WILDLIFE INVENTORY OF THE SHORELINE PARK SYSTEM PORT MOODY, BC

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BURKE MOUNTAIN NATURALISTS

City of Port Moody

Burrard Inlet Environmental Action Program

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SUMMARY AND RECOMMENDATIONS

Recognition must be given to the City of Port Moody for its foresight and wisdom in creating the Shoreline Park System and thus preserving a remarkable ecosystem along the shores of Burrard Inlet.

The following recommendations are based on information from our wildlife inventory work in the Shoreline Park System during 1992.

1. We seriously urge that the name of the Shoreline Park System be changed to the Port Moody Nature Park, to reflect its natural significance. This small park system contains 116 species of birds, nearly 270 species of plants, 48 species of fish, and smaller numbers of reptiles, amphibians and mammals. The abundance and diversity of flora and fauna in such a small area is truly staggering.

2. The coniferous forest component of the park is important for a variety of birds, but in particular it has regional significance for Band-Tailed Pigeons (*see* Special Features). Because of this, we encourage retention of the entire coniferous forest. Any proposed alterations should be minor and must be considered in the above context. No tree removal should be permitted within the coniferous forest.

3. Judicious removal of certain non-native plants (such as English Ivy, *Hedera helix*) should be considered only when native species are threatened.

4. Where removal of non-native vegetation is required, replanting must be with native vegetation, preferably with plants that provide food for wildlife (*see* Special Features). Certain native food-producing shrubs such as honeysuckle (*Lonicera ciliosa*) which are absent from the park at present could be considered as part of the re-vegetation plan.

5. Because surrounding areas of natural habitat, such as the north shore escarpment, form an important link with the park system, any disturbance to these areas will impact the park. Therefore any potential development should be carefully considered. For example, Pileated Woodpeckers, considered a regionally uncommon resident, utilize snags in the park for feeding, but because they require extensive wooded areas in which to breed, they undoubtedly nest in the escarpment area, where they have been observed.

6. Ecologically significant areas adjacent to the park, such as the forested portions of the IPSCO lands, should be incorporated into the park system as they become available.

7. Snags, also known as 'wildlife trees', are an important part of the forest ecosystem and provide food and nest holes for a wide variety of small mammals and birds. They should be retained throughout the park. Public education on the value of 'dead' trees will encourage an understanding of why it is important to maintain snags (*see* Special Features). A 'snag retention policy' should be developed to deal with snags, particularly where there is a perceived safety threat. A snag identification program should be implemented similar to that proposed by the Ministry of Forests and Ministry of Environment, Lands and Parks.

8. Downed logs and other debris on the forest floor should be left to provide shelter and nest sites for wildlife (*see* Special Features). Where deadfall occurs along public trails it should, of course, be removed.

9. To minimize impact on wildlife, there should be areas within the park free of human disturbance. Usage of secondary trails should be discouraged and these trails should be allowed to grow over. Disturbance to wildlife is particularly severe during nesting season, when nests with eggs or young may be dislodged or destroyed by the actions of people pushing through the underbrush. Birds also need 'quiet' areas to roost and feed. Secondary trails fragment the habitat to such a degree that few areas remain where birds and other wildlife can hide undisturbed.

10. The Old Mill site provides important wildlife habitat, as well as a peaceful refuge for park users. It should be allowed to revegetate naturally. In particular, the old dykes should remain unaltered as much as possible because they form an important 'loafing' or resting site for waterfowl, especially in fall and winter.

11. Consideration should be given to placing nest boxes in appropriate areas in the park area to encourage cavity nesters such as Black-capped Chickadees, Downy woodpeckers, Bewicks's Wrens and Tree and Violet-Green Swallows.

12. Nesting platforms for Osprey can be located on pilings in the Inlet. Ospreys feed over Burrard Inlet and are frequently seen throughout the summer. Provision of nesting platforms could encourage them to nest in the area.

13. A concerted effort should be made to fulfill the public's desire to know more about the unique natural values of the area through brochures, signage, and public tours arranged through the Parks and Recreation Department. The Burke Mountain Naturalists will assist in the preparation of brochures to enable visitors to the area learn more about the flora and fauna found there.

14. A self-guiding interpretive trail highlighting the natural features of the park should be implemented. A brochure describing 15 or 20 significant features can be prepared, each number in the brochure corresponding to a numbered 'station' along the route. This is an excellent way for people to learn about the park at their own pace.

15. Some aspects of the City of Port Moody Shoreline Park Master Plan (1987) should be re-evaluated in light of increased public awareness of the environment and the importance of natural green spaces. In particular, elimination of a forested area to allow for construction of playing fields at the Inlet Park would severely impact on the Band-tailed Pigeon habitat, as well as destroy nesting habitat for a variety of neotropical migrants and resident species.

16. Although the original master plan calls for increased parking areas, there appears to be sufficient parking along the entire length of the park to allow users access at a number of entry points. Because of this, and because of the negative impact on the park, we strongly discourage the construction of more parking areas.

17. A seawall around the head of Burrard Inlet, proposed on and off over the years, would entirely destroy the natural shoreline and severely impact on the wildlife values of the area. We recommend that the head of the inlet be left untouched and the idea of a seawall strongly discouraged.

18. The wildlife inventory should be repeated every five years to determine changes to the area's flora and fauna.

19. In view of the ecological significance of the Shoreline Park, we recommend that the City of Port Moody hire a part-time naturalist who would develop nature-awareness courses for children and adults to be offered by Parks & Recreation. Programs should also be developed for school classes in District 43, and teachers invited to bring their classes. to the Shoreline Park for field trips and nature study. The services of a naturalist could also be used for consultation on any projects which require alteration to the natural environment. The City should explore the possibility of applying for grants to fund this position.

PORT MOODY'S SHORELINE PARK SYSTEM:

AN INTRODUCTION

On November 4, 1991, Port Moody Council unanimously agreed to ask the Burke Mountain Naturalists to undertake an inventory of flora and fauna around the head of Burrard Inlet from Rocky Point Park to Old Orchard Park, for which an honorarium of $500 was paid to the club. The inventory was carried out over the course of a full year (1992) and this report and two seasonal brochures are the final result of our work. The project was carried out under the supervision of the Education/Conservation Committee of the Burke Mountain Naturalists.

Field work (data collection) began in January, 1992; however, a preliminary census made in November, 1991 generated a base list of birds and plants. Five people volunteered to participate in the project and experts in various fields also helped with data collection.

The Shoreline Park System lies within the City of Port Moody at the head of Burrard Inlet. Only 125 acres in size, this small area contains a remarkable diversity of habitat and an astonishing number of species of flora and fauna. Our work during 1992 revealed nearly 270 species of plants, five of them regionally significant, 116 species of birds, nearly 50 species of fish, and lesser numbers of mammals and reptiles and amphibians in the park and in the waters of the Inlet. The numbers are very significant, particularly when one makes comparisons with other well-known areas. At the 850 acre Reifel Bird Sanctuary in Delta, for example, over 240 species of birds have been found. This data collection has taken place over a number of years. Our work during one year found 116 species of birds. Who knows how many more will be identified over the next few years. Many of the birds found at Reifel also occur in the park. We feel that the Shoreline Park compares very favourably with the Reifel Refuge and has the added bonus of being on our own doorstep!

In addition to the regionally rare plants, a number of bird species found there are considered of provincial or national significance, such as the Green-backed Heron, a provincially vulnerable species, and the Cooper's Hawk, considered vulnerable nationally. The park provides over-wintering habitat for hundreds of waterfowl, and nesting habitat not only for resident species but for a number of neotropical migrants.

We suggest that the name of the park be changed from the Shoreline Park System to **The Port Moody Nature Park**, a name which reflects its natural significance. The abundant natural attributes of the park and its similarity to Reifel Refuge, attract large numbers of visitors, not only from Port Moody and surrounding municipalities, but from much further afield. The park offers something for everyone, whether birder, botanist, general nature lover, stroller, dog-walker, or jogger. During our work in the park we heard many comments similar to that expressed by one particular family who said they had planned to take their children to Reifel Refuge but decided to go to the Inlet instead where, as they said, "we can see just about everything we'd have seen at Reifel, without the long drive!"

Beginning at Rocky Point Park on the western end, the well-marked Shoreline Trail runs for three kilometres to Old Orchard Park on the northern end. In between the trail passes through dense coniferous woods, open mixed and deciduous woodland, across tidal mudflats,

past thickets of crabapples, and continues along through salmonberry and honeysuckle shrubs to the small beach area at Old Orchard, surrounded by the fruit trees which give it its name.

A walk through the park at any time of year is an enchanting experience, and for the naturalist every season produces its own unique pleasures. Spring brings an explosion of soft white blossoms as the abundant Indian Plum flowers in profusion. Migratory birds begin to appear and swallows are soon swooping overhead while bird song fills the park. By summer, most wildflowers are blooming and adult birds are busy feeding hungry young. Fall is a time of departure when the birds of summer head southwards again. It is also the time to look for interesting migrants such as shorebirds, and to admire the purple haze of fall-blooming asters. Winter heralds the arrival of many over-wintering ducks, loons and grebes, and can be an exciting time for the birdwatcher.

There is little natural habitat left on Burrard Inlet, the only other site similar to the Shoreline Park is the Maplewood Mudflats in North Vancouver. But even the Shoreline Park area has seen its share of development. The remains of the old brick factory on the north side of the park in the area known as the Old Mill Site, bear witness to the hand of humans. Nonetheless, since being abandoned, nature has done an excellent job of cloaking the site with abundant vegetation. The process is ongoing, changing yearly, as new plants sprout up and existing trees grow taller. With the change in vegetation there will come a change in the birds and other wildlife using the area. The Old Mill Site provides us with a prime opportunity to observe natural progression at work.

The value of the Shoreline Park System area was recognized in 1972 when Eikos Consultants linked it with Stanley Park and Reifel Refuge noting that together with these locations the Inlet was "a unique and attractive area in the Greater Vancouver region offering access to an environment of water, trees and wildlife." They go on to say that "***with proper planning, this area could be made as attractive to birds and birdwatchers as the Reifel Refuge or Stanley Park. As one of only three coastal bird sanctuaries of its kind in the Vancouver area, it would have considerable intrinsic value for long time residents of Port Moody, and in addition it would attract large numbers of birdwatching visitors to the area.***" They also noted that the mudflats at Port Moody "are the only ones easily accessible to our large urban population in the Greater Vancouver area."

In the following report we provide an overview of the Shoreline Park ecosystem, annotated lists of the flora and fauna, in which relative abundance, status, habitat and location are discussed. A section on Special Features of the park describes in detail some of the very special and significant aspects of the park's ecosystem and its wildlife.

METHODS OF DATA COLLECTION

The survey methods varied for each of the categories listed below.

BIRDS: survey methods consisted of 1) informal counts of species observed or heard during a one to three hour walk through the park, and 2) point counts. This latter method requires setting up 'stations' approximately one-quarter kilometre apart, and counting every bird heard or seen within a 5 minute period, repeated every 2nd day from approximately 6:00 a.m. to 9:00 a.m. during the spring migration period and part of the summer breeding season. The rest of the year method #1 was used.

The survey recorded not only the number of species found, but also the number of individual birds, and breeding evidence, if any. Other information recorded includes time of visit, tide information (low or high tide), and weather.

The field work and data collection was conducted primarily by Christine Hanrahan, with additional data from Tom Hanrahan and Jeff Rosen.

Plants: were recorded by walking the main trails, the GVRD pipeline trail, and the rougher tracks found throughout the park. As well, sections of representative habitat were studied in detail. Plants were generally surveyed at the same time as birds were being censused. However, on three separate occasions all-day field trips were made exclusively to survey plants.

Data collection was performed by Barry Gibbs, Christine Hanrahan, Huber Moore, Dr. Wilf Schofield, and Terry Taylor.

Reptiles and Amphibians: were surveyed by carefully but intensively searching the appropriate habitat for these animals.

Field work and data collection were done by Jake Klaver.

Fish: data came from a variety of sources including recent and previous research by the Department of Fisheries and Oceans (DFO) which was supplied to the Port Moody Ecological Society for this inventory.

The compilation of material supplied by DFO was performed by Rick Simpson. Additional material was supplied by Elaine Golds.

Mammals: No separate field trips were made to survey the mammals of the park, but they were looked for and recorded when field work was being carried out on the bird fauna.

Data was collected primarily by Christine Hanrahan in the course of doing bird surveys. Additional data came from Elaine Golds and Peter Hulbert.

Number of hours spent on wildlife inventory:

Although an accurate figure cannot be given for all of the hours involved in performing the wildlife inventory, a rough estimate can be given for the number of hours spent on field work.

