and fall in. Traps were checked every 24 hours to prevent mortality and stress.

Time-Constrained Searches

Time-constrained searches involved conducting reptile and amphibian surveys at specific times of the day (afternoon) when these herpetiles prefer to sun themselves. They were conducted on foot and by canoe. For amphibians the surveys were performed along all watercourses, lake and riparian edges and pooled/pounded water. The reptiles surveys were performed throughout the study areas in all vegetation units. For reptiles, the surveys focused on the rock outcrop areas where the reptiles prefer to bask in the sunshine.

Systematic Searches

Systematic searches for amphibians were conducted in conjunction with the stream surveys. Salamanders and frogs encountered in the mud bottom of a stream or pond often turn and swim out to deeper water or under a log if they detect the surveyor approaching (MELP 1997). Therefore, the systematic searches focused on looking for disturbances in the water created by swimming amphibians and looking in areas where amphibians tend to hide. The following survey methodologies were employed to find larvae of salamanders and/or the target red-legged frog:

- Randomly uncovering woody debris encountered during the top-of-bank surveys, and
- Examining lake and stream edges, ephemeral pools, and searching among aquatic vegetation and under logs and debris adjacent to streams.

2.1.3.3.3 Small Mammals

Pitfall and Sherman (live-traps) traps were randomly located in the target habitat throughout the property (Figure 7). Focus was on identifying the presence of the red-listed Vancouver Island water shrew (*Sorex palustris brooksi*). The following methodology was used during the survey:

- All traps were placed at strategic locations where the water shrew was expected to occur. These sites included positions along or under woody debris or rocks in forest habitat by fast flowing streams, along the fast flowing streams themselves and along worn small mammal travel trails associated with the stream habitat;
- Sherman live traps were placed near the pitfall traps;
- The traps were set in groups of two to three, with a minimum 15 m spacing between groups. Traps within groups were placed >2 m apart;

ENVIRONMENTAL INVENTORY SURVEYS

2.1 Methods

2.1.1 General

Environmentally sensitive areas on the Maltby Lake property were determined based on three criteria:

- The site meets the criteria of a Sensitive Ecosystem as outlined by the Ministry of Environment, Lands and Parks' (now Ministry of Water, Land and Air Protection) SEI classification;
- The site contains rare or endangered plant species or plant communities; or
- The site is wildlife habitat supporting rare vertebrate or invertebrate animal species (both aquatic and terrestrial).

2.1.2 Office Study

Prior to conducting a field investigation an office study was completed to compile available information on the Maltby Lake property. The following was reviewed:

- Aerial photographs;
- 1:20,000 scale Terrain Resource Inventory Mapping (TRIM);
- 1:20,000 scale Sensitive Ecosystem Inventory (SEI) Mapping.

ENKON reviewed existing vegetation, wildlife and aquatic resource information on Maltby Lake and the surrounding area. The information review included the following:

- vegetation plant communities/structural stage classification;
- aquatic resources (FISS database, Ministry of Water, Land and Air Protection fish and wildlife branch, and Fish Wizard);
- previous data and reports.

In addition, ENKON contacted the Ministry of Sustainable Resource Management's Conservation Data Centre to request an element occurrence report (EOR) which provides any records of rare vascular plant, plant community and rare vertebrates in the study area.

Based on information collected during this study, ENKON completed preliminary mapping of environmentally sensitive areas. These areas were subsequently confirmed in the field. A short list of suspected rare or endangered wildlife

species that have a potential of occurring on the site was compiled prior to the field program.

2.1.3 Field Surveys

The field program consisted of the following components:

- Rare plant survey (May 14 and 15, 2002)
- Tree survey (June 27, 2002)
- Nocturnal raptor survey (April 10 & 11, 2002)
- Diurnal Bird Nest Surveys (May 16, 2002)
- Herpetile survey (April 12 & June 21, 2002)
- Small mammal survey (June 21, 2002).

2.1.3.1 Rare Plant Survey

A rare plant survey was completed by Adolf and Oluna Ceska on May 14 and 15, 2002. ENKON's preliminary site assessment conducted in June 2001 indicated that there are areas on the property that have a high likelihood of rare plant and rare plant community occurrence; in particular, rock outcrops, dry deciduous woodlands and wetlands. The rare plant field assessment focused on these areas. A short list of rare plant communities known to occur in the region was consulted to determine the likelihood of these occurring on the site. Details of the survey are presented in Appendix II and survey points are presented in Figure 3.

2.1.3.2 Tree Survey

The Maltby Lake site was surveyed on June 27, 2002 to identify those trees considered to be bylaw protected by the District of Saanich. The District of Saanich Tree Bylaw states that a protected tree shall mean:

- All Garry oak, arbutus, Pacific dogwood and Pacific yew
- Douglas-fir or western redcedar having a DBH greater than 60 cm
- Any tree having a DBH greater than 80 cm.

Trees or close clusters of trees were recorded and their positions were marked using a GPS (Figure 4). Prior to the June 27th survey which concentrated on the area surrounding Maltby Lake and its adjoining wetland, stands of Garry oak and arbutus located throughout the property were recorded.

2.1.3.3 Wildlife Surveys

All wildlife surveys were conducted as much as possible according to Resource Inventory Committee (RIC) standards. The standards used included:

- *RIC's Standard Inventory Methodologies for Components of British Columbia's Biodiversity: Raptors (Version 1.1)*; Sections 3.3.4, and 3.3.6;
- *Inventory Methods for Small Mammals: Shrews, Voles, Mice & Rats Standards for Components of British Columbia's Biodiversity*, No. 31 (1998);
- *RIC's Inventory Methods for Pond-breeding Amphibians and Painted Turtle Standards for Components of British Columbia's Biodiversity* No. 37 (Version 2.0); and
- Section 2 "Conducting Wildlife Inventory" in *Species Inventory Fundamentals* (No.1).

2.1.3.3.1 Raptor and Passerine Nest Searches

Foot Transects

Foot (transect) surveys were performed along the lake margins and at locations along the perimeter of the study boundary (Figure 5). Searches were conducted to identify any new and/or old raptor and passerine nests and in order to verify use of the site by raptors, herons and passerines. Based on visual observations and calls heard, the occurrences of breeding or roosting raptors, heron nests and other nests on the property were classified as "present" or "not detected."¹

ENKON's wildlife biologist investigated the occurrence of raptor and other bird species nests on the property. Any significant cavity trees which may be potential roost sites were also checked for bird (owl) presence. Raptor evidence and site use was evaluated by using direct observation, faecal wash, prey remains or any other sign of raptors or herons that may inhabit the area.

Diurnal Call Playback Surveys (Hawk Surveys)

Methodology for the diurnal call playback surveys for raptors followed procedures outlined in "Standard Inventory Methodologies for Components of British Columbia's Biodiversity: Raptors (Version 2.0) Section 3.0".

Twelve point counts were set up throughout the study area along the road and trail system (Figure 12). All points were spaced approximately 250 - 300 m apart so that all areas within the study site would be surveyed. Counting involved a five minute survey at each stop, standing and watching the surrounding area and

¹ ENKON's not having observed nests would not rule out the possibility of one or more nests being present on the site.

recording the numbers and species of birds seen (visuals) and heard (calls) within a radius of approximately 250 m surrounding the point.

A diurnal raptor (hawk) call playback survey was conducted at each point count station. These surveys were conducted on foot, although transportation from station to station for some was by car. Based on the habitat of the study site calls of potentially occurring diurnal raptors were played. Only the potentially breeding red-tailed Hawk (*Buteo jamaicensis*), Cooper's hawk (*Accipiter cooperii*) and American kestrel (*Falco sparverius*) were played at all the stations for a duration of one minute. Following each broadcast, the observer looked and listened for one minute for visual and/or vocal response of the target species.

Nocturnal Call Playback Survey (Owl Survey)

Two owl call playback surveys were performed on the property. This methodology followed procedures outlined in "Standard Inventory Methodologies for Components of British Columbia's Biodiversity: Raptors (Version 2.0) Section 3.0".

Twelve point counts were set up throughout the study area along the roads and trail system (Figure 5). A lower number of point counts for nocturnal species was used because the calls broadcast during the surveys resonated very well throughout the entire study area in the night. Counting involved a ten minute survey at each stop where calls of potentially occurring nocturnal raptors were played. Following the calls the biologist stood and watched the surrounding area and recorded the numbers and species of birds seen (visuals) and heard (calls) surrounding the point.

The call playback surveys were conducted from the point count stations. These surveys were conducted on foot, although transportation between some stations was by car. Calls of five target nocturnal raptor species potentially occurring in the study area were played at all the stations. Each species call was broadcast for one minute. Following each broadcast, the observer looked and listened for one minute for visual and/or vocal response of the target species. Following the playbacks of the five calls, the observer used a flashlight to see if any perching birds were present in the immediate area surrounding the point count center.

Target species songs and calls used at each PC station were played in the following order:

- Northern Pygmy Owl,
- Northern Saw-whet Owl,
- Western Screech Owl,
- Barred Owl, and
- Great-horned Owl.

2.1.3.3.2 Herpetifauna

Searches were performed along Maltby Lake, stream margins and wet pool areas to locate herpetifauna² (reptiles and amphibians). The surveys primarily targeted watercourses.

Herpetifaunal survey methodologies included:

- Gee-trapping in wetland pools,
- Pitfall trapping,
- Time-constrained searches, and
- Systematic surveys.

The amphibian surveys focused on identifying the presence/not-detected status of any frogs or amphibians, but special focus was on the blue listed red-legged frog (*Rana aurora*). Although the red-legged frog and its habitat characteristics were the focus of the survey, all incidental amphibian sightings were recorded.

Time-constrained reptile surveys were performed during the afternoon, during optimal reptile activity. Based on the habitat present in the study area reptile searches focused on potentially occurring species. These included the following:

- sharp-tailed snake (*Contia tenuis*), red-listed,
- painted turtle (*Chrysemys picta*) blue-listed, *now red-listed-Coastal population*
- Northwestern garter snake (*Thamnophi ordinoides*),
- common garter snake (*Thamnophis sirtalis*), and
- Northern alligator lizard (*Elgaria coerulea*).

24 hour Gee trapping

Gee trapping involved placing minnow traps (Gee-traps) baited with cat food in pools located in Maltby Lake, streams and wetland pools on the property for a minimum of 24 hours (Figure 6). This is an effective way of capturing larval, neotenic³ and adult water loving salamanders.

Pitfall Trapping

Using pitfalls (upturned "coke" bottles with the bottle bottom cut off) and drift fences, traps were placed parallel to the wetland to intercept frogs and salamanders (Figure 7). The caps of the bottles were removed for drainage to prevent flooding and drowning of captured animals.

² Amphibians and Reptiles

³ Neotenic: Attaining reproductive maturity while in the larval state by delayed somatic development. The larva fails to metamorphose into an adult form, resulting in a permanent, sexually mature larva (neotene).

Salamanders and frogs forage along wetland margins, upon encountering the drift fencing they follow the fencing to the pitfall trap and fall in. Traps were checked every 24 hours to prevent mortality and stress.

Time-Constrained Searches

Time-constrained searches involved conducting reptile and amphibian surveys at specific times of the day (afternoon) when these herpetiles prefer to sun themselves. They were conducted on foot and by canoe. For amphibians the surveys were performed along all watercourses, lake and riparian edges and pooled/ponded water. The reptiles surveys were performed throughout the study areas in all vegetation units. For reptiles, the surveys focused on the rock outcrop areas where the reptiles prefer to bask in the sunshine.

Systematic Searches

Systematic searches for amphibians were conducted in conjunction with the stream surveys. Salamanders and frogs encountered in the mud bottom of a stream or pond often turn and swim out to deeper water or under a log if they detect the surveyor approaching (MELP 1997). Therefore, the systematic searches focused on looking for disturbances in the water created by swimming amphibians and looking in areas where amphibians tend to hide. The following survey methodologies were employed to find larvae of salamanders and/or the target red-legged frog:

- Randomly uncovering woody debris encountered during the top-of-bank surveys, and
- Examining lake and stream edges, ephemeral pools, and searching among aquatic vegetation and under logs and debris adjacent to streams.

2.1.3.3.3 Small Mammals

Pitfall and Sherman (live-traps) traps were randomly located in the target habitat throughout the property (Figure 7). Focus was on identifying the presence of the red-listed Vancouver Island water shrew (*Sorex palustris brooksi*). The following methodology was used during the survey:

- All traps were placed at strategic locations where the water shrew was expected to occur. These sites included positions along or under woody debris or rocks in forest habitat by fast flowing streams, along the fast flowing streams themselves and along worn small mammal travel trails associated with the stream habitat;
- Sherman live traps were placed near the pitfall traps;
- The traps were set in groups of two to three, with a minimum 15 m spacing between groups. Traps within groups were placed >2 m apart;

- Each Sherman trap was baited with peanut butter and rolled oats, and the pitfall traps were baited with rolled oats, peanut butter and cotton placed in the bottom for bedding material;
- The GPS coordinates of all trap locations were recorded, and the locations of trap groupings were marked with flagging tape;
- The traps were set during daytime and checked the following day (after ~24 hours) to minimise mortalities and trap stress;
- On completion of the study all flagging tape, markers, traps and other debris were removed from the site.

Seven pitfall traps and twenty-four Sherman traps were placed on the property

2.1.3.3.4 Large Mammals

Large mammal presence/not-detected surveys were conducted during all field activities and results were recorded as incidental observations. The presence/not-detected status of large mammals was based on the following:

- Scat sign,
- Track sign,
- Forage/browse sign,
- Scrapings, and
- Direct field observation.

2.2 Results

2.2.1 Rare Plants and Plant Communities

Rare vascular plants occurring within the South Island Forest District listed by the Conservation Data Center (CDC) are shown in Appendix Ia. As of October 2002, 157 plant species were present on the CDC list, including 76 red-listed species and 81 blue-listed species.

Rare and endangered vascular plant species are listed by the Conservation Data Center (CDC), which categorizes them as either red-listed or blue-listed. Red-listed species include species that are extirpated in British Columbia, in danger of becoming extirpated, or threatened. Blue-listed species are species that are sensitive or vulnerable to human activity or habitat encroachment. The CDC compiled a rare element occurrence report (EOR) for the project site. The EOR report outlines those species of red and blue-listed vascular plants, vertebrate animals and plant communities that have been documented in the area.

In response to an EOR request made on October 10, 2002, the Conservation Data Centre indicated that there have been no reported occurrences of rare species or plant communities on the Maltby Lake property (Appendix Ia). However, the EOR report (Appendix Id) does indicate that there have been two records of slender woolly-head (*Psilocarphus tenellus* var. *tenellus*), a blue-listed species occurring in the area:

- Adjacent to Prospect Lake Road at the powerline crossing, on compacted sand and gravel (500 m to the southeast of Maltby Lake), in 2001.
- At the powerline corridor, north of Francis King Park (approximately 700 m to the south of Maltby Lake), on gravel, in 2001.

During the rare plant site survey, the following rare vascular plants were found:

- California willowherb, *Epilobium foliosum*: on rock outcrops above the lake (blue-listed).
- Humped bladderwort, *Utricularia gibba*: in water of the lake (blue-listed).

In addition, the rare fungi, *Amanita aprica*, was found along the trail on east side of lake.

The CDC reports the occurrence of 18 rare and endangered plant communities in the South Island District within the CDFmm of which 14 are red-listed and 4 are blue-listed (Appendix Ib).

Consultation with Jan Kirkby of the Conservation Data Centre indicates that there are rare plant communities on the Maltby Lake property (Figure 3). Although the current CDC list of rare plant communities specifies only mature plant communities (structural stages 6 and 7) Ms. Kirkby stated that the revised list will not be specific to these older communities. Therefore, the following rare plant communities are known to be present on the site:

- Red alder / skunk cabbage, CDFmm/11 – blue-listed;
- Douglas-fir / salal, CDFmm/01 – red-listed;
- Garry oak - arbutus, CDFmm/00 – red-listed;
- Garry oak / California brome, CDFmm/00 – red-listed; and,
- Garry oak / oceanspray, CDFmm/0 –red-listed.

According to the Sensitive Ecosystem Inventory maps from the Ministry of Environment, Lands and Parks (MELP) there is one sensitive ecosystem polygon, occurring on the property (Figure 2). Polygon C0434, a wetland polygon encompasses the swamp and shallow water wetland located to the north of Maltby Lake. In addition to the polygon identified by the SEI surveys, ENKON observed two wetland, eight woodland and one riparian ecosystem that meet the SEI criteria as sensitive ecosystems (Figure 8).

Wetlands ecosystems can consist of swamps, fens, bogs, meadows or shallow open water. Swamps are vegetated by flood-tolerant trees such as Pacific crabapple, Sitka willow and Pacific willow. Shallow water wetlands feature submerged and floating plants such as yellow pond-lily, common duckweed, verticillate milfoil, common bladderwort, bur-reed and Canadian waterweed. Fens develop on continuously wet peaty soils; they are fed by water enriched with minerals from upslope drainage. Wet meadows consist of flood-tolerant grasses, low sedges and rushes. Many wetlands include a mosaic of these different wetland types.

Terrestrial herbaceous ecosystems are defined as natural grasslands or byrophyte-dominated vegetation, including rock outcrop/grassland and rock outcrop/moss types, having greater than 20% cover.

Woodlands can consist of Garry oak woodlands, arbutus/Douglas-fir woodlands or trembling aspen stands.

Riparian ecosystems are found on the margins of rivers, streams, lakes and marshes as well as the floodplains of large rivers and small streams and in gullies.

2.2.2 Bylaw Protected Trees

As stated in Section 2.1.3.2 the District of Saanich Tree Bylaw considers the following as protected trees:

- All Garry oak, arbutus, Pacific dogwood and Pacific yew,
- Douglas-fir or western redcedar having a DBH greater than 60 cm,
- Any tree having a DBH greater than 80 cm.

There are small pockets of Garry oak and arbutus located throughout the property on dry rock outcrops as shown in Figure 8 as “Rocky Outcrop/Garry oak” areas.

There are four Pacific yew located on the property within the riparian zone of Maltby Lake.

There are numerous large diameter (greater than 60 cm) Douglas-fir located around the perimeter of Maltby Lake (Figure 4). There is also a large cluster of mature western redcedar located within the floodplain of Maltby Lake near the inlet of an ephemeral watercourse at the north end of the lake.

Two large diameter black cottonwoods (greater than 90 cm) are also present on the property, located to the east of Maltby Lake.

2.2.3 Birds

2.2.3.1 Raptors

Diurnal Species (Hawk Surveys)

A breeding raptor and nest survey was performed on April 10 and 11, 2002 through the property along the existing trail system. Point Counts were set up such that the raptor calls could be played throughout the property and all areas would be covered (Figure 5).

No red or blue-listed raptor species listed in the Southern Vancouver Island Forest District Rare Vertebrate Tracking List were recorded during any of the field surveys or field visits. The only raptor recorded for the property was one red-tailed hawk, which has a nest immediately along the shore of Maltby Lake in a large Douglas fir. It was seen many times during the fieldwork (Figure 5). No other diurnal raptor nests were found on the property.

Forest-dwelling diurnal raptors that may use the study area for foraging include the Cooper's Hawk, Merlin and Sharp-shinned hawk. Diurnal raptors such as the Cooper's hawk, Sharp-shinned hawk and Northern Goshawk would likely occur on the site as they are dependent on the thicker forest areas with open understoreys, which are found throughout. However, due to their habitat requirements, it is unlikely that these diurnal raptors, except the Cooper's Hawk, would nest on the property.

The possibility of a Cooper's Hawk occurring on the property is high due to the habitat structure of the study site. Likely areas of occurrence are in the older growth forests surrounding Maltby Lake in area associated with stream habitat and water. High bird abundance areas, around Point Counts 1 and 2 are good foraging areas for this raptor.

In personal conversations with Andy Stewart (Wildlife Biologist, MWLAP, Victoria) on Southern Vancouver Island the Cooper's Hawk prefers nesting and foraging in the woods of all forest ages and urban areas. Nests have been observed in tree heights of 3 - 40 m of pole sapling and mature forest stages. Territories have been observed to be from 10 ha in size and larger. This hawk is very opportunistic as well as quite tolerable to urban encroachment and presence. Food preference on the island has been observed to be primarily American robins and European starlings taken along forest edges (100 m from edge). Territories have been separated approximately 1,000 m apart of one another with densities at one nest every 3 km.

Nocturnal Species (Owl Surveys)

Nocturnal raptors, like the great-horned owl, the Northern saw whet-owl, Western screech-owl and the Northern pygmy-owl, prefer closed forest communities with

riparian areas for nesting. These areas also provide opportunities to forage for small mammals. All riparian habitat areas on the study site may be considered high value for foraging and roosting for these species. Additionally, the rodents in the area (i.e. red squirrels, deer mice and shrews) provide an abundant source of food for these species.

The most significant value of the site for raptors is its potential to provide food, roosting and nesting habitat. Many of the trees are large with heart rot and thus provide good cavity roost sites for small raptors like the Northern Saw Whet-owl, Western screech-owl and the Northern pygmy-owl.

The nocturnal raptor survey was conducted from the point counts on the night of May 10, 2002 along the south of the study site from 2100 to 2330 h and on May 16th, 2002 from 2055 to 0020 h. Conditions for broadcasting were excellent on both nights, with no wind and starry skies.

A great-horned owl nest was discovered by ENKON on the night of April 10, 2002 (Figure 5). It was successful in hatching and fledging three young during the 2002 season. The parents responded to the calls numerous times and in subsequent breeding bird surveys were located around the nest with young. Additionally, on the evening of April 10 and 11, 2002 a barred owl replied to the survey call playbacks. An individual is assumed to breed off the property along the north section of the site and was sited several times during daylight hours to the northwest of Maltby Lake.

On Vancouver Island owls begin breeding by mid-March and the survey was conducted during the peak of nesting season for the target species. No other owls were recorded during any of the surveys.

2.2.3.2 Passerine and Passerine Like Birds

Field surveys identified nine (9) active and three (3) inactive (old) passerine nests on the property (Figure 5). These consisted of:

- Three active dark-eyed junco (*Junco hyemalis*) nests - along a rock outcrop with one young;
- Two American robin (*Turdus migratorius*) nests - all with 2-3 young;
- An active willow flycatcher (*Empidonax trallii*) nest - by point count 7 with two eggs on the bark of a large Douglas fir tree; and
- Two old thrush nests, either from the existing year or the previous year.

A total of forty (40) bird species were observed and/or heard as incidental sightings (Table 1) and all forty are potential breeders on the site. No red or blue-listed bird species listed in the Southern Vancouver Island Forest District's Rare Vertebrate Tracking List (Appendix Ic) were observed or heard during the June 21st, 2002 survey period.

Table 1 Birds Observed or Heard during the June 13th, 2002 Breeding Bird Survey

Common Name	Latin Name	Potential Breeders
American Goldfinch	<i>Carduelis tristis</i>	X
*American Robin	<i>Turdus migratorius</i>	X
Bewick's Wren	<i>Thryomanes bewickii</i>	X
Brown Creeper	<i>Certhia americana</i>	X
Brown-headed Cowbird	<i>Molothrus ater</i>	X
California Quail	<i>Callipepla californica</i>	X
Chestnut-backed Chickadee	<i>Poecile rufescens</i>	X
Cassin's Vireo	<i>Vireo cassinii</i>	X
Common Raven	<i>Corvus corax</i>	X
*Dark-eyed Junco	<i>Junco hyemalis</i>	X
Downy Woodpecker	<i>Picoides pubescens</i>	X
European Starling	<i>Sturnus vulgaris</i>	X
House Finch	<i>Carpodacus mexicanus</i>	X
Hutton's Vireo	<i>Vireo huttoni</i>	X
McGillivray's Warbler	<i>Oporornis tolmiei</i>	
Nashville Warbler	<i>Vermivora ruficapilla</i>	X
Northern Flicker	<i>Colaptes auratus</i>	X
Northwestern Crow	<i>Corvus caurinus</i>	X
Orange-crowned Warbler	<i>Vermivora celata</i>	X
Pacific-slope Flycatcher	<i>Empidonax difficilis</i>	X
Pileated Woodpecker	<i>Dryocopus pileatus</i>	X
Pine Siskin	<i>Carduelis pinus</i>	X
Purple Finch	<i>Carpodacus purpureus</i>	X
*Red-breasted Nuthatch	<i>Sitta canadensis</i>	X
*Red-breasted Sapsucker	<i>Sphyrapicus ruber</i>	X
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	X
Rufous Hummingbird	<i>Selasphorus rufus</i>	X
Song Sparrow	<i>Melospiza melodia</i>	X
Spotted Towhee	<i>Pipilo maculatus</i>	X
Steller's Jay	<i>Cyanocitta stelleri</i>	X
Swainson's Thrush	<i>Catharus ustulatus</i>	X
Townsend's Warbler	<i>Dendroica townsendi</i>	X
Turkey Vulture	<i>Cathartes aura</i>	-
Violet-green Swallow	<i>Tachycineta thalassina</i>	X
Warbling Vireo	<i>Vireo gilvus</i>	X
Western Tanager	<i>Piranga ludoviciana</i>	
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	X
Wilson's Warbler	<i>Wilsonia pusilla</i>	X
Winter Wren	<i>Troglodytes troglodytes</i>	X
Yellow-rumped Warbler	<i>Dendroica coronata</i>	X

*** Confirmed Actively Breeding - nest found or nesting activity observed

Species Diversity

The results of the bird survey show that Point Counts (PCs) 1, 3 and 4 had the highest species diversity (Table 2). This was likely due to the diversity of vegetation and edge habitat very characteristic of cleared forest areas. Vegetation diversity creates a diversity of habitat thus allowing opportunistic nesters like the invasive species European Starling, the American Robin and Black-capped Chickadee to nest. These three were the most abundant species at each of the survey stations.

The lowest bird species diversity was observed at PCs 8, 9 and 12 (Table 2). The low diversity was likely due to the deeper forest environment and lack of vegetative diversity. Dense mature forest habitat likely restricts use by many opportunistic species and favours forest specialists like the Townsend's warbler and Swainson's thrush.

