

Songbird Nesting and Feeding Habitat Inventory of the Noons Creek Riparian Corridor, Winter 1999 - 2000

Prepared for:

The Port Moody Ecological Society

Submitted to:

Danny Catt
Wildlife Instructor
British Columbia Institute of Technology

May 10, 2000

Submitted by:

Sue Harder
Helen Olynyk

ABSTRACT

The Port Moody Ecological Society requested involvement of the BCIT Fish, Wildlife and Recreation program to carry out a study of Noons Creek. Noons Creek is located in the rapidly developing community of Port Moody, British Columbia. This study was carried out from October 1999 to March 2000 to examine the forest structure within the Noons Creek riparian corridor and the use of this corridor by over-wintering songbirds. Six strata were identified in the study area, and in each of the stratum a vegetation transect was established. The plant species composition and their percent coverage were used to describe the plant community of each stratum. The results revealed differences in the physical structure of each transect. These differences are related to the impacts of residential development and past logging.

Bird surveys were performed in each transect to examine the use of the riparian corridor by songbirds. Physical evidence such as cavities, feeding holes, and the abundance of wildlife trees were also used to determine the use by birds of this corridor. The results showed the greatest number of bird species used the deciduous stand at the outflow of Noons Creek during the winter months. The forest structure of the riparian corridor and the surrounding forest appears to provide suitable nesting and feeding habitat for a variety of bird species.

The results of this study will be used to update existing information on the use of the Noons Creek riparian corridor by songbirds and provide additional information on the habitat available for these birds.

Table of Contents

ABSTRACT	I
TABLE OF CONTENTS	II
LIST OF FIGURES	III
LIST OF TABLES	IV
ACKNOWLEDGEMENTS	V
1.0 INTRODUCTION	1
1.1 BACKGROUND	1
1.2 PURPOSE AND OBJECTIVES	1
2.0 STUDY AREA	2
2.1 STUDY AREA LOCATION	2
2.2 VEGETATION	2
2.3 HUMAN HISTORY	2
3.0 METHODS AND MATERIALS	5
3.1 LITERATURE REVIEW	5
3.2 VEGETATION INVENTORY	5
3.2. TRANSECT LOCATIONS	5
3.3 SONGBIRD SURVEY	9
4.0 RESULTS AND DISCUSSION	9
4.1 VEGETATION TRANSECTS	9
4.2 BIRD SURVEYS	12
4.2. PHYSICAL EVIDENCE OF BIRD USE	14
4.3 FOREST STRUCTURE AND BIRD USE	15
5.0 CONCLUSIONS AND RECOMMENDATIONS	19
6.0 LITERATURE CITED	20
7.0 ADDITIONAL REFERENCES	21
APPENDIX 1 – LIST OF PLANT SPECIES	22
APPENDIX 2 – LIST OF BIRD SPECIES	24

List of Figures

Figure 1 Area map of Noons Creek and the City of Port Moody, BC.....	3
Figure 2 Noons Creek corridor showing Noons Creek and vegetation strata, Port Moody, BC.	4
Figure 3 Lower Noons Creek and associated vegetation strata, Port Moody, BC.	6
Figure 4 Upper Noons Creek and the associated strata, Port Moody, BC.	7
Figure 5 The four vegetative layers surveyed within the transect of each stratum in the Noons Creek riparian corridor, Port Moody, BC.	8
Figure 6 Total vegetative coverage in each of the six transects along Noons Creek, Port Moody, BC.	9
Figure 7 Number of bird species observed in the transects and strata on the Noons Creek riparian corridor, Port Moody, BC.	12
Figure 8 Wildlife tree observed in transect 5, Noons Creek, Port Moody, BC.	15
Figure 9 Young deciduous stand associated with transect 4, Noons Creek, Port Moody, BC.	16
Figure 10 Dense coniferous forest associated with transect 6, Noons Creek, Port Moody, BC. ...	17

List of Tables

Table 1 Criteria used to distinguish vegetative layers during vegetation surveys, Noons Creek, Port Moody, BC.	8
Table 2 Vegetation by canopy layer and species in the Noons Creek riparian corridor, Port Moody, BC.....	11
Table 3 Bird species observed in the transects and vegetation strata of Noons Creek riparian corridor, Port Moody, BC.....	13
Table 4 Nest type, nest location and diet of songbird species in the Noons Creek riparian corridor, Port Moody, BC.....	18

Acknowledgements

The Port Moody Ecological Society (PMES) is leading the rehabilitation efforts in the Noons Creek watershed. The PMES operates a fish hatchery, organizes community volunteer work projects, and provides opportunities for education to the local schools. Rick Simpson, the president of the PMES, has provided us with valuable background information. We would like to extend our sincere thanks and appreciation for Rick's continued interest, enthusiasm, and support.

We would also like to thank our project supervisor Danny Catt, and our BCIT project support staff, Laurie Smith and Tom Saare, for their assistance. They have been very helpful in designing this study, in information gathering, and in problem solving.

1.0 Introduction

1.1 Background

Port Moody is a growing community located 20 kilometres east of Vancouver and covers an area of 26.21 km² (City of Port Moody, 1999). In 1996, Port Moody's population consisted of 20,850 residents, which was an increase of 17.4% since the previous census in 1991 (City of Port Moody, 1999). Today's estimated population of Port Moody is 23,736, and this increase of 25.5% represents the population change between 1992-1999 (GVRD Key Facts, 1999). This rapid development has resulted in the loss of large amounts of land previously available as habitat for wildlife. In particular, riparian habitats and streams have been impacted by past logging practices, industry, and residential pressures.

The Port Moody Ecological Society (PMES) has been tireless in its efforts to conserve and rehabilitate Noons Creek, and its riparian corridor, in order to restore salmon stocks and protect wildlife in the area. To better understand the impact of past practices on Noons Creek, several studies have been completed to assess the condition of this riparian corridor. These studies have focused on the vegetation (Walsh, 1996), stream invertebrates (Hagmeier & Logan, 1996), songbirds (Waskiewich, 1993) and the creek's hydrology (Poirier, 1999). Further research must be undertaken to monitor the ecological balance of species within the riparian corridor.

Although both songbirds and vegetation studies have been completed in the past, the focus of this survey was to inventory bird species present in the riparian corridor during the winter months. The need for an assessment of habitat for songbirds in riparian zones is important, since wildlife use of these areas is disproportionately more than any other habitat in North America (Morgan & Wetmore, 1986). The physical structure of plant communities within riparian areas contributes largely to the diversity and density of bird species (Morgan & Wetmore, 1986). Consequently, disturbances to riparian habitat, due to development and urbanization, can have severe impacts on the diversity of birds within these areas.