Approximately 500 hours were spent by C. Hanrahan collecting bird and plant data. T. Hanrahan and J. Rosen added approximately another 30 hours between them, for a total of 530 hours.

PRINCIPAL PROJECT CONTRIBUTORS

Christine Hanrahan, former Vice President of the Burke Mountain Naturalists, has been involved with bird and conservation projects for many years. She was the Ottawa area Regional Coordinator for the Ontario Breeding Bird Atlas (1981-86) and for the Southern Ontario Loggerhead Shrike Survey (1986-87). She has written many articles on birds including status reports on the Loggerhead Shrike and the Ruddy Duck in Ontario, as well as an article on the birds of Colony Farm for Discovery, the journal of the Vancouver Natural History Society. She has contributed a chapter to the recently published A birdwatching guide to the Vancouver area. During the spring of 1992 she was hired by the Ministry of Environment, Lands and Parks to monitor a great blue heron colony on DeBouville Slough in Coquitlam.

Elaine Golds is Vice President of the Burke Mountain Naturalists, chair of their Education and Conservation Committee, and a frequent contributor to the BMN Newsletter. She is also a Director of the Port Moody Ecological Society.

Barry Gibbs is a botanist with the Vancouver Natural History Society (VNHS) and has extensive experience in field botany. He leads many botany field trips for the VNHS.

Huber Moore is an experienced field botanist with the Vancouver Natural History Society, He has contributed many plant specimens to the UBC Herbarium.

Wilf Schoefield, PhD, is a professor of botany at UBC, one of the foremost experts on mosses and lichens, and the author of Some common mosses of British Columbia.

Rick Simpson is one of six founders and the Past President (1989-1992) of the Port Moody Ecological Society which runs the Waite's Hatchery on Noon's Creek in Port Moody. He is also the volunteer chairman for the Canada Trust Friends of the Environment Foundation, Tri-Cities Chapter. He is actively involved with hatchery programs and fish release projects, including volunteer work at the Coquitlam River Hatchery (1981-present), Reed Point Marina fish pens (1986-present), and most recently with the Buntzen Lake fish pens.

Terry Taylor is a well-known and highly regarded botanist with the Vancouver Natural History Society. He has written many articles on botanical subjects amd regularly leads botany field trips for the VNHS and other local natural history groups. He is in great demand to compile vegetation inventories of areas under threat of development throughout the Greater Vancouver area.

ADDITIONAL CONTRIBUTORS

We wish to thank the many people who contributed to this project throughout its duration. We would especially like to recognize Councillor Anne Hulbert who proposed this project to Port Moody Council. In addition to the people below who undertook specific aspects of the project, the following provided information and help without which this project would have been much more difficult: Jack Evans, Marjorie Griffin, Ruth Hoyem, Peter Hulbert, Rick McKelvey, Tom Plath, Ron Reichelt, Wilma Robinson.

We also thank Jay Burr, PhD, Associate Professor, Department of Biological Sciences, Simon Fraser University, who wrote the section on the nematodes of the Port Moody Mudflats. In particular, we thank the following for providing their expertise and assistance in helping complete this project.

Birds: Tom Hanrahan, Jeff Rosen.

Botany: Mossses, Lichens and Fungi: Huber Moore, Wilf Schoefield, Terry Taylor, Heather Washburn (Compiler).

Trees, Shrubs, Herbaceous Plants: Barry Gibbs, Christine Hanrahan, Huber Moore, Terry Taylor.

Fish: Poul Bech, Ken Berry, Peter Caverhill, Maurice Coultier-Boisvert, Ruth Foster, John Gregson, Al Grist, Lee Harding, Wendy Hessler, Jason Hwang, Mark Johnson, John Jordan, Alan Kolok, Tim Lissimore, Elmer (Al) Rudolph, Judy Russell, Louis Rzen, Al Sawchuck, Fred Smallenberg, Gary Taccogna, Chris Tullock, Rob Way, Ian W. Whyte, Rick Simpson.

Insects: Louis Rzen, Tim Lissimore.

Photography: Bruce Brandhorst, Peter Hulbert, Quirien Mulder ten Kate.

Reptiles and Amphibians: Jake Klaver.

Proof Reading and Suggestions: Diane Cornejo, Ruth Foster, Peter Hulbert, Rick Simpson

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SPECIAL FEATURES

- Band-tailed Pigeons
- Pacific Crabapple Thickets
- The Importance of Nettles to Butterflies
- The Mudflats of Moody Inlet
- Plants That Provide Food for Wildlife
- Regionally Rare and Significant Plants
- Snags, Stumps and Downed Logs
- Western Hemlock
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BAND-TAILED PIGEONS

Introduction

The Band-tailed Pigeon (*Columba fasciata*) breeds from southeastern Alaska southwards in a narrow band down the coast of BC, the western United States and into Mexico, Central America and South America (Campbell et al. 1990). Non-breeding birds have been observed in the southern portion of the province to "Sparwood and Mount Robson" (IBID). It winters from "southwestern British Columbia south through the breeding range" (IBID).

Both Brooks and Swarth (1925) and Munro and Cowan (1947) listed the Band-tailed Pigeon as a regular summer visitor. R.A. Cumming in his checklist of Vancouver birds (1932) noted it was abundant in the region in summer. Campbell, et al. (1990) calls it an "*uncommon* to locally *very abundant* resident on the south coast" and notes that it is slowly expanding its range in the province, but states that the known breeding range in BC is considerably reduced from that reported in 1983 by the American Ornithologists' Union and in 1986 by Godfrey. Concern over declining populations, discussed below, is not in contradiction with range expansion or local abundance as discussed in Campbell et al. (1990) above.

In the Tri-City area, this species is found in a number of locations including Burke Mountain, Colony Farm, Riverview Hospital grounds, Mundy Park, and DeBouville Slough. It is also an irregular visitor to feeders in the area. However, the most important site for Band-tailed Pigeons is Pigeon Cove/Pigeon Point at the head of Burrard Inlet in Port Moody.

Status of Band-tailed Pigeons in BC

According to the 1991 Yellow List (management emphasis species) produced by the Ministry of Environment, Lands and Parks, Band-tailed Pigeons are increasing in the province, with a population of between 5,000 to 10,000 birds, and they are not considered a species at risk. However, this information does not accurately reflect recently expressed concerns over declining populations throughout their range (T. Plath, J. Evans, R. McKelvey, personal communication).

Over the last few years both hunters and birdwatchers have commented on the decreasing numbers of Band-tailed Pigeons. Information derived both from hunter-harvest statistics and Breeding Bird Survey (BBS) data confirm the decline. No studies have been carried out in British Columbia to determine the reason for this problem. However, ongoing work in the United States is attempting to discover the cause(s) behind the decline. Recently, a series of disease outbreaks in California have had a substantial negative impact on this species. Although the exact nature of the disease is uncertain, there appears to be some neurological problems associated with it (R. McKelvey, personal communication). It is uncertain whether birds from British Columbia winter that far south, but if so, they would almost certainly be affected by the disease outbreaks.

Habitat loss, particularly from development and logging, which eliminates large stands of coniferous forests, the preferred habitat of this species (Bent, 1932), is believed to be another contributing factor to the Band-tailed Pigeon decline. Loss of mineral-gravelling sites,

particularly those adjacent to coniferous growth, and loss of food resources also impact negatively on the reproductive success of these birds (Washington Dept. of Wildlife, 1991).

Data from earlier reports suggests that the number of Band-tailed Pigeons using the Inlet area has definitely declined. A 1972 study (Eikos) stated that the area "probably supports up to 500 resident birds during the summer, but many thousands more use it during migration in spring and fall". During 1992 not more than 30 pigeons were observed at any one time, mostly during April and May. It is not clear whether this species once nested in the immediate area, but reports of large numbers of resident birds during the summer (above) would indicate that nesting occurred. However, the coniferous woods were certainly once more extensive and combined with the mineral-gravelling site and food-bearing shrubs, would have provided appropriate habitat. There is no indication now that Band-tailed Pigeons nest in the park area.

Hunting

Band-tailed pigeons are considered a game species throughout their range, and as such are included in the federal Migratory Birds Convention Act. They are susceptible to overhunting and were once hunted to near extinction (Bent 1932; Ehrlich et al. 1988), largely due to market gunners (March 1971).

In the Lower Mainland they are hunted from 1-30 September, a reduction in season from the earlier two full months (R. McKelvey, personal communication). The bag limit in now 5 birds per day with a possession limit of 10, reduced from 10 birds per day a few years ago (J. Evans, personal communication). Both reduction in season and reduction in bag limit are in response to overall concerns about the population of these pigeons. R. McKelvey (personal communication) believes that most hunters now generally take no more than 6 birds per season, partly because there are fewer birds to hunt.

Band-tailed Pigeons were extensively hunted until 1971 in Port Moody's Inlet around the area known as Pigeon Cove and Pigeon Point. Lead pellet counts conducted during 1972 found an average density of 86 pellets per square foot (LIP 1972), indicating the high level of hunting which took place there over the years.

Mineral-gravelling sites

Band-tailed Pigeons need large amounts of calcium for egg production and crop-gland function (March 1971), and they make extensive use of mineral-gravelling areas to satisfy these requirements. The Port Moody mudflats at the head of the Inlet are especially significant because studies have shown that "they will only gravel in the immediate vicinity of shoreline coniferous growth" (IBID). In the Lower Mainland only a few sites have the unique combination of coniferous trees adjacent to a mineral-gravelling site.

Breeding

Once their mineral requirements have been satisfied, Band-tailed Pigeons disperse to other areas to nest. They have been observed nesting in both deciduous and coniferous woodlands, at a height of from 2 to 10 metres above the ground (Bent 1932; Ehrlich et al. 1988). The nest is a loosely made platform-like structure of twigs usually unlined, and placed on a horizontal limb (IBID). One to two eggs are laid, with one egg being the norm. Incubation

takes from 18-20 days and fledging occurs in about 27 days. Locally, Band-tailed Pigeons have been observed nesting on the slopes of Burke Mountain.

Feeding habits

Band-tailed Pigeons feed extensively on fruits, nuts and grains, and are dependent on seasonal availability of the various crops. Bent (1932) lists a wide range of fruits consumed by these birds including wild cherries, blueberries, blackberries, cascara berries, salmonberries, and salal berries.

Locally, March (1971) found that the pigeons fed on grain spillage in railway yards (rarely available now) when they first returned to this area, leaving only when berries and fruit appeared in the wild. Studies of birds collected in April and May showed that many of the females had also been feeding on hemlock pollen. An analysis of approximately 600 crop samples over a 3 year period performed by March (1971) indicated that red elderberries (*Sambucus racemosa*) were extensively consumed, followed by cascara berries (*Rhamnus purshiana*) which ripen at about the time the elderberries finish. Other fruits found in the crops were black mountain huckleberry (*Vaccinium membranaceum*), dogwood (presumably *Cornus stolonifera*), and choke cherry (*Prunus virginiana*) (IBID).

Importance of the Shoreline Park

The Shoreline Park provides a very important and unique habitat for Band-tailed Pigeons. The proximity of mineral rich mudflats to shoreline coniferous growth represents a disappearing habitat. The Eikos report (1972) notes that "some forty or fifty years ago there were many places in the Lower Mainland, in inlets and along rivers, where this combination...existed." Today, few such areas are to be found. Thus the habitat of the Pigeon Point area in the park assumes ever greater value as its rarity increases.

Protection of Band-tailed Pigeons and their Habitat at the Shoreline Park.

Given the serious concern both provincially and internationally over depleted numbers of Band-tailed Pigeons throughout their range, Port Moody is indeed fortunate in having one of the few remaining sites of great significance for these birds. Everything possible should be done to protect the important remnant habitat so vital to the continued well-being of these birds. Specifically, the coniferous forest adjacent to the mineral-gravelling site at Pigeon Point should be preserved in its entirety.

Most sources agree that protection of mineral sources and adjacent growth is vital if the pigeons are to survive (Wash. Dept. of Wildlife, 1991; Eikos, 1972; R. McKelvey, personal communication). Because the reproductive success of this species is strongly tied to obtaining sufficient minerals (March, 1971) populations could suffer further declines if these important sites are destroyed or severely degraded by development or poor land-management practices.

PACIFIC CRABAPPLE THICKETS

The mature, well-established pacific crabapples (*Malus fusca*) form dense, tangled, impenetrable thickets which extend along the trail and to some depth on either side at the head of the Inlet. These thickets provide cover for migratory and overwintering songbirds, and habitat for Saw-whet Owls. Birds nest in their protective shelter and in late summer feed on their tiny yellowish apples.