Table 2 Number of Species at Each Point Count

Point Count	Number of Species
1	52
2	37
3	41
4	47
5	36
6	33
7	36
8	31
9	32
10	33
11	35
12	32

Potential Nesters

Table 1 presents all the species encountered during surveys. At the time of year of the bird survey a vast majority of the birds were nesting and active nesters display and protect territories. Many of the birds which were recorded around each point count nest approximately 200 m around each, therefore we may assume that the birds recorded at each point count may be actively nesting in close proximity. If this is so, then the results indicate that Point Counts 1, 3 and 4 had the greatest diversity of species nesting around them. This is likely because it has the most diverse vegetation consisting of shrub, pole/sapling and mature forest stands. This habitat structure allows for multi-species nesting. Similar high density areas for passerine nesting may be found in the south of the lake where structural diversity of vegetation is high. Point Counts 6, 8 and 9 had the least diversity possibly due to its mature forest habitat. This provides nesting to specific species (i.e. Townsend's warbler and the winter wren). Similar areas of potential low bird diversity may include areas along the west and north where denser vegetation, sometimes homogeneous in composition, reduces the species abundance.

2.2.4 Amphibians

Three species of amphibian were observed during the April 12, 2002 and June 21, 2002 surveys periods but only the rough-skinned newt was caught in the minnow traps. Results of the minnow trapping are as follows:

- Two rough-skinned newts in Trap 16 and two in Trap 17; and
- Two rough-skinned newts in Trap 2 and one in Trap 4.

Both the April and June survey searches also produced Pacific tree frogs (*Hyla regilla*) and numerous bullfrogs (*Rana catesbiana*) from around the perimeter of the lake.

The blue-listed red-legged frog was not encountered during any of the field visits but it has been recorded as a breeder along the edges of the lake and wetland. Using hydrophone⁴ surveys of breeding American bullfrogs, Ms. Pernima Price from the University of Victoria has positively identified the submergent water calls of the red-legged frog along the edges of Maltby Lake.

Favoured habitats for amphibians on the study site include Maltby Lake, the mature forest zones adjacent to riparian areas in proximity to pools and stream margins. Here extensive coarse woody debris and wet areas are the most likely sites to encounter amphibians.

⁴ Under water microphone

2.2.5 Reptiles

Historical information review and field surveys did not identify any red or blue-listed reptiles on the study site. Species potentially occurring in the area include the Western terrestrial garter snake (*Thamnophis elegans*), Northwestern garter snake (*Thamnophis ordinoides*), common garter snake (*Thamnophis sirtalis*) and northern alligator lizard (*Elgaria coerulea*). Where rock outcrops occur (Figure 5) reptiles may bask in sunshine during daytime hours and these locations may also contain significant overwintering sites. Adjacent forest environments to these areas can be used as foraging and shelter habitat. The best habitat for reptiles on the property may be considered as wet pool areas with associated rock outcrops and stream margins and/or along the riparian areas surrounding these locations.

2.2.6 Small Mammals

Signs of three larger mammals were found throughout the study area in numerous locations. These include the black-tailed deer (*Odocoileus hemionus*) (tracks and foraging), Eastern cottontail rabbit (*Sylvilagus floridanus*) (scat and forage), and the red squirrel (*Tamiasciurus hudsonicus*) (forage). All were recorded during each survey. Other mammals that have a potential to occur in the study area but only as transients include the raccoon (*Procyon lotor*) and the cougar (*Felis concolor*).

Due to the habitat structure the three most abundant large mammals on the property may be the black-tailed deer, red squirrel and the Eastern cottontail rabbit. The wetland areas (ESA's X and X) are important for the American mink and the open waterbodies like Maltby Lake are important foraging and denning habitat for river otter.

Black-tailed Deer

The winter diet of Black-tailed Deer consists of Douglas-fir, Western Red Cedar, trailing blackberry, red huckleberry, and salal. The summer diet is supplemented by a great variety of herbaceous plants. Many populations migrate to mountain tops and high valleys during the summer and back to lower ranges during the winter. Coniferous trees are essential for thermal cover during the winter. On Vancouver Island predators consist of cougar and wolves.

Black-tailed Deer sign was present throughout the entire site and many of the sightings were concentrated on the rock outcrop areas (Figure 8). Sign of browse were seen on salal, grasses, red huckleberry, and bracken fern throughout the study site but primarily around the trail areas associated with the lake. The deer use the study site through all four seasons because scat (summer and winter) sign were observed throughout and most extensively in the rock outcrop areas and around the trail, circumventing the lake. It is likely that the deer forage on the lush vegetation in the lower wetland areas and then move to the rock outcrops

Environmental Inventory Surveys

to rest and bask in sunshine to better digest the food. All rock outcrop areas are important for deer resting. Several deer tracks were found in this area. Additionally the forest areas associated with the riparian areas are important thermal and security habitat for deer.

Red Squirrel

This squirrel feeds heavily on pine and the Douglas-firs tree seeds in the area. In the fall it cuts green cones and buries them in damp earth. Other food includes nuts, seeds, birds' eggs, young birds and fungi. It makes a nest of leaves in a hollow or fallen tree, hole in the ground or tree crotch. Three to seven young are born in March or April and there is sometimes a second litter in August or September. The squirrel is a loud with a variety of calls to announce its home range or the presence of intruders. While no individual was observed or heard, Red Squirrel foraging signs were observed throughout each of the vegetation polygons. Foraging evidence was on forest floors adjacent to coarse woody debris and at the edges of the rock outcrop areas throughout the property as well as the riparian zones of the lake. This mammal uses all of the properties structural stages but prefers the mature forest areas of that are present along the north edge of Maltby Lake.

Eastern Cottontail Rabbit

This rabbit is introduced to British Columbia and has become very abundant throughout southern Vancouver Island. Cottontails eat a wide variety of plant materials. In spring and summer they usually feed on herbaceous plants such as succulent wild grasses. In winter, Cottontails may eat woody plants including willows, huckleberries, salmon berries and blackberries. It is a prolific breeder. Although females are capable of breeding during their first year, most have their first litters during their second summer. Litter sizes up to 10 have been reported, but typical litters number from 3 to 5 young, born after a gestation period of about 28 days. The rabbits construct their nests by digging a shallow depression in the ground and then lining it with grasses and other plants, along with fur plucked from the female's belly. Young Cottontails are blind at birth and their eyes remain closed until they are about a week old. Baby rabbits leave the nest and can survive on their own by the time they are 3 to 4 weeks old. Eastern Cottontails are most likely to be found in and around old, overgrown fields, brushy forest edges and other habitats with mixtures of herbaceous and shrubby plants. They can also be found living in close proximity to humans as long as there is adequate escape cover available.

Eastern Cottontail Rabbit scat signs were observed in thick shrub zones and at along the rock outcrop areas. No sign of rabbit use was seen in any of the forested areas. The shrubby areas are important to this mammal because they act as winter cover as well as provide cover from potential predators like the Barred, Great-horned Owl and Cougar which forage primarily on this species on the

property. The larger rock outcrop areas (Figure B) may provide good winter denning habitat.

American Mink

This is an aquatic member of the weasel family and is found throughout most of northern North America. Commercially it is a valuable fur-bearer. Large males as adults are bold, ferocious, and virtually untamable. The mink is a skillful hunter and preys on a wide variety of game including rodents, and rabbits, as well as fish, crayfish, and frogs. Its own principal enemies are the great horned owl, wolves, and coyotes in BC. A solitary, mainly nocturnal animal, the mink is active throughout the year on the property. Critical habitat for this fur bearer on the property is along the edges of the wetlands and immediate 30 metres riparian vegetation surrounding them.

River Otter

The river otter is resident throughout the year on the property. It is almost impervious to cold because of an outer coat of coarse guard hairs, plus a dense, thick undercoat that helps to "water-proof" the animal.

The diet of the river otter on the property may consist primarily of crayfish, frogs, and aquatic invertebrates, plus an occasional bird, rodent or rabbit. Because otters prey most easily on fish that are slow and lethargic, much of the diet consists of "rough" fish like sculpins and sticklebacks. The best location on the study area would be on Matson Lake due to the deeper water and good food supply although it may be found along the larger wetlands on the property foraging for terrestrial food in close proximity to water.

2.2.7 Accounts of Red, Blue and Yellow-listed Species

2.2.7.1 Species Rating Definitions

The COSEWIC and British Columbia's Red, Blue and Yellow rating status definition for each species identified are presented below. COSEWIC ratings for species have been defined the following ways:

Extinct - A species that no longer exists.

Extirpated - A species that no longer exists in the wild in Canada, but occurring elsewhere (for example, in captivity or in the wild in the United States).

Endangered - A species facing imminent extirpation or extinction.

Threatened - A species likely to become endangered if limiting factors are not reversed.

Vulnerable - A species of special concern because of characteristics that make it particularly sensitive to human activities or natural events.

Not At Risk - A species that has been evaluated and found to be not at risk.

Indeterminate - A species for which there is insufficient scientific information to support status designation.

Red, Blue and Yellow status as defined by the B.C. Conservation Data Centre's Red, Blue and Yellow definitions are as follows:

Red list

Includes any indigenous species or subspecies (taxa) considered to be Extirpated, Endangered, or Threatened in British Columbia. Extirpated taxa no longer exist in the wild in British Columbia, but do occur elsewhere. Endangered taxa are facing imminent extirpation or extinction. Threatened taxa are likely to become endangered if limiting factors are not reversed. Red-listed taxa include those that have been, or are being, evaluated for these designations.

Blue List

Includes any indigenous species or subspecies (taxa) considered to be Vulnerable in British Columbia. Vulnerable taxa are of special concern because of characteristics that make them particularly sensitive to human activities or natural events. Blue-listed taxa are at risk, but are not Extirpated, Endangered or Threatened.

Yellow list

Any indigenous species or subspecies (taxa) which is not at risk in British Columbia. The CDC tracks some Yellow listed taxa which are vulnerable during times of seasonal concentration (e.g. breeding colonies).

Species listed in BC Conservation Data Centre's Rare Vertebrate Animal Tracking List South Vancouver Island Forest District (July 2002) and their COSEWIC status are presented in a species evaluation below. Presented are only the "target species", potential animals occurring on the study area based on the study site characteristics and the animals habitat requirements. The target species have been selected by evaluating the habitat necessary to sustain the animal and comparing these requirements to the study areas attributes. Study area attributes have been taken a review of BEC zone, an evaluation of the study sites general vegetative structure, and the field surveys.

2.2.8 Documented Rare and Endangered Species

In response to an EOR request made on October 10, 2002, the Conservation Data Centre indicated that there have been no reported occurrences of rare vertebrate

occurring on the property. The EOR does indicate that American bittern, a blue-listed bird, was observed in Trevlac Pond, located to the east of the property in 1993. Although not observed during ENKON's surveys, the presence of the blue-listed red-legged frog was confirmed by Pemima Price. Conversations with Mr. Woody Thomson (resident) also confirm the historical occurrence of both the blue and green heron (blue-listed) and purple martin (red-listed) on the property. Maltby Lake supports a population of resident coastal cutthroat trout (*Oncorhynchus clarki clarki*) which are considered a blue-listed fish species.

In addition to rare vertebrates species the freshwater jellyfish, *Craspedacusta sowerbii*, has been observed in Maltby Lake. Currently, the CDC does not have a list of rare and endangered freshwater invertebrates, but consultation with Kelly Sendall, Royal B.C. Museum and Ken Lozoway, CDC indicates that occurrences of this species are regionally rare.

The following are accounts of the BC Conservation Data Centre: Vertebrate Animal Tracking List, Southern Vancouver Island Forest District (October 2002) potentially occurring red, blue and yellow-listed species on the study site. These species have been chosen based on the vegetation habitat present on the site and by the surveys conducted. Rare or threatened animal species listed by the Conservation Data Center are shown in Appendix Ic.

In addition to those species observed habitat on-site is suitable for some other rare or endangered species listed such as painted turtle, sharp-tailed snake and the Pacific water shrew. Many species listed as rare or threatened are inconspicuous and would only be observed during intensive surveys.

2.2.9 Species Profiles

Presented below is a short summary that describes the habitat requirements for each animal and it assesses the potential of it occurring on the study site.

2.2.9.1 Herpetifauna (Amphibians and Reptiles)

Red-legged Frog (*Rana aurora*), Blue-listed

This species has been designated as vulnerable by COSEWIC in BC and Blue listed by the CDC in the South Vancouver Island Forest District (July 2002).

This frog uses the property's ponds, wetlands and stream areas for all of its life requirements, breeding, foraging, shelter and as dispersal corridors between wetland areas adjacent to the property.

While lowland areas are the limiting/critical habitat areas for this frog, adult red-legged frogs also use the adjacent forested uplands for foraging as well as for dispersal from natal areas. These upland forested habitats are primarily used for living out its adult life.

“*Critical Habitat*”, defined as habitat which is necessary for this species to carry out its entire life process includes areas that support all of the following:

- suitable aquatic habitat;
- associated uplands, and
- suitable dispersal habitat connecting the suitable aquatic habitat.

Aquatic Habitat

At a minimum, this includes two (or more) suitable breeding locations, one of which must be a permanent water source, the associated upland surrounding the water body(s) (extending to approximately 150 m from the water’s edge), all within 1 km of each other and connected by barrier-free dispersal habitat (of at least 150 m in width)⁵. For this species suitable *aquatic* habitat on the property consists of the *permanent* water bodies along the south. They are virtually still and have slow-moving fresh water. For optimal growth of this species it requires a minimum water depth of 20 cm during the entire tadpole rearing season (at least March through July), and a dense, shrubby riparian vegetation, e.g. willow (*Salix spp.*) and bulrush (*Scirpus spp.*) species. The ponds along the south of the site provide these required habitats.

Upland Habitat

Suitable *upland* habitat for this frog consists of all upland areas (riparian or otherwise) within 150 m of the water’s edge, (but not further than the watershed boundary). This upland habitat is important in maintaining the integrity of the frog aquatic/breeding habitat.

Dispersal Habitat

For this frog’s *dispersal*, habitat consists of all upland and wetland habitat that connect two or more patches of suitable aquatic habitat within 2 km of one another. This is present at both the north and south end of the site. Dispersal habitat must be at least 150 m wide and free of barriers such as, heavily traveled roads (with more than approx. 30 cars per hour)⁶.

Painted Turtle (*Chrysemys picta*), Blue-listed

This species has been designated as vulnerable by COSEWIC in BC and Blue listed by the CDC in the South Vancouver Island Forest District (July 2002).

Potentially may occur in Maltby Lake and wetland habitats on the property. Primarily in areas with muddy bottoms, slow-moving water and emergent aquatic

⁵Center for Conservation Biology University of California Riverside, California Michael F. Allen Tracy Tennant November 2, 2000

⁶Center for Conservation Biology University of California Riverside, California Michael F. Allen Tracy Tennant November 2, 2000

vegetation (Green and Campbell 1996). The painted turtle is very common in such situations, often occurring at densities of 500 or more per hectare (Green and Campbell 1996). Movements of this turtle for several hundred metres on land are not uncommon. These are observed primarily on the spring and fall upon dispersal from local areas. They are quite hardy compared to other species and do not hibernate for as long as other species with which they co-exist.

The only habitat present for this species is found in Maltby Lake or in the large wetlands surrounding the lake to the east.

Sharptail Snake (*Conita tenuis*), Red-listed

This species has been designated as vulnerable by COSEWIC in BC and Red-listed by the CDC in the South Vancouver Island Forest District (July 2002).

The Sharptail snake is very illusive and rarely seen (Cook 1984). In British Columbia, several scattered records have been made from Vancouver Island and the Gulf Islands, in the Coastal Douglas-fir Biogeoclimatic Zone; one additional record made from McGillivray Lake, in the Engelmann Spruce-Subalpine Fir Biogeoclimatic Zone. Elsewhere, range extends from western Washington and Oregon south to central California.

Little is known about the Sharptail because of its secretive activity and it is primarily nocturnal. Sharp-tailed Snakes occur in a variety of habitats, however, they are most commonly found in moist environments with an abundance of surface debris, such as twigs, roots, and leaves. The Sharp-tailed Snake is found in areas with surface moisture and it becomes active during the cool fall and winter temperatures. Because of their preference for cooler temperatures and higher moisture levels, *C. tenuis* is active at different times and in different microhabitats than most snakes. This snake can be found mainly in wooded areas or near intermittent streams (Leviton 1971; Morey 1989; Basey 1976). The staple diet of the snake consists mainly of slugs (Cook 1960; Nussbaum *et al.* 1983; Spalding 1993).

Habitat on the study site for this snake is possible in several defined vegetation zones but sightings on the Island are very few. Green and Campbell 1996, describe the Sharptail as mostly known from North and South Pender Islands in the Gulf Islands, although two specimens were caught near Chase in the interior in 1964. One specimen collected in the 1800's has its locality noted as Vancouver Island and two more specimens have recently been found in Metchosin on Vancouver Island. It is not clear whether this distribution is due simply to the secretive nature of the snake and the resulting scarcity of recorded specimens or that the BC populations are relicts of a wider range in the past.

Due to the noted above it is likely not to occur on the study site.

2.2.2 Birds

Great Blue Heron (*Ardea herodias fannini*), Blue-listed

Only the pacific race (*A.h.fannini*) is considered vulnerable and at risk by COSEWIC. This race is not likely to occur on the project site. Because GBHE prefer to nest in colonies "heronries" it is not anticipated that they would occur, due to insufficient habitat; no breeding habitat present in the study site or adjacent to it. This species prefers large wetland areas to breed and forage in. It may occur as an incidental to the study site and historically has nested around the causeway. If at all, most likely as passing by for forage in streams most likely during natal dispersal or during migration in spring and fall as an incidental sighting.

Green Heron (*Butorides virescens*), Blue-listed

This heron is not listed with COSEWIC as either rare, threatened or endangered but it is blue-listed in the South Vancouver Forest District.

The Green Heron occurs regularly along Vancouver Island from Victoria north to Campbell River and on the southern mainland from the Fraser River delta east to Hope (Campbell *et al.* 1990). It prefers aquatic habitats of either fresh or marine brackish water areas with good amounts of closed in shrubs or trees. It prefers ponds, rivers, lakes or sloughs but also uses marshes, sewage ponds, bays, irrigation ditches, beaches and golf courses for foraging. Preferred areas for breeding include lakes and sloughs (Campbell *et al.* 1990).

It occurs year round in the coastal areas of BC. Recorded records of breeding on southeastern Vancouver Island are from Victoria to Courtenay and Port Alberni. On the mainland it has been found nesting throughout the Fraser Lowlands east to Chilliwack. Nesting habitat is restricted to areas of dense willow and alder shrub along the shore. Campbell 1990 describes nest found in the coastal areas as being in dense alder and willow thickets. One nest account was recorded to be located in a Douglas Fir tree. All nests encountered in BC for this bird were made of sticks and twigs placed near the end of branches where nest height was approximately 3.8 to 9.1m above ground. Breeding for this species in BC has been recorded from May 24th to the 5th of July.

The perimeter of Maltby Lake around the causeway and the shrubby riparian areas along the west are the most likely habitats for this bird. It was not located during the breeding bird surveys performed in June.

Bald Eagle (*Haliaeetus leucocephalus*), Yellow-listed

The bald eagle is listed Yellow by the CDC in the South Vancouver Forest District (June 2000) and is not listed with COSEWIC.

The habitat in the study site is not suitable for breeding or foraging for this species. The bald eagle is primarily associated with aquatic habitats including estuaries, lakes, rivers, large sloughs, and marshes (Campbell *et. al.* 1990, Bennett and Palmer, 1988). Most nests of this species along the coast have been no further than 100 m from the shore of a large water body (Campbell *et. al.* 1990).

This species was not located on the property. Based on the overview assessments conducted it does not appear to be present because no individual or nest was identified either active or historically active. It has the potential to occur.

Northern Pygmy-Owl (*Glaucidium gnoma swarthi*), Blue-listed

This species has been designated as "not at risk" by COSEWIC in BC and is not listed as species of concern by the CDC in the Southern Vancouver Island Forest District.

The northern pygmy owl is an uncommon resident across the province of BC and most abundant across the northwest and southern part of the province. Resident populations are restricted to the southern portions of the province (Campbell *et. al.* 1990).

This owl occupies the edges of open coniferous forests or mixed woodlands of riparian thickets, damp and dry meadows, vacant city lots, parks, cemeteries and residential areas.

Primarily a cavity nester, historically, all nests discovered in BC have been in old woodpecker holes of coniferous trees including Douglas-fir, western hemlock, and western larch. It is possible to occur in the study area.

Lewis's Woodpecker (*Melanerpes lewis*), Blue-listed

This species has been designated by COSEWIC as vulnerable in BC and is considered blue-listed in the Southern Vancouver Island Forest District.

It has been identified in BC to occupy primarily IDFdk and IDFxh habitats. This species has a potential to occur along the riparian areas and it forages in open woodlands and riparian areas that provide sufficient visibility and space for effective fly catching. Nesting habitat consists of excavated cavities by other woodpeckers (i.e. Northern Flickers), but natural cavities are occasionally used (Campbell *et. al.* 1990). In a few places, Lewis' woodpeckers nest in loose aggregations. During winter it keeps feeding areas of up to six hectares and may be impacted by the proposed development. In winter, they roost in mature deciduous and coniferous trees and snags, similar to those used for nesting. Scanning perches are important year-round adjacent to riparian zones.

Favored habitat by this species can be found in areas of open regions of structural aged stands 3a: shrub stage. For foraging, 6-7: mature - old conifer stands (age

class 7-9), mature hardwoods, and finally, (age class 5-7), especially in low elevation riparian habitats.

It excavates cavities in large trees, primarily ponderosa pine and black cottonwood, with extensive heartrot (decaying centre). Optimal breeding habitats contain large snags (>30 cm dbh), open tree canopy (25% closure), and a shrub understorey (50% crown cover) that harbours abundant insect prey. In riparian areas the understorey component is not essential. Broken-topped or large limbed trees are used as hawking perches and live or dead trees with heartrot (Wild Tree class 2-6, dead internal decay, heartrot, loss of branches) are suitable nesting and roosting trees; however, softer snags (WT class 4-6) are preferred. (Biodiversity Guidelines, 1995).

This species has been historically located in the Victoria area in 1984 (Campbell *et. al.* 1990). Campbell *et. al.* 1990 also indicates that from 1920 to 1940 it was an abundant nester in the environs of southeast Vancouver Island where logging and forest fires had left an abundance of tall "snags" and standing trunks of giant Douglas fir, western redcedar and western hemlock. The decline in Gary oak communities likely caused a decline in this species (Campbell *et. al.* 1990). Additionally they state that the increase of European Starling (*Sturnus vulgaris*) has caused a decline in this species nesting due to the competition for nest habitat. This species is possible on the study site.

Band-tailed Pigeon (*Columba fasciata*), Blue-listed

The Band-tailed Pigeon is found in the forests or coastal woodlands of western British Columbia. They perch, nest and feed in coniferous trees such as pines as well as maples and alders. Unlike the common pigeon (Rock Dove) (*Columba livida*) which can be found in cities around the world, the Band-tailed Pigeon will avoid populated areas and any human contact. It prefers forest environments. This bird eats nuts, seeds, berries, blossoms and insects found in coastal woodland and forest habitat. When in season, it is also known to eat domestic crops such as cherries, berries, oats, barley and wheat. Breeding season begins in March and lasts through late spring. The female builds a flat, loose nest on the ground, in low brush, or in the fork of lower tree branches usually associated with stream habitat. Nesting materials are provided by the male and consist mainly of twigs and pine needles. One, egg sometimes, two eggs are laid per season with both male and female responsible for incubation. They hatch within 18 - 20 days, and chicks fledge 28 - 30 days after hatching.

Field searches failed to detect any evidence of the blue-listed band-tailed pigeon past or present nesting activity on the property, but the study site contains suitable breeding habitat.

2.2.9.3 Mammals

Vancouver Island Water Shrew (*Sorex palustris brooksi*), Red-listed

This species has been designated as threatened by COSEWIC in BC and Red listed by the CDC in the Southern Vancouver Island Forest District (July 2000).

The largest of the shrews in BC occupying only the southwestern part of the province, in the section of the Fraser and Delta (Nagorsen 1996). This small mammal is a habitat specialist and prefers moist riparian habitats with dense, moist coniferous forests, on beaches, and in marshes, in heavily wooded, wet areas, on the banks of sluggish streams, in beach debris, and during winter rainy season may be found well away from water (McComb *et al.* 1993). It is found primarily near estuaries, wetlands, lakes, streams, and in agricultural areas and riparian forests. In the south of North America along the west coast in Oregon, restricted to Skunk Cabbage Marsh and Riparian Alder/Small Stream habitats throughout most of the year (Nagorsen 1996). It is insectivorous with foods including soft-bodied arthropods and terrestrial and aquatic invertebrates; insect larvae, slugs and snails, Ephemeroptera naiads, earthworms and unidentified invertebrates, primarily aquatic (Pattie 1969, Whitaker and Maser 1976).

It has a potential of occurring on the study site along watercourses draining the property to Maltby Lake.

Short-tailed Weasel (Ermine) (*Mustela frenata anguinae*); Blue-listed

This species is Blue-listed by the CDC in the Chilliwack Forest District (July 2000) and is not listed in BC by COSEWIC.

The short-tailed weasel is found in many different biogeoclimatic zones in both B.C. and through a very wide circumpolar distribution in Europe, North Africa, Asia, northern North America, and northeastern Greenland. Ermines are most abundant in boreal, montane, and Pacific Coast coniferous forests. They avoid dense forests and settle in successional or forest-edge habitats, wet meadows, marshes, ditches, riparian woodlands, or river banks with high densities of small mammals. Ermine prefer early successional communities and avoid forested habitats. Elevations of habitat for the Ermine ranges from sea level to alpine tundra at about 10,000 ft. They often take over burrows of mice, chipmunks, ground squirrels, or pocket gophers. Not all Ermines live underground as some may build dens in hollow logs, under roots and buildings, abandoned farm machinery/structures. Their populations fluctuate greatly in areas, corresponding to the populations of their species of prey (mice, shrews, hares, porcupine, birds, fish, squirrels, etc). Ermines are usually nocturnal and primarily terrestrial; they can climb well and are very quick and agile on the ground. They are widely regarded as having insatiable curiosity and appetite for killing, with a great degree of boldness allowing them to haul down larger prey like cottontails and hares to even large resting birds like hawks. The breeding period for males ranges from about late February to August, females ovulate in the spring. Mating usually occurs in early summer, and the gestation period is about 10 months. One litter is born in mid April/early may.

Environmental Inventory Surveys

The weasel prefers small mammals like mice squirrels, hares, porcupines, birds, shrews, and even snakes and fish, as they are the main diet. They often store extra carcasses in the larders of their dens. Ermines likely have a variable dietary composition, changing with prey availability.

Mating takes place in the summer and there is a 10-month gestation period. Reproductive success is strongly influenced by food supplies prior to parturition. Dens are often underground in former burrows of other small mammals, but also in hollow logs, stumps, and under roots and abandoned structures.