1.2 Purpose and Objectives

The project goal is to provide updated information on songbird nesting and feeding habitat in the Noons Creek riparian corridor. The purpose of this study was to determine the current use of the riparian corridor by over-wintering songbirds. Also, the data obtained from this study will be used for comparison with past studies to develop a greater understanding of songbird use of riparian corridors in urban settings and the changes that have occurred over time.

The objectives of this study are to:

- Describe the species composition and physical structure of the vegetation present within the corridor
- Determine what songbird species use the corridor in winter
- Determine the nesting habitat potential for songbirds.

2.0 Study Area

2.1 Study Area Location

Noons Creek is 11 kilometres in length and is located in Port Moody, BC (Figure 1). The creek begins at the headwaters of Cypress Lake on Eagle Mountain, and drains into the eastern arm of the Burrard Inlet (Figure 2). The upper two thirds of the creek is contained within the Port Moody Conservation Reserve in the Coquitlam District Municipality. The lower one third of Noons Creek is in the Port Moody District Municipality.

2.2 Vegetation

The study area is located in the Coastal Western Hemlock (CWH) biogeoclimatic zone (Meidinger & Pojar, 1991) characterized by western hemlock (*Tsuga heterophylla*), western redcedar (*Thuja plicata*), and Douglas-fir (*Pseudotsuga menziesii*). The entire watershed is second growth forest, except for the area surrounding Cypress Lake, which is third growth forest (Poirier, 1999).

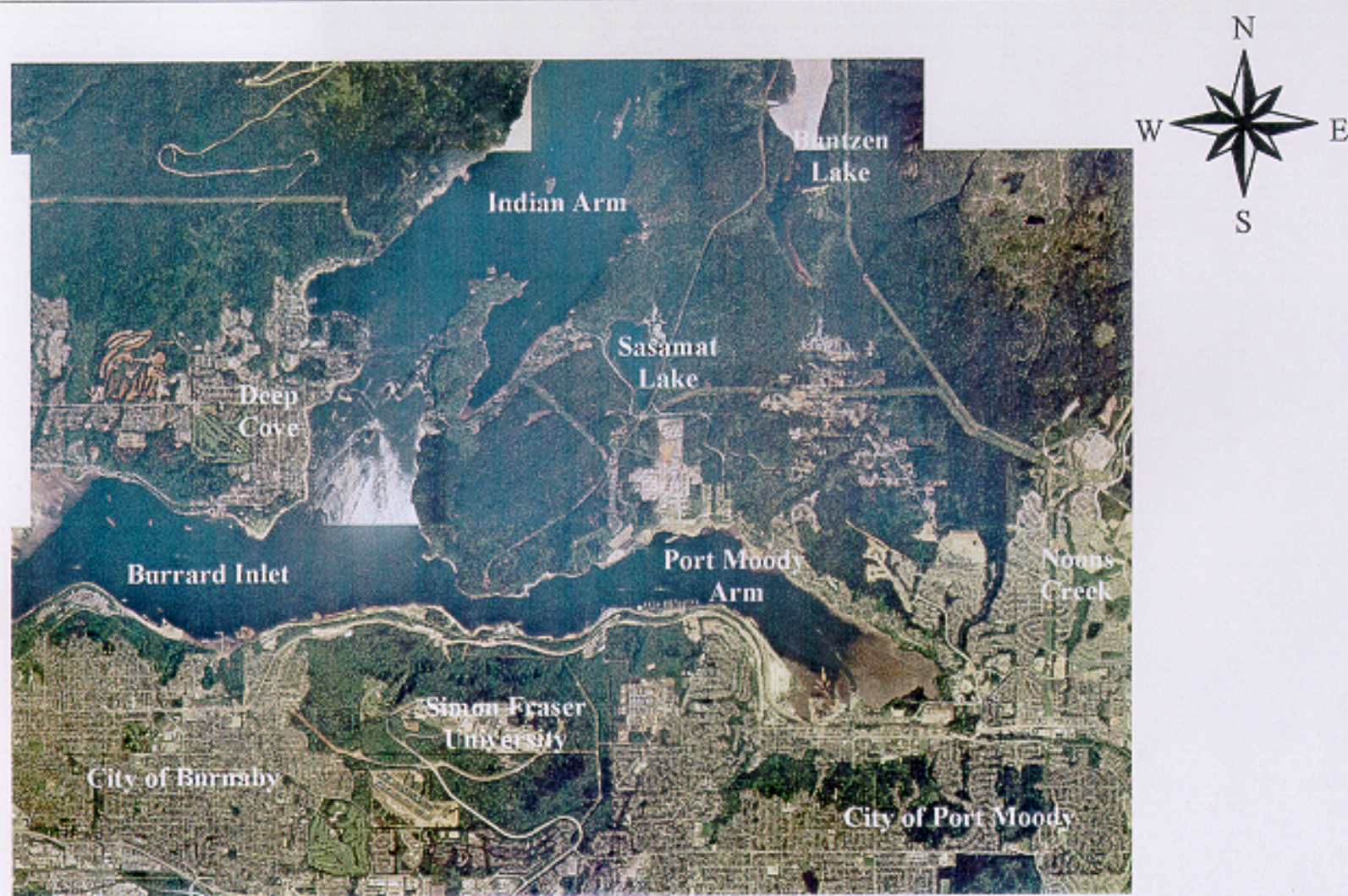
2.3 Human History

Since the late 1800's, Noons Creek has been impacted by industrial and urban development, which included a brick foundry, a sawmill, and a shipping port (Poirier, 1999). The streams at the eastern end of the Port Moody Arm of the Burrard Inlet supported abundant runs of chum salmon (*Oncorhynchus keta*), coho salmon (*Oncorhynchus kisutch*), and other salmonids.

The creek has also been heavily impacted by extensive logging in the watershed until as recently as the early 1980's. The last logging operation cleared the area surrounding Cypress Lake, the headwaters of Noons Creek, leaving a young third growth forest (Poirier, 1999). The rest of the watershed supports a second growth forest of western hemlock, western redcedar, and Douglas-fir.

In 1911, a timber crib dam was installed at Cypress Lake, which was initially used by the brick foundry, but later served as a water source for the City of Port Moody until 1953 (Poirier, 1999). The dam deteriorated over time and offered little control over the creek's flows. In 1999, the Cypress Lake dam was reconstructed under the direction of the PMES in an effort to control the flow of water, and thereby support the revitalized salmon runs.