Crabapples prefer moist to wet ground such as that around the head of the Inlet. They can be found, however, scattered throughout the park but they do not grow well in shade. More like a bush than a tree with their multiple stems, the crabapple can grow to about 9 metres in height in good conditions. From mid-April clusters of creamy white flowers appear, followed later by the fruit.

According to Butler (1987), pacific crabapples "once lined many natural levees in the Fraser River Delta" but "today only a few remain". We are fortunate that the Shoreline Park System still retains a good representative sample of this habitat, and we must ensure that it is protected.

THE IMPORTANCE OF NETTLES TO BUTTERFLIES

Stinging nettles (*Urtica dioica*) are generally regarded as a nuisance weed, to be removed wherever they occur. But the survival of four species of local butterflies depends entirely on the presence of stinging nettles: the Comma or Anglewing (*Polygonia satyrus*), Milbert's Tortoiseshell (*Aglais milberti*), the Red Admiral (*Vanessa atalanta*), and the Western Painted Lady (*Vanessa annabella*) (Ashton 1990).

In areas where the nettles have been eradicated these butterflies have declined (IBID). In their caterpillar stage, these four species feed upon the nettle leaves and form their chrysalis under the leaves. Butterflies face innumerable problems, but we can certainly do our part to help them by maintaining the plants so necessary to their survival. Within the Shoreline Park, stinging nettles should be retained, with judicious removal only when they intrude upon the trail.

Certain Vancouver parks are now being planted with small beds of nettle to encourage these nettle butterflies to stay in the area. Both Stanley Park and Jericho Park were planted with nettle beds in 1990 (Ashton 1990).

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THE MUDFLATS OF MOODY INLET

Contributed by Jay Burr

The extensive mudflats exposed at low tide, though they appear barren, are actually teeming with life. Marine invertebrates from earthworm size to microscopic are numerous in each tablespoon of the soft sediment. The greatest variety are found in mud samples taken from areas exposed by tides lower than 2.5 metres. Check a tide table for times (times for the Inlet are within an hour of the times listed for Point Atkinson). Samples from the top one cm of mud can be scooped up with a trowel into a plastic bag. Few animals are found in the black mud below the surface because it is too anaerobic there. Wear old sneakers or hip-waders and be prepared to sink into the mud over your ankles. If kept for more than an hour before examination the mud samples should be spread to a depth of one cm in a container and overlain with a few cm of seawater which is kept aerated with an aquarium bubbler. To view the organisms just put a tablespoon of the mud in a shallow dish and dilute with enough seawater to make the organisms visible. A good magnifying glass or dissecting microscope would help.

The appearance of the mud invertebrates can be fascinating. A fuzzy blob crawling around on cilia could be a species of flatworm. Several annelid worms are seen, some very similar to earthworms. More interesting are various species of the annelid class: Polychaeta. These are also segmented, but they crawl on numerous legs, have decorative tufts and about six tiny eyes at the anterior end and sometimes others along the sides. These tiny predators look ferocious under the microscope.

The most common animals in marine mud are nematodes or roundworms. At first these seem all alike but closer examination reveals a variety of types. Some marine nematodes have a pair of simple eyes - each consisting of a dot of melanin pigment adjacent to a light-sensitive nerve ending. One species with eyes is particularly common in mud near the site of the old sawmill. It was discovered as a new species, *Enoplus anisospiculus*, by a student at SFU (Nelson et al., 1972). The photographs show several larvae hatching from eggs, and the head at higher magnification. This species was not found in any of seven other sites around Burrard Inlet investigated by another student as a part of her masters thesis (Bollerup, 1973). It is possible that this site is unique because of the freshwater stream flowing over the mud at low tide about 2 metres from where the species is found. Or perhaps the wood chips and sawdust in the mud at this site are an important part of its ecology. A description of the eyes of marine nematodes of Burrard Inlet has been published (Bollerup and Burr, 1979).

There is a tremendous variety of animals in the mudflats and it is a challenge to identify them to animal class and family. A good reference book on marine invertebrates is helpful. There are so many different species with subtle differences between them, that usually only experts on a given phylum can identify them, however. For the novice it is fascinating just to discover such a variety of unfamiliar creatures in every spoonful of mud.

* * *

PLANTS THAT PROVIDE FOOD FOR WILDLIFE

Many of the plants growing in the Shoreline Park System provide food for wildlife, especially birds. Seeds, cones, fruits, berries, nectar, are all used by one form of wildlife or another. We have listed the plants found in the park which have been identified as food sources for wildlife. In some cases the plants do double duty, their flowers providing nectar for hummingbirds, butterflies, and bees, their berries, food for birds. Deer like to browse the fresh leaves of salal and nibble on buds of various trees.

Seed and cone-bearing plants

Big-leaf maple
Broadleaf dock
Bull thistle
Canada thistle
Curly dock
Dandelion
Douglas fir
Hardhack
Lady's thumb
Red-alder
Sitka Spruce
Various grasses
Vine maple
Western hemlock
Western red cedar

Nectar sources

Alsike clover
Canada goldenrod
Canada thistle
Dandelion
Flowering red currant
Hop clover
Oxeye daisy
Red clover
Tufted vetch
White clover
White sweet clover
Yarrow

Berry and fruit bearing plants

Bitter cherry
Black hawthorn
Black raspberry
Black twinberry
Bunchberry
Cascara
Cherry
Devil's Club
Dewberry (trailing blackberry)
Domestic apple
Dull Oregon grape
English Holly
Evergreen blackberry
False-lily-of-the-valley
Flowering red currant
Himalayan blackberry
Indian plum
Mountain ash (Rowan tree)
Nootka rose
Pacific crabapple
Plum
Red elderberry
Red huckleberry
Red osier dogwood
Salal
Serviceberry (Saskatoon berry)
Squashberry
Sweet cherry
Tall blue huckleberry
Woods strawberry

Nut-bearing shrubs and trees

Hazelnut
Walnut

Leaves

Cow parsnip
Salal
Seacoast angelica
Skunk cabbage
Stinging nettle

SNAGS, STUMPS AND DOWNED LOGS

A forest is a living entity, constantly changing and evolving. Old trees die, new ones sprout up and over many years the very composition of a forest changes as climax species eventually overshadow the seral community. An important component of all forests are dead and dying trees, whether standing as snags or lying on the forest floor as downed logs. So vital is their role in the forest ecosystem that it is not an exaggeration to say that dead trees give life to the forest. Norse (1990) states that "rotting snags and logs provide the tunnels, dens, and nesting cavities needed by animals from black bears and spotted owls to land snails and springtails. They are the birthplaces for western hemlocks, Sitka spruce, and smaller plants....They are sites of biological nitrogen fixation, adding to the nutrient wealth of the forest."

SNAGS OR WILDLIFE TREES

Snags are standing dead trees. Their value to wildlife is immeasurable for they provide not only food but safe nesting and roosting sites for a wide variety of species. From the time a standing tree dies until it falls to the forest floor, its many stages of decomposition attract different birds, mammals and invertebrates. Charles Elton (*in* Kennedy, 1991) observes that "dying and dead wood provides one of the two or three greatest resources for animal species in a natural forest...if fallen timber and slightly decayed trees are removed the whole system is greatly impoverished of perhaps more than a fifth of its fauna."

The Importance of Snags

When a tree dies it is attacked by a variety of insects and fungi which soften the wood allowing it to be easily shredded by birds and mammals. These insects then attract woodpeckers and other forest-dwelling animals who in the course of excavating for food create holes or cavities which become in turn, nesting sites for birds and small mammals. Biologists call those species which greatly influence other species, 'keystone species'. Woodpeckers are one such example, for the holes they create as they search for food provide homes for countless other creatures.

Norse (1990) writing of the beneficial role played by the primary 'colonizers' of snags, insects and fungi, comments that "people who automatically consider insects and fungi to be pests might be surprised to learn of their essential service to all cavity dwellers...". The variety of invertebrates inhabiting dead and dying trees is staggering: millipedes, mites, earwigs, beetles, spiders, centipedes, termites, ants and even earthworms; all of these creatures help in some way to carry on the long process of decomposition. But while they are at their work they provide a rich bounty of food for birds, so rich that some trees have been called "candy trees" for birds! (Kennedy, 1991).

A standing dead tree can remain in place for many years. Some of the forest giants have been snags for well over 150 years when they fall. Smaller trees come down sooner, but even they can last for many decades, and this should be remembered when considering the 'safety' aspects of snags in the Shoreline Park.

Cavity Nesting Birds

Many people do not realize that when they put up nest boxes each year they are offering 'homes' to cavity-nesting birds whose natural nest sites are holes (or cavities) in snags. Some of our most familiar birds are cavity-nesters along with other species perhaps less familiar. However, nest boxes can never be a complete substitute for natural cavities. One authority (Norse 1990) states that 30 to 45 percent of forest birds on the west coast use cavities in snags for nesting. For some birds, such as the tiny Brown Creeper, it is the loose bark on dead trees that gives shelter for nests.

The following list is of the many birds occurring within the region which require cavities for nesting. While a few can use other nest sites, most will use only cavities. Some of them nest in the park, others do not; still others (goldeneyes and bufflehead) nest in the interior of the province but are found in the park during winter months:

Wood Duck
Common Goldeneye
Barrow's Goldeneye
Bufflehead
Common Merganser
Hooded Merganser
American Kestrel
Barn Owl
Western Screech Owl
Northern Pygmy Owl
Spotted Owl
Barred Owl
Northern Saw-whet Owl
Vaux's Swift
Red-breasted Sapsucker
Downy Woodpecker
Hairy Woodpecker
Northern Flicker
Pileated Woodpecker
Tree Swallow
Violet-green Swallow
Black-capped Chickadee
Chestnut-backed Chickadee
Red-breasted Nuthatch
Bewick's Wren
Winter Wren
European Starling
House Sparrow

Mammals

Mammals also make use of snags for both shelter and for rearing young. Martens, squirrels, bats, even bobcats will den up in cavities. Black bears find winter refuge at the base of snags, as well as in hollowed out downed logs.

Wildlife Trees in the Shoreline Park

Within the Shoreline Park there are many examples of snags and a careful examination will reveal a number of holes or cavities. Long rectangular openings indicate the work of a Pileated Woodpecker, a bird almost entirely dependent on snags. Breeding species of the park such as woodpeckers, chickadees, Bewick's Wrens and other cavity-nesters will only continue nesting there as long as these snags are retained. Other birds use snags as loafing sites or lookouts. Red-tailed, Cooper's and Sharp-shinned Hawks have all been found perched on top of snags in the park. Snags also serve as perches for smaller birds such as flycatchers, swallows, tanagers, and grosbeaks from where they can 'hawk' for insects. Woodpeckers drum their mating call on snags, and during early spring the woods around the Inlet ring with their sound. Even living trees can have some of the advantages of a snag: those with dead tops are often utilized in much the same way as a snag. The resident Bald Eagles in the park are almost always found perched on the dead top of a Sitka spruce by Pigeon Cove.

Recognition of Wildlife Trees

In recent years the importance of snags has become much more widely recognized. Even the Ministry of Forests (1993) which once felled every dead tree, is beginning to realize the value of these trees once routinely dismissed as 'decadent' and useless. Together with the Ministry of Environment, Lands and Parks, they have implemented a program of marking snags with identifying tags alerting people to their wildlife value. The term 'wildlife tree' is gradually replacing 'snag' in the terminology of biologists and naturalists alike, and with good reason.

DOWNED LOGS

An old-growth forest is full of fallen trees, or downed logs. It is thought that in an ancient Douglas fir/western hemlock forest up to 25% of the forest floor is covered by logs (Norse 1990). In an area such as the Shoreline Park, logs are much less in evidence, yet even here they form an important part of the overall ecosystem just as they do in any forest or wooded area. In fact, biologists are now calling logs the "hot-spots" of the forest ecosystem, "essential to biological diversity" (IBID).

When a tree falls to the ground, it is quickly taken over by insects, especially beetles. Earlier, woodpeckers were referred to as a keystone species; beetles serve that same function in downed logs (Norse 1990). As they bore into the log they open up the way for fungi which in turn help to decompose the inner bark. As the beetles tunnel further into the log they provide access for spiders, ants, millipedes, termites, and salamanders and the process of decomposition initiated by the beetles continues.

Like snags, downed logs provide shelter and denning sites for mammals, birds, and for amphibians and reptiles such as salamanders, newts, snakes and Alligator Lizards. Small animals use logs as easy routes through the forest.

Even more importantly, logs act as 'nurseries' for plants, allowing them a nutrient-rich base in which to take root. In fact, some species such as Sitka spruce and western hemlock will only root readily on logs not yet covered with thick mats of moss. These same mosses which carpet the forest floor, make it difficult for the roots of these trees to establish. Many other plants take root on downed logs and it is a fascinating exercise to count the number of plant species growing on a single 'nurse log'.