The habitat present on the study site has the potential to sustain this species.

DEVELOPMENT REGULATIONS

3.1 Federal Regulations

3.1.1 Migratory Bird Act

During any time that construction is taking place the following federal laws apply to all nesting birds. Federal migratory bird protection under the Migratory Bird Act under Section 6 states that:

Subject to subsection 5(9), no person shall:

(a) disturb, destroy or take a nest, egg, nest shelter, eider duck shelter or duck box of a migratory bird, or

(b) have in his possession a live migratory bird, or a carcass, skin, nest or egg of a migratory bird except under authority of a permit therefore.

3.1.2 Fisheries Act

Sections 34 and 35 of the Federal Fisheries Act address the deposition of deleterious materials into fish habitat and the harmful alteration, disruption and destruction of fish habitat, respectively. Section 34 states:

34. (1) For the purposes of sections 35 to 43, "deleterious substance" means

(a) any substance that, if added to any water, would degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water, or

(b) any water that contains a substance in such quantity or concentration, or that has been so treated, processed or changed, by heat or other means, from a natural state that it would, if added to any other water, degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water,

and without limiting the generality of the foregoing includes

(c) any substance or class of substances prescribed pursuant to paragraph (2)(a),

(d) any water that contains any substance or class of substances in a quantity or concentration that is equal to or in excess of a quantity or concentration

Development Regulations

prescribed in respect of that substance or class of substances pursuant to paragraph (2)(b), and

or any water that has been subjected to a treatment, process or change prescribed pursuant to paragraph (2)(c);

"deposit" means any discharging, spraying, releasing, spilling, leaking, seeping, pouring, emitting, emptying, throwing, dumping or placing;

"fish habitat" means spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes;

"water frequented by fish" means Canadian fisheries waters.

(2) The Governor in Council may make regulations prescribing

(a) substances and classes of substances,

(b) quantities or concentrations of substances and classes of substances in water, and

(c) treatments, processes and changes of water for the purpose of paragraphs (c) to (e) of the definition "deleterious substance" in subsection (1). R.S., c. F-14, s. 31; R.S., c. 17(1st Supp.), ss. 2, 3; 1976-77, c. 35, ss. 5, 7.

Section 35 of the Fisheries Act states:

35. (1) No person shall carry on any work or undertaking that results in the harmful alteration, disruption or destruction of fish habitat.

(2) No person contravenes subsection (1) by causing the alteration, disruption or destruction of fish habitat by any means or under any conditions authorized by the Minister or under regulations made by the Governor in Council under this Act.

3.2 Provincial Regulations

3.2.1 Activities In or About a Stream

The Water Act is the chief provincial law controlling the use of fresh water. It regulates quantities of water through a licence system. This Act may be relevant for fish and near shore habitat protection if, for example, there is a proposal to withdraw water from a wetland or carry on activities in or around a stream.

The Water Act also provides authority for works or activities which will affect streams. Approvals are given for "changes in and about a stream" which includes any modification to the nature of a stream, including the land, vegetation, natural

environment, or flow of water within a stream or any activity or construction within the stream channel that has or may have an impact on the stream. The Comptroller of Water Rights or Regional Water Manager (or an engineer, in the case of changes in and about a stream) may place conditions on the approvals. Generally, standard conditions on approvals will reflect the concerns of the Water Management Branch for water quality implications, downstream flooding, and potential effects on the works of downstream licensees, as well as habitat and ecosystem concerns from provincial and federal fisheries and wildlife agencies.

Regulations under section 9 of the Act further define the standards for protection of water quality and habitat that apply to changes in and about a stream. The regulations define "habitat" and require people who are making changes in and about a stream to follow any terms and conditions that a habitat officer of the Ministry of Water, Land and Air Protection (MWLAP) may impose to protect habitat. These may include restrictions on the times of year that changes may be made, minimum instream flow requirements, restoration requirements and directions to obtain approvals from Department of Fisheries and Oceans.

3.2.2 Streamside Protection Regulation

The Streamside Protection Regulation, enacted under Section 12 of the Fish Protection Act in January 2001, calls on local governments to establish streamside protection and enhancement areas in residential, commercial and industrial zones and to identify these areas through their land use plans and regulations by the year 2006. The purpose of the Regulation is to provide protection for the features, functions and conditions that are vital in the natural maintenance of stream health and productivity.

Section 6 of the Streamside Protection Regulation indicates that a permanent, fish bearing watercourse having a channel width of less than 15 m should have a development setback of 30 m. This area should exclude buildings and structures on permanent foundations. The purpose of the regulation is to protect "streamside protection and enhancement areas" from residential, commercial and industrial development so that the areas can provide natural features, functions and conditions that support fish life processes.

3.2.3 Protection of Active Nests

Section 34 of the Wildlife Act is the only legislation able to provide protection for wildlife, primarily for eagles, herons, peregrine falcons, osprey, gyrfalcon or burrowing owls, their eggs and young while the nest is occupied and the nests at all times. Section 34 of the act states that for birds, nests and eggs a person commits an offence if the person, except as provided by regulation, possesses, takes, injures, molests or destroys:

A bird or its egg;

Development Regulations

The nest of an eagle, peregrine falcon, gyrfalcon, osprey, heron or burrowing owl;
or

The nest of a bird when the nest is occupied by a bird or its egg.

3.2.4 Protection of Sensitive Ecosystems

The Sensitive Ecosystems Inventory (SEI) project identifies remnants of rare and fragile terrestrial ecosystems and to encourage land-use decisions that will ensure the continued integrity of these ecosystems. It is intended for use in a variety of land-use planning processes.

The Ministry of Environment, Lands and Parks' (now MWLAP) Environmental Objectives, Best Practices and Requirements for Land Developments (2002) recommends that all wetlands and watercourses with riparian ecosystems should have a 30 meter buffer from the winter flood level or top of bank. Woodland and herbaceous terrestrial ecosystems should have a 15 m buffer.

3.3 Municipal Regulations

3.3.1 Environmentally Significant Areas Atlas

The District of Saanich's Environmental Services has an Environmentally Significant Areas Atlas, which indicates areas within the district that are considered to have significant ecological value. "Little Maltby Lake" and its associated wetland is considered to be an environmentally significant ecosystem and is mapped as such by the in the atlas. In addition, the District of Saanich indicates that the area surrounding Maltby Lake, which constitutes most of the property, consists of significant native vegetation.

3.3.2 Removal of Soil Bylaw

The Soil Removal bylaw states that:

2. No person shall remove or cause to be removed from any land within the municipality any soil until a permit for such removal is first had and obtained from the Engineer pursuant to the provisions of this by-law
3. No person shall be issued to authorize the removal of soil from:
 - a) Land designated as an Agricultural Land Reserve, or
 - b) Land designated as "Floodplain" pursuant to the deposit of fill bylaw

Development Regulations

Unless prior approval is first obtained from the Saanich Council and in the case of the Agricultural Land Reserved, the provisions of the Soil Conservation Act has been complied with.

According to the District of Saanich Planning Department maps the approximate floodplain boundaries for the Maltby Lake area is 55.87 m which encompasses all of Maltby Lake, the wetland to the north of the lake (Little Maltby Lake) and Bleathman Creek. No material can be removed from this area. In addition, no fill can be added to this area.

3.3.3 Tree Protection Bylaw

Bylaw No. 7362 regulates and prohibits the cutting of trees within the District of Saanich. A tree is defined as any living, erect, woody plant which is 5 m in height or greater, 10 cm or more in diameter or is considered a planted "replacement tree".

3.3.3.1 Protected Trees

A Protected Tree shall mean:

- i. A Garry oak tree,
- ii. An arbutus tree
- iii. A Pacific dogwood tree
- iv. A Pacific yew tree
- v. A Douglas-fir tree having a diameter greater than 60 cm
- vi. A western redcedar tree having a diameter greater than 60 cm
- vii. Any tree having a diameter greater than 80 cm

As indicated in Section 2.1.5 tree specimens of all of the above are present on the Maltby Lake site.

3.3.3.2 Urban Land

No person shall cut down a protected tree growing on urban land, with the exception of those:

- i. Growing on a building envelope of an urban lot less than 2000 m²
- ii. Growing on a reduced building envelope of an urban lot 2000 m² or larger if the removal of the tree is necessary for the purpose of constructing a building or addition to a building
- iii. Required for the installation of roads or services shown on an engineering drawing approved by District engineering services

Development Regulations

No person shall cut down a tree growing on any land designated as a Development Permit Area in the Saanich Official Community Plan prior to the issuance of a development permit.

No person shall cut down a tree shown as "to be retained" on a plan attached to a development permit.

The Maltby Lake property is located within Development Permit Area No. 24.

3.3.3.3 Streams and Floodplains

No person shall cut down a tree growing within 15 m of the natural boundary of a watercourse, except when a tree or the roots of a tree are blocking a watercourse or reducing its drainage capacity. No person shall cut down a tree growing on a floodplain.

This applies to all trees within a 15 m setback of Maltby Lake, Bleathman Creek and all other unnamed tributaries or the wetland, or an elevation of 55.87 m, which is the floodplain designation.

3.3.3.4 Steep Slope Areas

No person shall without first obtaining a development permit cut down more than two trees in any one calendar year growing on any parcel of land designated as a steep slope area as indicated in Schedule A. Stumps and roots cannot be removed from steep slope areas without specific written permission.

The Maltby Lake site is not within the Schedule A area.

3.3.3.5 Significant Trees

Significant Trees are identified in Schedule B of the Tree Protection Bylaw. These trees have been identified as such because of their importance to the community, including importance for heritage or landmark value or as wildlife habitat. No person shall cut down a significant tree designated under this bylaw.

There are no Significant Trees registered with the District of Saanich for the Maltby Lake property.

3.3.4 Development Permit Area #24

The Maltby Lake property lies within the Tod Creek Watershed and therefore must comply with all regulations under Development Permit #24. The development permit area applies to watercourse and their adjacent 30 m riparian areas. Should development be proposed within this area a Development Permit Application must be submitted to the District of Saanich. Development permits issued in these areas must be in accordance with the following:

Development Regulations

- No unnecessary site disturbance shall be permitted within the DPA. Existing vegetation shall be maintained in order to control erosion, protect bank stability protect habitat, perform natural hydrological function and retain the natural character of water features.
- Measure should be taken to ensure that site construction including buildings, structures and septic tanks or fields, do not negatively impact riparian vegetation, water quality or other watercourse features which generally requires a minimum 15 m buffer from the top of bank of a watercourse or a natural water boundary of major watercourses or lakes including Tod Creek, Meadowbrook Creek, Bleathman Creek, Prospect Lake, Killarney Lake and Maltby Lake, or 7.5 m for all other watercourses.
- Efforts should be made to avoid disturbing existing natural vegetation in riparian areas, and to restore damaged riparian areas with natural planting.
- The storage of prohibited waste (identified in Watercourse Bylaw) is prohibited
- Suitable vegetation indigenous to the District of Saanich may be required to be planted on the site
- Removal of gravel, sand, soil or peat from stream beds, lakes or wetlands and the draining dredging, infilling or dumping of material will be strictly limited
- Modification of channels, banks or shores that could cause environmental harm or significantly alter local hydrological conditions will not be permitted.
- Pollutants will be prevented from entering water features or wetland by requiring the control of surface water drainage
- Nutrient rich run-off water from residential, agricultural and commercial uses must not enter water features
- All new developments or modifications to existing developments shall be designed so that the development will cause no increase in run-off compared to existing conditions on the site
- Impervious cover with the DPA should be kept to a minimum

RECOMMENDATIONS AND CONCLUSIONS

When considering land development of the Maltby Lake property the following guidelines are recommended:

- Buffer zones of a minimum of 30 meters be placed around the wetland areas. This area should not be cleared or developed;
- Buffer zones of 15 to 30 meters be placed around the riparian zones of Maltby Lake, Bleathman Creek and unnamed tributaries of Maltby Lake. These areas should not be cleared or developed;
- Buffer zones of a minimum of 15 meters be placed around woodland and herbaceous terrestrial (Garry oak/rocky outcrops) areas. These areas should not be cleared or developed;
- A minimum naturally vegetated "no disturbance" buffer of 60 metres, measured as a radius from the base of nest trees should be maintained. This distance may be lessened slightly for shorter trees (1 ½ tree lengths), provided that wind firmness of the tree is not compromised through grading or other ground disturbance, that all vegetation within this zone is retained and that no structures or other property are located within the buffer.
- An additional noise and "no disturbance" buffer at least 100 metres in radius during the breeding season (January 30 – June 30) should be maintained to prevent disruption of brooding or abandonment of the clutch.
- No filling or excavation of soils below an elevation of 55.87 m, which encompasses Maltby Lake and the wetland to the north of the lake referred to as "Little Maltby Lake"

The most ecologically sensitive area on the site is Maltby Lake, the associated wetland (Little Maltby Lake) and Bleathman Creek (upstream and downstream of Maltby Lake). Within the recommended 30 m buffer zone of the Maltby Lake watershed are numerous bylaw protected trees, two raptor nests, a rare plant community and riparian and wetland sensitive ecosystems. Maltby Lake itself provides habitat for cutthroat trout (blue-listed), blue heron (blue-listed) and red-legged frog (blue-listed). It also supports a population of freshwater jellyfish which have been documented in only a few lakes on Vancouver Island and are considered rare.

In addition, there are several rock outcrops located at higher elevations around Maltby Lake. Many of these qualify as sensitive ecosystems and contain rare plants and rare plant communities.

Recommendations and Conclusions

Based on the ecological site conditions and the existing federal, provincial and municipal regulations the most suitable areas for land development are those areas that have been previously logged.

As part of the Subdivision Approval Process the District of Saanich will require the completion of an Environmental and Social Review (ESR), which should consist of an environmental inventory, a concept plan, an impact assessment and proposed protection and mitigation strategies to minimize impacts to the surrounding environment.

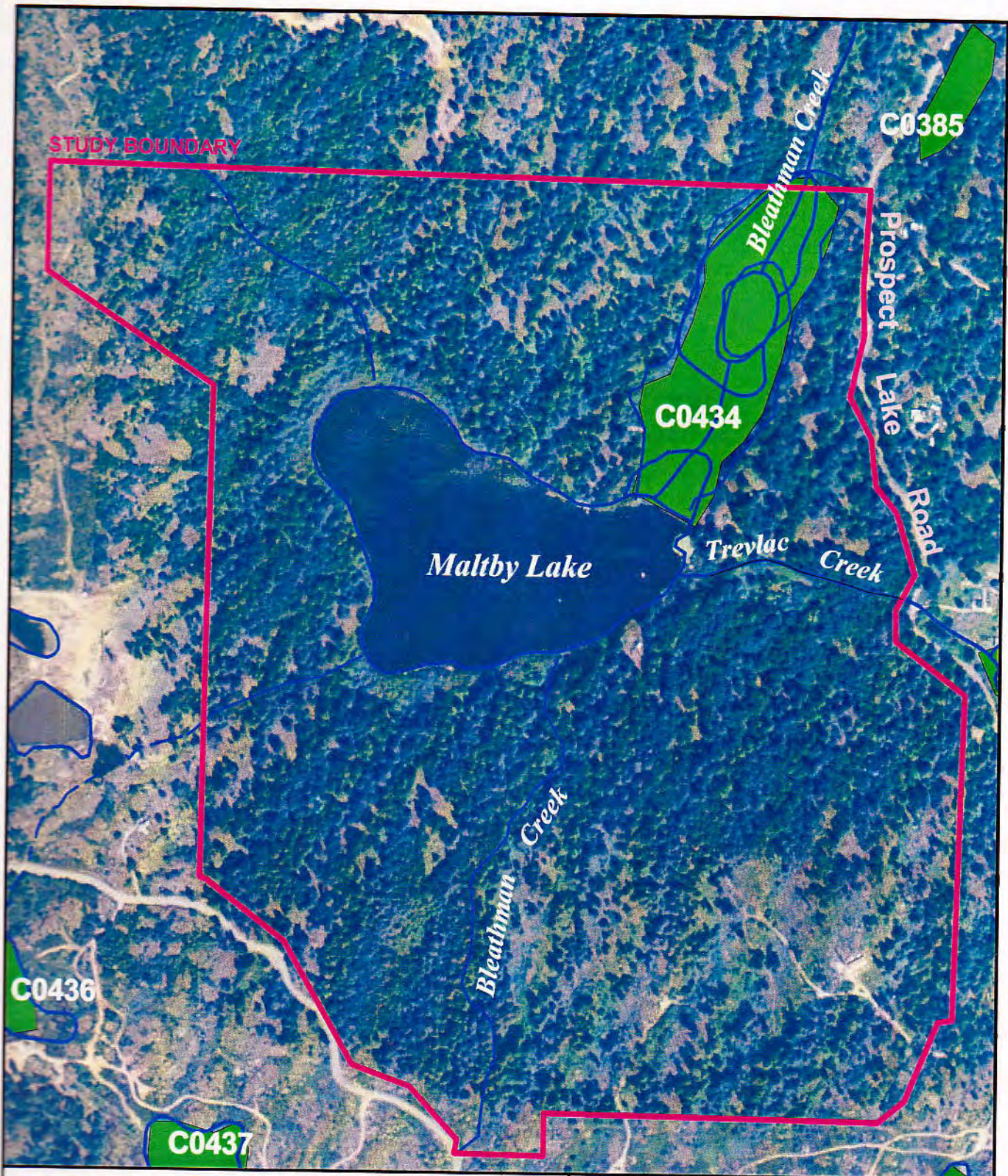
The following studies are recommended to meet the ESR requirements:

- Tree survey (completed by arborist)
- Soil and drainage survey (completed by engineer)
- Vegetation mapping

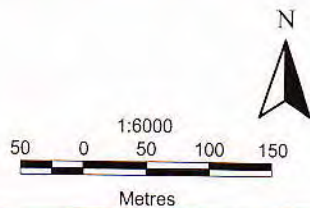
Protection and mitigation strategies would include the following:

- Tree Protection Plan
- Sensitive Ecosystem Plan
- Erosion and Sediment Control Plan
- Spill Prevention Plan
- Stormwater Management Plan
- Guidelines for Construction In and About a Watercourse





 Wetland

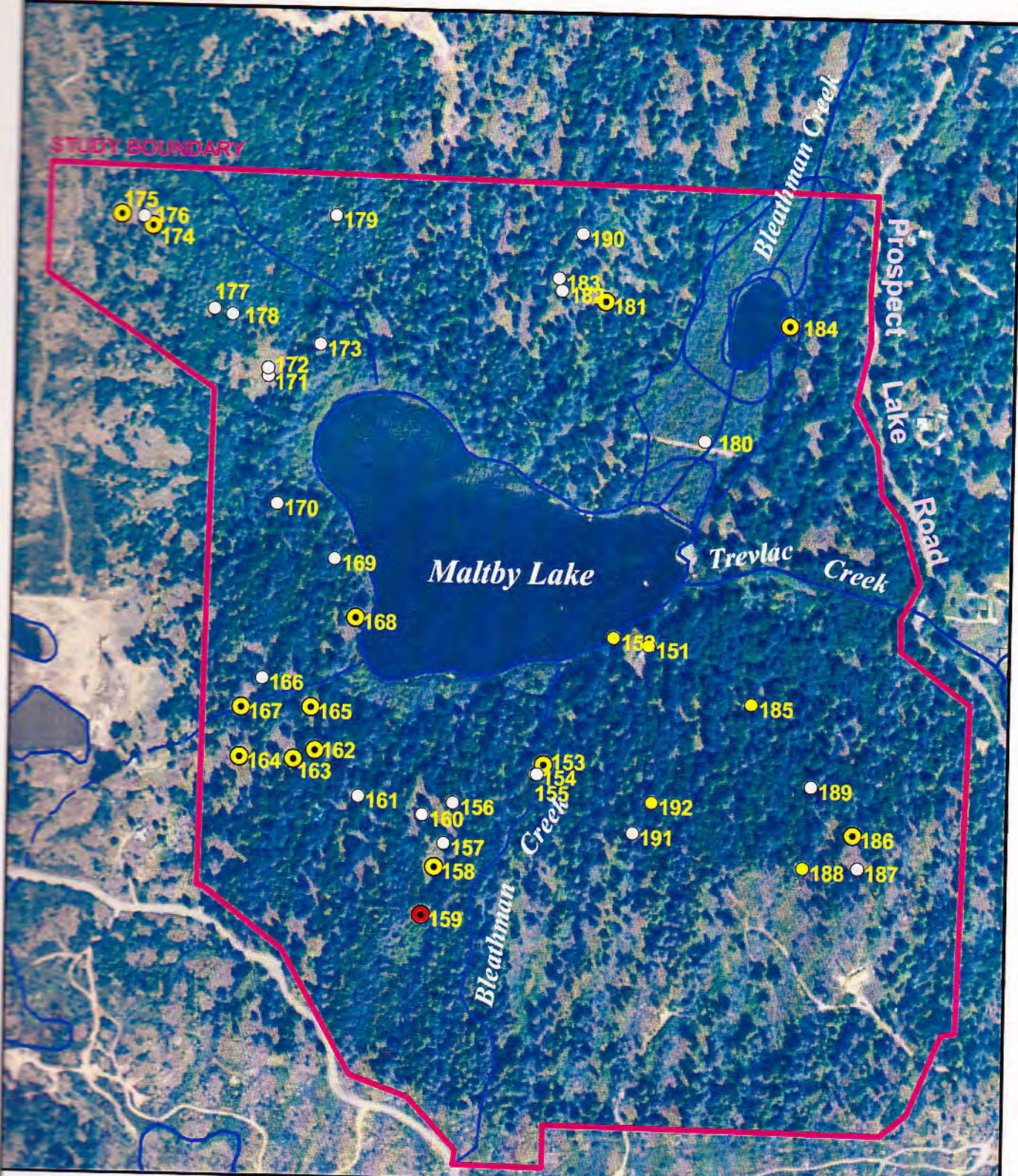


Sensitive Ecosystems

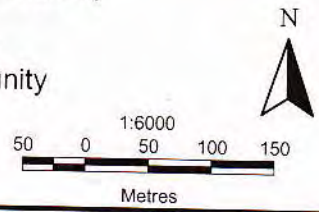
M. Holmes

October 2002

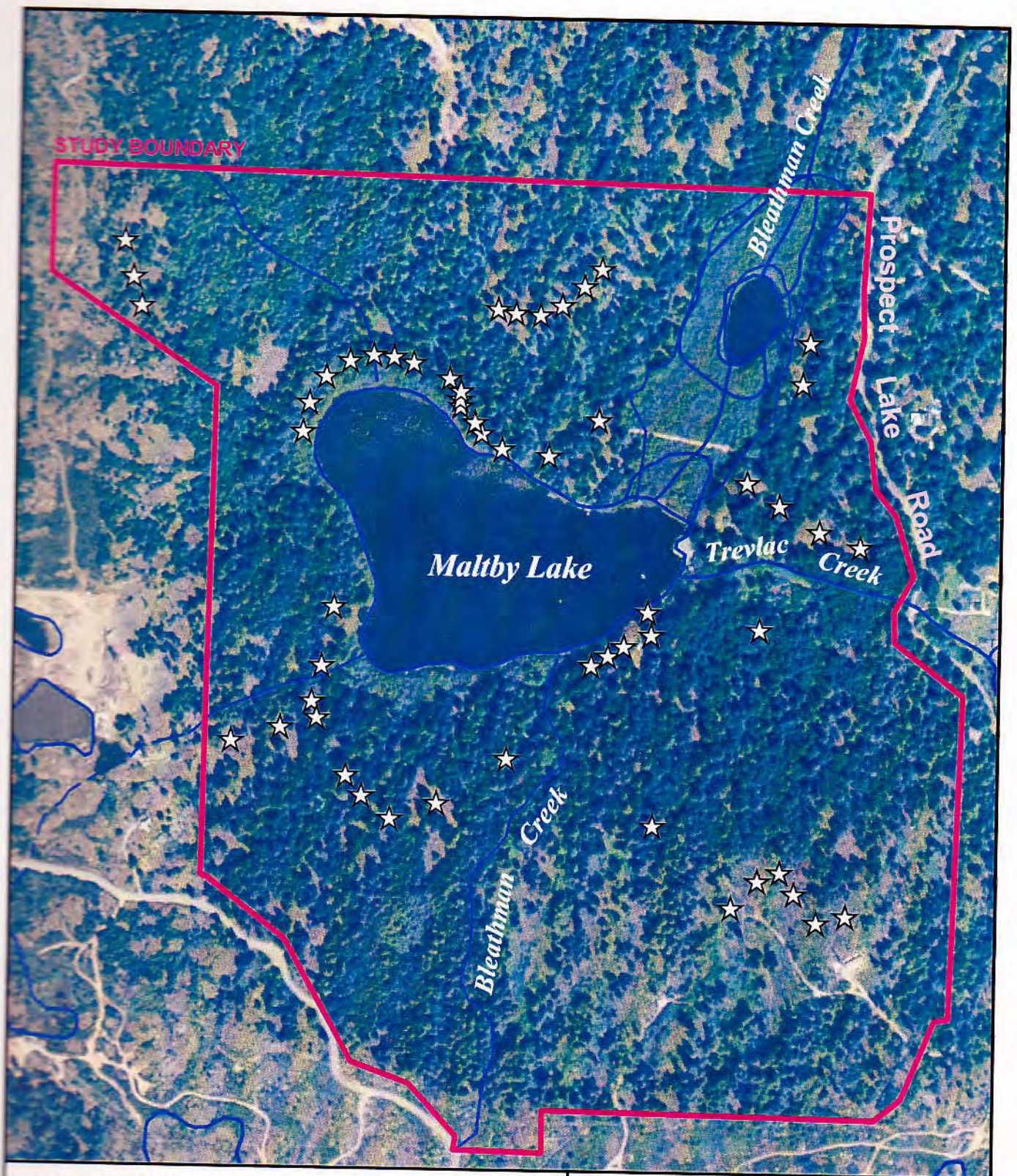
Figure 2



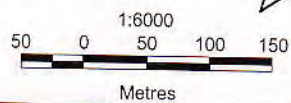
- Survey Points (see appendix II)
- Rare Plant Species
- Rare Plant Community
- Rare Plant and Community



Rare Plant Survey	
M. Holmes	
October 2002	Figure 3



☆ Bylaw Protected Trees
 (note ☆ may indicate a single tree or a cluster of trees)