Restoration efforts began in 1978, with a small salmon hatchery in the backyard of the Waite family whose property bordered Noons Creek (Poirier, 1999). Presently, the PMES and community volunteers continue to make efforts to protect the riparian corridor, and restore the salmon runs. In spite of extensive urban development, salmon are returning to Noons Creek, and the riparian corridor does provide habitat for birds, mammals and a variety of other species.

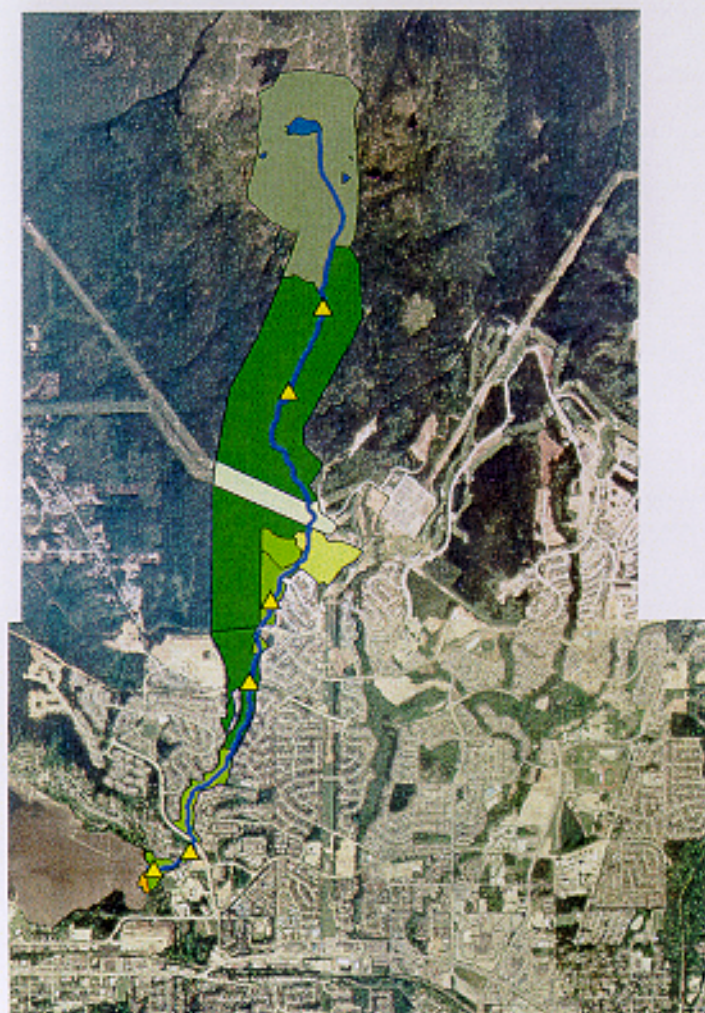


Location of Noons Creek Burrard Inlet and Port Moody Arm

Scale: 2 0 2 4 6 Kilometers



Figure 1 Area map of Noons Creek and the City of Port Moody, BC



Legend

- ▲ Stations
- ▲ Noons Creek
- ▲ Lakes
- Vegetation Polygons
 - Coniferous forest
 - Deciduous forest
 - Golf course
 - Hydro ROW
 - Mixed forest
 - Third growth coniferous forest
 - Tidal marsh

Noons Creek corridor Creek, Stations and Vegetation polygons

Scale: 0.5 0 0.5 1 1.5 2 Kilometers



Figure 2 Noons Creek corridor showing Noons Creek and vegetation strata, Port Moody, BC

3.0 Methods and Materials

3.1 Literature Review

Prior to any fieldwork, a literature review of previously published studies was performed to obtain the necessary background information used in this study. These studies focused on vegetation (Walsh, 1996), stream invertebrates (Hagmeier & Logan, 1996), songbirds (Waskiewich, 1993) and the creek's hydrology (Poirier, 1999). Once the review was completed, a reconnaissance of the study area was done to confirm the information gathered from aerial photographs and topographic maps.

3.2 Vegetation Inventory

A vegetation inventory was conducted in six different locations based on the stratification of different vegetation types and the availability of access points. One transect was established within each of the six strata. The strata were determined by viewing aerial photographs to identify different vegetation types and by performing a ground reconnaissance of the study area. Access points were chosen from topographic maps and based on the reconnaissance.

Vegetation transects were measured from the centre of Noons Creek and extended 20 m on each bank of the creek. From the line transect, 10 m was measured on the downstream side and the upstream side of both banks resulting in a vegetation transect of 40 m x 20 m. The area of the line transect was limited in size to ensure reasonable visual accuracy by the surveyors, yet large enough to represent the riparian corridor for the individual strata.

3.2. Transect Locations

Transect 1 was located 50 m upstream from where Noons Creek drains into the Burrard Inlet. It was accessed by the trail leading from the Noons Creek hatchery to the Foreshore Park. Transect 2 was located 50 m downstream from the Heritage Mountain Boulevard bridge that crosses the creek. Transect 3 was accessed via Magnolia Crescent off of Noons Creek Drive. A trail, beginning at the Magnolia Crescent cul-de-sac, lead to this transect 50 m from the entrance. Figure 3 shows the transect locations and strata in the lower section of the riparian corridor

Transect 4 was located 50 m downstream of the creek as it flows through the Westwood Plateau subdivision off of Diamond Crescent. Transect 5 was accessed by the Noons Creek trail leading to the headwaters of Cypress Lake. The location of this transect was 50 m downstream from where the trail crossed the main logging road leading to the lake. Transect 6 was the located near the terminus of the Noons Creek Trail. A small access road leads west from the trail and joins up with the main logging road leading to the lake. From this intersection, the transect was accessed 50 m downstream from that point. Figure 4 shows the transects location and strata in the upper section of the riparian corridor.



Legend

- Stations
- Noons Creek
- Vegetation Polygons
- Coniferous forest
- Deciduous forest
- Golf course
- Hydro ROW
- Mixed forest
- Third growth coniferous forest
- Tidal marsh

Lower Section of Noons Creek Creek, Stations and Vegetation polygons

Scale: 6 Kilometers



Figure 3 Lower Noons Creek and associated vegetation strata, Port Moody, BC



Legend

- Stations
- Noons Creek
- Lakes
- Vegetation Polygons**
 - Coniferous forest
 - Deciduous forest
 - Golf course
 - Hydro ROW
 - Mixed forest
 - Third growth coniferous forest
 - Tidal marsh