Ecologists have classified five stages of decay in a downed log, from the first stage when a log is intact and not yet decayed, to the fifth, where the log has crumbled into a mass of organic material (Norse 1990). Because logs are more moisture-retentive than snags they decay more slowly since oxygen is excluded from wet wood (IBID). Large old-growth logs can take two hundred or more years to decompose completely. Smaller logs such as those found in the Shoreline Park will decay much faster.

Downed Logs in the Shoreline Park

While many logs are far from the trail, a large one lies near the intersection of the main shoreline trail with the trail from the recreation centre. Because of evidence of tunnels made by toredo clams (shipworms) it appears that this log must have been in saltwater for some time

before being carried ashore possibly by wave action many years ago. At one time it was surely a tree of good size before it toppled from wherever it grew and came to rest across the trail where it now lies in two sections. The section on the west side is a prime example of a 'nurse log'. Growing in profusion are at least a dozen species of plants, from tiny mosses to large shrubs of elderberry. The section on the east side of the trail offers a glimpse into the heart of the log where the process of decay from the inside out can be seen.

STUMPS

Stumps are what is left when a tree has been cut. They serve many of the same functions as downed logs but on a much smaller scale, providing denning sites, shelter, and acting as a 'nursery' for seedlings. The Shoreline Park has several very large stumps, reminders of the ancient forests that once cloaked this area. An especially good example of a stump is near Suter Brook west of the proposed bicycle path (GVRD pipeline). It bears several springboard marks, the grooves cut into the lower part of a tree by loggers to hold boards on which they stood to fell the tree. This stump sports a lush growth of salal and red huckleberry as well as a number of smaller plants.

REGIONALLY RARE AND SIGNIFICANT PLANTS

The Shoreline Park is home to five regionally rare or significant plants. For such a small area, the number of rarities is quite remarkable and care must be taken to protect the plants and their habitat.

Spreading starwort. (*Stellaria crispa*). A low, creeping plant, this native chickweed occurs more frequently on Vancouver Island and is considered regionally rare in the Lower Mainland, according to botanist Terry Taylor (personal communication). Hitchcock and Cronquist (1973) comment that it is only found in a few places in Washington and Oregon. A plant of the saltmarshes, *S. crispa* is found in only one location in the park. It is an insignificant looking plant and difficult to pick out from other vegetation growing in the vicinity.

Chocolate lily. (*Fritillaria camschatsensis*). Further north and around the Queen Charlotte Islands, this native species is a common plant. However, on the south coast where *F. lanceolata* is the expected species of chocolate lily, it is considered quite rare. It is known from only a few locations, one being the Maplewood Mudflats across the Inlet in North Vancouver (Terry Taylor, personal communication). It grows in four locations in the park, but new sites could be found in the future. The bulb of the other lily, *F. lanceolata* is covered with rice-like grains which gives rise to its other common name of rice root. Native peoples apparently ate the bulbs which taste somewhat like rice (Lyons 1991).

Helleborine. (*Epipactis helleborine*). An introduced orchid, this species is not usually found outside of a small population growing near Victoria on Vancouver Island. It is considered regionally rare on the mainland. Introduced as a garden plant it occasionally escapes cultivation. It is far more common in Ontario where it spreads rapidly in the wild and is sometimes considered a bit of a pest. About 12 twelve plants are found in a moist, shaded location within the park. The lipped greenish-flowers are typical of orchids and although it can grow up to 3 feet tall, it is a plant not readily noticed.

Low club rush. (*Scirpus cernuus*). This small sedge is another regionally rare species which is more commonly known from Vancouver Island (Terry Taylor, personal communication). It is a plant of damp places and the one small patch found in the park is growing near the main Shoreline Trail in the vicinity of the Old Mill site. Use of this area by trucks during construction of the bicycle path may have eliminated this species from the Park.

Lungwort. (*Lobaria pulmonaria*). Lungwort is a lichen which generally grows on deciduous trees in relatively open, sunny sites. Its common name is derived from its look and texture which greatly resembles a human lung. Because of this it was once widely thought to have curative powers for all lung disorders (Vitt et al. 1988).

Once more widespread, it is now considered uncommon to rare in the Lower Mainland (Terry Taylor, personal communication). It is usually found growing on big-leaf maples (*Acer macrophyllum*). In the park there are small clumps growing on four maples on the north side of the Inlet near the Old Mill site.

Lungwort is considered an indicator of pure air and is not expected to grow in areas with poor air quality. In Britain where the same species occurs, it was once very common in the oak forests of mid to southern England, but with increased air pollution the lichen has all but disappeared (T. Taylor, personal communication). Why it should be growing near the Inlet with all the oil refineries is a mystery. There could perhaps be a flow of clean air from Eagle Mountain sweeping down the escarpment and through the area where the lungwort is growing, to the Inlet.

A piece of lichen which fell to the ground was collected and deposited in the UBC Herbarium (C. Hanrahan, 1992).

WESTERN HEMLOCK

Western hemlock (*Tsuga heterophylla*) is quite common in the park, particularly in the coniferous forest where it exists in nearly equal numbers with western red cedar. Scattered trees also grow in the mixed woods. Foresters too often consider hemlock a 'useless' species which should be replaced with Douglas fir and western red cedar, tree species considered to be more economically valuable.

Yet the western hemlock is an exceptionally valuable tree for wildlife. Red-breasted Sapsuckers appear to prefer this tree above all other species and many hemlocks sport bands of neatly drilled sapsucker holes. A particularly fine example of this occurs near the intersection of the main Shoreline Trail with the trail from the Inlet Park playing fields. Red Crossbills, Pine Siskins and squirrels feast upon the seeds of the small cones (Grass 1984), while Band-tailed Pigeons feed on the hemlock pollen in spring (March 1971).

Even the parasitic dwarf hemlock mistletoe (*Arceuthobium tsugense*) normally considered a pest is important to many species of wildlife. It provides nest sites for Red Crossbills and food for grouse and squirrels. The deeply grooved bark harbours many larvae and insects and Red-breasted Nuthatches, Brown Creepers and Black-capped Chickadees can be found probing the trunk for food (Grass 1984). The endangered Johnson's Hairstreak butterfly (*Mitoura johnsoni*), which occurs in only a few locations in the province, is dependent

on this mistletoe. In BC at least, the caterpillars of this species will feed only on dwarf mistletoe (Guppy 1989). Thus, despite the commonly held beliefs of many in the forest industry, hemlocks and their parasitic dwarf mistletoe are vitally important to a number of wildlife species.

* * *

RED ALDER

Contributed by Elaine Golds

Probably the most-despised and least-understood native plant of British Columbia is our native Red Alder. It was, however, prized by the native people for the red dye extracted from its bark and for its wood which was used for carving ceremonial bowls and as fuel to produce an excellent fire for smoking salmon.

More importantly, living alder trees play a significant role in the forest ecosystem. Alder, a hardy, fast-growing pioneer species, is one of the first trees to grow back after an area has been logged or burned. In the neglected corners of our gardens, we often find red alder seedlings shooting up. Perhaps we should let some of those seedlings grow because alder is a marvelous soil conditioner. Like peas, beans and clover, alder has nitrogen-fixing bacteria in root nodules which improve the fertility of the soil. Soil fertility is also improved by the litter of leaves which fall from the trees each fall.

Alder is much disliked by foresters who are often impatient to establish a monoculture of Douglas Fir trees on logged-over areas. However, alder if allowed to grow for a few years, will condition and improve the soil for the next generation of coniferous trees.

Forestry researchers have now discovered an additional benefit of allowing alders to establish themselves on a logged site. In areas where young Douglas Firs have been planted, a type of fungus sometimes infects the roots. It appears that red alder secretes from its roots a phenolic biochemical which inhibits the spread of the root rot which infects the Douglas Firs Some forestry researchers are now realizing that, perhaps, the best way to prepare the soil for a plantation of Douglas Firs is to allow a generation of alders to grow on the site to enrich and condition the earth. Once again, modern science triumphs by mimicking nature.

Alders are beneficial in many other ways. Their seed cones provide an important source of food for birds such as pine siskins. One of our most spectacular butterflies, the Western Tiger Swallowtail lays it eggs on tender alder leaves. The elimination of red alder from our suburban streets might also cause the loss of this beautiful butterfly from our backyards.

If a weed can be defined as a plant which we have not yet learned to appreciate, then, perhaps red alder is simply a special tree with many more wonderful features to be discovered.

* * *

HABITAT DESCRIPTION:SHORELINE PARK SYSTEM

INTRODUCTION

The 125 acre Shoreline Park System contains nine distinct habitats including the open saltwater and mudflats. For such a small area the diversity is truly unique.

In the habitat descriptions below, only the dominant vegetation is described for (where appropriate), the overstory, understory and groundcover. Following each section there is a list of other plants found in that particular habitat. Plants which grow in a variety of habitats are listed more than once. For a complete list of all plants found in the park (*see* Appendix VII.a). For a complete description of each plant and their habitat requirements, see the Annotated List of Plants.

A habitat inventory was produced by TERA Environmental Consultants for Port Moody in 1987. Our report follows this inventory in part, but expands the descriptions based on our more extensive surveys which identified nearly 270 species of plants.

WILDLIFE HABITAT

In terms of wildlife, a habitat can be defined as an animal's home, "the place where it finds the combination of water, food, cover, and space that it needs to survive. The sum total of an animal's needs is expressed in its habitat" (Benyus 1989).

Following each habitat description there is an account of the wildlife species which can be expected to occur there. Because some species utilize more than one habitat there will be some overlap. For detailed wildlife information please refer to the annotated lists of birds, mammals, reptiles and amphibians and fish.

It is habitat which determines the type and number of bird species attracted to the Shoreline Park System. Different species require different habitats, and while some birds are generalists, able to exist in several or many habitats, most are linked to specific types. However, these specific types may change at different times of the year although similarities will continue to exist. Waterfowl and most shorebirds, for example, still require water, but whether they require precisely the same water-based habitat for overwintering as for breeding depends on the adaptability and evolutionary pattern of the individual species. A diversity of habitat then, should encourage a diversity of species, and this is precisely the situation with the Shoreline Park System. Within its small area there are nine distinct habitat types, each conducive to certain bird species, and within these habitats 116 species of birds have been found. Those species for which nesting has been confirmed in the different habitats are marked with an asterisk (*), and those for which nesting is suspected are marked with an asterisk and a question mark (*?).

RIPARIAN HABITAT

Riparian habitat is defined as a vegetation community which grows near, and is dependent on, freshwater. In the Shoreline Park System riparian habitat exists along all the streams flowing through the park. The largest continuous stretch of this habitat type occurs around Suter Brook and extends for some distance north and south of the creek.

The dominant tree cover of the **Suter Brook riparian area** is pacific crabapple (*Malus fusca*) and red alder (*Alnus rubra*), with scattered Sitka spruce (*Picea sitchensis*) and western red cedar (*Thuja plicata*). The understory is characterized by Nootka rose (*Rosa nutkana*), hardhack (*Spirea douglasii*), Indian plum (*Oemleria cerasiformis*), and various blackberry species (*Rubus sp.*). The common groundcover species are wall lettuce (*Lactuca muralis*), false-lily-of-the-valley (*Maianthemum dilatatum*), bleeding heart (*Dicentra formosa*), and large-leaved avens (*Geum macrophyllum*).

The composition of the **Noon's Creek riparian area** differs slightly from that described above. The band of vegetation is narrower and overstory species are fewer, but still consist of black cottonwood *(Populus trichocarpa)*, red alder, and pacific crabapple, with scattered walnut (*Juglans sp.*), and cherry (*Prunus sp.*) trees. The understory is primarily ninebark (*Physocarpus capitatus*), Nootka rose, and blackberry species. Groundcover is characterized by false-lily-of-the-valley, creeping buttercup (*Ranunculus repens*), and rush species (*Juncus sp.*).

Other plants found in the above riparian zones of the park include tall blue lettuce, yarrow, chocolate lily, ribwort plantain, common plantain, field milk-thistle, vine maple, big-leaf maple, western white birch, English ivy, trembling aspen, domestic apple, plum, cascara, red elderberry and black hawthorn.

Birds

The riparian habitat of the Shoreline Park supports a wide variety of bird fauna. In the breeding season nesting species include Willow Flycatchers, Song Sparrows, Rufous-sided Towhees, Yellow Warblers, and Swainson's Thrushes. Throughout the year many other species find food and safe cover in the vegetation. The Pacific crabapple thickets which form part of the riparian vegetation of the park, are important in their own right (*see* Special Features).