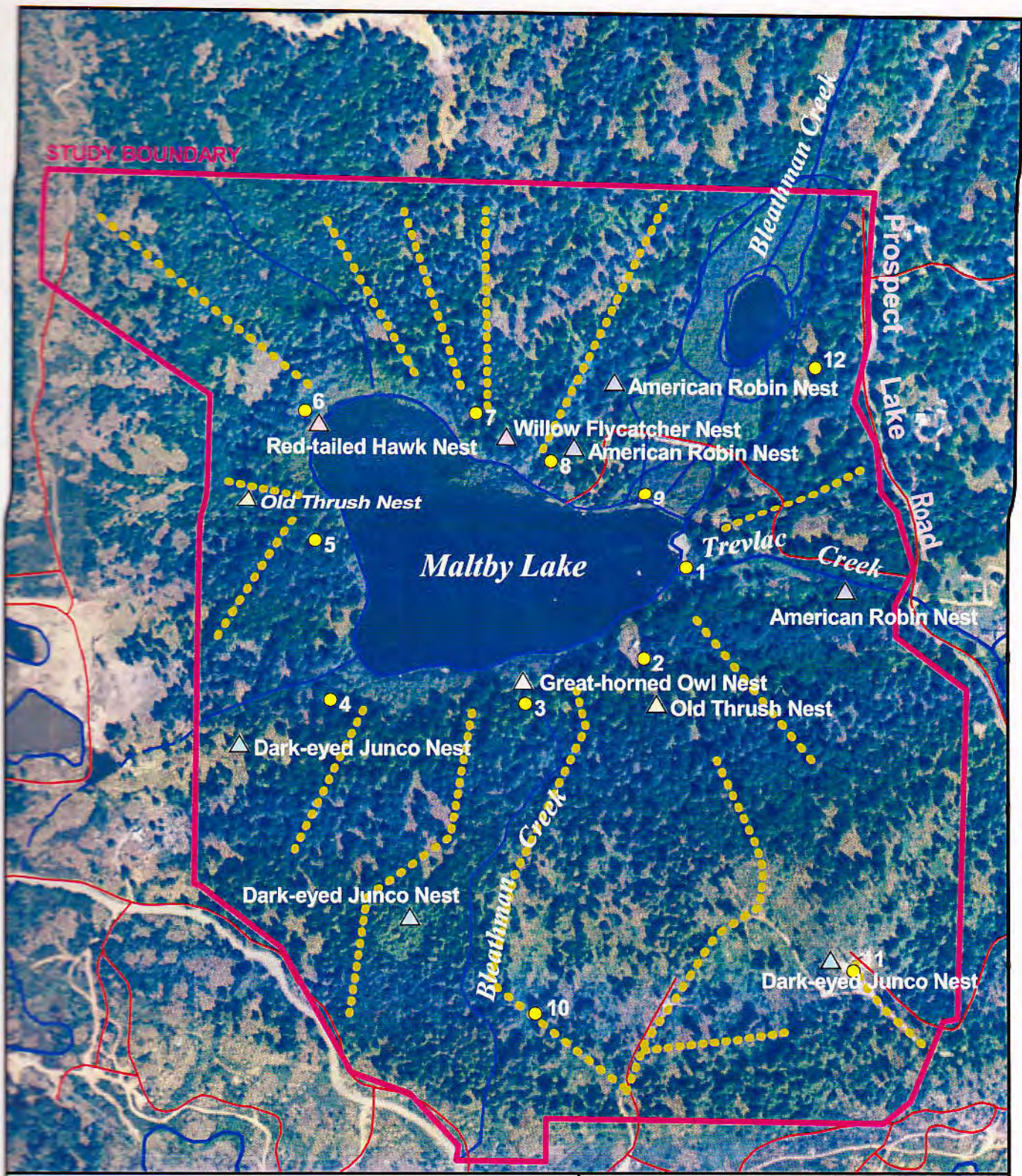


Bylaw Protected Trees

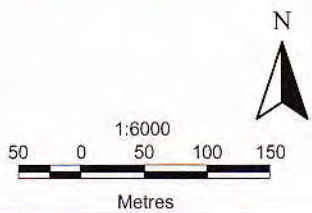
M. Holmes

October 2002

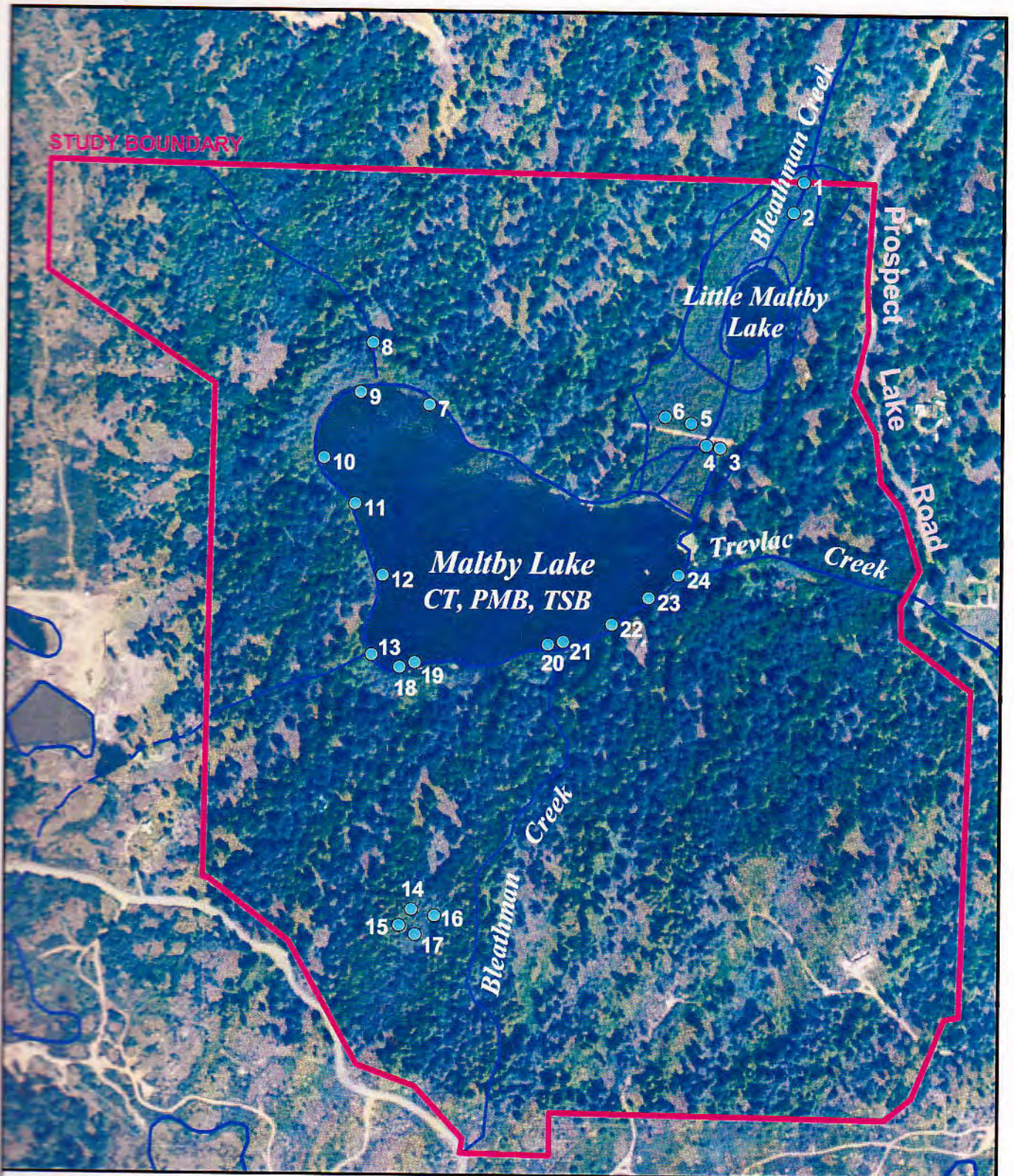
Figure 4



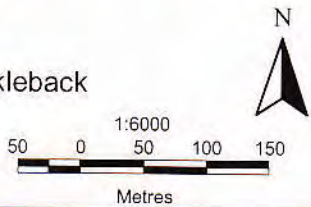
- Transect
- Point Count
- △ Bird nest



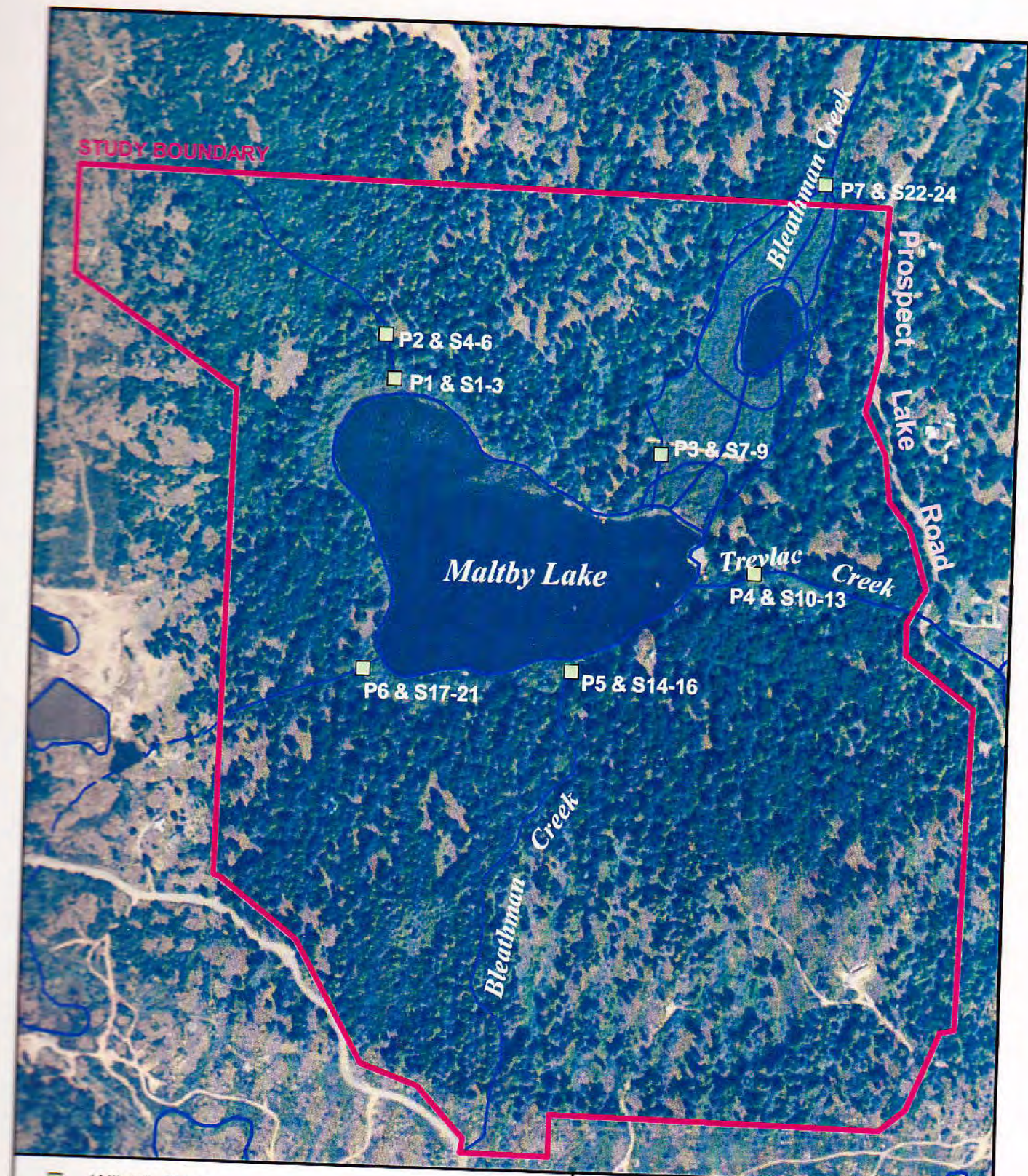
Point Counts, Transects and Bird Nests	
M. Holmes	
October 2002	Figure 5



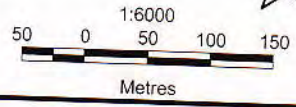
- Minnow Trap Locations
- CT = Cutthroat trout
- PMB = Pumpkinseed
- TSB = Three-spine stickleback



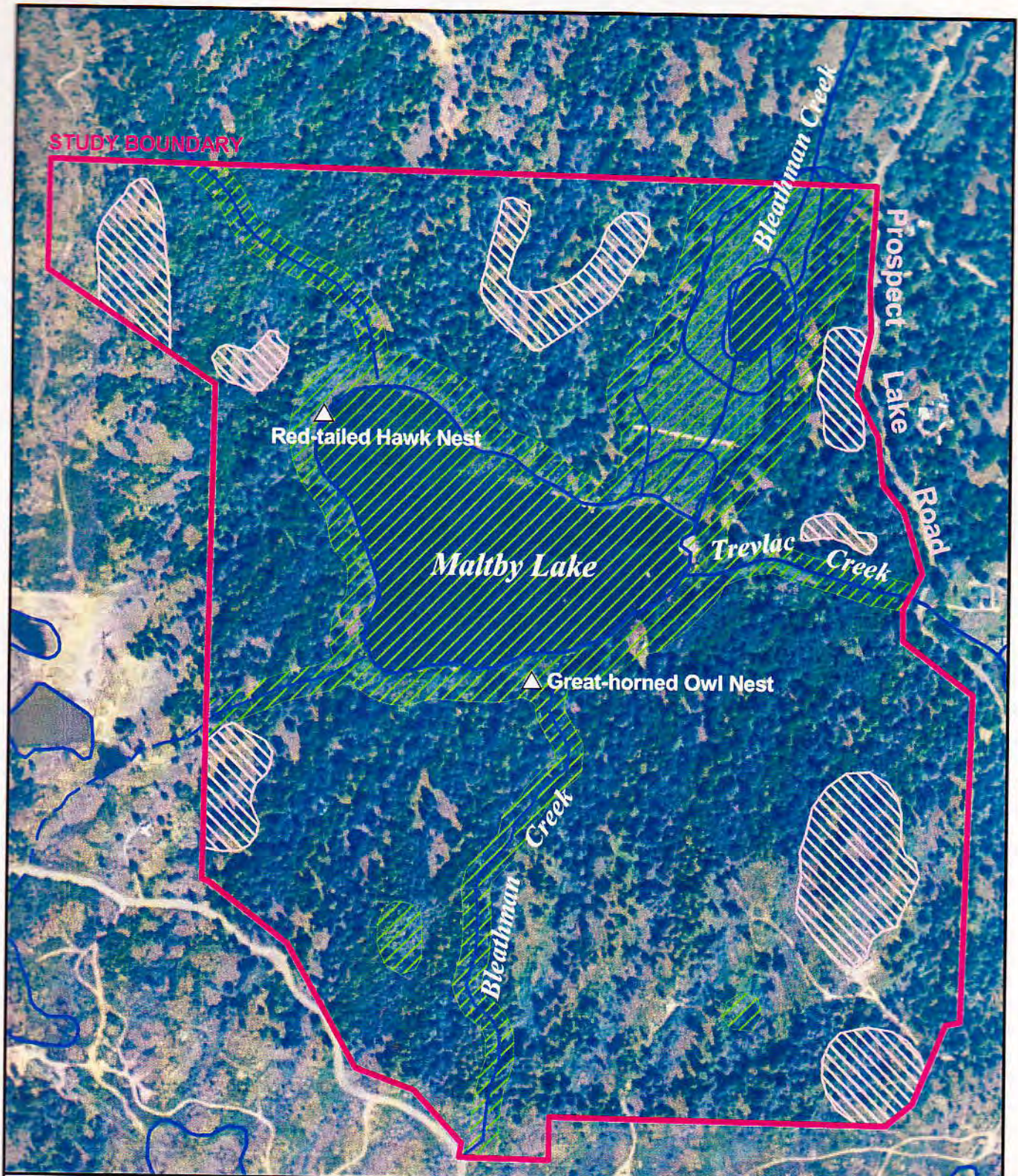
Aquatic Resources	
M. Holmes	
October 2002	Figure 6






■ Wildlife Traps
 P = Pitfall Trap
 S = Sherman Trap




Small Mammal Trapping	
M. Holmes	
October 2002	Figure 7

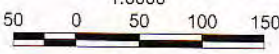


	Wetland/Riparian
	Rocky Outcrop/Garry Oak
	Raptor Nest

N



1:6000



50 0 50 100 150

Metres

Environmentally Sensitive Areas	
M. Holmes	
October 2002	Figure 8

REFERENCES CITED OR REVIEWED

- American Ornithologist's Union. 1957. Checklist of North American birds. Fifth ed. Amer. Ornith. Union, Baltimore, 691 pp.
- Austin, K. K. 1994. Habitat use and home range size of breeding northern goshawks in the southern Cascades. MSc thesis, Oreg. State Univ., Corvallis, OR.
- Berris, Catherine, and Associates Incorporated. 1995. Northeast Coquitlam Environmental Assessment. Prepared for the City of Coquitlam.
- Beebe, F.L. 1974. Field studies of Falciiformes of British Columbia: vultures, hawks, falcons, eagles. Occas. Pap. Brit. Columbia Prov. Mus. No 17. Victoria.
- Bent, A.C. 1937. Life histories of North American birds of prey. Part I. U.S Nat. Mus. Bull.
- Bright-Smith, D.J. and R.W. Mannan, 1994. Habitat use by breeding male northern goshawks in northern Arizona. In The northern goshawk: ecology and management. W.M. Block, M.L. Morrison and M.H. Reiser (eds.). Proc. symp. Cooper Ornith. Soc., 14-15 April 1993, Sacramento, CA., Studies in Avian Biol. No. 16.
- Brooke, M. and Tim Birkhead, ed. 1991. The Cambridge encyclopaedia of ornithology. Cambridge University Press. 362pp.
- Burt, William. H., and Richard P. Grossenheider. 1980. A field guide to the mammals of North America: Peterson Field Guide. Houghton Mifflin Press.
- Campbell, R. Wayne, Neil K. Dawe, Ian McTaggart-Cowan, John M. Cooper, Gary W. Kaiser, Micheal C.E. McNall, 1990. The birds of British Columbia - Vol. 1-4. Univ. B.C. Press.
- City of Coquitlam. (July 2001). Northeast Coquitlam Official Community Plan.
- City of Coquitlam. (May 2001). City of Coquitlam Tree Cutting Permit Bylaw.
- Committee on the Status of Endangered Wildlife in Canada 2000 Web Site: <http://www.cosewic.gc.ca/COSEWIC/faq.cfm>
- Cannings, Richard J. 1993. Northern Saw-whet Owl. The Birds of North America, No. 42. Edited by Poole, A., and F. Gill. The academy of natural sciences of Philadelphia. pp 17.
- _____, and A.P. Harcombe (eds). 1990. The Vertebrates of British Columbia: Scientific and English names. Royal British Columbia Museum Heritage Record

Recommendations and Conclusions

No. 20; Wildlife Report No R24. Ministry of Municipal Affairs, Recreation and Culture and Min. of Environ., Victoria, B.C.

_____, Richard J., and A.P. Harcombe (eds). 1990. The Vertebrates of British Columbia: Scientific and English names. Royal British Columbia Museum. Heritage Conant Roger, and Joseph T. Collins, 1991. Reptiles and Amphibians: Eastern and Central North America. Peterson Field Guides 3rd Ed. Houghton Mifflin Company, Boston New York.

Corkan, Charlotte, C., and Chris Thoms. 1996. Amphibians or Oregon. Washington and British Columbia: A field identification guide. Lone Pine Press, pp175.

Dayton & Knight Ltd. 1999. Best Management Practices Guide for Stormwater Appendix H Construction Site Erosion and Sediment Control Guide. Greater Vancouver Regional District.

Dayton & Knight Ltd. 1998. Northeast Coquitlam Terrain and Watershed Study. Prepared for the City of Coquitlam.

Department of Fisheries and Oceans. FISHERIES ACT [RSBC 1996] CHAPTER 149.

Devereux, James, and Mosher, James, A., 1984. Breeding ecology of Barred Owls in the central Appalachians. Raptor Research 18(2):49-58.

Ehrlich, Paul, E. Dobkin, David, S. and Darryl Wheye, 1988. The birder's handbook: A Field guide to the natural history of North American birds. 785pp.

Envirowest Environmental Consultants [ECL Envirowest Consultants Limited]. 1997. Northeast Coquitlam Terrain and Watershed Assessment. 1:10,000 Map. Drawing number 311-04-01. June 9, 1997. Appendix C to Dayton & Knight (1998).

Graham, R.T., R.T. Reynolds, M.H. Reiser, R.L. Bassett and D.A. Boyce, 1994. Sustaining forest habitat for the northern goshawk: a question of scale. In The northern goshawk: ecology and management. W.M. Block, M.L. Morrison and M.H. Reiser (eds.). Proc. symp. Cooper Ornith. Soc., 14-15 April 1993. Sacramento, CA., studies in Avian Biol. No. 16. pp. 12-17.

Green M. David, and R. Wayne Campbell 1992. The amphibians of British Columbia. Royal British Columbia Museum Handbook No. 45. pp.100.

Gregory Patrick, T., and R. Wayne Campbell 1996. The Reptiles of British Columbia. Royal British Columbia Museum Handbook No. 45. pp.102.

Harrison, H.H., 1979. A field guide to western birds' nests. Boston. MA: Houghton Mifflin Co. 279 p.

Recommendations and Conclusions

- Hayes, M. P. and M. R. Jennings. 1986. "Habitat Correlates of Distribution of the California Red-Legged Frog: (*Rana catesbeiana*) Responsible?" *Journal of Herpetology*. 20:(4):490-509.
- Hovingh, P. 1993. Aquatic habitats, life history observations, and zoographic considerations of the spotted frog (*Rana pretiosa*) in Tule Valley, Utah. *Great Basin Nat.* 53:168-179.
- Lawler, S. P., D. Dritz, T. Strange, and M. Holyoak. 1999. "Effects of Introduced Mosquitofish and Bullfrogs on the Threatened California Red-Legged Frog." *Conservation Biology* 13(3):613-22.
- Leviton, Alan E. 1971. Reptiles and Amphibians of North America. Doubleday & Company, Inc., New York.
- Licht, L. E. 1969. Comparative breeding behavior of the red-legged frog (*Rana aurora aurora*) and the western spotted frog (*Rana pretiosa pretiosa*) in southwestern British Columbia. *Can. J. Zool.* 47:1287-1299.
- Licht, L. E. 1971. Breeding habits and embryonic thermal requirements of the frogs (*Rana aurora aurora*) and (*Rana pretiosa pretiosa*), in the Pacific Northwest. *Ecology* 52:116-124.
- Maser, Chris 1998. Mammals of the Pacific Northwest: From the Coast to the High Cascades. Oregon State University Press.
- Mattison, Chris. 1995. The Encyclopedia of Snakes. Facts on File, Inc., New York.
- McComb, W.C., K. McGarigal and R.G. Anthony. 1993. Small mammal and amphibian abundance in streamside and upslope habitats of mature Douglas-fir stands, western Oregon. *Northwest Science* 67:7-15.
- Meidinger, D. and J. Pojar, 1991. Ecosystems of British Columbia. B.C. Ministry of Forests, Victoria, B.C.
- Ministry of Environment, Lands and Parks (MELP), (2001). Best Management Practices - Land Development. Vancouver Island Region (Region I).
- Ministry of Environment, Lands and Parks (MELP), (September 2000). Best Management Practices for Streambeds and Streambanks.
- Ministry of Environment, Lands and Parks (MELP), (September 2000). Best Management Practices for Wildlife.
- Ministry of Environment, Lands and Parks (MELP), (September 2000). Best Management Practices to Protect Water Quality.

Recommendations and Conclusions

_____, 1988. Northern goshawk. In *Handb. NA Birds*, Vol. 4: diurnal raptors. R.S. Palmer (ed.). Yale Univ. Press, New Haven, CT. pp. 355-378.

Ralph, C.J., G.R. Geupel, P. Pyle, T.E. Martin and D.F. DeSante, 1993. *Handbook of field methods for monitoring landbirds*. Gen. Tech. Rep. PSW-GTR-144. Albany, CA

Resource Inventory Committee, Wildlife Branch, 1998. *Inventory Dataforms for Raptors Standards for Components of British Columbia's Biodiversity No. 11 [Forms]*.

Resource Inventory Committee, Wildlife Branch, 1997. *Inventory Methods for Pond-breeding Amphibians and Painted Turtle Standards or Components of British Columbia's Biodiversity No. 37 (Version 2.0)*

Resource Inventory Committee, Wildlife Branch, 1997. *Standard Inventory Methodologies for Components of British Columbia's Biodiversity: Raptors (Version 1.1)*

Resource Inventory Committee, Wildlife Branch. *Conducting Wildlife Inventory" in Species Inventory Fundamentals (No.1)*.

Riley, John, L. and Pat Mohr, 1994. *The natural heritage of southern Ontario's settled landscapes: A review of Conservation and restoration ecology for land-use and landscape planning*. Ont. Min. Nat. Res. 77pp.

Sherman, A. R., 1911. Nest life of the Screech Owl. *Auk* 28:155-168.

Sibley David Allen, 2000. *The Sibley guide to birds*. National Audubon Society 3rd Ed. Alfred A. Knopf, New York pp 544.

Snyder, N. F. R. and H. A. Snyder, 1991. *Birds of prey: natural history and conservation of North American raptors*. Voyageur Press, Inc. Stillwater MN.

Stebbins, R.C. 1954. *Amphibians and Reptiles of Western North America*. McGraw-Hill, New York.

Van Zyll de Jong, C.G., (1983). *Handbook of Canadian Mammals: Marsupials and Insectivores*. National Museum of Sciences, National Museums of Canada.

Vantyne, Josselyn and Berger Andrew, J., 1971. *The fundamentals of ornithology*. Dover Pub. Inc. New York. 624 pp.