Upper Section of Noons Creek Creek, Stations and Vegetation polygons

Scale: 0.3 0 0.3 0.6 0.9 1.2 1.5 1.8 Kilometers



Figure 4 Upper Noons Creek and the associated strata, Port Moody, BC

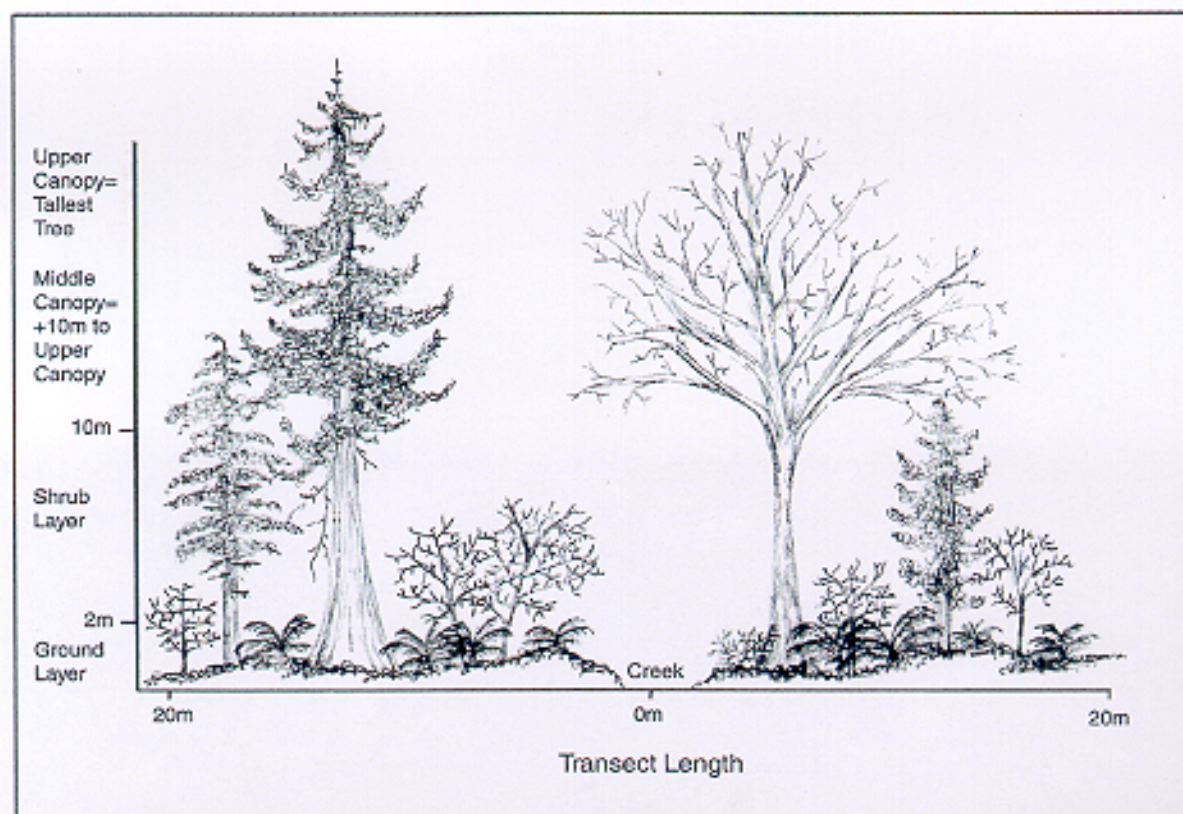


Figure 5 The four vegetative layers surveyed within the transect of each stratum in the Noons Creek riparian corridor, Port Moody, BC.

The transect layout and vegetative layers used to determine forest structure can be seen in Figure 5. The percent coverage of four vegetative layers was visually estimated in each transect (Table 1) to determine the physical structure of the riparian corridor vegetation. Resources Inventory Committee (1999) ground sampling procedures were used as a guideline to sample forest structure characteristics and plant species composition. The percent coverage of the vegetation was recorded for each vegetative layer.

Table 1 Criteria used to distinguish vegetative layers during vegetation surveys, Noons Creek, Port Moody, BC.

Upper Canopy layer (UC)	Tallest tree along transect
Middle Canopy layer (MC)	Species with broadest coverage between 10 m and UC
Shrub layer (S)	Species with broadest coverage between 2 – 10 m
Ground layer (G)	Species with broadest coverage between 0 – 2 m

3.3 Songbird Survey

Songbird surveys were performed twice in each of the six vegetation transects. The presence of bird species and the number of individuals were recorded by both direct observation (sight) and by sound (call). The length of time selected to record the data was 30 minutes. This time frame was chosen to ensure an accurate count by the observers (mental concentration) and to prevent double counting of individuals. The songbird surveys in each transect were conducted from January to March. All bird surveys were completed between approximately 9:00 am and 12:00 pm. Bird observations within each of the stratum were done from October to March.

All physical signs of use by birds such as tree cavities, bark peelings, nests, feeding holes and wildlife trees were recorded. Bird species encountered during the hike into and out of the six transect locations were also recorded. This was done to gain a better understanding of the bird species within the riparian corridor even though they were not observed directly within the transects themselves.

Nest searches have been limited to those observed while walking to and from the transect locations. Wildlife tree observations were made for signs of cavities during the walk-ins and while in the transects themselves.

4.0 Results and Discussion

4.1 Vegetation Transects

A vegetation inventory was conducted in each of the six strata to determine the forest structure in these areas. The results show a difference in the physical makeup in each of the stratum (Figure 6).

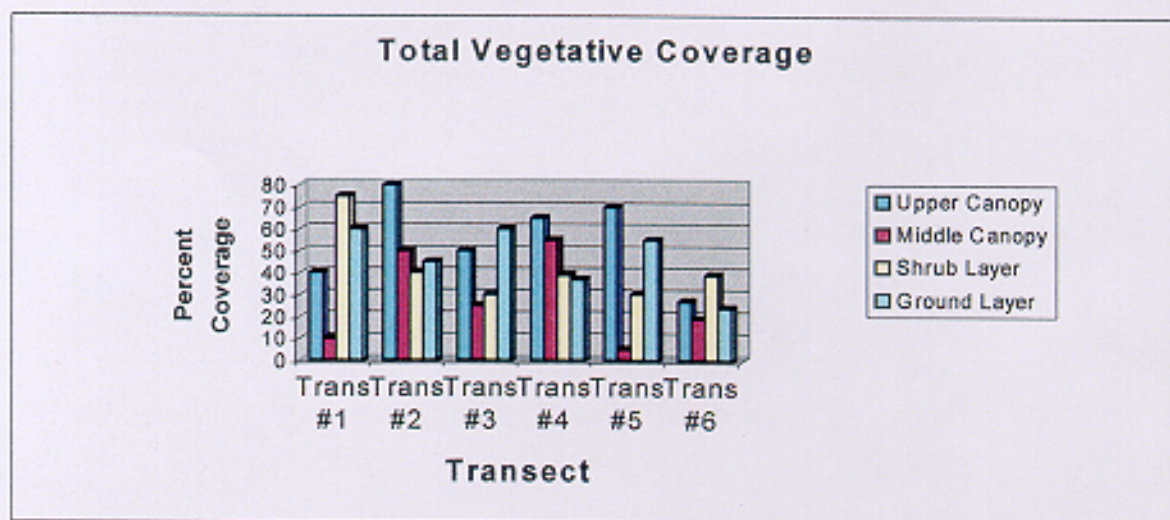


Figure 6 Total vegetative coverage in each of the six transects along Noons Creek, Port Moody, BC.