Northern Saw-whet Owl
Downy Woodpecker*
Northern Flicker
Willow Flycatcher*
Steller's Jay
Bewick's Wren*
Golden-crowned Kinglet
Ruby-crowned Kinglet
Swainson's Thrush*
American Robin*
Varied Thrush
Cedar Waxwing*?
Warbling Vireo*
Red-eyed Vireo
Common Yellowthroat
Wilson's Warbler*?
Black-headed Grosbeak*
Rufous-sided Towhee*
Song Sparrow*
Lincoln's Sparrow
White-crowned Sparrow
Brown-headed Cowbird*
Purple Finch
House Finch
Pine Siskin
American Goldfinch*?
Evening Grosbeak
Yellow warbler*

Mammals

Mammals large and small find food and cover in the riparian zones of the park.

Black-tailed Deer	Douglas Squirrel
Black Bear	Raccoon
Coyote	Bats

Reptiles and Amphibians

Few herptiles have been found in the park to date, but the following use the riparian zones:

Garter Snake	Western Toad
Pacific Tree Frog	

STREAMS

Smaller creeks draining through the park are fringed with skunk cabbage (*Lysichitum americanum*), and sword fern (*Polystichum munitum*). Tree cover is a mix of cedar, western hemlock (*Tsuga heterophylla*), birch (*Betula papyrifera and B. pendula*), red alder and big-leaf maple (*Acer macrophyllum*), depending upon location in the park. The understory again is dependent on the location of the small creeks, but generally is composed of vine maple (*Acer circinatum*) and blackberry species (*Rubus sp.*). In addition to the dominant skunk cabbage and sword fern, other groundcover plants include horsetail, creeping buttercup, and bittercress.

* * *

Fish Contributed by Elaine Golds

Of the ten streams that flow into Port Moody Arm within the boundaries of the Shoreline Park, only two, Noons Creek and Suter Brook are especially significant for fish. The other smaller creeks suffer either from inadequate water flow or from upstream culverts which apparently prevent the entry of fish. Storm drains supply much of the water for these smaller creeks, thus, carrying the added danger of pollutants from road runoff and uncaring citizens who dump chemicals down storm drains. Even such seemingly innocuous activities as letting soap suds from car washing enter a storm drain or the excessive use of garden chemicals can have lethal consequences for the aquatic organisms which depend upon unpolluted urban runoff for their survival. A small stream which enters Pigeon Cove consistently runs with a rusty red colour which is presumably iron oxide leaching from the IPSCO site.

Noons Creek, at the head of the Inlet provides the greatest flow of fresh water into the Inlet. The headwaters of Noons Creek arise from Cypress Lake high on Eagle Mountain. The Creek tumbles down an eight kilometer course through young second-growth forest, a golf course and housing developments before entering the Shoreline Park. Suter Brook arises on the opposite side of the Inlet from a ravine in the Chines area of Coquitlam. Suter Brook, a more slowly moving stream, meanders gently through the flatlands of a proposed high-density development, past the City Works yard and under the railway tracks before entering the Shoreline Park. The mouths of these two adjacent streams form a fertile estuary and marsh in the tidal mudflats.

NOONS CREEK

Middens found in the Noons Creek area suggest that, prehistorically, the area provided an abundance of shellfish and salmon for the Coast Salish people. Some of the artifacts collected at this site may be now viewed at the Port Moody Station Museum.

Before the European invasion, with the concommitant intensive logging and industrial activities, the habitat found in the vicinity of Noons Creek must have been quite different than it appears today. No doubt, massive cedars towered over the creek. The decaying remains of one fairly large cedar stump may be seen near the railway bridge which crosses Noons Creek. According to the Local Initiatives Project Report (1972), the last large tree in the area was cut down in Coronation Heights in the 1920s. It was reported to have measured well over 5 meters in diameter.

During the early days of European settlement, fish habitat on Noons Creek is believed to have declined dramatically. However, recent efforts to protect habitat on Noons Creek and enhance salmon stocks are beginning to have their desired effect. In the late 1970's, two former Port Moody residents, Brian and Margaret Waite began to improve fish habitat on a section of Noons Creek which ran through their backyard just above Ioco Road. When the Waites moved, their project was continued and expanded by the Port Moody Ecological Society with assistance provided by the Centennial High School students who operate a highly successful hatchery on nearby Mossom Creek. For most of the past decade, eggs have been incubated and coho fry reared at the Mossom site for release into Noons Creek.

Since its incorporation in 1991, the Ecological Society has been maintaining a rearing pond and building a hatchery on Noons Creek on land generously provided by the City of Port Moody. From summer to early spring, coho are fed by volunteers in the rearing pond which is connected to Noons Creek. For the first time in the fall of 1993, eggs taken from mature coho and chum which have returned to Noons were incubated on site. Both coho and chum have been released into Noons Creek. Future plans call for enhancing cutthroat stock on the creek as well.

Some of the returning mature salmon spawn naturally in the stream. Good spawning habitat for coho exists in the upper reaches of Noons Creek well beyond the Shoreline Park. It has been estimated that Noons Creek provides natural spawning habitat for approximately 125 pairs of returning salmon. Some of the mature salmon are collected for egg-taking so that additional fry can be hatchery-reared. The following spring, the release of the hatchery-reared stock to augment the number of in-stream fry will help to ensure that some of their progeny will return to spawn in future years. In the fall of 1992, it was estimated that approximately 275 adult coho returned to spawn in Noons Creek. For further information about the hatchery or for a guided tour, contact the Port Moody Ecological Society, 300 Ioco Road, Port Moody, V3H 2V7.

At almost any time of year, you may be fortunate enough to observe young coho fry or small cutthroat in Noons Creek. The best time to look for mature adults is in the fall after a rainy period. In the autumn, heavy rains flush massive amounts of fresh water into the Inlet. This infusion of fresh water entices mature salmon waiting in the Inlet to enter the streams to spawn. At the appropriate time of year, mature coho can sometimes be observed resting in the pools of Noons Creek adjacent to the skating rink.

SUTER BROOK

The mouth of Suter Brook forms a rich estuarine habitat in the Shoreline Park. The area just upstream of the estuary is particularly valuable habitat because it is mostly inaccessible to humans. In addition to cutthroat trout, sculpin (bullhead) and three spine stickleback likely lurk along the muddy bottom of slow-moving Suter Brook..

Just above the Shoreline Park, Suter Brook passes under the railway tracks and enters the City Works Yard. With the assistance of an Environmental Partners Grant from Environment Canada, the City has just completed the "day-lighting" of a long section of Suter Brook which had been previously culverted. The City of Port Moody is to be commended for its wise decision to rehabilitate Suter Brook.

The opening of Suter Brook will enable returning salmon to migrate further upstream where good coho spawning habitat may be found. The lower reaches of Suter Brook just above the Shoreline Park have excellent potential to provide spawning habitat for chum whereas the steeper reaches adjacent to Coquitlam are best suited for coho spawning. In the fall of 1992, attempts by chum salmon to enter Suter Brook are thought to have been unsuccessful. Both chum and coho have been released into Suter Brook by students from Centennial High School and the Burrard Inlet Marine Enhancement Society. For more information about these releases, contact the Burrard Inlet Marine Enhancement Society (this group manages the Mossom Creek Hatchery), 300 Ioco Road, Port Moody, BC, V3H 2V7 or phone Centennial High School at 936-7205.

* * *

Birds

Of the ten streams that flow through the park, the most significant in terms of birds are Slaughterhouse Creek, Suter Brook and Noon's Creek. When salmon are spawning, the mouths of Noon's Creek, and to a lesser extent, Suter Brook, become a feeding ground for scores of gulls and crows. In fall and winter, waterfowl and gulls gather at the mouths of these three streams to feed. The regionally rare Franklin's Gull stayed in the vicinity of Slaughterhouse Creek for a week in early fall, 1992. In winter, ducks such as Green-winged Teal, Mallards and American Wigeon congregate on Suter Brook and Slaughterhouse Creek, feeding on the streamside vegetation. Also in winter, Noon's Creek which is the only fast-flowing rocky stream in the park attracts American Dipper. Both Great Blue Heron and Green-backed Heron feed along the larger streams, and occasionally Common Snipe may be flushed from Suter Brook. Along the smaller streams, birds which prefer dense vegetation near water such as Song Sparrows, can be found.

Green-winged Teal
Mallard
American Wigeon
Hooded Merganser
Common Merganser
Common Snipe
Franklin's Gull
Bonaparte's Gulld
Mew Gull
Ring-billed Gull
California Gull
Thayer's Gull
Glaucous-winged Gull
Northwestern Crow
Common Yellowthroat
Song Sparrow

Mammals

Many of the mammals found in the park utilize a wide range of habitat. Those listed below are not restricted to small streams.

Black Bear
Black-tailed Deer
Coyote
Douglas Squirrel
Raccoon

Reptiles and Amphibians

Several herps found within the park need slow-moving streams in which to breed.

Pacific Tree Frog
Rough-skinned Newt

MATURE CONIFEROUS FOREST

There are two main coniferous sections in the park, one large and one very small.

Site one: This cedar/hemlock-dominated forest occurs between Pigeon Point and the Inlet Park playing field. A few Sitka spruce grow along the trail, and one has achieved a good size. Douglas fir (*Pseudotsuga menziesii*), big-leaf maple, birch, cascara (*Rhamnus purshiana*), and red alder are scattered throughout this community. The understory is primarily vine maple, devil's club (*Oplopanax horridus*), red huckleberry (*Vaccinium parvifolium*), false azalea (*Menziesia ferruginea*) and salal (*Gaultheria shallon*). The groundcover is characterized by foamflower (*tiarella trifoliata*), fringecup (*Tellima grandiflora*), lady fern (*Athyrium filix-femina*), sword fern, and shield fern (*Dryopteris assimilis*).

Other vegetation includes woods strawberry, bunchberry, fragrant bedstraw, deer fern, western trillium, English holly, English oak, mountain ash, bracken and starflower.

The GVRD pipeline bisects this habitat creating open wet, boggy conditions. Vegetation along this stretch is typical of wet sites: Hardhack, black cottonwood, rushes (*Juncus sp.*) and in a few locations, oval-leaf blueberry (*Vaccinium ovalifolium*). [*See also* the section on Disturbed Sites below.]

Site two: A small coniferous stand has grown up between the shore and the Shoreline Trail consisting exclusively of cedar with an understory of salal and red huckleberry. This cedar stand is located between the Old Mill site and Noon's Creek.

Birds

A diverse group of birds use this type of habitat, here represented by western red cedar and western hemlock. Nesting was suspected for Brown Creeper, Golden-crowned Kinglet, and Red-breasted Nuthatch, species which use this habitat and which were observed throughout the breeding season. In the more open sections where maples grow, Orange-crowned Warblers nest. Hemlocks seem to be a preferred food-source of Red-breasted Sapsuckers (Grass 1984), and careful examination reveals many hemlocks encircled by the distinctive small drill holes. Hemlock cones provide food for Pine Siskins and Red Crossbills

(IBID). Winter Wrens nest in the dense understory. Band-tailed Pigeons require the conifers for protective cover in conjunction with the mudflats below on which they seek minerals (*see* Special Features). Bald Eagles favour the dead crown of a Sitka spruce from which to survey the Inlet throughout most of the year.

Bald Eagle
Red-tailed Hawk
Band-tailed Pigeon
Red-breasted Sapsucker
Pileated Woodpecker
Western Wood Pewee
Hammond's Flycatcher
Pacific-slope Flycatcher*
Steller's Jay
Common Raven
Black-capped Chickadee*
Red-breasted Nuthatch*?
Brown Creeper*?
Winter Wren*?
Golden-crowned Kinglet*?
Ruby-crowned Kinglet
Varied Thrush
Orange-crowned Warbler*
Yellow-rumped Warbler
Black-throated Gray Warbler
Dark-eyed Junco
Purple Finch
Red Crossbill
Pine Siskin
Evening Grosbeak

Mammals

The dense conifers provide good resting, hiding and denning sites for many species of wildlife including several mammals.

Black Bear
Black-tailed Deer
Coyote
Douglas Squirrel

Reptiles and Amphibians

Northern Alligator Lizard

DECIDUOUS WOODS

There are five main deciduous wooded areas in the park.

Site one: Located between Slaughterhouse Creek and the mature coniferous zone. Red alder and birch dominate, with scattered hemlock and big-leaf maple. Salmonberry (*Rubus spectabilis*) and vine maple form a sometimes dense understory, with groundcover consisting primarily of shield fern, and along the edges, thimbleberry (*Rubus parviflorus*).

Other vegetation includes European white birch, fleabane, Japanese knotweed, trailing blackberry and evergreen blackberry.

Site two: This alder-dominated wood extends from the mature coniferous area east to the boardwalk. Young red cedar form the understory, while sword fern and bracken are the dominant groundcover. This is an excellent example of forest succession where in time, the cedar will dominate, forming the climax forest.