Whittaker, J.O. Jr., and C. Maser. 1976. Food habits of five western Oregon shrews. *Northwest Science* 50:102-7

APPENDICES

Appendix I: Conservation Data Centre Information

Appendix II: Rare Plant Survey

Appendix III: Photoplates

APPENDIX I

Conservation Data Centre Information

Appendix I-a
 Conservation Data Centre: Rare Vascular Plant Tracking List
 South Island Forest District, July 2002

Scientific Name	English Name	G Rank	Subnational	COSEWIC	BC Status
<i>Abronia latifolia</i>	yellow sand-verbena	G5	S3		BLUE
<i>Abronia umbellata</i> ssp. <i>acutalata</i>	pink sand-verbena	G4G5T1	S1		RED
<i>Acaulon muticum</i> var. <i>rufescens</i>		G4G5T4	S1		RED
<i>Agrostis pallens</i>	dune bentgrass	G4G5	S3		BLUE
<i>Allium acuminatum</i>	Hooker's onion	G5	S3		BLUE
<i>Allium amplexans</i>	slimleaf onion	G4	S3		BLUE
<i>Allium crenulatum</i>	Olympic onion	G4	S2		RED
<i>Allium geyseri</i> var. <i>tenerum</i>	Geyer's onion	G4G5T?	S2		RED
<i>Alopecurus carolinianus</i>	Carolina meadow-foxtail	G5	S2		RED
<i>Anagallis minima</i>	chaffweed	G5	S2S3		BLUE
<i>Anemone drummondii</i> var. <i>drummondii</i>	alpine anemone	G4T4	S2S3		BLUE
<i>Asplenium adulterinum</i>	corrupt spleenwort	G3?	S2S3		BLUE
<i>Aster curtus</i>	white-top aster	G3	S2	T (MAY 2000)	RED
<i>Aster paucicapitatus</i>	Olympic mountain aster	G3?	S2S3		BLUE
<i>Aster radulinus</i>	rough-leaved aster	G4G5	S1		RED
<i>Balsamorhiza deltoidea</i>	deltoid balsamroot	G5	S1	E (May 2000)	RED
<i>Bidens amplissima</i>	Vancouver Island beggarticks	G3	S3	SC (NOV 2001)	BLUE
<i>Bolboschoenus fluviatilis</i>	river bulrush	G5	S2S3		BLUE
<i>Botrychium simplex</i>	least moonwort	G5	S2S3		BLUE
<i>Callitriche heterophylla</i> ssp. <i>heterophylla</i>	two-edged water-starwort	G5T5	S2S3		BLUE
<i>Callitriche marginata</i>	winged water-starwort	G4	S1		RED
<i>Camissonia contorta</i>	contorted-pod evening-primrose	G5	S1		RED
<i>Cardamine angulata</i>	angled bitter-cress	G5	S2S3		BLUE
<i>Cardamine parviflora</i> var. <i>arenicola</i>	small-flowered bitter-cress	G5T5	S1		RED
<i>Carex feta</i>	green-sheathed sedge	G5	S2S3		BLUE
<i>Carex interrupta</i>	green-fruited sedge	G3G4	S1		RED
<i>Carex pansa</i>	sand-dune sedge	G4	S2S3		BLUE
<i>Carex scoparia</i>	pointed broom sedge	G5	S2S3		BLUE
<i>Carex tumulicola</i>	foothill sedge	G4	S1		RED
<i>Castilleja ambigua</i> ssp. <i>ambigua</i>	paintbrush owl-clover	G4T?	S2		RED
<i>Castilleja levisecta</i>	golden paintbrush	G1	S1	E (May 2000)	RED
<i>Centaurium muehlenbergii</i>	Muhlenberg's centaury	G5?	S1		RED
<i>Cephalanthera austiniiae</i>	phantom orchid	G4	S2	T (MAY 2000)	RED
<i>Chamaesyce serpyllifolia</i> ssp. <i>serpyllifolia</i>	thyme-leaved spurge	G5T5	S2S3		BLUE
<i>Cheilanthes gracillima</i>	lace fern	G4G5	S2S3		BLUE
<i>Clarkia amoena</i> var. <i>caurina</i>	farewell-to-spring	G5T5?	S3		BLUE
<i>Clarkia amoena</i> var. <i>lindleyi</i>	farewell-to-spring	G5T5	S3		BLUE
<i>Clarkia purpurea</i> ssp. <i>quadrivulnera</i>	small-flowered godetia	G5T5	S1		RED
<i>Claytonia rubra</i> ssp. <i>depressa</i>	redstem springbeauty	G5T?	S2		RED
<i>Corydalis scouleri</i>	Scouler's corydalis	G4	S2	T (MAY 2001)	RED
<i>Crassula connata</i> var. <i>connata</i>	erect pygmyweed	G5T?	S2		RED
<i>Cuscuta pentagona</i>	field dodder	G5	S2S3		BLUE
<i>Cyperus squarrosus</i>	awned cyperus	G5	S3		BLUE
<i>Draba lonchocarpa</i> var. <i>vestita</i>	lance-fruited draba	G4T3	S2S3		BLUE
<i>Dryopteris arguta</i>	coastal wood fern	G5	S2S3	SC (NOV 2001)	BLUE
<i>Elatine rubella</i>	three-flowered waterwort	G5	S2S3		BLUE
<i>Eleocharis parvula</i>	small spike-rush	G5	S2S3		BLUE
<i>Eleocharis rostellata</i>	beaked spike-rush	G5	S2S3		BLUE
<i>Epilobium ciliatum</i> ssp. <i>watsonii</i>	purple-leaved willowherb	G5T?	S2S3		BLUE
<i>Epilobium densiflorum</i>	dense spike-primrose	G5	S2		RED
<i>Epilobium halleianum</i>	Hall's willowherb	G5	S2S3		BLUE
<i>Epilobium leptocarpum</i>	small-fruited willowherb	G5	S2S3		BLUE
<i>Epilobium oregonense</i>	Oregon willowherb	G5	S2S3		BLUE
<i>Epilobium torreyi</i>	brook spike-primrose	G5	S1		RED
<i>Erysimum arenicola</i> var. <i>torulosum</i>	sand-dwelling wallflower	G4G5T?	S2S3		BLUE
<i>Erythronium montanum</i>	white glacier lily	G4	S2S3		BLUE
<i>Fraxinus latifolia</i>	Oregon ash	G5	S1		RED
<i>Githopsis specularioides</i>	common bluecup	G5	S2S3		BLUE
<i>Glyceria leptostachya</i>	slender-spiked mannagrass	G3	S2S3		BLUE
<i>Glyceria occidentalis</i>	western mannagrass	G5	S2S3		BLUE
<i>Grindelia hirsutula</i> var. <i>hirsutula</i>	hairy gumweed	G5T3T4	S1		RED

Appendix I-a
 Conservation Data Centre: Rare Vascular Plant Tracking List
 South Island Forest District, July 2002

Scientific Name	English Name	G Rank	Subnational	COSEWIC	BC Status
<i>Hedysarum occidentale</i>	western hedysarum	G5	S2S3		
<i>Helenium autumnale</i> var. <i>grandiflorum</i>	mountain sneezeweed	G5T?	S2S3		BLUE
<i>Heterocodon rariflorum</i>	heterocodon	G5	S3		BLUE
<i>Hippuris tetraphylla</i>	four-leaved mare's-tail	G5	S2S3		BLUE
<i>Hutchinsia procumbens</i>	hutchinsia	G5	S1		BLUE
<i>Hydrophyllum tenuipes</i>	Pacific waterleaf	G4G5	S2S3		RED
<i>Hypericum majus</i>	large Canadian St. John's-wort	G5	S2S3		BLUE
<i>Hypericum scouleri</i> ssp. <i>nortoniae</i>	western St. John's-wort	G5T?	S2S3		BLUE
<i>Idahoia scapigera</i>	scalegod	G5	S2		BLUE
<i>Isoteles nuttallii</i>	Nuttall's quillwort	G4?	S3		RED
<i>Jaumea carnosa</i>	fleshy jaumea	G4G5	S2S3		BLUE
<i>Juncus kelloggii</i>	Kellogg's rush	G3?	S1		BLUE
<i>Juncus oxymetris</i>	pointed rush	G5	S2S3		RED
<i>Lasthenia maritima</i>	hairy goldfields	G4	S2S3		BLUE
<i>Leymus triticoides</i>	creeping wildrye	G4G5	S1		BLUE
<i>Lilaea scilloides</i>	flowering quillwort	G5?	S2S3		RED
<i>Limnanthes macounii</i>	Macoun's meadow-foam	G3	S3		BLUE
<i>Lomatium dissectum</i> var. <i>dissectum</i>	fern-leaved desert-parsley	G3G4T4	S1	SC (1988)	BLUE
<i>Lomatium grayi</i>	Gray's desert-parsley	G5	S1		RED
<i>Lotus formosissimus</i>	seaside birds-foot trefoil	G5	S1		RED
<i>Lotus pinnatus</i>	bog birds-foot trefoil	G4G5	S1	E (May 2000)	RED
<i>Lotus unifoliolatus</i> var. <i>unifoliolatus</i>	Spanish-clover	G5T5	S2S3		RED
<i>Lupinus densiflorus</i> var. <i>densiflorus</i>	dense-flowered lupine	G5T4	S1		BLUE
<i>Lupinus lepidus</i>	prairie lupine	G5	S1		RED
<i>Lupinus oreganus</i> var. <i>kincaidii</i>	Kincaid's lupine	G5T2	SX	E (May 2000)	RED
<i>Lupinus rivularis</i>	streambank lupine	G4G5	S1		RED
<i>Madia minima</i>	small-headed tarweed	G4	S1		RED
<i>Malaxis brachypoda</i>	white adder's-mouth orchid	G4	S2S3		RED
<i>Marah oreganus</i>	manroot	G5	S2S3		BLUE
<i>Meconella oregana</i>	white meconella	G2	S2		BLUE
<i>Megalodonta beckii</i> var. <i>beckii</i>	water marigold	G4G5T4	S3		RED
<i>Melica smithii</i>	Smith's melic	G4	S2S3		BLUE
<i>Microseris bigelovii</i>	coast microseris	G4	S1		BLUE
<i>Microseris lindleyi</i>	Lindley's microseris	G5	S1		RED
<i>Mimulus dentatus</i>	tooth-leaved monkey-flower	G5	S1		RED
<i>Minuartia pusilla</i>	dwarf sandwort	G5	S1		RED
<i>Mitella caulescens</i>	leafy mitrewort	G5	S2S3		RED
<i>Montia chamissoi</i>	Chamisso's montia	G5	S2S3		BLUE
<i>Montia diffusa</i>	branching montia	G4	S1		BLUE
<i>Myrica californica</i>	California wax-myrtle	G5	S2S3		RED
<i>Myriophyllum quitense</i>	waterwort water-milfoil	G4?	S2S3		BLUE
<i>Myriophyllum ussuriense</i>	Ussurian water-milfoil	G3	S3		BLUE
<i>Navarretia intertexta</i>	needle-leaved navarretia	G5?	S2		BLUE
<i>Nothochelone nemorosa</i>	woodland penstemon	G5	S2S3		RED
<i>Ophioglossum pusillum</i>	northern adder's-tongue	G5	S2S3		BLUE
<i>Orobanche pinorum</i>	pine broomrape	G4	S1		BLUE
<i>Orthocarpus bracteosus</i>	rosy owl-clover	G3?	S1		RED
<i>Orthocarpus imbricatus</i>	mountain owl-clover	G5	S1		RED
<i>Oxalis oregana</i>	redwood sorrel	G5	S2		RED
<i>Piperia candida</i>	white-lip rein orchid	G3G4	S2		RED
<i>Plagiobothrys figuratus</i>	fragrant popcornflower	G4	S1		RED
<i>Plagiobothrys tenellus</i>	slender popcornflower	G4G5	S2		RED
<i>Pleuricospora fimbriolata</i>	fringed pinesap	G4	SH		RED
<i>Pleuropogon refractus</i>	nodding semaphoregrass	G4	S3		RED
<i>Polygonum hydropiperoides</i>	water-pepper	G5	S2S3		BLUE
<i>Potamogeton oakesianus</i>	Oakes' pondweed	G4	S2S3		BLUE
<i>Prosartes smithii</i>	Smith's fairybells	G5	S2S3		BLUE
<i>Psilocarphus elatior</i>	tall woolly-heads	G4	S1		BLUE
<i>Psilocarphus tenellus</i> var. <i>tenellus</i>	slender woolly-heads	G4T4	S2	E (May 2001)	RED
<i>Pyrola elliptica</i>	white wintergreen	G5	S2S3	NAR (1996)	RED
<i>Ranunculus alismifolius</i> var. <i>alismifolius</i>	water-plantain buttercup	G5T5	S1		BLUE
<i>Ranunculus californicus</i>	California buttercup	G5	S2	E (May 2000)	RED

Appendix I-a
 Conservation Data Centre: Rare Vascular Plant Tracking List
 South Island Forest District, July 2002

Scientific Name	English Name	G Rank	Subnational	COSEWIC	BC Status
<i>Ranunculus lobbii</i>	Lobb's water-buttercup	G4	SX		RED
<i>Romanzoffia tracyi</i>	Tracy's romanzoffia	G4	S2S3		BLUE
<i>Rubus lasiococcus</i>	dwarf bramble	G5	S2S3		BLUE
<i>Rubus nivalis</i>	snow bramble	G4?	S2		RED
<i>Rupertia physodes</i>	California-tea	G4	S3		BLUE
<i>Sagina decumbens</i> ssp. <i>occidentalis</i>	western pearlwort	G5T?	S3		BLUE
<i>Salix lemmonii</i>	Lemmon's willow	G5	S1		RED
<i>Salix sessilifolia</i>	soft-leaved willow	G4	S2S3		BLUE
<i>Sanguisorba menziesii</i>	Menzies' burnet	G3G4	S2S3		BLUE
<i>Sanicula arctopoides</i>	snake-root sanicle	G5	S1	E (May 2001)	RED
<i>Sanicula bipinnatifida</i>	purple sanicle	G5	S2	T (May 2001)	RED
<i>Schoenoplectus americanus</i>	Olney's bulrush	G5	S1		RED
<i>Scrophularia lanceolata</i>	lance-leaved figwort	G5	S2S3		BLUE
<i>Selaginella oregana</i>	Oregon selaginella	G4	S2S3		BLUE
<i>Senecio macounii</i>	Macoun's groundsel	G5	S3		BLUE
<i>Sidalcea hendersonii</i>	Henderson's checker-mallow	G3G4	S3		BLUE
<i>Silene scouleri</i> ssp. <i>grandis</i>	Scouler's campion	G5T?	S1		RED
<i>Spergularia macrotheca</i> var. <i>macrotheca</i>	beach sand-spurry	G5T?	S2S3		BLUE
<i>Thelypteris nevadensis</i>	Nevada marsh fern	G4	S1		RED
<i>Tonella tenella</i>	small-flowered tonella	G5	S1		RED
<i>Toxicodendron diversilobum</i>	poison oak	G5	S2S3		BLUE
<i>Trifolium cyathiferum</i>	cup clover	G4	S1		RED
<i>Trifolium dichotomum</i>	Macrae's clover	G3G4	S2S3		BLUE
<i>Triglochin concinna</i>	graceful arrow-grass	G5	S2		RED
<i>Trillium ovatum</i> var. <i>hibbersonii</i>	dwarf trillium	G5T1	S1		RED
<i>Triphysaria versicolor</i> ssp. <i>versicolor</i>	bearded owl-clover	G5T5	S1	E (May 2000)	RED
<i>Triteleia howellii</i>	Howell's triteleia	G5	S2		RED
<i>Utricularia ochroleuca</i>	ochroleucous bladderwort	G4?	S1		RED
<i>Verbena hastata</i> var. <i>scabra</i>	blue vervain	G5T?	S2		RED
<i>Viola howellii</i>	Howell's violet	G4	S2S3		BLUE
<i>Viola praemorsa</i> ssp. <i>praemorsa</i>	yellow montane violet	G5T3T5	S2	T (MAY 2000)	RED
<i>Wolffia columbiana</i>	Columbian water-meal	G5	S1		RED
<i>Woodwardia fimbriata</i>	giant chain fern	G5	S3		BLUE
<i>Yabea microcarpa</i>	California hedge-parsley	G5?	S1		RED

Appendix 1b
B.C. Conservation Data Centre: Rare Natural Plant Community Tracking List
South Island Forest District in the CDFmm Subzone
August 2000

The natural plant community tracking list is incomplete since there is not yet enough data available for the CDC to rank all of the rare natural plant communities in B.C. This applies especially to many wetland, alpine, and grassland plant communities. This year, the Ministry of Forests will be classifying grassland and wetland plant communities throughout B.C., and this will enable the CDC to produce a more comprehensive natural plant community tracking list. In preparation for this, the rarity ranks of those wetland and grassland plant communities already on the tracking list have the "Q" modifier (e.g. S2Q) to indicate that their classification is about to change. Their names and ranks will be updated after the classification is completed. Until then, they will be retained on "interim" red and blue lists to indicate that there are conservation concerns for these plant communities which will probably also apply to the corresponding plant communities in the new classification.

Please note that all ranks reflect the rarity of plant community occurrences that have not been disturbed by humans or domestic animals, and are in a natural or "climax" state. Do not confuse these natural plant communities with successional plant communities (e.g. second-growth Douglas-fir and salal forests), or with degraded plant communities (e.g. a weedy bluebunch wheatgrass and junegrass grassland). However, be aware that for the purposes of conservation, disturbed occurrences of rare plant communities may be ecologically valuable if there are few or no natural, undisturbed occurrences left in the Province (e.g. Garry Oak plant communities). Please visit the CDC's Ecology web page (www.cdp.gov.bc.ca/rib/wis/cdc/ecology.htm) or contact the CDC for more information on rare natural plant communities and rare natural plant community conservation.

Scientific name	Common name	Biogeoclimatic Ecosystem Classification (Unit(s))	Provincial Rank	Provincial List	Successional Status	Structural Stage
<i>Abies grandis</i> / <i>Mahonia nervosa</i>	Grand fir / duil Oregon grape	CDFmm/04	S1	Red	CC	7
<i>Abies grandis</i> / <i>Tiarella trifoliata</i>	Grand fir / three-leaved foamflower	CDFmm/06	S1	Red	CC	7
<i>Ainus rubra</i> / <i>Carex obtusata</i> / <i>Populus balsamifera</i> ssp. <i>trichocarpa</i> / <i>Ainus rubra</i> / <i>Lysichiton americanum</i> / <i>Festuca idahoensis</i> - <i>Koeleria macrantha</i>	Red alder / slough sedge [black cottonwood]	CDFmm/14	S1	Red	EC	6
<i>Myosurus minimus</i> - <i>Montia</i> spp. - <i>Limnanthus macounii</i>	Red alder / skunk cabbage	CDFmm/11	S2S3	Blue	EC	7
<i>Pinus contorta</i> / <i>Sphagnum</i> spp. CDFmm	Idaho fescue - junegrass	CDFmm/00	S1	Red	DC	2
<i>Pseudotsuga menziesii</i> - <i>Arbutus menziesii</i>		CWHxm1/00				
<i>Pseudotsuga menziesii</i> - <i>Pinus contorta</i> - <i>Arbutus menziesii</i>	Lodgepole pine / sphagnum CDFmm	CDFmm/00	S1	Red	EC	7
<i>Pseudotsuga menziesii</i> - <i>Quercus garryana</i> / <i>Melicope subulata</i>	Douglas-fir - arbutus	CDFmm/00	S2Q	Interim Red	EC	7
<i>Quercus garryana</i> - <i>Arbutus menziesii</i>	Douglas-fir - lodgepole pine - arbutus	CDFmm/02	S2S3Q	Interim Blue	EC	7
<i>Quercus garryana</i> / <i>Bromus cuneatus</i> / <i>Quercus garryana</i> / <i>Hobbesia discolor</i> / <i>Thuja plicata</i> - <i>Pseudotsuga menziesii</i> / <i>Kindbergia argentea</i>	Douglas-fir - Garry oak / Alaska oniongrass	CDFmm/03	S1	Red	EC	7
<i>Thuja plicata</i> / <i>Achlys triphylla</i> / <i>Thuja plicata</i> / <i>Ceanothus cuneifolius</i> / <i>Thuja plicata</i> / <i>Symphoricarpos albus</i>	Douglas-fir / salal	CDFmm/01	S2	Red	CC	7
	Garry oak - arbutus	CDFmm/00	S1	Red	EC	7
	Garry oak / California brome	CDFmm/00	S1	Red	EC	7
	Garry oak / oceanspray	CDFmm/00	S1	Red	EC	7
	Western redcedar - Douglas-fir / Oregon beaked moss	CDFmm/05	S2	Red	CC	7
	Western redcedar / vanilla leaf	CDFmm/12	S2	Red	TC	7
	Western redcedar / Indian-plum	CDFmm/13	S2	Red	TC	7
	Western redcedar / snowberry	CDFmm/07	S1	Red	TC	7

Appendix 1b
B.C. Conservation Data Centre: Rare Natural Plant Community Tracking List
South Island Forest District in the CDFmm Subzone
 August 2000

18 Natural Plant Communities Listed

Biogeoclimatic Ecosystem Classification (BEC) Unit(s): This column gives the BEC unit(s) in which each plant community can occur. These units are described in the Ministry of Forests' "Field Guide to Site Identification and Interpretation" for the appropriate Forest Region. Please note that the BEC units listed are for the entire Forest Region, and may not all occur in this Forest District. Units numbered "00" have not yet been assigned site series numbers by the Ministry of Forests. Site series are NOT equivalent to natural plant communities as defined by the CDC; visit the CDC's Ecology web page (www.elp.gov.bc.ca/rib/wis/cdc/ecology.htm) for an explanation.

Successional Status: This column indicates the successional status of each natural plant community. Natural plant communities are, almost without exception, climax plant communities. Younger successional stages are considered to be different plant communities, though they may eventually develop into climax plant communities. For more information on successional status, visit the CDC's Ecology web page (www.elp.gov.bc.ca/rib/wis/cdc/ecology.htm) or consult the Field Manual for Describing Terrestrial Ecosystems (www.for.gov.bc.ca/RIC/Pubs/teEcolo/fmdte/deif.htm).

Code	Successional Status	Definition
CC	Climatic climax	The oldest expression of an ecosystem, where succession has been unimpeded by edaphic (site) limiting factors or ecological disturbance. This state is self-perpetuating in the absence of disturbance.
EC	Edaphic climax	The oldest possible expression of an ecosystem given edaphic (site) limiting factors atypical for the landscape which arrest or redirect succession so that the climatic climax is never achieved. Edaphic limiting factors include extremely dry soil, extremely wet soil, and very poor nutrient regime, relative to the landscape norms.
DC	Disclimax	The oldest possible expression of an ecosystem given a natural disturbance regime which arrests or redirects succession so that the climatic climax is never achieved. Natural disturbances include periodic surface fires and annual flooding.

Structural Stage: This column indicates the structural stage(s) of each natural plant community. Similar plant communities at younger structural stages are considered to be different plant communities, though they may eventually develop into natural plant communities. For definitions, see the Field Manual for Describing Terrestrial Ecosystems (www.for.gov.bc.ca/RIC/Pubs/teEcolo/fmdte/deif.htm).