A complete listing of each plant species and the percent coverage in each transect can be viewed in Table 2 on the following page. The upper canopy layer in Transect 1 consisted entirely of deciduous tree species. The total coverage for this layer was 40 %. An explanation for this may be that a railway bridge and a footpath passes through the transect. Both of these features limit the amount of vegetation that can establish in the area. The middle canopy layer represented a total of 10% coverage. The shrub and ground layers were 75% and 60% respectively. Both the shrub and ground layers seemed to be flourishing. This may be due to the openings created by the railway line and the trail allowing light to penetrate to the forest floor. No coniferous species were noted in this transect.

Transect 2 contained a mix of deciduous and coniferous tree species. The upper canopy crown closure in this area was 80% with bigleaf maple (*Acer macrophyllum*) representing half of the coverage. A more evident middle canopy layer was observed in this transect consisting of deciduous shrub species and some young coniferous species. Both the shrub and the ground layer were approximately equal in coverage at 45%. All four layers within this transect were well developed and light was able to reach the forest floor.

The coniferous tree species in Transect 3 represented an upper canopy closure of 50%. The middle canopy layer was not well developed with 25% coverage being provided by younger coniferous species. This transect was located in a deep canyon with erosion evident by slumping soils and recently downed large trees. These fallen trees have created an opening and consequently more light penetrates to the forest floor. The 30% coverage of the shrub layer was moderately developed but in time may increase, as more light is able to penetrate the forest canopy. The ground layer was well established and at 60% was the highest of all the transects observed in the riparian corridor. Sword fern (*Polystichum munitum*) dominated the forest floor.

Transect 4 was closely bordered by a highly developed residential area in Westwood Plateau. Red alder (*Alnus rubra*) dominated the upper canopy representing 50% of the total upper canopy coverage of 65%. It was not surprising that this transect contained so many red alder as most of the area had been logged to develop the residential area. The middle canopy consisted mainly of young hemlock and salmonberry (*Rubus spectabilis*). The shrub layer coverage was 39% with salmonberry dominating this layer. The poorly developed ground layer consisted mainly of salal (*Gaultheria shallon*). The pioneer species growing within this transect were typical of sites that have been disturbed by either man-made or natural processes.

The upper canopy vegetation in Transect 5 consisted entirely of coniferous tree species. Western hemlock and amabilis fir (*Abies amabilis*) were the two main species with western redcedar providing minimal coverage. The total upper canopy coverage was 70%. The area surrounding the riparian corridor was second growth forest. The dense canopy cover reflected the young age of the second growth forest. The middle canopy was almost non-existent except for a few western hemlocks covering only 5%. The shrub layer coverage in this transect was the lowest of all transects in the study area. The undeveloped middle canopy and shrub layer were consistent with the forest structure of second growth forests. The ground layer was well developed within the transect covering 55% of the forest floor.

Table 2 Vegetation by canopy layer and species in the Noons Creek riparian corridor, Port Moody, BC.

Layer	Tran 1	Tran 2	Tran 3	Tran 4	Tran 5	Tran 6
Upper Canopy (Tallest tree)						
amabilis fir	-	-	-	-	15	-
black cottonwood	10	-	-	-	-	-
red alder	20	10	-	50	-	5
bigleaf maple	10	40	-	-	-	-
western redcedar	-	20	10	-	5	10
Douglas-fir	-	-	20	5	-	2
western hemlock	-	10	20	10	50	10
Total %	40	80	50	65	70	27
Middle Canopy (10 m +)						
indian plum	-	15	-	-	-	-
vine maple	-	25	10	5	-	-
red alder	-	-	-	-	-	2
bigleaf maple	10	-	-	-	-	-
western redcedar	-	5	10	-	-	5
Douglas-fir	-	-	-	-	-	2
salmonberry	-	-	-	15	-	-
grand fir	-	-	-	-	-	-
western hemlock	-	5	5	35	5	10
Total %	10	50	25	55	5	19
Shrub Layer (2 – 10 m)						
salmonberry	40	25	5	30	2	15
Himalayan blackberry	15	10	-	-	-	-
indian plum	15	5	-	-	-	-
red elderberry	5	-	-	-	-	-
red huckleberry	-	5	5	5	-	-
red alder	-	-	-	-	-	2
hardhack	-	-	-	-	-	20
western hemlock	-	-	10	2	25	2
western redcedar	-	-	10	-	-	2
grand fir	-	-	-	2	-	-
Total %	75	45	30	39	27	41
Ground Layer (0 – 2 m)						
red huckleberry	-	5	-	-	-	-
dull Oregon grape	-	-	10	-	-	-
deer fern	-	-	5	-	10	5
English ivy	20	-	-	-	-	-
salmonberry	-	5	-	-	-	-
sword fern	20	30	35	5	-	-
Himalayan blackberry	-	-	-	5	-	-
lady fern	10	5	-	2	-	-
bunchberry	-	-	-	-	5	2
skunk cabbage	-	-	-	-	-	2
western hemlock	-	-	-	-	30	-
salal	-	-	10	25	10	15
Total %	50	45	60	37	55	24

Transect 6 contained the least developed upper canopy layer in the study area. Only 27% crown closure was recorded with a mix of deciduous and coniferous tree species. The middle canopy layer was also poorly developed with 19% vegetative coverage. Hardhack (*Spiraea douglasii*) and salmonberry were the two dominant species in the shrub layer. Young western hemlock, western redcedar and red alder made up a small portion of the 41% coverage found in the shrub layer. The 24% ground coverage on the forest floor was the least among all of the transects in the study area. Transect 6 was located in a third growth forest. The poorly developed upper and middle canopy layers were indicative of simplified forest structure.

4.2 Bird Surveys

The bird surveys were carried out within each of the vegetation transects to determine the number of songbirds species present in the transect. The physical signs of use and the abundance of wildlife trees within each transect were also recorded. In addition to the transect observations, the songbird species, physical signs of bird use, and abundance of wildlife trees were recorded to document observations made within each vegetation stratum. Figure 7 compares the number of bird species observed in the transects and the number of bird species observed in the associated vegetation stratum. The two levels of observations present a more complete picture of songbird presence, use and potential use within the riparian corridor.