Site three: This area is located north of Murray St. between the Inlet and the railway tracks, with Suter Brook forming the northern boundary. Black cottonwood and red alder dominate the

overstory, with salmonberry the primary understory species. Groundcover is characterized by fern species.

Site four: This site occurs between the trail from the Recreation Centre and Noon's Creek. The composition is similar to that of site No. 2, with cottonwood and alder forming the overstory. Indian plum is abundant in this site and together with salmonberry and thimbleberry characterizes the understory. Groundcover consists of bleeding heart, false lily-of-the-valley, and blackberry.

Other plants found here include helleborine, ribwort plantain, cat's ear, and wall lettuce.

Site five: This area is located between Noon's Creek and Old Mill site. Alder and Cottonwood are dominant with scattered bigleaf maple, cedar and hemlock. Some cottonwooods along the Shoreline Trail have achieved a considerable size. Understory consists of abundant Indian plum and salmonberry, with a groundcover of pig-a-back plant, wall lettuce, sword fern and English ivy..

Birds

The breeding bird fauna of the alder and alder-cottonwood associations in the park is characterised by vireos, both Warbling and Red-eyed, robins, Swainson's Thrushes, chickadees, Black-headed Grosbeaks, and crows. The cones of alder provide food for seed-eaters, especially siskins. In winter two small woodland hawks, the Sharp-shinned Hawk and Cooper's Hawk, can be found in these habitats. The Sharp-shinned breeds in more mountainous areas, while the Cooper's seems to need larger wooded tracts, but in winter they are found feeding on small songbirds and shorebirds of the Inlet and roosting in the woods. The understory of salmonberry and Indian plum is also important, providing nest sites and food. While some birds occupy the canopy others forage and nest close to the ground; furthermore, some birds need the wooded interior, while other species prefer the edges. It is the conditions found in these deciduous woodlots that attracts such a variety of birds throughout the year, and particularly in migration.

Sharp-shinned Hawk
Cooper's Hawk
Downy Woodpecker*
Northern Flicker
Steller's Jay
Northwestern Crow*
Black-capped Chickadee*
Bushtit*
Bewick's Wren*
Winter Wren
Golden-crowned Kinglet
Ruby-crowned Kinglet
Swainson's Thrush*
American Robin*
Varied Thrush
Cedar Waxwing
Warbling Vireo*
Red-eyed Vireo*
Black-throated Gray Warbler
MacGillivray's Warbler
Wilson's Warbler*?
Western Tanager
Black-headed Grosbeak*
Rufous-sided Towhee*
White-crowned Sparrow
Brown-headed Cowbird
House Finch
Pine Siskin
Evening Grosbeak

Mammals

Deciduous woods are used by most of the species found elsewhere in the park.

Black-tailed Deer
Douglas Squirrel
Raccoon

Reptiles and Amphibians

Only two species of herps are usually found in this habitat.

Garter Snake
Pacific Tree Frog

MIXED WOODS

Mixed woods occur in small stands in two locations:

Site one: This area forms part of the riparian zone of Suter Brook and stretches from the creek north to deciduous area No. 3. Cedar, hemlock and bigleaf maple are the dominant tree species. Vine maple and red huckleberry form the understory species, while sword fern, false-lily-of-the-valley and wall lettuce characterise the groundcover.

Site two: This site occurs between Old Orchard Park and the Old Mill site and consists of a small section of mixed forest composed mainly of cedar and alder, with an understory of Himalayan blackberry, hazel, and salmonberry. Sword fern is the dominant groundcover.

Birds

Mixed woods, here characterized by a cedar-alder association, with pockets of birch, maple and other tree species, attract many of the birds found in the deciduous woods. Blackberry thickets form part of the understory and provide a home for Bewick's Wrens, towhees, and other species.

Downy Woodpecker*
Pileated Woodpecker
Steller's Jay
Northwestern Crow*
Black-capped Chickadee*
Bewick's Wren*
Winter Wren
Golden-crowned Kinglet
Ruby-crowned Kinglet
American Robin*
Varied Thrush
Orange-crowned Warbler*?
Rufous-sided Towhee*
Dark-eyed Junco
Red Crossbill
Pine Siskin

Mammals

Mixed wood habitat attracts most of the same species found elsewhere in the park.

Black-tailed deer
Coyote
Douglas Squirrel
Raccoon

Reptiles and Amphibians

Northern Alligator Lizard
Pacific tree frog

OPEN DISTURBED AREAS

TERA (1987) considered a disturbed area to be that which has been cleared by man. There are many such areas in the park, two of them quite distinct: one along the route of the GVRD pipeline and the second at the site of the Old Mill. Other disturbed areas are scattered throughout the park, usually in small patches such as near Slaughterhouse Creek and along portions of the trail.

GVRD pipeline route: the pipeline route, site of the new bicycle path, parallels the Shoreline Trail and runs between the Inlet and the railway tracks. It is bordered variously by coniferous, mixed, and deciduous woods, and by narrow bands of big-leaf maple, alder and cottonwood, and by young alder scrub. Thickets of Himalayan blackberry (*Rubus discolor*), salmonberry, and in places, hardhack form a dense understory. Groundcover plants are indicative of the wet and in some areas, boggy, conditions of this site. The dominant plants are horsetail, broadleaf dock, creeping buttercup and American brooklime.

Other plants found along this route include spotted ladysthumb, doorweed, waterpepper (in only a few locations), curly dock, largeleaved avens, Bicknell's geranium (one location), and wall lettuce.

Birds

The route of the GVRD pipeline attracts a surprising number of species. Thickets of blackberries, hardhack and salmonberry provide much needed food, nest sites, and in winter, warm, protective cover. A variety of sparrows use this area, and this is the best area to find Rufous Hummingbirds in spring.

Rufous Hummingbird
Downy Woodpecker*
Willow Flycatcher
Tree Swallow
Violet-green Swallow
Northwestern Crow*
Black-capped Chickadee*?
Bushtit*
Bewick's Wren
Winter Wren
American Robin*
Cedar Waxwing
European Starling
Yellow-rumped Warbler
Black-throated Gray Warbler
Wilson's Warbler
Western Tanager
Rufous-sided Towhee*
Fox Sparrow
Song Sparrow*
Lincoln's Sparrow
Golden-crowned Sparrow
White-crowned Sparrow
Dark-eyed Junco
Brown-headed Cowbird
House Finch*?
Pine Siskin

Mammals

This is the area where all the small rodents were found. Common Shrews prefer moist edges of brushy thickets and the shrews found along the pipeline were probably this species.

Black Bear
Black-tailed Deer
Coyote
Mole sp.
Rat sp.
Shrew sp.

Reptiles and Amphibians

Garter Snake

Old Mill Site:

Old Mill site #1:

Once the site of a factory, the area from the trail to the water's edge contains abundant reminders of previous human activity. However, the entire Old Mill site is being gradually revegetated. A small stand of alder and a few *Prunus spp.* occupy one section, while a thick groundcover of white sweet clover (*Melilotus alba*) covers much of the northern end. Other groundcovers include various grasses, tufted vetch (*Viccia cracca*), white clover (*Trifolium repens*), seaside plantain (*Plantago maritima juncoides*), oxeye daisy (*Chrysanthemum leucanthemum*) and common dandelion (*Taraxacum officinale*). Where water covers the ground at high tide sea milkwort (*Glaux maritima*) and orache (*Atriplex patula*) grow.

Old Mill site #2:

The area from the Shoreline Trail to the railway tracks and beneath the San Remo subdivision, is also part of the Old Mill site. Significant stands of red alder saplings and thickets of Himalayan blackberry dominate, but Scotch broom (*Cytisus scoparius*) and hardhack also occur. Groundcover is composed primarily of plants characteristic of dry open sites, including eyebright (*Euphrasia officinalis*), common plantain, ribwort plantain, various grasses, and pineapple weed (*Matricaria matricarioides*).

Other plants found in this area include pearly everlasting (*Anaphalis margaritacea*), tansy (*Tanacetum vulgare*), bur-marigold (*Bidens cernua*), and beggar-ticks (*Bidens frondosa*), the latter growing in the same location as the regionally rare rush *Scirpus cernuus*.

Birds

The disturbed habitat around the Old Mill site attracts a very different bird association. Savannah Sparrow and Northern Shrike both occurred here in the only suitable habitat in the entire park for these species. The shrike ranged between this area and the small stand of alder and *Prunus sp.* by the mudflats. American Goldfinches favour this site, and both the Sharp-shinned and Cooper's Hawk hunt this area, flying back to the woods to feed on their prey. Aerial birds such as swifts and swallows catch insects here and over the adjacent mudflats.

Sharp-shinned Hawk
Cooper's Hawk
Vaux's Swift
Tree Swallow
Violet-green Swallow
Barn Swallow
Bushtit*
American Robin*
Northern Shrike
European Starling
Song Sparrow*
Savannah Sparrow
White-crowned Sparrow
House Finch
American Goldfinch

Mammals

In addition to the common species of mammals found elsewhere, one interesting species was found here, the River Otter. It was observed on the mud flats at low tide but entered the Inlet when disturbed. Bats were also observed flying over the water at this site, catching insects.

Bat sp.
Coyote
Harbour Seals
Raccoon
River Otter

PARKLAND

Parkland, characterized by groomed lawns, picnic sites, buildings, swimming pools, and playground areas, anchor each end of the shoreline Park System. Of the two, Rocky Point Park to the west has the most amenities and is the most barren in terms of plant variety, while Old Orchard Park at the opposite end is considerably richer.

Rocky Point Park:

A small woodlot occurs at the eastern end of Rocky Point Park, near the playground, and offers the greatest plant diversity in an area consisting largely of manicured grass. The woodlot contains western red cedar, red alder, and a few cottonwood, with an understory of salmonberry, blackberry, and vine maple. Groundcover is predominantly English ivy and creeping buttercup.

Birds

The groomed aspect of Rocky Point Park attracts only those adaptable species comfortable with human intrusion. Canada Geese find the broad swaths of green grass especially attractive. Gulls, crows, swallows, rock doves and robins will also be found in the area. Pine Siskins and chickadees feed in the small stand of mixed woods between Slaughterhouse Creek and the Playground, but the area is too disturbed for most species.

Canada Goose*
Glaucous-winged Gull
Rock Dove
Northwestern Crow
Black-capped Chickadee
American Robin
European Starling
House Finch
Pine Siskin

Mammals

Few mammals use the Rocky Point Park area but occasionally the following may be seen:

Black-tailed deer
Bats
Raccoon

Old Orchard Park:

Many large trees, including fruit trees (hence the park's name) have been left on-site and the undergrowth has, for the most part, been allowed to remain in a natural state. Even the picnic tables have been tucked into the shrubs, providing an attractive setting for both humans and birds. Several large cedars and a Douglas fir grow on the edge, while the other large trees are primarily *Prunus spp.* The understory consists of salmonberry and blackberry, while the groundcover is composed largely of a mix of English ivy and pig-a-back plant.

Other vegetation includes ground ivy, wall lettuce, creeping buttercup, and thimbleberry.

Birds

More birds are found at the Old Orchard park site than at Rocky Point. Canada Geese use the sandy beach and grassy open area, while robins and starlings can be found around the buildings. The trees, particularly the fruit trees, attract not only robins, but Varied Thrushes, Northern Flickers, and Cedar Waxwings. Several other species feed in the undergrowth and hide in the blackberry thickets.

Canada Goose*	Cedar Waxwing
Glaucous-winged Gull	European Starling
Downy Woodpecker	Rufous-sided Towhee
Northwestern Crow	Song Sparrow*?
Black-capped Chickadee*?	Dark-eyed Junco
Bushtit	Brown-headed Cowbird
American Robin*	House Finch
Varied Thrush	Pine Siskin

Other

Mammals

More mammals can be found in Old Orchard Park where the habitat offers better food and cover.

Black Bear	Douglas Squirrel
Black-tailed Deer	Mole sp.
Coyote	Raccoon

* * *

INTERTIDAL ZONE

Contributed by Elaine Golds

The salt water area of the Shoreline Park, which is extremely important for a variety of fish, falls entirely within the intertidal zone. The term, "intertidal" refers to the area between the high and low water tides. Beyond the intertidal area lies open salt water. Since this area is always covered by water, it provides a very different kind of habitat than the intertidal zone. From the point of view of a fish, these two zones, of course, merge since many fish that are found in the open salt water at low tide will come into the intertidal zone during high tide to search for food or to escape predators. The intertidal zone in the Shoreline Park is characterized by extensive mudflats and the absence of any significant wave action. A few rocky outcroppings can be seen off Pigeon Point at low tide. These mudflats and the bordering marshes, which are fed by the fresh waters of Noons Creek and Suter Brook, are an extremely productive ecosystem.