Code	Structural Stage	Code	Structural Stage
1	Sparse/bryoid	3	Shrub/Herb
1a	Sparse	3a	Low shrub
1b	Bryoid	3b	Tall shrub
2	Herb	4	Pole/Sapling
2a	Forb-dominated	5	Young Forest
2b	Graminoid-dominated	6	Mature Forest
2c	Aquatic	7	Old Forest
2d	Dwarf shrub-dominated		

Appendix I-c
B.C. Conservation Data Centre: Rare Vertebrate Tracking List
South Island Forest District, July 2002

Scientific Name	English Name	G Rank	Subnational	COSEWIC	BC Status
<i>Accipiter gentilis laingi</i>	Northern Goshawk, <i>laingi</i> subspecies	G5T2	S2B,SZN	T (NOV 2000)	RED
<i>Aeshna tuberculifera</i>	Black-tipped Darner	G4	S3		BLUE
<i>Ardea herodias fannini</i>	Great Blue Heron, <i>fannini</i> subspecies	G5T4	S3B,S4N	SC (1997)	BLUE
<i>Asio flammeus</i>	Short-eared Owl	G5	S3B,S2N	SC (1994)	BLUE
<i>Botaurus lentiginosus</i>	American Bittern	G4	S3B,SZN		BLUE
<i>Brachyramphus marmoratus</i>	Marbled Murrelet	G3G4	S2B,S4N	T (NOV 2000)	RED
<i>Branta canadensis occidentalis</i>	Canada Goose, <i>occidentalis</i> subspecies	G5T2T3	S1N		BLUE
<i>Butorides virescens</i>	Green Heron	G5	S3S4B,SZN		BLUE
<i>Cercyonis pegala incana</i>	Common Woodnymph, <i>incana</i> subspecies	G5T?	S3		BLUE
<i>Cervus elaphus roosevelti</i>	Roosevelt Elk	G5T4	S2S3		BLUE
<i>Chrysemys picta</i>	Painted Turtle	G5	S3S4		BLUE
<i>Coccyzus americanus</i>	Yellow-billed cuckoo	G5	SXB,SAN		RED
<i>Coenonympha californica insulana</i>	Common Ringlet, <i>insulana</i> subspecies	G5T3T4	S2		RED
<i>Colias occidentalis</i>	Western Sulphur	G3G4	S3S4		BLUE
<i>Columba fasciata</i>	Band-tailed Pigeon	G4	S3S4B,SZN		BLUE
<i>Contia tenuis</i>	Sharp-tailed Snake	G5	S1	E (1999)	RED
<i>Corynorhinus townsendii</i>	Townsend's Big-eared Bat	G4	S2S3		BLUE
<i>Dermochelys coriacea</i>	Leatherback	G2	S1S2N	E (May 2000)	RED
<i>Enhydra lutris</i>	Sea Otter	G4	S2	T (MAY 2000)	RED
<i>Epitheca canis</i>	Beaverpond Baskettail	G5	S3		BLUE
<i>Erynnis propertius</i>	Propertius Duskywing	G5	S3		BLUE
<i>Erythemis collocata</i>	Western Pondhawk	G5	S3		BLUE
<i>Eschrichtius robustus</i>	Grey Whale	G3G4	S2N	NAR (1987)	BLUE
<i>Euchloe ausonides</i> ssp. 1	Large Marble, undescribed island subspecies	G5T1	SX	XT (May 2000)	RED
<i>Eumetopias jubatus</i>	Northern Sea Lion	G3	S2B,S3N	NAR (1987)	RED
<i>Euphydryas editha taylori</i>	Edith's Checkerspot, <i>taylori</i> subspecies	G5T1	SH	E (Nov 2000)	RED
<i>Euphyes vestris</i>	Dun Skipper	G5	S3	T (Nov 2000)	BLUE
<i>Falco peregrinus anatum</i>	Peregrine Falcon, <i>anatum</i> subspecies	G4T3	S2B,SZN	T (MAY 2000)	RED
<i>Falco peregrinus pealei</i>	Peregrine Falcon, <i>pealei</i> subspecies	G4T3	S3B,SZN	SC (NOV 2001)	BLUE
<i>Fratercula cirrhata</i>	Tufted Puffin	G5	S3B,S4N		BLUE
<i>Gasterosteus</i> sp. 2	Enos Lake Limnetic Stickleback	G1	S1	T (1988)	RED
<i>Gasterosteus</i> sp. 3	Enos Lake Benthic Stickleback	G1	S1	T (1988)	RED
<i>Glaucidium gnoma swarthi</i>	Northern Pygmy-Owl, <i>swarthi</i> subspecies	G5T3Q	S3		BLUE
<i>Gulo gulo vancouverensis</i>	Wolverine, <i>vancouverensis</i> subspecies	G4T1Q	SH	SC (1989)	RED
<i>Hesperia colorado oregonia</i>	Common Branded Skipper, <i>oregonia</i> subspecies	G5T3T4	S3		BLUE
<i>Icaricia icarioides blackmorei</i>	Boisduval's Blue, <i>blackmorei</i> subspecies	G5T3	S3		BLUE
<i>Incisalia mossii mossii</i>	Moss' Elfin, <i>mossii</i> subspecies	G4T4	S3		BLUE
<i>Lagopus leucurus saxatilis</i>	White-tailed Ptarmigan, <i>saxatilis</i> subspecies	G5T3	S3		BLUE
<i>Lampetra macrostoma</i>	Cowichan Lake Lamprey	G1	S1	T (NOV 2000)	RED
<i>Loranthomitoura johnsoni</i>	Johnson's Hairstreak	G2G3	S1S2		RED
<i>Marmota vancouverensis</i>	Vancouver Island Marmot	G1	S1	E (May 2000)	RED
<i>Megaptera novaeangliae</i>	Humpback Whale	G3	S1N	T (1985)	BLUE
<i>Melanerpes lewis</i>	Lewis's Woodpecker	G4	S3B,SZN	SC (NOV 2001)	BLUE
<i>Melanerpes lewis</i> pop. 1	Lewis's Woodpecker (Georgia Depression population)	G5T?Q	SXB,SZN		RED
<i>Melanitta perspicillata</i>	Surf Scoter	G5	S3B,S4N		BLUE
<i>Mustela erminea anguinae</i>	Ermine, <i>anguinae</i> subspecies	G5T3	S3		BLUE
<i>Myotis keenii</i>	Keen's Long-eared Myotis	G2G3	S1S3	SC (1988)	RED
<i>Oeneis nevadensis</i>	Great Arctic	G5	S3		BLUE
<i>Oncorhynchus clarki clarki</i>	Cutthroat Trout, <i>clarki</i> subspecies	G4T4	S3S4SE		BLUE
<i>Orcinus orca</i> pop. 1	Killer Whale (Northeast Pacific resident population)	G4G5T3Q	S2	T (NOV 2001)	RED
<i>Orcinus orca</i> pop. 2	Killer Whale (Northeast Pacific offshore population)	G4G5TUQ	S3	SC (NOV 2001)	BLUE
<i>Orcinus orca</i> pop. 3	Killer Whale (West Coast transient population)	G4G5T4Q	S2	T (NOV 2001)	RED

Appendix I-c
 B.C. Conservation Data Centre: Rare Vertebrate Tracking List
 South Island Forest District, July 2002

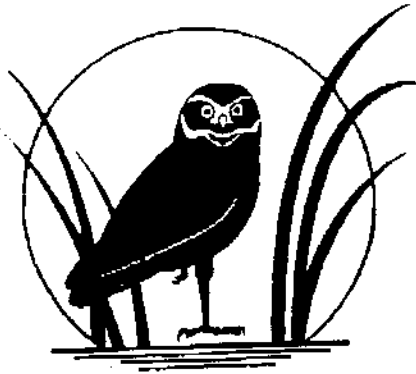
Scientific Name	English Name	G Rank	Subnational	COSEWIC	BC Status
<i>Pachydiplax longipennis</i>	Blue Dasher	G5	S3		BLUE
<i>Phalacrocorax auritus</i>	Double-crested Cormorant	G5	S2B,SZN		RED
<i>Phalacrocorax penicillatus</i>	Brandt's Cormorant	G5	S1B,S4N	NAR (1978)	RED
<i>Pinicola enucleator carlottae</i>	Pine Grosbeak, <i>carlottae</i> subspecies	G5T3	S3B,SZN		RED
<i>Pituophis catenifer catenifer</i>	Gopher Snake, <i>catenifer</i> subspecies	G5T5	SX	EX (MAY 2002)	RED
<i>Plebejus saepiolus insulanus</i>	Greenish Blue, <i>insulanus</i> subspecies	G5TH	SH	E (Nov 2000)	RED
<i>Poocetes gramineus affinis</i>	Vesper Sparrow, <i>affinis</i> subspecies	G5T3	S1B		RED
<i>Progne subis</i>	Purple Martin	G5	S2B		RED
<i>Ptychoramphus aleuticus</i>	Cassin's Auklet	G4	S2S3B,S4N		RED
<i>Rana aurora</i>	Red-legged Frog	G4	S3S4	SC (MAY 2002)	BLUE
<i>Sialia mexicana</i> pop. 1	Western Bluebird (Georgia Depression population)	G5T?Q	SHB,SZN		RED
<i>Sorex palustris brooksi</i>	Common Water Shrew, <i>brooksi</i> subspecies	G5T2	S2		RED
<i>Speyeria zerene bremnerii</i>	Zerene Fritillary, <i>bremnerii</i> subspecies	G5T3T4	S3		BLUE
<i>Sturnella neglecta</i> pop. 1	Western Meadowlark (Georgia Depression population)	G5T?Q	SXB,SZN		RED
<i>Sympetrum vicinum</i>	Yellow-legged Meadowhawk	G5	S3S4		BLUE
<i>Tyto alba</i>	Barn Owl	G5	S3	SC (NOV 2001)	BLUE
<i>Uria aalge</i>	Common Murre	G5	S2B,S4N		RED

BIOLOGICAL CONSERVATION COMMISSION
 250 374-9312 FAX 250-374-7711

THE PARLIAMENT OF BRITAIN, MALDEN LAKES STUDY AREA

The report which follows has been produced in response to your request of October 1999 regarding the status of the above occurrence list of rare species or natural populations within the Conservation Data Centre's jurisdiction in Malden Lakes. It includes the following items:

A "Rare Species Occurrence" report listing the occurrence tracked by the CDC in Malden Lakes. The report includes a map number, scientific name, vernacular name, global conservation status (a conservation status assigned by the IUCN, combined in appropriate places, also included), status on the Ministry's Red or Blue List, location, the date of the last sighting, distributional map, placement occurrence rank, type of occurrence, association with biogeographic subunits of the province, date last observed, and a brief description of the species used to compile the information contained in the report.



**British Columbia
Conservation Data Centre**
Ministry of Sustainable Resource Management
Terrestrial Information Branch
P.O. Box 9993, Stn. Prov. Govt.
Victoria, B.C.
Canada V8W 9R7
Location: 3rd fl. 722 Johnson St. V8W 1N1

FAX COVER SHEET

TO: Susan Blundell
ENKON Environmental Ltd.
FAX: 250-480-7141

DATE: 21 October, 2002
PHONE: 250-480-7103

FROM: Marta Donovan
Biological Information Coordinator
PHONE: 250-356-0928
FAX: 250-387-2733
EMAIL: cdcddata@victoria1.gov.bc.ca

FAX LENGTH: 12 pages, including this page.

RE: RARE ELEMENT OCCURRENCES¹, MALTBY LAKE STUDY AREA

Dear Susan,

The material which follows has been produced in response to your e-mail of October 17 requesting details on known occurrences of rare species or natural plant communities which the Conservation Data Centre has mapped to date at Maltby Lake. It includes the following items:

1. A "Rare Element Occurrence" report listing one occurrence mapped by the CDC at Trevlac Pond. The record includes a map number, scientific name, common name, global rank, provincial rank (a conservation status rank assigned by the CDC, explained in a separate sheet, also enclosed), status on the Ministry's Red or Blue List, location, directions to the location, informational notes, element occurrence rank, type of occurrence, ecosection and biogeoclimatic subzone of the occurrence, date last observed, and a code identifying the sources used to compile the information contained in the record.

¹ An Element Occurrence is an area where a species or plant association is or was present. An Element Occurrence has practical conservation value because it represents a habitat capable of sustaining or contributing to the survival of that element.

NOTE: The CDC's database is dynamic; records are added or amended on a regular basis. Rare element reports summarise information in the database at the time of the request. They should not be interpreted as a comprehensive or definitive list of rare species and communities, or used as a substitute for the on-site surveys usually required for environmental assessment.

2. A map of your study area indicating the locations of the occurrence listed in the Rare Element Occurrence report.
3. Two new vascular plant records that have not yet been entered into our main database. Each record includes the taxon name, status on the Ministry's Red or Blue List, herbarium, collector, date of collection or observation, collection number, location, UTM, lat/long, elev. (m), elev. (ft.) habitat information and additional notes. ***Please note that this data has not undergone the review process that takes place when occurrences are mapped. The recorded coordinates have not been checked against the TRIM spatial datasets and may not represent the actual location.
4. Field Data Reports for SEI polygons C0434 and C0386. Though many SEI polygons contain rare plant associations, most of these have not yet been mapped by the CDC and are therefore not included in the Rare Element Occurrence reports.

Please note that *Senecio macounii*, *Aster radulinus*, *Viola howellii* and *Propertius Duskywing* have been recorded from Pike Lake nearby. These rare species may also be present in appropriate habitat in your study area. A detailed assessment conducted during the appropriate season is recommended.

Please contact us again if you require further information or explanation. Note that the material included in this letter was produced by CDC staff at a cost of 1 hour of staff time and should be properly acknowledged if quoted or reproduced. Thank you for your cooperation.

Sincerely,



Marta Donovan

Biological Information Coordinator

BC CONSERVATION DATA CENTRE: RARE BIRDS OCCURRENCES, VICINITY OF MALLEBY LAKE

October 21, 2002

PAGE 1

MAP #	LOCATION	DIRECTIONS	NOTES	EX BOTYPH RANK	RECOLLECTION - HOC	LAST OBSERVED	SOURCE CODE
6850	TREVLAC POND		<p>* BIRDS</p> <p>*** BOTAURUS LENTIGIOSUS (AMERICAN BITTERN) : G4 - S3B, S2N - BLUE LIST</p> <p>1993; 1 bird seen through February, March and April - G. Calvert and m.obs. (P91VRP01BCCA). 1985 and 1988; single birds seen - G. Calvert (P93CAL01BCCA).</p>		NAL - CDP min	1993-04	091VRP01 P93CAL01

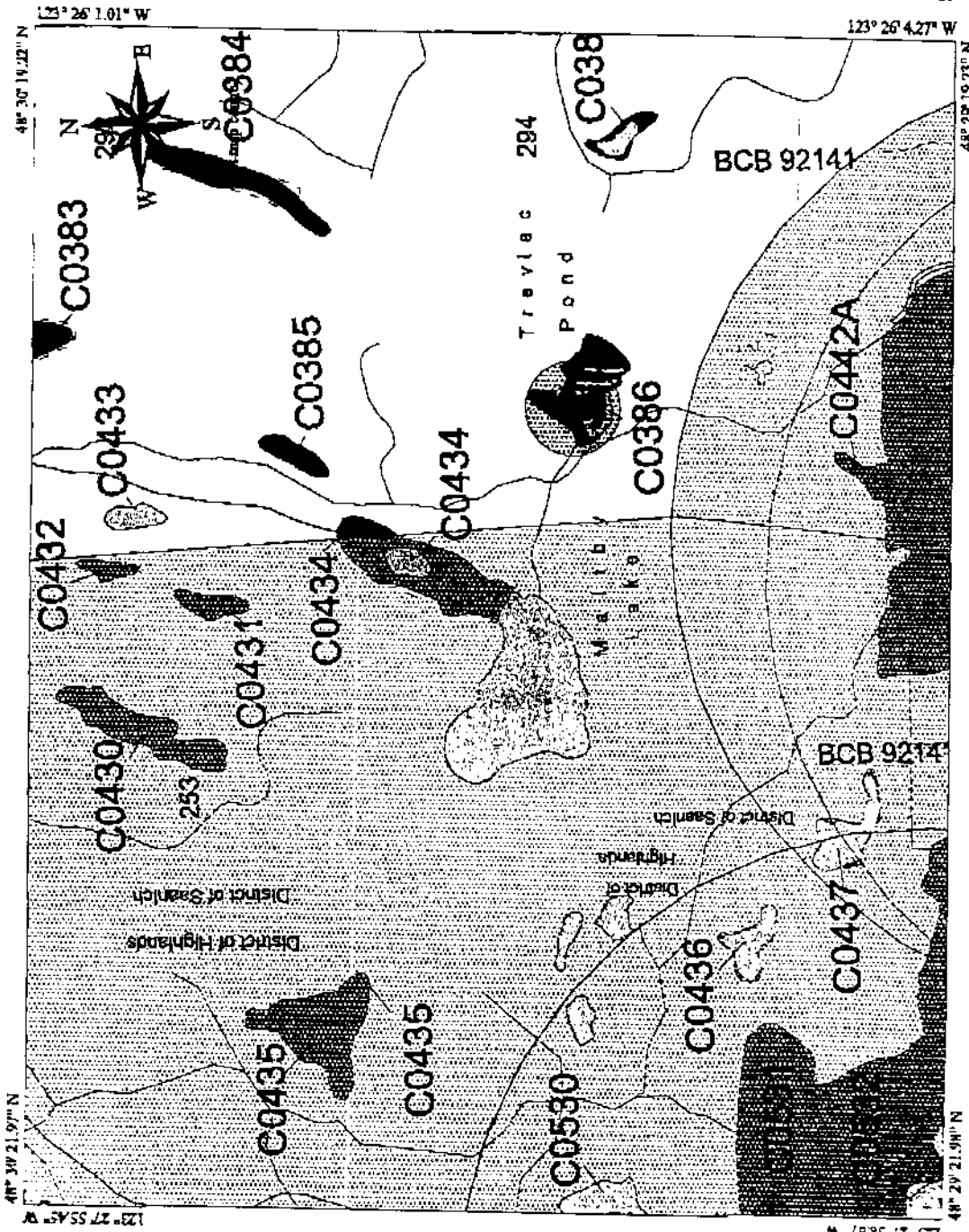
1 Records Processed

SOURCES CITED

- 091VRP01BCCA British Columbia Vertebrate Record File, Royal British Columbia Museum, Victoria, B.C. V8V 1X4.
- P93CAL01BCCA Calvert, Gilbert (Giff). Deceased.

2 Records Processed

BC Conservation Data Centre - Rare Element Occurrences, SLEI polygons vicinity of Malloy Lake



Legend

- Vertebrate Animal
- Community
- Geologic
- Invertebrate Animal
- Neovascular Plant
- Other
- Vascular Plant

Information on this map is frequently updated or changed. This map is valid for a maximum of six months after issue, and is considered out of date after April 21, 2003.

For further information, see our web page at <http://wwwwww.gov.bc.ca/cdc> or contact Mars Donovan at 250-356-0928

Index Map



Province of British Columbia
 Ministry of Sustainable Resource Management
 Registrar and Resource Information Division
 October 21, 2002



MAP COMPILATION
 Projection: Albers Equal Area Conic
 Datum: NAD 83



BC CONSERVATION DATA CENTRE: RARE VASCULAR PLANT COLLECTIONS (IND)
OBSERVATIONS - Malby Lake study area

TAXON NAME	LIST STATUS	HERBARIUM COLLECTOR, DATE, NUMBER	LOCALITY	UTM NAD LAT/LONG ELEV m, ft	HABITAT	NOTES
<i>Psilocarphus tenellus</i> var. <i>tenellus</i> new	R	V J.L. Penny 2001-07-12 423	Prospect Lake road, right-of-way crosses road	10.00 467043.000 5370994.00 83.000	On compacted sandy/gravelly road with <i>Gnaphalium</i> sp., <i>Altra</i> <i>praecox</i> ; substrate fine sand with large fragments, heavily compacted by vehicle traffic	probably 10,000 plants over a large length of road, S UTM: 10 466974 5370926, N end; 10 467196 5370775; popn extends further S as well
<i>Psilocarphus tenellus</i> var. <i>tenellus</i> new?	R	V J.L. Penny 2001-07-12 422	Francis King Park, right-of-way N of	10.00 460596.000 5370820.00 83.000 80 m	On gravelly roadside with <i>Gnaphalium</i> sp. and <i>Plantago</i> major	few plants over few m ²

Sensitive Ecosystems Inventory of East Vancouver Island & Gulf Islands

Field Data Report

1 of 4 Pages

21-Oct-02

Polygon ID: C0386 Sub-unit: CAPITAL-VI Polygon Size (ha): 2.43
 Map Sheet(s): 92B/043 Air photo(s): 92141-294
 Location: PROSPECT LAKE RD. SOUTH OF VIADUCT
 Ecosystem 1: WN.ms.s Ecosystem 2: _____ Forest Age: _____
 Data Source: PK,GT Soil Unit: _____

Ecosystem 1 or 2: 1 Multiple Plots: No Ecoplot No(s): _____
 Landscape Condition: Highly Fragmented (>25% landscape fragmentation)

Polygon Description

Environmental Uniformity: Low Vegetation Uniformity: Medium
 Forested Site Association(s): _____

Environmental Characteristics

Slope _____ Slope Range: _____ Mesoslope: n/a
 Elevation: 260m Elevation Range: _____ Aspect: _____
 Mineral Soil: Yes Organic Soil: _____ Drainage: n/a
 Moisture Regim n/a Nutrient Regime: n/a
 Hydrology Inflow Hydrology Data Source: Field checked

Fish Observations: Present

Disturbance History (Natural)

Fire: Flooding: Animal Use: Erosion: Disease: Windthrow: Other:

Disturbance History (Anthropogenic)

Logging: Grazing: Agriculture: Construction: Recreation: Water Level Control:
 Dyking: Dredging: Pollutants (Dump): Other:

Adjacent Land Uses: RESIDENTIAL; RECREATION

Known Threats: _____



Environment
Canada

Environnement
Canada



Sensitive Ecosystems Inventory of East Vancouver Island & Gulf Islands

2 of 4 Pages

Polygon ID: C0386

21-Oct-00

Comments: SHRUB SWAMP; EXCELLENT BIRD HABITAT; WAS DAMMED AROUND 1975; DRAINS INTO MALTBY LAKE; NOW A SAANICH REGIONAL PARK; EDIT NOTE: NO INDIVIDUAL % COVERS DONE FOR VEGETATION

Vegetation Data

In general, dominant species only are recorded for each vegetation type. Rare, uncommon or indicator species may also be included.

Non-vegetated Type: OPEN WATER

Vegetation Type	Percent Cover	Type	Species Code	Scientific Name	Common Name	Percent Cover
1 Coniferous Trees:		3	ALNURUB	Alnus rubra	red alder	
2 Hardwood Trees:		3	CORNSTO	Cornus stolonifera	red-osier dogwood	
3 Tall Shrubs:	7	3	SALIX	Salix sp.	willow	
4 Low Shrubs:	10	4	RUBUDIS	Rubus discolor	himalayan blackberry	
5 Forbs:		4	RUBUSPE	Rubus spectabilis	salmonberry	
6 Grasses:		4	SALIX	Salix sp.	willow	
7 Rushes:	10	4	SPIRAEA	Spiraea sp.		
8 Sedges:		7	TYPHLAT	Typha latifolia	common Cattail	
9 Mosses/Lichens:		10	CALLITR	Callitriche sp.		
10 Aquatics:	20	10	HIPPVUL	Hippuris vulgaris	common mare's-tail	
11 Non-vegetated:	10	10	POLYAMP	Polygonum amphibium	water smartweed	
12 Introduced Species:		12	RUBUDIS	Rubus discolor	himalayan blackberry	



Environment Canada / Environnement Canada



Sensitive Ecosystems Inventory of East Vancouver Island & Gulf Islands

3 of 4 Pages

Field Data Report

21-Oct-02

Polygon ID: C0434 Sub-unit: CAPITAL-VI Polygon Size (ha): 3.77
 Map Sheet(s): 92B 043, 92B 053 Air photo(s): 92141-253
 Location: NORTH SHORE OF MALTBY LAKE
 Ecosystem 1: WIN:sp:sw Ecosystem 2: _____ Forest Age: _____
 Data Source: GT Soil Unit: _____

Ecosystem 1 or 2: 1 Multiple Plots: No Ecoplot No(s): _____

Landscape Condition: Partly Fragmented (5-25% landscape fragmentation)

Polygon Description

Environmental Uniformity: Low Vegetation Uniformity: High

Forested Site Association(s): _____

Environmental Characteristics

Slope _____ Slope Range: _____ Mesoslope: n/a

Elevation: 225m Elevation Range: _____ Aspect: _____

Mineral Soil: _____ Organic Soil: _____ Drainage: n/a

Moisture Regim n/a Nutrient Regime: n/a

Hydrology Non-tidal shoreline Hydrology Data Source: Not verified

Fish Observations: No Data

Disturbance History (Natural)

Fire: Flooding: Animal Use: Erosion: Disease: Windthrow: Other:

Disturbance History (Anthropogenic)

Logging: Grazing: Agriculture: Construction: Recreation: Water Level Control:

Dyking: Dredging: Pollutants (Dump): Other:

Adjacent Land Uses: RESIDENTIAL; RECREATION

Known Threats: _____

Sensitive Ecosystems Inventory of East Vancouver Island & Gulf Islands

4 of 4 Pages

Polygon ID: C0434

21-Oct-01

Comments: ROAD OR CHANNEL THROUGH POLYGON (JU) DISTURBANCE ADJACENT;
 RICH SHRUB; VERY RIGOROUS; POND SEPARATED FROM WETLAND SITE; EDIT NOTE:
 INDIVIDUAL % COVER NOT DONE FOR VEGETATION

Vegetation Data

In general, dominant species only are recorded for each vegetation type. Rare, uncommon or indicator species may also be included.

Non-vegetated Type: OPEN WATER

Vegetation Type	Percent Cover	Type	Species Code	Scientific Name	Common Name	Percent Cover
1 Coniferous Trees:		3	CORNSTO	Cornus stolonifera	red-osier dogwood	
2 Hardwood Trees:		3	LONIINV	Lonicera involucrata	black twinberry	
3 Tall Shrubs:	85	3	MALUFUS	Malus fusca	pacific crab apple	
4 Low Shrubs:	35	3	SALIX	Salix sp.	willow	
5 Forbs:	10	4	AMELALN	Amelanchier alnifolia	saskatoon	
6 Grasses:		4	CORNSTO	Cornus stolonifera	red-osier dogwood	
7 Rushes:	1	4	LONIINV	Lonicera involucrata	black twinberry	
8 Sedges:		4	SALIX	Salix sp.	willow	
9 Mosses/Lichens:		4	SPIRDOU	Spiraea douglasii	hardhack	
10 Aquatics:		5	ATHYFIL	Athyrium filix-femina		
11 Non-vegetated:	20	5	LYSIAME	Lysichiton americanum	skunk cabbage	
12 Introduced Species:		5	VIOLA	Viola sp.	violet	
		7	TYPHLAT	Typha latifolia	common Cattail	
		10	NUPHPOL	Nuphar polysepala	rocky Mountain cow-lily	



Environment Canada / Environnement Canada





BRITISH COLUMBIA CONSERVATION DATA CENTRE

CONSERVATION STATUS RANKING

Conservation Status Ranks reflect the relative imperilment or 'conservation status' of plants, animals and ecological communities on a global, national and subnational (provincial) level. These ranks are assigned, reviewed and revised according to standard criteria developed by The Nature Conservancy and the Association for Biodiversity Information (ABI).

Each element is assigned a global rank (called a G-rank), that applies across its entire range; a national rank (N-rank) for each nation in its range and a provincial rank (S-rank) based solely on its status within British Columbia. In general, global and national ranks are assigned by taxonomists, on the basis of information supplied by subnational data centres and experts on particular taxonomic groups. Provincial ranks are assigned by Program Specialists at the Conservation Data Centre. New information provided by field surveys, monitoring activities, consultation, and literature review is used to improve accuracy and keep ranks current.

The conservation status of an element consists of a whole number from 1 to 5 preceded by a G (Global), N (National) or S (Subnational). The numbers have the following general meanings:

- 1 = Critically imperiled, either because of known threats or declining trends, or because extremely restricted breeding or non-breeding range make the element vulnerable to unpredictable events; a candidate for 'endangered' status.
- 2 = Imperiled; a candidate for 'threatened' status.
- 3 = Vulnerable; usually more abundant or widespread than elements defined above, but sensitive to threats; perhaps declining
- 4 = Apparently secure, but may have restricted range or possible long-term concerns.
- 5 = Demonstrably secure; usually widespread and abundant.

A provincial rank cannot imply that the element is more abundant at the provincial level than it is nationally or globally (e.g., a G1/S2 rank should not occur).

Rank qualifiers are used to add information about the element or to add uncertainty. These are defined below:

- H = Historical occurrence; despite no recent evidence that the element is extant, there is some expectation that it may be rediscovered.
- X = Presumed extirpated; not located despite intensive searches of historical sites and appropriate habitat and there is virtually no likelihood that it will be rediscovered.
- U = Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
- R = Reported from the province, but without persuasive documentation for either accepting or rejecting the report.
- EE = Reported in error, but this error has persisted in the literature
- = Unranked; rank not yet assessed.
- A = Accidental or casual in the province; includes elements (usually animals) that are infrequent and outside their usual range.
- E = An exotic or introduced species established in the province
- T = Migratory transient; generally used for long distance migrants that pass through the province as a diffuse, usually moving population for which enduring, mappable occurrences cannot be defined.
- V = Designates a rank associated with a subspecies or variety.
- Q = Taxonomic validity of the element is not clear or in question
- P = Potential that element occurs in the province but no extant or historic occurrences are accepted.

Breeding Status Qualifiers are used for migratory animals:

- B = Breeding; the associated rank refers to the breeding population in the province.
- N = Non-breeding; the associated rank refers to the non-breeding population in the province.

Assessing the conservation status of species and ecological communities allows targeting of the most at-risk elements for inventory, protection, management and research. In an effort to balance global and local conservation concerns, both global and provincial ranks are used to identify the elements that should receive priority in a jurisdiction. In general, the Conservation Data Centre will give the highest priority to those elements with ranks of 1 to 3.