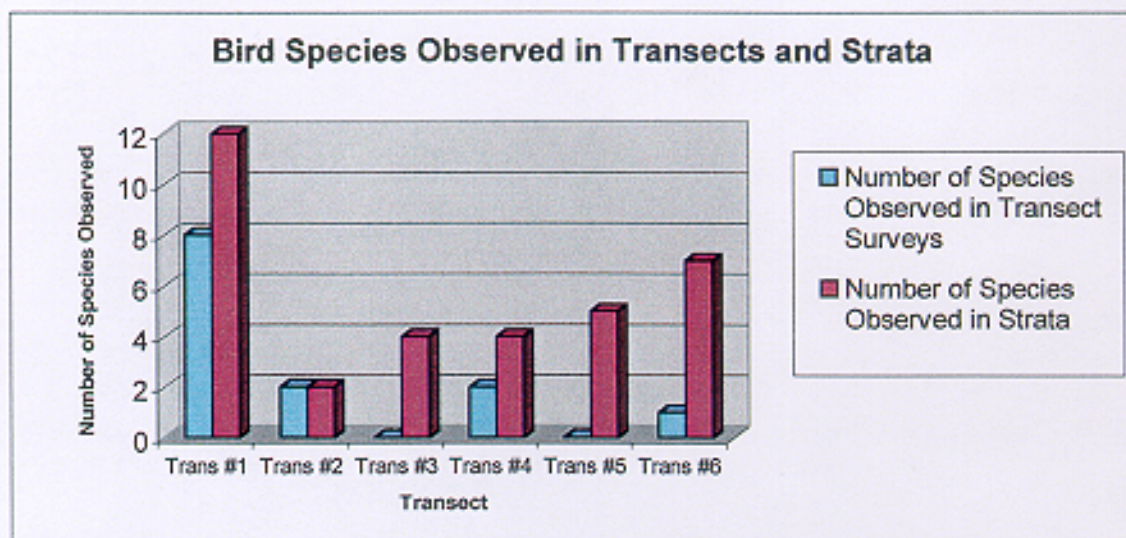


Figure 7 Number of bird species observed in the transects and strata on the Noons Creek riparian corridor, Port Moody, BC.

The greatest number of bird species was observed in Transect 1. Eight species were noted within the transect during the surveys and a total of twelve species were observed in the associated vegetation stratum. The four species observed in the stratum but not the transect were the Dark-eyed Junco (*Junco hyemalis*), the Great Blue Heron (*Ardea herodias*), the Northern Flicker (*Colaptes auratus*) and the Spotted Towhee (*Pipilo maculatus*). The abundance of species in Transect 1 may be explained by the time of the year and the lower elevation that creates a more

favourable habitat than the higher elevation, snow-covered forest surrounding Cypress Lake (Transect 6). A listing of bird species observed in the transects and strata can be seen in Table 3.

Table 3 Bird species observed in the transects and vegetation strata of Noons Creek riparian corridor, Port Moody, BC.

Bird Species Observed	Strata 1	Strata 2	Strata 3	Strata 4	Strata 5	Strata 6
Passeriformes						
Black-capped Chickadees	✓		✓	✓	✓	✓
Chestnut-backed Chickadees						✓
Golden-crowned Kinglet	✓					
Ruby-crowned Kinglet	✓					
Pine Siskin				✓	✓	✓
Winter Wren	✓		✓	✓	✓	✓
Spotted Towhee	✓					
Varied Thrush			✓	✓	✓	✓
Dark-eyed Junco	✓					✓
Northwestern Crow	✓	✓				
Common Raven						✓
Steller's Jay	✓		✓			
American Dipper	✓	✓				
Piciformes						
Downy Woodpecker	✓					
Northern Flicker	✓					
Falconiformes						
Bald Eagle					✓	
Ciconiiformes						
Great Blue Heron	✓					
Total Number Observed	12	2	4	4	5	7

*Scientific names for all bird species are listed in Appendix 2.

The fewest number of bird species observed were in Transect 2. Only two species were noted: the Northwestern Crow (*Corvus caurinus*) and the American Dipper (*Cinclus mexicanus*). No other bird species were observed in the vegetation stratum outside the transect area. This may be due to the urban encroachment on this section of the riparian corridor where the width of the corridor at this location was 12 metres. The stratum, compressed between two major road systems, Ioco Road and Heritage Mountain Boulevard, may not provide adequate habitat for birds in this developed area.

No bird species were observed in Transect 3 during the time of the surveys. Black-capped Chickadees (*Parus atricapillus*), a Steller's Jay (*Cyanocitta stelleri*), Varied Thrush (*Ixoreus*

naevius) and a Winter Wren (*Troglodytes troglodytes*) were the species observed in the stratum but outside the transect.

The Black-capped Chickadee and the Winter Wren were the two species observed in Transect 4 during the time of the surveys. Two other species were noted in the stratum including the Pine Siskin (*Carduelis pinus*) and the Varied Thrush. The few number of species in this location may be due to the young age of the stand and the amount of residential development surrounding the area.

There were no bird species observed during the surveys in Transect 5. Varied Thrush were observed on several occasions in the surrounding area within the stratum. Other species seen in this area were the Bald Eagle (*Haliaeetus leucocephalus*), the Black-capped Chickadee, the Pine Siskin and the Winter Wren.

Chestnut-backed Chickadees (*Parus rufescens*) were the only species observed in Transect 6 during the surveys. There were five other species observed during the reconnaissance and the time spent in the stratum. These were the Black-capped Chickadee, the Dark-eyed Junco, Pine Siskin, Winter Wren and a Common Raven (*Corvus corax*).

4.2. Physical Evidence of Bird Use

Visual sightings of nests were complicated by the difficulty in seeing nests in the thick foliage of coniferous tree species, the expanse of the riparian corridor, and time constraints. Consequently, nest searches were not carried out.

There were many signs of wildlife use in Transect 1 and its associated stratum based on the physical evidence observed. The physical evidence included two crow's nests, square holes created by a Pileated Woodpecker (*Dryocopus pileatus*) and the orderly round holes created by the Red-breasted Sapsucker (*Sphyrapicus ruber*). All of these were observed in the deciduous trees within this stratum.

Physical evidence of bird use was observed in Transect 2 and included bird droppings, one crow's nest and square holes created by Pileated Woodpeckers. The holes were observed in old western redcedar stumps in the transect. No evidence of use was seen in younger wildlife trees present.