According to the Local Initiatives Project Report (1972), the mudflats are 2-12 inches thick and overlie a sandy substratum in many places. During recent history, erosion caused by logging and, later, by development is likely to have contributed to the expansion of the mudflats. The fact that shellfish remains were found in the Coast Salish middens of the Shoreline Park suggests that the Port Moody flats were once less muddy than they are now.

The geological history of the mudflats is interesting. It is believed that thousands of years ago, before the Fraser River assumed its present course, the Pitt River system drained into the Burrard Inlet through the Port Moody Arm. It challenges the imagination to think of the mighty Pitt River emptying into an area which is now so quiet and protected. Perhaps some of the grains of sand which lie buried beneath the Port Moody mudflats found their origin in the massive cliffs which tower over the upper end of Pitt Lake.

Animals which live on the mudflats exist under the most extreme of conditions. With no rocks to cling to or hide under, they must be able to endure widely fluctuating levels of salinity, withstand long periods without water and harsh exposure to the summer sun and winter cold. Some seek protection at low tide by burying themselves in the mud but that survival technique presents another problem in that oxygen levels in the fine, silty mud are extemely low. The characteristic unpleasant smell of the mudflats is due to the anaerobic conditions (i.e.,lack of oxygen) beneath the surface which slow the processes of natural decomposition.

Despite these uninviting conditions, many animals live beneath the mud and rise to the surface with the incoming tide to feast on microscopic organisms washed in by the ocean currents. These mud-dwelling creatures which include polychaete worms, nematodes, clams, snails and cumaceans, become, in turn, a meal for a variety of small fish and shorebirds. Barren though they appear to our eyes at low tide, the mudflats and adjacent marsh are literally teeming with life. In 1972, a new species of marine worm was discovered in the mudflats near the old saw mill (*see* Special Features).

In his report, Salt Marshes, Rod MacVicar states, "I feel that of all the lower mainland's ecosystems, the salt marsh and mud flat most resembles an ancient type that preceeded humans and that could still be considered to retain a semblance of wilderness. We are fortunate that this 'island in time' exists in the heart of Port Moody. ...In the process of recognizing the uniqueness and value of the salt marsh, I hope we don't hasten its demise."

Of the 48 species of fish which have been found in the Port Moody Arm, many would be expected to come into the intertidal zone during high tide. Among these 48 species are fish that spend most of their lives in shallow estuaries. Fish specialized for living in the intertidal zone have often developed unique adaptations for living under harsh conditions. Such fish must be able to endure wide swings in the salinity of the water which can range from being almost the equivalent of fresh water at the mouths of the creeks to salinity approaching that of the ocean a meter below the surface just beyond the intertidal zone. They must also be able adapt to fluctuating changes in the oxygen level of the water which can vary tremendously from low levels associated with a planktonic bloom and high levels near the mouths of fast-running streams. Most of the intertidal fish are small in size and have developed an elongate shape which enable them to blend in with the background of grasses or hide amongst the rocks.

Sculpin, of which six different species have been found in the Port Moody Arm, rest on the bottom and have protective colouration which makes them difficult to find in shallow water. Many fish will come into the shallow water to feed only at night when they have the protective cover of darkness. Some species, such as the penpoint gunnel have the ability to change their colour according to their diet so as to better blend in with their environment. Other fish, such as pricklebacks have highly modified shapes which allow them to hide in crevices or, like the kelp greenling, to blend in with their background.

The shallow intertidal waters and closely-associated open salt water zone are very much areas of transition. While some fish will move in and out of these areas to feed or to avoid predators, other species, such as salmon, will use the shallow waters only at certain times of their life cycle. Herring and surf smelts come into the shallow water to spawn where their young will remain for some time. In order to spawn successfully, surf smelts require clean, pea-sized gravel in shallow water. Few appropriate sites are left along the Burrard Inlet. Midshipmen, which are known as "singing fish" because of the grunting sound the male makes when disturbed, spawn in the intertidal zone in the spring. Other fish, such as small dogfish sharks, likely enter shallow water with hunting exclusively on their minds.

Such an abundance of fish in shallow water attracts many birds such as the Great Blue Heron. Some intertidal fish such as the pacific sand lance and the tube-snout feed on plankton and thus form a critical link in the food chain since they, in turn, are consumed by seals, shorebirds and larger fish.

For most of us, as we look out over the Port Moody mudflats, it is difficult to imagine all the activity that goes on below the surface of these smooth, still waters.

* * *

Plants

Plants of the intertidal zone are a special group for they must withstand being underwater for part of their life. The most abundant plants are pacific silverweed (*Potentilla pacifica*), orache, Douglas aster (*Aster subspicatus*), and various grasses and rushes. Saltwort (*Salicornia virginica*) grows in scattered colonies particularly in the northern side of the Inlet intertidal zone near Old Orchard Park. Small stands of seacoast angelica (*Angelica lucida*) occur near Noon's Creek and Suter Brook.

Birds

Extensive mudflats are exposed at low tide, attracting, in season, numerous shorebirds. Gulls, crows, and waterfowl also take advantage of these flats for feeding.

Shorebirds: Eleven species of shorebirds use the tidal mudflat area. Most occur in small numbers during spring and fall migration, but Dunlin and Long-billed Dowitchers overwinter in large flocks (over 350 Dunlin, and over 150 dowitchers). In addition, small numbers of Killdeer are present all year. One Spotted Sandpiper, rare in winter, overwintered in 1992/93. Depending on the shorebird species, aquatic insects, marine worms, seeds of aquatic vegetation, molluscs or fish form the diet.

Killdeer*?
Greater Yellowlegs
Lesser Yellowlegs
Spotted Sandpiper
Western Sandpiper
Least Sandpiper
Pectoral Sandpiper
Dunlin
Short-billed Dowitcher
Long-billed Dowitcher
Common Snipe

Waterfowl: As noted above, twenty species of waterfowl use the area. It is primarily the dabblers, or surface feeders, which are found in the intertidal zone, although some of the species listed under the 'Open saltwater' section, such as mergansers and goldeneye, will also

utilize this area for feeding. Dabblers are almost entirely vegetation feeders (including seeds and grains) although they will eat some aquatic insects and invertebrates. In winter large flocks of teal and wigeon, along with smaller numbers of other dabblers, congregate along the shoreline, gleaning exposed vegetation.

Trumpeter Swan	Northern Shoveler
Canada Goose*	Gadwall
Green-winged Teal	Eurasian Wigeon
Mallard	American Wigeon
Northern Pintail	

Other birds: Belted Kingfishers use snags over the water and pilings along the shore as lookout perches when fishing the intertidal zone. American Pipits pause in their southbound migration to feed along the shore. Song Sparrows also feed along the shore, hopping over logs, and around rocks, seeking seeds.

Belted Kingfisher	American Pipit
Northwestern Crow	Song Sparrow
Great Blue Heron	

Mammals

Raccoons feed on the mudflats, and River Otter can occasionally be found.

Raccoons	River Otter

* * *

OPEN SALT WATER

Contributed by Elaine Golds

Fish

Just beyond the reaches of the Shoreline Park lies the open salt water area. This area provides unique habitat which greatly enhances the species diversity found within the Shoreline Park. Highly productive eel grass beds, which are absent from the intertidal zone, are located just beyond Old Orchard Beach. Many of the 48 species of fish found in Port Moody arm likely find refuge and food in the eel grass. These eel grass beds are enriched by nutrients washed into the Inlet from Noons Creek and the other streams.

It has been estimated that only about 30% of the water in the Port Moody Arm is exchanged with each tide. Even though no major river empties into the Port Moody Arm, salinity levels in this part of the Inlet can be quite low. Since salt water is more dense, the salinity will vary according to depth. For example, at a depth of 7 meters, the concentration of salt is similar to that found in the ocean while surface levels are often only half that. Salinity levels are also subject to seasonal variations - during the winter rains, overflowing creeks flush vast amounts of fresh water into the Inlet. In contrast, during the summer when there is little rain, the salinity concentration can be quite high, even on the surface.

Many people assume that Burrard Inlet is too polluted to support much marine life so it comes as a pleasant surprise to learn that almost 50 species of fish have been found in the Port Moody Arm alone. However, some parts of Burrard Inlet are heavily contaminated with our waste products.

More than any other area, the bottom sediments of the open salt water in Port Moody arm appear to be bearing the brunt of mankinds' lack of concern about the environment. Although the release of effluents into the Inlet have been dramatically reduced, pollutants released from local industries over the years have collected on the bottom of the Inlet. The fish who dwell on the bottom are very sick. A study done in 1986-87 indicated that the bottom of Port Moody Arm near the Ioco Oil Refinery was the most contaminated site in the entire Burrard Inlet. Approximately 75% of the bottom-dwelling English sole were found to have precancerous liver lesions. These bottom-dwelling, territorial fish are particularily susceptible to this type of pollution. Other species of fish are unlikely to be so dramatically affected.

For a complete list and description of the 48 species of fish found in Port Moody Arm, please refer to the annotated list found towards to end of this report.

Mammals

Harbour seals are commonly seen in open salt water or resting on the log booms in the Inlet. According to Peter Hulbert, a member of the Port Moody Ecological Society, old-timers recall that harbour seals hauled out on the mudflats to rest and to give birth. Because of human intrusion, the mudflats are no longer a safe haven for the seals. However, an excellent substitute has been found in the log booms provided by the Flavelle-Cedar Mill. Should this mill ever cease to operate and the log booms be removed, some suitable alternative for the seals will have to be found.

Harbour seals can usually be observed at close range from a canoe in the Inlet. People who have canoed on the Inlet close to the Shoreline Park have, themselves, probably been the object of intense scrutiny by one of these curious and delightful animals. In British Columbia, harbour seals were given protected status in 1970 and they are becoming increasingly abundant.

Salmonid enhancement projects which have brought increasing numbers of salmon into the Port Moody Arm may also be helping to sustain an increase in the seal population. Although, the extent to which the seals depend upon salmon as a food source is not clearly understood, local residents have noted a huge increase in the seal population in the fall when the salmon are known to be gathering in the Inlet. Preliminary analysis of seal scat (i.e. feces) collected from the log booms by the Centennial High School students indicated the major component of the seals' diet to be hake. In 1992, the local seal population was estimated to be about 300 at the height of the season. Before becoming overly concerned about what effect the seals might having on the salmon population, we should keep in mind that, before the arrival of Europeans, both seals and salmon were abundant and managed to thrive together.

For many people, it is thrilling to realize that marine life in the Burrard Inlet seems to be making a comeback. The arrival of gray whale and false killer whales in Port Moody Arm in April of 1993 was an exciting event and was taken by many as a sign that our waters are again becoming hospitable to the large sea mammals who once made this area their home.

* * *

Birds

This marine habitat attracts loons, grebes and cormorants, waterfowl, gulls, and raptors, in varying numbers, depending on the available food supply.

Loons, Grebes and Cormorants: Two species of loons, five species of grebes, and two species of cormorants feed in the open saltwater habitat. The loons and cormorants are primarily fish-eaters. The grebes, however, seek out aquatic larvae and marine invertebrates in addition to fish.

- Red-throated Loon
- Common Loon
- Pied-billed Grebe
- Horned Grebe
- Red-necked Grebe
- Eared Grebe
- Western Grebe
- Double-crested Cormorant
- Pelagic Cormorant

Waterfowl: Of the twenty species of waterfowl using the Inlet area, only the eleven species of diving ducks regularly use the open saltwater, although some will be also be found close to shore. As their name suggests, this group of ducks dive for their food, feeding on fish, aquatic invertebrates or aquatic vegetation, depending on availability. None of these species nest in the area, and all but the Common and Hooded Mergansers, return to interior and northern nesting grounds in spring. The Common Merganser nests within park boundaries.

- Canvasback
- Ring-necked Duck
- Greater Scaup
- Lesser Scaup
- Surf Scoter
- Common Goldeneye
- Barrow's Goldeneye
- Bufflehead
- Hooded Merganser
- Common Merganser*
- Red-breasted Merganser

Gulls: Seven species of gulls use the Inlet area. While they feed along the shorelines much of the time, they will also feed on open water. Log booms and pilings provide them with roosts. No evidence of breeding for Glaucous-winged Gulls was found in the survey area, although it is possible that they are nesting on pilings further up the Inlet or Indian Arm. They are, however, an abundant nesting bird in the region.

- Franklin's Gull
- Bonaparte's Gull
- Mew Gull
- Ring-billed Gull
- California Gull
- Thayer's Gull
- Glaucous-winged Gull

Raptors: Although it might appear odd to place raptors under 'open saltwater' habitat, both Bald Eagles and Ospreys feed on fish which they catch in the open water.