For complete descriptions of ranks and qualifiers, see the lists of Conservation Status Rank definitions at <http://www.natureserve.org/ranking.htm>



BRITISH COLUMBIA CONSERVATION DATA CENTRE

PROVINCIAL LIST STATUS AND CDC RANKS

All rare entities tracked by the B.C. Conservation Data Centre have been assigned provincial and global conservation status ranks (see separate Ranking sheet for an explanation of the CDC ranking system). Most entities also have a designation on the Ministry of Environment's Red or Blue list. Definitions of the Ministry's Red and Blue lists, and the relationship between list status and the CDC provincial rarity rank ("S" rank) are explained below.

The provincial rank will always be less than or equal to the global rank. An element cannot be given a provincial rank that indicates it is more common locally than globally.

I. PROVINCIAL LIST STATUS

RED LIST:

Includes indigenous species or subspecies that have, or are candidates for Extirpated, Endangered, or Threatened status in British Columbia. Extirpated taxa no longer exist in the wild in British Columbia, but do occur elsewhere. Endangered taxa are facing imminent extirpation or extinction. Threatened taxa are likely to become endangered if limiting factors are not reversed.

BLUE LIST:

Includes indigenous species or subspecies considered to be Vulnerable in British Columbia. Vulnerable taxa are of special concern because of characteristics that make them particularly sensitive to human activities or natural events. Blue-listed taxa are at risk, but are not Extirpated, Endangered or Threatened.

YELLOW LIST:

Any indigenous species or subspecies (taxa) which is not at risk in British Columbia. The CDC tracks some Yellow listed taxa which are vulnerable during times of seasonal concentration (eg breeding colonies).

II. DERIVATION OF LIST STATUS FROM CDC "S" RANK (PROVINCIAL RANK)*

	RED LIST	BLUE LIST
ANIMALS	S1 S1S2 S2 S2? S1S3	S2S3 S2S4 S3 S3? S3S4
PLANTS	S1 S2	S2S3 S3
PLANT COMMUNITIES	S1 S1S2 S2 S2?	S2S3 S3 S3?

*See separate 'Ranking' sheet for explanation of the CDC ranking system.

Sensitive Ecosystems of East Vancouver Island and Gulf Islands

Ecosystem Categories

- CB Coastal bluff**
Vegetated rocky islet, rocky shoreline/grassland, rocky shoreline/moss or coastal cliff (**cl**)
- HT Terrestrial herbaceous**
Natural grassland or bryophyte-dominated vegetation, including rock outcrop/grassland and rock outcrop/moss types (**ro**); >20% shrub cover (**sh**).
- OF Older forest**
Forested ecosystem with dominant age class >100 years; coniferous (**co**), mixed with broadleaf component >15% (**mx**).
- RI Riparian**
All stages of floodplain vegetation including riparian vegetation associated with lakes or gullies (**g**). Structural stages: **1, 1a, 1b** non-vegetated/sparse; **2** herb; **3** shrub/herb; **3a** low shrub; **3b** tall shrub; **4** pole/sapling; **5** young forest; **6** mature forest; **7** old forest.
- SV Sparsely vegetated**
Ecosystem with sparse vegetation; cliff (**cl**), sand dune (**sd**), spit (**sp**).
- WN Wetland**
Ecosystem with wet soil and moisture-dependent plants; bog (**bg**), fen (**fn**), marsh (**ms**), swamp (**sp**), shallow water (**sw**), wet meadow (**wm**).
- WD Woodland**
Open woodlands (stands of Garry oak and mixed stands of Garry oak/Arbutus, Garry oak/Douglas-fir, Arbutus/Douglas-fir)

Areas with general biodiversity values

- FS Seasonally flooded agricultural field**
- SG Second growth forest**
Forested ecosystem with dominant age class 60 - 100 years; coniferous (**co**), mixed with broadleaf component >15% (**mx**).

APPENDIX II

Rare Plant Survey

Maltby Lake Rare Plant Summary

Grassy/mossy rock outcrops

Mostly covered with *Racomitrium elongatum*, *Selaginella wallacei*, *Brodiaea coronaria*, *Dicranum scoparium*, and introduced plants such as *Hypochaeris radicata*, *Aira praecox*, *Anthoxanthum odoratum*, *Vicia lathyroides*, etc.

Fragments of grassy vegetation are uncommon. The red listed community *Festuca roemeri-Koeleria micrantha* are present only in fragments and lack the co-dominant *Koeleria micrantha*. *Danthonia californica*, however, is present throughout. The example of such a fragment is at Waypoint # 163: 10 U 0466389 5371405 .

Annual species are a conspicuous component of rock outcrops in spring:

Collinsia parviflora (more correctly *Collinsia grandiflora* var. *pusilla*)
Nemophila parviflora, *Lithophragma parviflorum*, *Lithophragma glabrum*,
Trifolium microcephalum, *Trifolium willdenowii*, *Trifolium variegatum*, *Plectritis congesta*.

Several bulbous geophytes are conspicuous in spring aspect. These are *Camassia leichtlinii* and *Camassia quamash*, *Brodiaea coronaria* and *Triteleia hyacinthina* and *Zigadenus venenosus*.

Southern part of Vancouver Island has interesting flora and vegetation on rock outcrops in seepy places. In the Maltby Lake area we found only one such a place

Waypoint 171 10 U 0466372 5371813 and Waypoint 172 10 U 0466372 5371821

Aphanes microcarpa, *Mimulus guttatus*, and *Mimulus sookensis* (yet undescribed species of *Mimulus*) occur in this seepage.

Rock outcrops with Quercus garryana

Rock outcrops with deeper soil host fragments of *Quercus garryana* – *Arbutus menziesii* and *Quercus garryana*/*Holodiscus discolor* plant communities. *Quercus garryana* regenerates in this area and we saw clusters of young seedlings. *Holodiscus discolor*, *Carex inops*, *Dodecatheon hendersonii*, *Mahonia aquifolium*, *Erythronium oregonum*, *Trachybryum megaptilum*, *Elymus glaucus*, *Symphoricarpos hesperius* are characteristic species of this vegetation type.

Douglas-fir forests

Douglas-fir forest communities belong to the Coastal Douglas-fir site series (CDFmm). Douglas-fir – Salal and Douglas-fir-Grand Fir – Oregon grape communities are relatively well represented in younger stands of Douglas-fir.

Fragments of tracked *Pseudotsuga menziesii*-*Quercus garryana*-*Melica subulata* have several nice veteran trees of Douglas-fir

Waypoint 165 - picture on airphoto # 5

165 10 U 0466409 5371460

The condition of these fragments is good, but their area is quite small. Nevertheless, they should be preserved. These communities are floristically rich and contain *Melica subulata*, *Moehringia macrophylla*, *Hieracium albiflorum*, *Festuca occidentalis*, *Rosa gymnocarpa*, *Sanicula crassicaulis*, *Rhytidadelphus triquetrus*, etc.

Wetlands

The main extent of wetland plant communities is around Little Maltby Lake. They consist of bushes of willows (*Salix scouleriana*, *Salix lucida* ssp. *lasiandra*, *Salix sitchensis*, *Salix hookeriana*, *Salix geyeriana*), hardhack (*Spiraea douglasii* var. *menziesii*, *Spiraea douglasii* var. *douglasii*, *Cornus sericea*, *Physocarpus capitatus*). *Scirpus microcarpus* and *Carex obnupta* are dominant species in the herb layer.

Shrubby wetland communities also occur in several depressions scattered throughout the property. The largest of them (Point No. 4 on the map Waypoint 159: 10 U 0466521 5371236) host *Alnus rubra*-*Lysichiton americanus* community.

Water plants

Margin of Maltby Lake hosts communities with *Nuphar polysepala*. *Myriophyllum sibiricum* is uncommon in the Victoria area and *Utricularia gibba* is a BLUE listed species. *Potamogeton robbinsii* grew at the bottom, *Potamogeton amplifolius* and *Potamogeton natans* forms stands in shallower water. Several clumps of introduced *Nymphaea odorata*.

Logged areas

The southern part of the area off Munn's Road has been logged. It regenerates with Douglas-fir. The species composition is typical for these habitats on southern Vancouver Island.

Rare plants

Two BLUE listed species have been found in this area:

- *Epilobium foliosum* – on rock outcrops above the lake
- *Utricularia gibba* – in water of the lake

In addition the following rare fungi was found:

- *Amanita aprica* – along trail on east side of lake

Maltby Lake Alphabetical list of species

- Abies grandis*
Acer macrophyllum
Achillea millefolium
Achlys triphylla
Agrostis capillaris
Agrostis stolonifera
Aira caryophylla
Aira praecox
Alnus rubra
Amelanchier alnifolia
Anaphalis margaritacea
Anthoxanthum odoratum
Aphanes arvensis
Aphanes microcarpa
Aphanes occidentalis
Apocynum androsaemifolium
Arbutus menziesii
Arctostaphylos uva-ursi
Athyrium filix-femina
Bellis perennis
Brodiaea coronaria
Brodiaea hyacinthina?
Bromus carinatus
Bromus hordeaceus
Bromus mollis
Bromus pacificus
Bromus sp.
Bromus sterilis
Calypso bulbosa
Camassia leichtlinii
Camassia quamash
Cardamine hirsuta
Cardamine oligosperma
Cares obnupta
Carex deweyana
Carex hendersonii
Carex inops
Carex obnupta
Carex rossii
Cerastium arvense
Cerastium glomeratum
Cerastium holosteoides
Cerastium semidecandrum
Chrysanthemum leucanthemum
Cirsium arvense
Cirsium vulgare
Clarkia amoena
Claytonia parviflora
Claytonia perfoliata
Claytonia sibirica
Collinsia parviflora
Comarum palustre
Coralorhiza maculata
Cornus nuttallii
Cornus sericea
Cotoneaster sp.
Crataegus monogyna
Cystopteris fragilis
Cytisus scoparius
Dactylis glomerata
Danthonia californica
Daphne laureola
Digitalis purpurea
Dodecatheon hendersonii
Dryopteris expansa
Elodea canadensis
Elymus glaucus
Epilobium angustifolium
Epilobium ciliatum
Epilobium foliosum
Epilobium minutum
Equisetum arvense
Equisetum telmateia
Erythronium oregonum
Festuca occidentalis
Festuca roemeri
Fragaria vesca
Fragaria virginiana
Fritillaria affinis
Galium aparine
Galium triflorum
Gaultheria shallon
Geranium molle
Geranium pusillum
Geranium robertianum
Geum macrophyllum
Glyceria borealis
Glyceria elata
Gnaphalium purpureum
Goodyera oblingifolia
Heuchera glabra
Heuchera micrantha
Hieracium albiflorum
Holcus lanatus
Holodiscus discolor
Hypochaeris radicata
Ilex aquifolium
Iris pseudacorus

Juncus bolanderi
Juncus effusus
Juncus ensifolius
Juncus tenuis s.l.
Lathyrus nevadensis
Lepidium heterophyllum
Leucanthemum vulgare
Lilium columbianum
Linnaea borealis
Lithophragma glabrum
Lithophragma parviflorum
Lonicer hispidula
Lonicera ciliosa
Lonicera hispidula
Lonicera involucrata
Lotus micranthus
Luzula comosa
Luzula multiflora s.l.
Luzula sp.
Luzula subsessilis
Lysichiton americanus
Madia madioides
Mahonia aquifolium
Mahonia nervosa
Maianthemum dilatatum
Malus fusca
Melica subulata
Mentha arvensis
Microsteris gracilis
Mimulus alsinoides
Mimulus guttatus
Mimulus sookensis
Moehringia macrophylla
Montia fontana
Montia linearis
Montia parvifolia
Montia perfoliata
Mycelis muralis
Myosotis discolor
Myosotis laxa
Myriophyllum sibiricum
Nasturtium aquaticum
Nemophila parviflora
Nuphar polysepala
Nymphaea odorata ?
Oemleria cerasiformis
Oenanthe sarmentosa
Orobanche uniflora
Osmorhiza berteroi
Paxistima myrsinites
Pentagramma triangularis

Phalaris arundinacea
Piperia sp.
Piperia sp. (*transversa*?)
Plantago lanceolata
Plectritis brachystemon
Plectritis congesta
Poa annua
Poa bulbosa
Poa canbyi
Poa compressa
Poa pratensis
Poa sp.
Polypodium glycyrrhiza
Polystichum imbricans
Polystichum munitum
Populus balsamifera subsp. *trichocarpa*
Populus tremuloides
Potamogeton amplifolius
Potamogeton natans
Potamogeton robbinsii
Prunella vulgaris
Prunus emarginata
Pseudotsuga menziesii
Pteridium aquilinum
Pyrola asarifolia
Quercus garryana
Ranunculus acer
Ranunculus aquatilis
Ranunculus flammula
Ranunculus occidentalis
Ranunculus repens
Ranunculus uncinatus
Rhamnus purshiana
Ribes sanguineum
Rosa gymnocarpa
Rosa nutkana
Rubus armeniacus
Rubus laciniatus
Rubus leucodermis
Rubus parviflorus
Rubus spectabilis
Rubus ursinus
Rumex acetosella
Rumex crispus
Salix geyeri
Salix hookeriana
Salix lasiandra
Salix scouleriana
Salix sitchensis
Salix with auricles
Sambucus racemosa

Sanicula crassicaulis
Satureja douglasii
Saxifraga integrifolia
Schoenoplectus validus
Scilla nonscripta
Scirpus microcarpus
Sedum spathulifolium
Sedum telmateia
Selaginella wallacei
Senecio sylvaticus
Senecio vulgaris
Sherardia arvensis
Sonchus asper
Sonchus oleraceus
Sorbus aucuparia
Spiraea douglasii
Spiraea menziesii
Stachys cooleyae
Stellaria media
Symphoricarpos albus
Symphoricarpos mollis
Symphytum officinale
Taraxacum officinale
Taxus brevifolia
Teesdalia nudicaulis
Tellima grandiflora
Thuja plicata
Tiarella trifoliata
Torreyochloa pauciflora
Trientalis latifolia
Trifolium dubium
Trifolium microcephalum
Trifolium sp.
Trifolium tridentatum
Trifolium variegatum
Trifolium willdenowii
Trillium ovatum
Trisetum cernuum
Triteleia hyacinthina
Typha latifolia
Urtica lyalii
Utricularia gibba
Utricularia macrorrhiza
Vaccinium parvifolium
Veronica americana
Veronica arvensis
Veronica scutellata
Viburnum escape (broad leathery leaves)
Vicia hirsuta
Vicia lathyroides
Vicia sativa

Vicia tetrasperma
Vulpia bromoides
Zigadenus venenosus

Bryophytes

Atrichum selwynii
Dicranum scoparium
Eurhynchium oreganum
Hylocomium splendens
Isoetecium stoloniferum on branches
Leucolepis acanthoneuron
Pleurozium schreberi
Polytrichum juniperinum
Porella navicularis
Racomitrium elongatum
Racomitrium lanuginosum
Rhytidiadelphus triquetrus
Trachybryum megaptilum

Lichens

Letharia vulpina on *Pseudotsuga menziesii*

Fungi

Amanita aprica (rare)
Amanita pantherina
Ganoderma aplanatum
Inocybe posterula
Omphalina ericetorum
Sarcosphaera crassa

Fungi – February 8, 2002

Auriscalpium vulgare
Clavulina crista
Clavulina rugose
Clavulinopsis laeticolor
Clitocybe aff. barbularum
Dacrymyces palmatus
Fayodia sp.
Fomitopsis pinicola
Galerina karstenii
Galerina laevis
Galerina lubrica
Geastrum saccatum
Gloeophyllum saepiarum
Helvella lacunose
Hydnum umbilicatum

Hypoholoma capnoides
Inocybe geophyla
Inocybe pseudodestructa
Laccaria tetraspora
Mycena alcalina
Mycena chlorinella
Mycena filipes group
Mycena galericulata
Mycena parabolica
Nidula candida
Pseudohydnum gelatinosum
Psilocybe montana
Tephroclybe rancida
Thelephora terrestris
Trichaptum abietinum
Trichoglossum walteri (rare)

Mycena
Psilocybe

Tricholomataceae

Arctiophila
Arctiophila
Arctiophila
Arctiophila
Arctiophila
Arctiophila
Arctiophila
Arctiophila
Arctiophila
Arctiophila

Cantharellaceae

Cantharellus
Cantharellus
Cantharellus

Wagleriaceae

Wagleriaceae

Wagleria
Wagleria
Wagleria

Wagleriaceae

Wagleriaceae

Wagleriaceae

Arctiophila
Arctiophila
Arctiophila
Arctiophila
Arctiophila
Arctiophila
Arctiophila
Arctiophila
Arctiophila
Arctiophila

Cantharellus
Cantharellus
Cantharellus
Cantharellus
Cantharellus
Cantharellus
Cantharellus
Cantharellus
Cantharellus
Cantharellus

Wagleria
Wagleria
Wagleria

Wagleria

MALTBY LAKE RARE PLANT SURVEY, MAY 2002

Waypoint 150

150 10 U 0466898 5371619 14-MAY-02 17:33

At Thomson Residence

Alnus rubra
Atrichum selwynii
Erythronium oregonum
Gaultheria shallon
Geum macrophyllum
Holodiscus discolor
Linnaea borealis
Lonicera ciliosa
Mahonia nervosa
Melica subulata
Polystichum munitum

Prunus emarginata
Pseudotsuga menziesii
Pteridium aquilinum
Ranunculus acer
Rhytidiadelphus triquetrus
Rosa gymnocarpa
Rubus ursinus
Spiraea menziesii
Symphoricarpos albus
Thuja plicata
Trientalis latifolia

Trampled spot

Acer macrophyllum
Achlys triphylla
Anthoxanthum odoratum
Bellis perennis
Cardamine oligosperma
Eurhynchium oreganum
Fragaria vesca
Fragaria virginiana
Ilex aquifolium
Leucanthemum vulgare
Mycelis muralis

Paxistima myrsinites
Plectritis brachystemon
Ranunculus occidentalis
Ranunculus uncinatus
Salix scouleriana
Sanicula crassicaulis
Scilla nonscripta
Tellima grandiflora
Thuja plicata
Vaccinium parvifolium

In the Douglas-fir forest

Galium aparine
Hypochaeris radicata
Plectritis congesta

Poa annua
Prunus emarginata
Vaccinium parvifolium

Waypoint 151

151 10 U 0466770 5371517 14-MAY-02 17:43

First cottage

Mossy rock outcrop
Cytisus scoparius (about 7 plants)
Pleurozium schreberi

Rhytidiadelphus triquetrus

Crossing the sundeck

Achillea millefolium
Aira praecox
Amelanchier alnifolia
Androsanthum odoratum
Aphanes microcarpa
Arctostaphylos uva-ursi
Brodiaea coronaria
Camassia leichtlinii
Cardamine hirsuta
Cerastium holosteoides
Cerastium semidecandrum
Collinsia pusilla
Erythronium oregonum
Galium aparine
Geranium molle
Heuchera micrantha
Holodiscus discolor
Lotus micranthus
Luzula multiflora s.l.
Luzula subsessilis
Mahonia aquifolium

Drier forest

Holodiscus discolor
Rosa gymnocarpa

Lakeside

Lonicera ciliosa
Lonicera involucrata
Rhamnus purshiana

WAYPOINT 152

152 10 U 0466733 5371526 14-MAY-02 18:16

Wharf

Agrostis stolonifera
Alnus rubra
Athyrium filix-femina
Cardamine hirsuta
Comarum palustre
Elodea canadensis

Back in the forest

Abies grandis
Amanita aprica

Open Douglas-fir forest

Mahonia nervosa
Melica subulata
Moehringia macrophylla
Montia parvifolia
Montia perfoliata
Myosotis discolor
Polypodium glycyrrhiza
Racomitrium elongatum
Rubus ursinus
Rubus ursinus
Sanicula crassicaulis
Saxifraga integrifolia
Scilla nonscripta
Sedum spathulifolium
Symphoricarpos albus
Taraxacum officinale
Thuja plicata
Trachybryum megaptilum
Trientalis latifolia
Veronica arvensis

Tiarella trifoliata

Salix scouleriana
Salix sitchensis
Sarcosphaera crassa

Myriophyllum sibiricum
Potamogeton amplifolius
Potamogeton robbinsii
Spiraea menziesii
Utricularia gibba

Sarcosphaera crassa
Taxus brevifolia
Thuja plicata

Cardamine oligosperma
Gaultheria shallon
Poa pratensis

Between Point 2 & 3

Knoll - full of *Anthoxanthum odoratum*

Anthoxanthum odoratum
Holodiscus discolor
Hylocomium splendens
Melica subulata
Moehringia macrophylla
Plectritis congesta
Polystichum munitum
Prunus emarginata

Depression & open logged area

Equisetum arvense
Festuca occidentalis

Along Bleathman Creek

Anthoxanthum odoratum
Athyrium filix-femina
Bromus sp.
Carex deweyana
Epilobium ciliatum
Equisetum arvense
Fragaria vesca
Geum macrophyllum

Trail going through logged area

Aira caryophyllea
Cirsium arvense
Cytisus scoparius
Elymus glaucus
Fragaria vesca
Heuchera micrantha
Holodiscus discolor
Mahonia aquifolium

154 10 U 0466646 5371383 14-MAY-02 18:42

155 10 U 0466648 5371383 14-MAY-02 18:43

Area was logged in 1991

Acer macrophyllum

Pteridium aquilinum
Rubus spectabilis
Tiarella trifoliata

Prunus emarginata
Rubus armeniacus
Sedum spathulifolium
Taxus brevifolia (2 trees)
Tellima grandiflora
Vaccinium parvifolium

Ilex aquifolium
Rosa gymnocarpa

Mycelis muralis
Oemleria cerasiformis
Rubus spectabilis
Rumex crispus
Spiraea menziesii
Stachys cooleyae
Tellima grandiflora
Veronica americana

Mahonia nervosa
Nemophila parvifolia
Pseudotsuga menziesii
Rubus armeniacus
Rubus ursinus
Symphoricarpos albus
Trientalis latifolia
Vaccinium parvifolium

Apocynum androsaemifolium

Brodiaea coronaria
Carex rossii
Cystopteris fragilis
Erythronium oregonum
Letharia vulpina on *Pseudotsuga menziesii*
Lotus micranthus

Small depression

Abies grandis
Acer macrophyllum
Achlys triphylla
Anaphalis margaritacea
Galium triflorum
Gaultheria shallon

Uphill, rock with

Danthonia californica
Galium aparine
Heuchera micrantha
Melica subulata
Moehringia macrophylla

WAYPOINT 156

156 10 U 0466558 5371355 14-MAY-02 18:58
Elev. 89 m

Another knoll with *Camassia quamash*

Anthoxanthum odoratum
Brodiaea coronaria
Bromus hordeaceus
Cytisus scoparius
Dicranum scoparium
Dodecatheon hendersonii
Erythronium oregonum
Fragaria vesca

WAYPOINT 157

157 10 U 0466547 5371312 14-MAY-02 19:02
Elev. 82

Edge of the forest

Carex inops
Collinsia pusilla
Cystopteris fragilis
Cytisus scoparius
Dicranum scoparium
Mahonia aquifolium

Quercus garryana about one doz.
Rosa gymnocarpa
Salix scouleriana
Spiraea douglasii s.str.
Vulpia bromoides

Holodiscus discolor
Lathyrus nevadensis
Pseudotsuga menziesii young
Spiraea douglasii
Spiraea menziesii
Symphoricarpos albus

Montia parvifolia
Polytrichum juniperinum
Pteridium aquilinum
Quercus garryana (1 on trail)
Satureja douglasii

Heuchera micrantha
Holodiscus discolor
Hypochaeris radicata
Plectritis congesta
Quercus garryana
Racomitrium elongatum
Ranunculus occidentalis

Plectritis brachystemon
Sanicula crassicaulis
Sedum spathulifolium
Teesdalia nudicaulis
Trientalis latifolia

WAYPOINT 158

158 10 U 0466536 5371287 14-MAY-02 19:07

Rock outcrop

Aira caryophylla
Aira praecox
Aphanes microcarpus
Cardamine hirsuta
Cardamine oligosperma
Cytisus scoparius
Dodecatheon hendersonii
Epilobium foliosum
Fritillaria affinis
Holcus lanatus
Inocybe cf. friesii
Lotus micranthus
Luzula comosa

Luzula subsessilis
Myosotis discolor
Plectritis brachystemon
Plectritis congesta
Polypodium glycyrrhiza
Quercus garryana
Racomitrium elongatum
Rhytidiadelphus triquetrus
Rubus ursinus
Sanicula crassicaulis trifida
Sherardia arvensis
Trachybryum megaptilum
Veronica arvensis
Vulpia bromoides

WAYPOINT 159 - Point No. 4 on the map

159 10 U 0466521 5371236 14-MAY-02 19:16

Elongated depression

Alnus rubra
Epilobium ciliatum
Juncus effusus
Juncus tenuis s.l.
Lysichiton americanus

Malus fusca
Oemleria cerasiformis
Oenanthe sarmentosa
Rubus spectabilis
Thuja plicata

Near old car

Athyrium filix-femina
Blechnum spicant
Carex deweyana
Carex obnupta
Epilobium ciliatum
Equisetum arvense
Gaultheria shallon
Juncus ensifolius
Lysichiton americanus
Malus fusca
Myosotis laxa
Populus tremuloides
var. *vancouveriana*
Porella navicularis

Pteridium aquilinum
Ranunculus flammula
Ranunculus repens
Ranunculus uncinatus
Salix lasiandra
Salix sitchensis
Sedum telmateia
Stachys cooleyae
Thuja plicata (15-20 m)
Torreyochloa pauciflora
Typha latifolia
Veronica americana
Veronica scutellata

Rock outcrop

Arbutus menziesii
Carex inops
Pseudotsuga menziesii
Moehringia macrophylla

WAYPOINT 160
160 10 U 0466525 5371343 14-MAY-02 19:50

Ridge with plentiful *Camassia quamash*
Collinsia grandiflora/pusilla

Crossing a logging road

Brodiaea coronaria
Sorbus aucuparia

WAYPOINT 161 Point No. 5
161 10 U 0466457 5371364 14-MAY-02 20:00
Elev. 82 m

Viewpoint at the owl nest

Lots of *Camassia leichtlinii* and *Camassia quamash*
Amelanchier alnifolia
Anthoxanthum odoratum
Bromus hordeaceus
Carex inops
Cirsium arvense
Cirsium vulgare
Clarkia amoena

Next ridge

Bromus hordeaceus

WAYPOINT 162
162 10 U 0466412 5371414 14-MAY-02 20:05

Camassia quamash
Cytisus scoparius
Elymus glaucus
Galium aparine
Gaultheria shallon
Lonicera ciliosa
Lotus micranthus
few young *Quercus garryana*

Ridge sloping towards the west

Fritillaria affinis
Zigadenus venenosus

Dodecatheon hendersonii
Erythronium oregonum
Gaultheria shallon
Holodiscus discolor
Lonicera ciliosa
Mahonia aquifolium
Plectritis congesta

Mahonia nervosa
Polystichum munitum
Pseudotsuga menziesii
Rhytidiadelphus triquetrus
Symphoricarpos mollis
Trientalis latifolia

Agrostis capillaris
Anthoxanthum odoratum
Camassia quamash
Danthonia californica
Dicranum scoparium
Dodecatheon hendersonii
Heuchera glabra
Holcus lanatus

WAYPOINT 163

163 10 U 0466389 5371405 14-MAY-02 20:35

Amelanchier alnifolia
Apocynum androsaemifolium
Camassia leichtlinii
Danthonia californica
Dodecatheon hendersonii
Elymus glaucus
Festuca roemerii
Fritillaria affinis

Oaks towards the power

Cystopteris fragilis
Dactylis glomerata
Digitalis purpurea

WAYPOINT 164

164 10 U 0466332 5371409 14-MAY-02 20:44
Elev. 87 m

Grove of small oaks

Anthoxanthum odoratum
Aphanes "arvensis"
Brodiaea coronaria
Camassia quamash
Elymus glaucus
Erythronium oregonum

Valley

Cytisus scoparius
Rubus armeniacus

Small lake close to the fence

Atrichum selwynii
Carex inops
Cornus stolonifera
Geranium pusillum

Hypochaeris radicata
Lotus micranthus
Montia parvifolia
Plectritis congesta
Sanicula crassicaulis
Sedum spathulifolium
Vicia hirsuta
Vicia lathyroides

Holodiscus discolor
Mahonia aquifolium
Picture of an oak
Plectritis brachystemon
Plectritis congesta
Poa compressa
Symphoricarpos albus

Pentagramma triangularis
Piperia sp.