Two physical signs of use were observed in Transect 3 in the wildlife trees present in the stratum. Both Red-breasted Sapsucker holes and Pileated Woodpecker holes were noted. There were many wildlife trees present in this stratum.

There were no signs of physical evidence in Transect 4. The young deciduous trees in this stratum may show signs of use as the trees mature.

The second growth coniferous forest of Transect 5 and its associated stratum contained many wildlife trees (Figure 8) and indicated use by the Pileated Woodpecker and Red-breasted Sapsucker.



Figure 8 Wildlife tree observed in transect 5, Noons Creek, Port Moody, BC.

No physical evidence was observed in the third growth forest stratum of Transect 6. There was a distinct lack of wildlife trees in the area. This may be due to logging activities that occurred previously.

4.3 Forest Structure and Bird Use

The deciduous stratum of Transect 1 contained the greatest number of bird species of all strata surveyed. The well developed shrub and ground coverage in this stratum provides a wintering food source for ground feeding species such as the Spotted Towhee, the Winter Wren and the Dark-eyed Junco. This stratum provides valuable habitat for these and other species that move down from the snow cover areas associated with the high elevation habitats (Baron & Acorn, 1997). The deciduous stand would also provide suitable nesting habitat for cavity nesting birds such as the Black-capped Chickadee, the Downy Woodpecker and the Northern Flicker. Northwestern Crows would be attracted to this stratum due to its close proximity to tidal waters (Harrison, 1979).

The mixed stand associated with Transect 2 contained an excellent mix of layers in the forest structure. The lack of birds observed in this stratum may be due to urban encroachment in the area rather than the forest structure, which appeared to provide suitable habitat for birds.

The coniferous forest surrounding Transect 3 contained good habitat for chickadees, kinglets and siskins. The Black-capped Chickadee uses cavities created by woodpeckers and by excavating its own cavities in soft, rotting wood (Harrison, 1979). The kinglets and siskins typically nest in the horizontal limbs of coniferous tree species (Harrison, 1979). The well-developed shrub and ground cover along with the many downed trees would provide suitable nesting habitat for the Winter Wren.

The forest contained in Transect 4 and its associated stratum would provide suitable nesting and feeding habitat for Black-capped Chickadees, Winter Wrens and Dark-eyed Juncos. The young deciduous stand and the well-developed ground and shrub layers provide the necessary habitat requirements for these species (Figure 9). The chickadees and juncos appear to be well adapted to urban environments. However, the close proximity of residential homes of Westwood Plateau may discourage use by other species.



Figure 9 Young deciduous stand associated with transect 4, Noons Creek, Port Moody, BC.

The second growth coniferous forest associated with Transect 5 has a poorly developed middle canopy layer and shrub layer. The birds identified in this stratum are those species that use this type of habitat. The Black-capped Chickadee, the Winter Wren, the Pine Siskin and the Varied

Thrush typically use coniferous stands for nesting and feeding habitats (Harrison, 1979). The well-developed ground layer provides suitable habitat for Winter Wrens.

The third growth coniferous forest associated with Transect 6 also contained deciduous species in the riparian corridor and along disturbed areas (logging roads). A lack of wildlife trees would limit the number of cavity nesters that could potentially use the area. The small deciduous trees within the riparian corridor and the disturbed areas may not support large cavity nesting birds such as Pileated Woodpeckers but may be suitable for smaller species such as chickadees. Other coniferous dependent species would benefit from the dense stand seen in Figure 10.



Figure 10 Dense coniferous forest associated with transect 6, Noons Creek, Port Moody, BC.

The plant species and forest structure present in the Noons Creek riparian corridor are important components of the nesting and feeding habitat requirements for songbirds. Table 4 shows the relationship between the songbird species present in the Noons Creek corridor, the nest type and location for each songbird species and the diet of each species (Ehrlich et al., 1988). The forest structure and plant species present would also determine the potential for use by other species

during different seasons of the year. The information presented in Table 4 shows that winter nesting and feeding habitat is present in the Noons Creek corridor.

Table 4 Nest type, nest location and diet of songbird species in the Noons Creek riparian corridor, Port Moody, BC

Songbird Species	Nest Type	Nest Location	Diet
Black-capped Chickadee	Nests lined with moss, feathers, hair, fur, etc.	In cavities of deciduous and coniferous trees.	Coniferous seeds
Chestnut-backed Chickadee	Nests lined with moss, feathers, hair, fur, etc.	In cavities of deciduous and coniferous trees	Coniferous seeds
Golden-crowned Kinglet	Pendant nest – long saclike nest suspended from a branch, lined with fine materials	Near the trunks of coniferous trees	Tree sap, insects, glean from bark
Ruby-crowned Kinglet	Pendant nest – woven of lichen, moss, dead leaves, lined with fine materials	Near the trunks of deciduous and coniferous trees	Insects, spiders, tree sap, berries, rarely seeds
Pine Siskin	Flat, saucer shaped nest of twigs, grasses, mosses, lichens	Usually in coniferous forests in horizontal limbs away from tree trunk	Insects, coniferous and deciduous seeds, sap, nectar, grasses, buds
Winter Wren	Nests in cavities lined with moss, twigs, feathers, hair, etc.	In dense coniferous forests under roots and stumps, tree holes and hummocks, in rocky crevices	Insects and spiders, rarely feeds on berries
Spotted Towhee	Cup shaped nest lined with leaves, grass, twigs, hair	On or near the ground by deciduous thickets, hedgerows, brushy fields	Insects, grass and forb seeds, acorns, berries
Varied Thrush	Cup-shaped nest of dried mud, twigs, leaves, moss, and bark	In coniferous trees in damp, shady coniferous forests	Fruit, acorns, weed seeds, snails, worms, bugs
Dark-eyed Junco	Cup-shaped nest of grass, moss, rootlets, twigs, bark	On the ground, well hidden by roots, logs and ledges	Mostly seeds, some insects
Northwestern Crow	Cup-shaped nest of sticks, twigs and mud lined with moss and grass	In crotch of coniferous and deciduous trees and shrubs, rarely on the ground	Omnivore, varied diet from insects and carrion to bird eggs, nestlings, fruit and seeds

Songbird Species	Nest Type	Nest Location	Diet
Common Raven	Deeply hollowed cup-shaped nest of twigs and branches lined with hair, moss, grass and bark	On cliff ledges or in coniferous trees	Omnivore, mostly carrion but also invertebrates, bird eggs and nestlings, fruit, seeds, garbage
Steller's Jay	Large cup-shaped nest of twigs, dry leaves, pine needles and mud	Usually in coniferous forests on horizontal branches or in crotch of the tree	Insects, invertebrates, bird eggs and nestlings, acorns and pine seeds in winter
American Dipper	Hut-shaped nest of mostly living moss with roots and grasses, an opening near the bottom of nest	On streamside, rocky cliffs or on mid-stream rocks, among moss and ferns	Small fish and aquatic plants
Downy Woodpecker	Nest lined with wood chips, entrance camouflaged with fungus/lichen/moss	In cavities in live or dead trees, in rotting wood and stumps	Mostly insects but some fruit, seeds and sap
Northern Flicker	Nest lined with wood chips, no additional material added	In cavities in coniferous, deciduous or mixed forests, prefers snags	Ants and insects but also seed, acorns, nuts and grain

5.0 Conclusions and Recommendations

The mix of tree species and forest structure contained in the riparian corridor and surrounding forests of Noons Creek provides suitable nesting and feeding habitat for a wide variety of bird species. Urban encroachment in sections of the corridor has affected the use of these habitats by birds.