Holodiscus discolor
Mahonia aquifolium
Montia linearis
Plectritis congesta
Sorbus aucuparia

Rubus ursinus
Salix scouleriana

Physocarpus capitatus
Poa canbyi
Poa compressa
Trachybryum megaptilum

Small grove of *Quercus garryana* (lots of small oak regenerating)

Arbutus menziesii
Carex inops
Erythronium oregonum
Hieracium albiflorum

Lilium columbianum
Pseudotsuga menziesii
Stellaria media

Veteran Douglas-fir and small oaks

Melica subulata

Mixed Douglas-fir with Garry oak & *Melica subulata*

Amelanchier alnifolia
Festuca occidentalis
Lonicera ciliosa
Mahonia nervosa

Quercus garryana
Rosa gymnocarpa
Trientalis latifolia

Waypoint 165 - picture on airphoto # 5

165 10 U 0466409 5371460 14-MAY-02 20:06

Veteran Douglas-fir

Gaultheria shallon
Mahonia nervosa
Montia sibirica

Polystichum munitum
Taxus brevifolia

Old growth conifer forest

Cystopteris fragilis
Galium aparine
Nemophila parviflora

Clinopodium douglasii
Stellaria media

Nice stand of *Melica subulata* Elev 90 m

Achillea millefolium
Aira praecox
Anthoxanthum odoratum
Bromus hordeaceus
Bromus sterilis soft hairs on sheaths (cf.
diandrus)
Carex inops
Cytisus scoparius
Dicranum scoparium
Elymus glaucus
Erythronium oregonum
Fritillaria affinis
Galium aparine
Geranium molle

Hypochaeris radicata
Lithophragma parviflorum
Lotus micranthus
Luzula subsessilis
Mahonia aquifolium
Melica subulata
Plantago lanceolata
Plectritis congesta
Ranunculus occidentalis
Rumex acetosella
Sanicula crassicaulis
Symphoricarpos albus
Trifolium variegatum
Veronica arvensis

Vicia hirsuta

Open area

Dodecatheon hendersonii

Geranium molle

Lithophragma parviflorum

Saxifraga integrifolia

Sedum spathulifolium

Vicia sativa

WAYPOINT 167

167 10 U 0466335 5371462 14-MAY-02 21:30

elev. 90 m

One old veteran Douglas-fir and single large arbutus

Bromus pacificus

Elymus glaucus

Mahonia aquifolium

Mahonia nervosa

Triteleia hyacinthina

WAYPOINT 168

168 10 U 0466459 5371554 14-MAY-02 21:54

Dodecatheon hendersonii

Piperia ? elongata

Claytonia sibirica

Lonicera hispidula

Back on the road

Arbutus

Carex inops

Dodecatheon

Festuca occidentalis

Goodeyera oblongifolia

Lilium columbianum

Madia madioides

Piperia sp.

Waypoint 168

168 10 U 0466459 5371554 14-MAY-02 21:54

Plectritis slope

Cardamine oligosperma

Geranium molle

Hypochaeris radicata

Montia parviflora ? (coll.)

Montia parvifolia

Montia perfoliata or

Plectritis congesta

Sedum spathulifolium

Selaginella wallacei

Stellaria media

Trachybryum megaptilum

Trifolium tridentatum

Vulpia bromoides

Deeper soil

Acer macrophyllum

Gaultheria shallon

Lonicera hispidula
Mahonia nervosa

Pteridium aquilinum
Rubus ursinus

Quercus garryana scattered throughout with lots of seedlings
Corallorhiza maculata

Waypoint 169

169 10 U 0466438 5371617 14-MAY-02 22:02
elev. 82 m

Amelanchier alnifolia
Goodeyera oblongifolia
Ganoderma aplanatum

Waypoint 170 large *Pseudotsuga menziesii*

170 10 U 0466378 5371677 14-MAY-02 22:10

Sorbus aucuparia

Next to the creek

Ilex aquifolium

Large *Pseudotsuga menziesii* & *Thuja plicata* along the lake
Gaultheria shallon 50%

Wet places

Carex obnupta
Lysichiton americanum

Polystichum munitum
Thuja plicata

Another rock outcrop

Plectritis congesta
Dicranum scoparium

Seepage area

Aphanes occidentalis
Camassia quamash
Cerastium glomeratum
Claytonia parviflora
Geranium molle
Hypochaeris radicata
Microsteris gracilis

Mimulus sookensis
Montia fontana
Plectritis congesta
Sedum spathulifolium
Stellaria media
Taraxacum officinale
Trifolium variegatum

Waypoint 171

171 10 U 0466372 5371813 14-MAY-02 22:34

Aimn praecox
Anthrananthum odoratum
Aphanes microcarpa
Camassia leichtlinii
Collinsia pusilla
Cynisus scoparius
Danthonia californica

Waypoint 172
172 10 U 0466372 5371821 14-MAY-02 22:49

Open *Thuja plicata* forest

Ashyrium filix-femina - scattered
Carex hendersonii
Gaultheria shallon

Waypoint 173
173 10 U 0466428 5371845 14-MAY-02 22:55

Isoheciium stoloniferum on branches
Leucolepis menziesii - wetter places

Climbing up the slope

Achlys triphylla
Trientalis latifolia scattered
Dryopteris carthusiana concolor rachis glabrous
Ranunculus uncinatus
Tiarella laciniata

Out of the forest

Cardamine oligosperma
Cerastium hairy
Geranium molle
Mimulus alsinoides
Mimulus sookensis
Montia fontana
Montia parvifolia

Waypoint 174
174 10 U 0466253 5371976 14-MAY-02 23:13

Base of the cliff

Lithophragma parviflorum
Mimulus guttatus
Montia linearis coll.
Montia parviflora ?
Racomitrium elongatum
Rosa nutkana

Ilex aquifolium
Mahonia nervosa
Polystichum munitum

Trillium ovatum
Trisetum cernuum

Omphalina ericetorum
Plectritis congesta lots
Rubus ursinus
Rumex acetosella
Stellaria media
Veronica arvensis

Aira praecox
Anthoxanthum odoratum
Camassia quamash
Cystopteris fragilis
Cytisus scoparius
Danthonia californica
Erythronium oregonum
Galium aparine
Lotus micranthus
Luzula
Mahonia aquifolium
Melica subulata
Montia fontana
Nemophila parviflora
Pentagramma triangularis

Shrubby *Quercus garryana* about 5 m tall

Arbutus menziesii - sound
Asterella
Bromus mollis
Cardamine oligosperma
Carex inops

Waypoint 175

175 10 U 0466220 5371989 14-MAY-02 23:28

Close to the power line

Brodiaea coronaria
Bromus carinatus
Heuchera micrantha on rocks
Lotus micranthus

Stand of *Arbutus menziesii*

Amanita pantherina
Cytisus scoparius
Dicranum scoparium in deep duff
Dodecatheon hendersonii
Erythronium oregonum
Festuca occidentalis
Heuchera micrantha
Holodiscus discolor
Kindbergia oregana

Plectritis congesta
Poa compressa
Polystichum munitum
Quercus garryana - scattered
Racomitrium elongatum
Rosa gymnocarpa
Sanicula crassicaulis
Trifolium tridentatum
Trifolium variegatum
Vicia hirsuta
Vicia lathyroides
Vicia sativa
Vicia tetrasperma
Zigadenus venenosus

Cirsium arvense
Dodecatheon hendersonii
Hypochaeris radicata
Kindbergia oregana
Rhytidiadelphus triquetrus

Piperia
Ranunculus occidentalis
Rhytidiadelphus triquetrus

Lathyrus nevadensis
Lonicera hispidula
Madia madioides
Melica subulata
Moehringia macrophylla
Polystichum munitum
Quercus garryana regen
Sanicula crassicaulis
Satureja douglasii

Sedum spathulifolium

Trientalis latifolia

Waypoint 176

176 10 U 0466244 5371986 14-MAY-02 23:45

On the other slope, quite seepy

Anthoxanthum odoratum
Dicranum scoparium
Hypochaeris radicata
Mimulus alsinoides - numerous
Montia fontana

Montia parvifolia
Pentagramma triangularis
Sedum spathulifolium
Selaginella wallacei

Waypoint 177

177 10 U 0466205 5371028 14-MAY-02 23:53

Another seepage area

Bromus carinatus
Camassia sp.
Carex inops
Cerastium arvense
Claytonia parviflora
Claytonia perfoliata
Cystopteris fragilis
Delphinium menziesii quite a bit
Dodecatheon hendersonii
Festuca occidentalis
Fragaria vesca
Heuchera micrantha
Hieracium albiflorum

Holodiscus discolor
Lathyrus nevadensis
Lilium columbianum
Lithophragma bulbiferum
Lithophragma parviflorum
Lonicera hispidula
Melica subulata
Moehringia macrophylla
Mycelis muralis
Polypodium glycyrrhiza
Rubus ursinus
Erythronium oregonum
Trientalis latifolia

Waypoint 178

178 10 U 0466229 5371069 15-MAY-02 00:11

Young Douglas-fir forest

Abies grandis seedlings ca 5 years old
Acer macrophylla
Chrysanthemum leucanthemum
Galium triflorum
Inocybe

Melica subulata
Osmorhiza berteroi
Tiarella trifoliata

Creek

Corallorhiza maculata
Polyporus

Waypoint 179

179 10 U 0466448 5371982 15-MAY-02 00:29
elev. 92 m

Fence/house with the horse

Abies grandis
Anaphalis margaritacea
Anthoxanthum odoratum
Aphanes arvensis
Black slug *Arion*
Calypto bulbosa
Carex hendersonii
Clarkia amoena
Cornus nuttallii
Cytisus scoparius
Daphne laureola
Digitalis purpurea
Fragaria vesca
Gaultheria shallon

Ilex aquifolium
Juncus effusus
Leucanthemum vulgare
Leucolepis menziesii
Mycelis muralis
Myosotis discolor
Pseudotsuga menziesii
Pteridium aquilinum
Rubus armeniacus
Rubus laciniatus
Rubus parviflorus
Stachys coo leyi
Taraxacum officinale
Tellima grandiflora

Waypoint 180

180 10 U 0466524 5371095 15-MAY-02 00:44

Wet area

Maianthemum dilatatum

Between a wetland and Maltby Lake

Agrostis stolonifera
Alnus rubra
Athyrium filix-femina
Carex deweyana
Carex obnupta
Cornus stolonifera
Epilobium angustifolium
Gaultheria shallon
Geum macrophyllum
Juncus effusus
Lonicera involucrata
Lysichiton americanus

Malus fusca
Nasturtium aquaticum
Oemleria cerasiformis
Pyrola asarifolia
Ranunculus flammula
Ranunculus repens
Rosa nutkana
Rubus parviflorus
Rubus spectabilis
Salix geyeriana
Salix hookeriana
Salix lasiandra

Salix sitchensis
Spiraea menziesii
Stachys cooleyae
Drier bank

Amelanchier alnifolia
Crataegus monogyna
Epilobium ciliatum
Juncus bolanderi
Juncus ensifolius (in the ditch)
Leucolepis menziesii

Waypoint 181

181 10 U 0466733 5371883 15-MAY-02 16:37

Rock outcrops

Achillea millefolium
Aira praecox
Amelanchier alnifolia
Anthoxanthum odoratum
Brodiaea coronaria
Triteleia hyacinthina
Camassia leichtlinii
Camassia quamash
Cardamine oligosperma
Collinsia pusilla
Collinsia pusilla
Cytisus scoparius
Dicranum scoparium
Dodecatheon hendersonii
Elymus glaucus
Erythronium oregonum
Galium aparine
Geranium pusillum
Holodiscus discolor
Hypochaeris radicata
Lotus microcarpus

Rock outcrop

Arbutus menziesii
Arctostaphylos uva-ursi
Camassia quamash
Carex inops
Danthonia californica

Symphoricarpos albus
Veronica scutellata
Viburnum escape (broad leathery leaves)

Myosotis laxa
Oenanthe sarmentosa
Potamogeton natans
Ranunculus repens
Rubus ursinus

Luzula subsessilis
Mahonia aquifolium
Montia perfoliata
Myosotis discolor
Nemophila parviflora
Pentagramma triangularis
Plectritis congesta
Plectritis brachystemon
Quercus garryana
Racomitrium elongatum
Ranunculus occidentalis
Rubus ursinus
Rumex acetosella
Sanicula crassicaulis
Sedum spathulifolium
Sonchus oleraceus
Stellaria media
Symphoricarpos albus
Trifolium sp.
Veronica arvensis
Vicia hirsuta

Erythronium oregonum
Gaultheria shallon
Hieracium albiflorum
Lonicera ciliosa
Lonicera hispidula

Lotus micranthus
Montia parvifolia
Pseudotsuga menziesii - old snags
Sanicula crassicaulis

Small depression

Alnus rubra
Carex obnupta
Cornus stolonifera

Rock outcrop

Cytisus scoparius
Holodiscus discolor
Lathyrus nevadensis
Maianthemum dilatatum
Melica subulata
Moehringia macrophylla
Piperia sp. (transversa?)
Polystichum imbricans

WAYPOINT 182

182 10 U 0466687 5371896 15-MAY-02 17:17

Abies grandis

WAYPOINT 183

183 10 U 0466684 5371909 15-MAY-02 17:26

Piperia sp.

Anaphalis margaritacea
Cerastium glomeratum
Cirsium arvense
Cirsium vulgare
Digitalis purpurea
Hieracium albiflorum

Back on the road

Anthoxanthum odoratum
Cares obnupta
Cirsium arvense
Cornus stolonifera
Digitalis purpurea

Sedum spathulifolium
Small oaks - quite a bit
Stellaria media
Symphoricarpos mollis

Rosa gymnocarpa
Rosa nutkana
Salix sitchensis

Populus tremuloides
Quercus garryana - largest 50 cm DBH ca 20 m
Ranunculus occidentalis
Rhytidadelphus triquetrus
Rubus armeniacus
Taraxacum officinale
Trientalis latifolia

Pentagramma triangularis
Rubus armeniacus
Rubus laciniatus
Senecio vulgaris
Sonchus oleraceus

Glyceria borealis
Leucanthemum vulgare
Lysichiton americanus
Mycelis muralis
Oenanthe sarmentosa

Oenanthe sarmentosa
Plantago lanceolata
Potamogeton natans
Ranunculus aquatilis (collapsing leaves)
Rubus leucodermis
Rumex acetosella

Waypoint 184

184 10 U 0466960 5371011 15-MAY-02 17:49

Outlet of the creek from the lake

Geranium robertianum
Prunus emarginata
Salix hookeriana

Little Maltby Lake

Nuphar polysepala
Potamogeton amplifolius
Utricularia macrorhiza

On the bluff above the lake

Aira praecox
Amelanchier alnifolia
Anthoxanthum odoratum
Bromus hordeaceus
Camassia leichtlinii
Collinsia pusilla
Hypochaeris radicata
Lepidium heterophyllum
Lonicera ciliosa
Montia perfoliata
Plectritis brachystemon
Plectritis congesta

Next to the fishing hole

Comarum palustre
Dactylis glomerata
Fontinalis antipyretica
Gaultheria shallon
Malus fusca
Montia parvifolia
Myriophyllum sibiricum

Salix lasiandra
Sambucus racemosa
Spiraea menziesii
Symphytum officinale
Veronica scutellata

Salix with auricles
Urtica lyalii

Poa annua
Poa bulbosa
Polypodium glycyrrhiza
Quercus garryana - seedlings
Racomitrium elongatum
Rumex acetosella
Sedum spathulifolium
Selaginella wallacei
Stellaria media
Trachybryum megaptilum
Vulpia bromoides

Nymphaea odorata ?
Orobanche uniflora
Potamogeton amplifolius
Potamogeton robbinsii
Schoenoplectus validus
Sedum spathulifolium
Teesdalia nudicaulis

Trifolium dubium

Along the boardwalk

Iris pseudacorus

Area degraded by logging

Anthoxanthum odoratum

Arbutus menziesii

Carex inops

Claytonia perfoliata

Cytisus scoparius

Dicranum scoparium

Elymus glaucus

Erythronium oregonum

Heuchera micrantha

Holcus lanatus

Holodiscus discolor

Hypochaeris radicata

Kindbergia oregana

Waypoint 185

185 10 U 0466877 5371452 15-MAY-02 18:57

Top of hill

Plectritis congesta

Open soil

Abies grandis

Amelanchier alnifolia

Arbutus menziesii

Cotoneaster sp.

Epilobium foliosum

Festuca occidentalis

Gaultheria shallon

Heuchera micrantha

Hylocomium splendens

Wet depression, dried up algae on the surface

Carex deweyana

Equisetum arvense

Juncus effusus

Rubus laciniatus

Typha latifolia

Lonicera ciliosa

Luzula sp.

Mahonia aquifolium

Melica subulata

Poa compressa

Polypodium glycyrrhiza

Quercus garryana - scattered throughout

Racomitrium elongatum

Rhytidiadelphus triquetrus

Rosa gymnocarpa

Rubus ursinus

Symphoricarpos albus

Lilium columbianum

Lonicera ciliosa

Lonicera hispidula

Myosotis discolor

Plectritis brachystemon

Pseudotsuga menziesii

Senecio sylvaticus

Trientalis latifolia

Vicia sativa

Salix sitchensis

Spiraea menziesii

Veronica scutellata

Towards the open area

Arbutus menziesii
Cytisus scoparius

Holodiscus discolor
Salix sitchensis

Rock outcrop

Cirsium vulgare
Cytisus scoparius

Sonchus asper
Symphoricarpos mollis

Thompson's property

lots of *Plectritis congesta*

Anthoxanthum odoratum
Arbutus menziesii
Arctostaphylos uva-ursi
Camassia leichtlinii
Camassia quamash
Collinsia parviflora
Dodecatheon hendersonii
Heuchera micrantha

Holodiscus discolor
Lithophragma parviflorum
Lonicera hispidula
Quercus garryana
Ranunculus occidentalis
Sanicula crassicaulis
Sedum spathulifolium
Vicia sativa

Waypoint 186

186 10 U 0466981 5371310 15-MAY-02 19:47

near the table on the top

Cotoneaster sp.

east from the bench

Aira praecox
Arbutus menziesii
Bromus hordeaceus
Bromus sterilis
Camassia leichtlinii
Cytisus scoparius
Elymus glaucus
few *Quercus garryana*
Galium aparine
Heuchera micrantha
Holodiscus discolor
Hypochaeris radicata
Leucolepis acanthoneuron

Montia parvifolia
Myosotis discolor
Plectritis congesta
Poa compressa
Poa sp.
Polytrichum juniperinum
Pseudotsuga menziesii
Quercus garryana
Racomitrium lanuginosum
Rumex acetosella
Sanicula crassicaulis
Sedum spathulifolium
Veronica arvensis

Waypoint 187

187 10 U 0466985 5371274 15-MAY-02 20:07

Farther along is nice stand of *Carex inops* in deeper soil

Arctostaphylos uva-ursi
Brodiaea coronaria
Cardamine oligosperma
Collinsia parviflora
Danthonia californica
Dodecatheon hendersonii

Erythronium oregonum
Lonicera hispidula
Mahonia aquifolium
Trifolium microcephalum
Vulpia bromoides

Waypoint 188

188 10 U 0466927 5371276 15-MAY-02 20:15

elev 97 m

going on the ridge

Achillea millefolium
Carex rossii
Epilobium foliosum
Geranium molle
Lotus micranthus
Montia parvifolia
Myosotis discolor

Piperia sp.
Salix scouleriana
Salix sitchensis
Teesdalia nudicaulis
Trifolium microcephalum
Zigadenus venenosus

Under the *Acer macrophyllum*

Ilex aquifolium
Polystichum imbricans

Spiraea douglasii subsp. *menziesii*
Vaccinium parvifolium

Waypoint 189

189 10 U 0466938 5371363 15-MAY-02 20:37

depression

Achlys triphylla
Epilobium minutum

Going from Munn's Rd.

Agrostis stolonifera
Alnus rubra
Anthoxanthum odoratum
Athyrium filix-femina

Atrichum selwynii
Epilobium ciliatum
Equisetum arvense
Equisetum telmateia

Eurhynchium oreganum
Fragaria vesca
Galium triflorum
Gaultheria shallon
Geum macrophyllum
Holodiscus discolor
Juncus ensifolius
Lysichiton americanus
Mentha arvensis
Oemleria cerasiformis
Oenanthe sarmentosa
Phalaris arundinacea
Polystichum munitum
Populus balsamifera subsp. *trichocarpa*

Waypoint 191

191 10 U 0466748 5371318 15-MAY-02 21:42

going up to the rock outcrops, old logging site

Heuchera micrantha
Hylocomium splendens
Ribes sanguineum

Waypoint 192

192 10 U 0466769 5371350 15-MAY-02 21:55

Logged-over area

remnants of *Pseudotsuga menziesii*
germinating *Pseudotsuga menziesii*

Aira praecox
Anthoxanthum odoratum
Cardamine hirsuta
Cytisus scoparius
Elymus glaucus
Epilobium foliosum
Erythronium oregonum
Galium aparine
Gnaphalium purpureum
Heuchera micrantha
Holcus lanatus
Holodiscus discolor
Hypochaeris radicata
Lonicera ciliosa

Prunella vulgaris
Pseudotsuga menziesii
Pteridium aquilinum
Ranunculus repens
Rubus armeniacus
Rubus spectabilis
Rubus ursinus
Scirpus microcarpus
Stachys chamissonis var. *cooleyae*
Taraxacum officinale
Tellima grandiflora
Tiarella trifoliata
Trientalis borealis subsp. *latifolia*
Veronica americana

Lonicera hispidula
Lotus micranthus
Melica subulata
Myosotis discolor
Polytrichum juniperinum
Racomitrium elongatum
Rosa gymnocarpa
Rubus ursinus
Salix scouleriana
Salix sitchensis
Senecio vulgaris
Symphoricarpos albus
Taraxacum officinale
Thuja plicata

Vicia hirsuta
Vicia sativa

Vulpia bromoides

Going over to the forest

Acer macrophyllum
Achlys triphylla
Anthoxanthum odoratum
Bromus carinatus

Gaultheria shallon
Heuchera micrantha
Linnaea borealis in a dense mat
Rubus armeniacus

Forest edge

Festuca occidentalis

Back to the boardwalk

Crataegus monogyna

Near the boardwalk

Glyceria elata

APPENDIX III

Photoplates



Plate 1: Shallow open water wetland, downstream of Maltby Lake known as "Little Maltby Lake"



Plate 2: Maltby Lake, looking west



Plate 3: Garry oak - Arbutus plant community (red-listed)

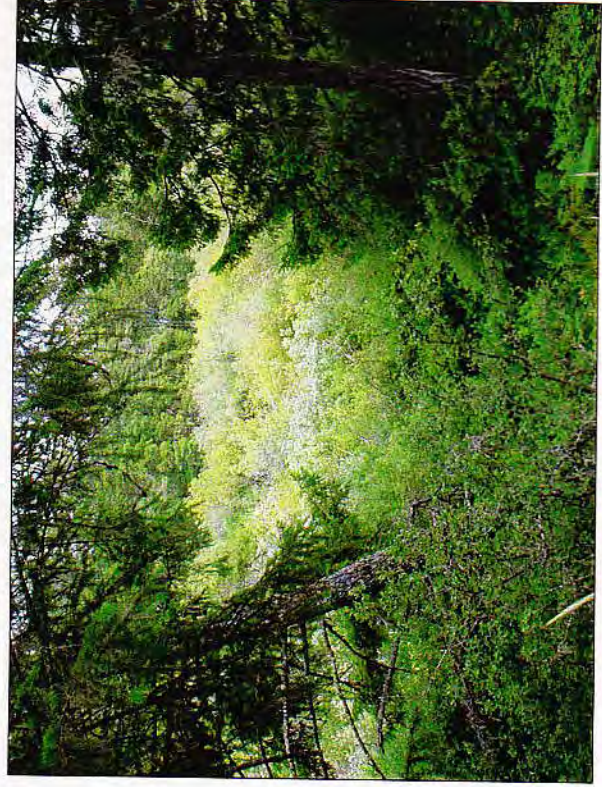


Plate 4: Shrub swamp north of Little Maltby Lake



Plate 5: Bleathman Creek (Upper Tod Creek) upstream of Maitby Lake



Plate 6: Shrub wetland dominated by red alder and trembling aspen



Plate 7: Wet wildflower meadow adjacent to Garry oak grove



Plate 8: Garry oak/oceanspray plant community (red-listed)



Plate 9: Great horned owl nest tree, at the south end of Maltby Lake



Plate 10: Veteran Douglas-fir, located on the west side of Maltby Lake