To accurately assess the use of the riparian corridor of Noons Creek by songbirds, a survey should be conducted in early spring when non-resident bird species arrive and begin mating and nest building. Yearly surveys should be conducted to assess changes in nesting use and vegetation.

The retention of vegetative buffers and the natural state of this riparian corridor are essential to maintain the diversity of bird species in the area. Development near riparian areas must be well thought out to ensure a variety of suitable habitats and forest structure are maintained to protect the ecological balance in this fragile system.

6.0 Literature Cited

- Baron, N. and J. Acorn. 1997. Birds of Coastal British Columbia. 1st ed. Vancouver, BC. Lone Pine Publishing.
- City of Port Moody. 1999. [web page]
<http://www.city.port-moody.bc.ca/web/promohub.nsf> [Accessed 26 January 2000]
- Ehrlich, P., D. Dobkin and D. Wheye. 1988. The Birder's Handbook. New York. Simon & Schuster Inc.
- Greater Vancouver Key Facts. 1999 [web page]
<http://www.gvrd.bc.ca/index.html> [Accessed 26 January 2000]
- Hagmeier, K. and L. Logan. 1996. A study of benthic macroinvertebrates and water quality in Noons Creek for the Port Moody Ecological Society. British Columbia Institute of Technology, Fish, Wildlife and Recreation Program. Burnaby, BC.
- Harrison, H.H. 1979. Western Birds' Nests. Peterson Field Guides. New York. Houghton Mifflin Company.
- Meidinger, D. and J. Pojar. 1991. Ecosystems of British Columbia. Victoria, BC. BC Ministry of Forests.
- Morgan, K.H. and S.P. Wetmore. 1986. A study of riparian bird communities from the dry interior of British Columbia. Technical Report Series No. 11. Canadian Wildlife Service, Pacific and Yukon Region, BC.
- Poirier, B. 1999. Noons Creek preliminary watershed assessment. Aquatech Services. Port Coquitlam, BC.
- Resources Inventory Committee (RIC). 1999. Vegetation Resources Inventory Ground Sampling Procedures. [web page]
<http://www.for.gov.bc.ca/RIC/Pubs/Teveg/gsp/index.htm> [Accessed 11 October 1999]
- Walsh, H. 1996. Vegetation and wildlife inventory of Noons Creek, Port Moody. British Columbia Institute of Technology, Fish, Wildlife and Recreation Program. Burnaby, BC.
- Waskiewich, S.L. 1993. 1993 Noon's Creek watershed bird baseline study. Douglas College, Institute of Urban Ecology. New Westminster, BC.

7.0 Additional References

Peterson, R.T. 1990. Peterson field guides: Western birds. 3rd ed. New York. Houghton Mifflin Company.

Pojar, J. and A. MacKinnon. 1994. Plants of Coastal British Columbia. 1st ed. Vancouver, BC. Lone Pine Publishing.

APPENDIX 1 – List of Plant Species

Appendix 1 List of plant species observed during vegetation surveys in the Noons Creek riparian corridor, Port Moody, BC.

Common Name	Scientific Name
Amabilis fir	<i>Abies amabilis</i>
Black cottonwood	<i>Populus balsamifera trichocarpa</i>
Red alder	<i>Alnus rubra</i>
Bigleaf maple	<i>Acer macrophyllum</i>
Western redcedar	<i>Thuja plicata</i>
Douglas-fir	<i>Pseudotsuga menziesii</i>
Grand fir	<i>Abies grandis</i>
Western hemlock	<i>Tsuga heterophylla</i>
Vine maple	<i>Acer circinatum</i>
Lady fern	<i>Athyrium filix-femina</i>
Deer fern	<i>Blechnum spicant</i>
Bunchberry	<i>Cornus canadensis</i>
Salal	<i>Gaultheria shallon</i>
Skunk cabbage	<i>Lysichiton americanum</i>
Indian plum	<i>Oemleria cerasiformis</i>
Sword fern	<i>Polystichum munitum</i>
Himalayan blackberry	<i>Rubus discolor</i>
Salmonberry	<i>Rubus spectabilis</i>
Red elderberry	<i>Sambucus racemosa</i>
Hardhack	<i>Spiraea douglasii</i>
Piggy-back plant	<i>Tolmiea menziesii</i>
Red huckleberry	<i>Vaccinium parvifolium</i>

APPENDIX 2 – List of Bird Species

Appendix 2 List of bird species encountered during surveys of the Noons Creek riparian corridor of Port Moody, BC.

Common Name	Scientific Name
Black-capped Chickadee	<i>Parus atricapillus</i>
Chestnut-backed Chickadee	<i>Parus rufescens</i>
Golden-crowned Kinglet	<i>Regulus satrapa</i>
Ruby-crowned Kinglet	<i>Regulus calendula</i>
Pine Siskin	<i>Carduelis pinus</i>
Winter Wren	<i>Troglodytes troglodytes</i>
Spotted Towhee	<i>Pipilo maculatus</i>
Varied Thrush	<i>Ixoreus naevius</i>
Dark-eyed Junco	<i>Junco hyemalis</i>
Northwestern Crow	<i>Corvus caurinus</i>
Common Raven	<i>Corvus corax</i>
Steller's Jay	<i>Cyanocitta stelleri</i>
American Dipper	<i>Cinclus mexicanus</i>
Downy Woodpecker	<i>Picoides pubescens</i>
Northern Flicker	<i>Colaptes auratus</i>
Pileated Woodpecker	<i>Dryocopus pileatus</i>
Red-breasted Sapsucker	<i>Sphyrapicus ruber</i>
Bald Eagle	<i>Haliaeetus leucocephalus</i>
Great Blue Heron	<i>Ardea herodias</i>