- Osprey
- Bald Eagle

PLANTS OF THE SHORELINE PARK SYSTEM

The small Shoreline Park System is rich in plant life, a reflection of the habitat diversity found within its boundaries. While some plants happily grow anywhere many, like birds and other wildlife, require certain conditions or habitats if they are to flourish. A walk along the park trails takes one through the different habitats each with characteristic vegetation.

The Annotated Plan List identifies the plants of the Shoreline Park System as either 'native' or 'introduced', and indicates their status, that is, whether they are widespread or localized within the park system. This status is not indicative of their rarity, but where plants are considered regionally rare this is noted. Additional information such as alternate common names, and other useful facts is included.

If the plant is used as a food source by wildlife this is denoted by WP (*see also* Special Features). A deciduous tree or shrub is indicated by 'D' and an evergreen tree or shrub by 'E'.

Scientific and common names and taxonomic order follow Hitchcock and Cronquist, 1973. Alternate common names are derived from this source and from sources listed in the bibliography. The taxonomic list varies from Hitchcock and Cronquist only to the degree that trees and shrubs are separated out from the herbaceous plants. In Hitchcock and Cronquist, strict taxonomic order is followed, and the artificial separation of trees and shrubs from other plants is not used.

Introduced plants

Many of the plants growing in the park are introduced or non-native species. Most are European in origin, although a few are from Asia. Alien species can arrive in a number of ways: often they are deliberately introduced for a specific purpose, as was the case with the European red clover, which was and is widely cultivated as a forage crop for cattle. Others were brought over by early settlers because of their medicinal values, for food (such as the dandelion), or because they were favourite garden plants and a reminder of home. Many more were inadvertently introduced, usually as seeds trapped in clothing, farm implements or hidden in bags of grain.

Many of these introduced plants have been here so long that they have become naturalized, able to exist on their own without human cultivation. Many are so familiar that we assume they are part of the native flora. Certainly, most botanical field guides list them alongside the native flora with only a brief reference to their origin.

Although native species are always to be preferred over alien plants, it is important to remember that many species have long provided abundant protective cover, nest sites, nest material and food for wildlife. The Himalayan blackberry, for example, a non-native species, forms immense tangled thickets heavily used by numerous sparrow species in winter. Their succulent berries give food to bears, birds and humans alike. Red and white clovers, yarrow, dandelion, mountain ash (rowan) and holly trees, the introduced hazelnut, walnut and fruit trees are heavily fed upon by birds. English ivy thickly wrapped around trees gives protection to mammals such as squirrels and raccoons, and to birds. The Saw-whet Owl found during the inventory was observed hiding in a thick growth of ivy. Douglas Squirrels frequently sit amongst its dense cover and feed on nuts from the introduced walnut tree.

Apart from their value to wildlife, amateur botanists and wildflower enthusiasts find beauty in plants such as oxeye daisy, sweet rocket, policeman's helmets and birdsfoot trefoil. As Ferguson and Sanders (1976) note, "In a country where [most] people are historically settlers from abroad, it ill behooves us to look down upon the introduced and naturalized. It is far better to see in them the beauty that is rightfully theirs and to enjoy the beautiful weeds that clothe the waste places of our land." Certainly, where humans have disturbed the land and destroyed the native vegetation it is often non-native wildflowers that are able to quickly set seed and grow.

Proportion of native to introduced plants: Within the Shoreline Park System there are 48 introduced herbaceous plants, three about which there is some uncertainty as to origin, and 14 introduced trees and shrubs. There are slightly fewer native herbaceous plants, 44 in all, and one which may be native. The proportion of native trees and shrubs is much higher, with 38 of the 52 species present native to the province.

Regionally rare plants: This area contains five regionally rare plants. *See* Special Features for more information.

Field guides: We recommend the use of field guides to wildflowers, trees and shrubs for help in identifying the species catalogued in the Annotated Plant List. No one field guide lists all plants found in this region and it may be necessary to refer to several. The Reference section at the end of this report gives a number of plant guides, some of which are more technical than others. Listed below are three easy to use guides designed for the non-professional:

- Lyons, C.P. 1991. Trees, shrubs and wildflowers to know in British Columbia. This compact guide lists only native plants and does not pretend to be comprehnsive. However, it is very useful for identifying most of the common trees and shrubs and as a bonus, is easy to use.

- Peterson, Roger Tory and Margaret McKenny. 1968. A field guide to wildflowers of northeastern and northcentral North America. Many of the plants found growing in the park (and in the region) are not listed in the following guide, therefore this guide is necessary as a companion book. Easy to use and well laid out with flowers grouped by colour.

- Niehaus, Theodore and Charles Ripper. 1976. A field guide to Pacific states wildflowers. Follows the same format as above, with flowers grouped by colour.

BIRDS OF THE SHORELINE PARK SYSTEM

The Annotated Bird List describes the status (abundance and seasonal occurrence), and locations of the birds found in the Inlet Park area. Birds considered to be of provincial and/or federal concern will be noted as such in the text using the provincial colour code system, and the federal COSEWIC status.

It must be stressed that the status assigned to each species reflects the results of only one year's worth of data. Further field work may show that a bird we listed as uncommon or even rare in the study area may be in fact more common than 1992 data shows.

Abundance or frequency of occurrence in suitable habitat is assigned using the terms common, uncommon and rare (defined below) and refers only to local abundance levels, that is, within the study area and based on observations during 1992. Precise abundance levels for the Inlet area are difficult to ascertain without at least 5 years worth of data to compare annual fluctuations and to average the number of birds per species per year. However, the local abundance level given is meaningful in that it provides a preliminary analysis of numbers of birds using the Inlet Park area.

Abundance levels are defined as follows:

- **Common:** Should be easily found in suitable habitat.
- **Uncommon:** Not easily found; present in limited numbers or secretive.
- **Rare:** Can be present but in very low numbers; may be difficult to find.

Seasonal Occurrence of a species in the area is defined as follows:

- **Resident:** present all year round.
- **Spring:** March-May
- **Summer:** June-mid August
- **Fall:** mid August-November
- **Winter:** December-February

Seasonal occurrence is always given with abundance levels. For example a species may be described as: Common, winter; rare, summer, which indicates that the species is commonly found in winter, but not generally expected to occur in summer.

It is important to note that the status shown for the avifauna on this list will differ to a greater or lesser degree from that of a regional checklist such as the Vancouver Natural History Society (VNHS) 'Checklist of Vancouver Birds'. These discrepancies occur because the VNHS Checklist includes the Inlet Park only as part of a much broader geographic framework. Status is defined for the region as a whole, not for each separate area within the region.

Endangered, Rare, Threatened or Uncommon Species. Because many species throughout North America are facing substantial problems, we feel that it is useful to indicate which of those using the Shoreline Park System are officially recognized as species of concern.

Birds of provincial significance are placed by the Ministry of Environment, Lands and Parks on one of two lists depending on their vulnerability.

- **Red-list** birds are those determined to be threatened or endangered.
- **Blue-list** birds are considered sensitive or vulnerable species, not yet threatened but deemed to be at risk because of low or declining numbers, or because of habitat restrictions or loss.

The federal government maintains the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) under the jurisdiction of the Canadian Wildlife Service. Status reports are prepared on species thought to be of concern. Each year the Committee assesses these reports and decides whether or not to place a particular species in the following categories: Rare, Threatened or Endangered.

The National Audubon Society implemented a **Blue-list** (unrelated to the MOELP Blue-list) to act as an "early warning system" for birds. In 1982 they began their list of Species of Special Concern for species which appeared to be recovering sufficiently to be removed from the "Blue-list", but were not yet considered problem-free. In some cases, species were returned to the "Blue-list" in subsequent years. Species of local concern were noted but not included in the "Blue-list" which concentrated on species showing "clear signs of population decline in all or a major portion of its range" (Tate and Tate, 1982).

In the Annotated List we indicate which species were "Blue-listed" and which were considered of Special Concern by the Audubon Society. The Audubon's "Blue-list" is always noted in parentheses (" ") to differentiate it from the MOELP Blue-list.

Breeding Evidence is indicated with an asterisk (*). A species was considered confirmed as a breeder if any of the following were observed during the nesting season: a nest with eggs or young; an adult carrying food; an adult carrying a fecal sac (many species carry these sacs to deposit away from the nest); newly-fledged young birds, clearly just out of the nest (once young are able to fly and feed themselves it cannot be determined whether or not they hatched in the study area or came in from elsewhere).

Neotropical Migrants are indicated on the Annotated list with NTM. Neotropical migrants are birds that spend much of the year in the new world tropics of Mexico, Central and South America. During the spring they head north to breed, leaving the crowded confines of the tropics where competition for nesting spaces and food is fierce, for the relatively less congested forests, meadows, wetlands and woodlots of North America. The annual migration of birds, northwards in the spring and southwards in the fall, has been described as 'a river of birds', and as such it is one of the truly breathtaking events of nature. It is hard to imagine that birds weighing only a few grams, such as most of the small songbirds, will fly virtually non-stop from Canada to South America, having 'fuelled up' on food at one of their last stopover points before heading south.

Many of these birds migrate at night, and on a clear, still night in spring and fall, you may hear them softly calling as they fly unseen overhead.

Areas such as the Shoreline Park provide much needed resting and feeding places for these neotropical migrants in both spring and fall. The park also offers good nesting habitat enabling many species to successfully breed.

Habitat fragmentation is causing severe problems for many birds unable to nest safely in isolated chunks of habitat. For species needing large continuous expanses of habitat, whether forest, field or wetland, the future is somewhat uncertain. Because the small remnants of habitat left in the park are still attractive to a number of neotropical birds, we must do our best to protect them in their entirety.

Definition of neotropical migrants for southwestern BC

The southwest corner of British Columbia is unique in Canada, for many species of birds migratory in the rest of the province and throughout Canada, remain here as year-round residents. Elsewhere, birds such as Great Blue Herons, Song Sparrows, and many species of ducks, leave at the first hint of colder weather in the fall. But in this temperate, protected pocket of the country there is little need to use energy undertaking a long and arduous journey to warmer climates. While flycatchers, vireos, warblers and many shorebirds head south, the above species, along with some others, are able to safely remain. Thus, we are only indicating as neotropical migrants (NTM), those birds which **from our area** truly migrate to the tropics. Hence, Great Blue Herons and Song Sparrows, which would normally migrate southwards, are not indicated as neotropical migrants.

It should be noted as well, that not all migratory birds are neotropical migrants. Many head south from Canada but do not go much further than the southern United States.

Purple Martins

During early spring of 1993, the Ministry of Environment, Lands and Parks placed a number of Purple Martin (*Progne subis*) nest boxes on pilings in the water near Rocky Point Park. This very rare species, considered only casual in spring and summer in the region, once nested in a cavity in a piling near Rocky Point Park in the mid-1970's. Breeding success was never determined, and the species was not known to have been found in the vicinity again. However, in 1992, a Purple Martin was observed around the Maplewood Mudflats in North Vancouver, not far, as the bird flies, from the Head of the Inlet. There is a reasonable chance that martins will return to nest here if there are sufficient nest sites safe from competition with other cavity nesters such as starlings.

Other information includes the food sources of species using the area, and nesting information for those found nesting or suspected of nesting in the park. Much of this information is derived from Campbell et al (1990), Ehrlich et al (1988), and A.C. Bent (1932, 1937).

Summary

When the data collection began in January, 1992, I anticipated finding a number of the species which appear on our list. However, because the park area is so small, I did not expect to find as many species as we did. Birds such as the Franklin's Gull are rarities which cannot be anticipated, but the diversity of gulls as well as grebes and waterfowl, was at first surprising. However, having studied the habitat within the park in some detail, and compared it to other

areas, it has become very apparent that the Head of the Inlet provides a safe, rich feeding and resting area for large numbers of birds. The Northern Shrike was a bonus, as were the Savannah Sparrows.

Some species which I thought would occur were not found. This may have been simply a case of not being there at the right time. Further work in the area could turn up species such as Black Swift, Common Nighthawk, Sanderling, Townsend's Warbler and Northern Oriole, to name only a few. Others such as Red-winged Blackbirds, were found in the park in the past, and have been observed outside the boundaries of the park recently. Additional observations in the future could substantially add to the park's bird list.

Field guides: We recommend the use of field guides to help in identification of birds described in the Annotated Bird List. We suggest the following:

- Peterson, Roger Tory. Field guide to western birds.

ANNOTATED LIST OF TREES, SHRUBS AND HERBACEOUS PLANTS: SHORELINE PARK SYSTEM

HERBACEOUS PLANTS

Data collected by: Barry Gibbs, Christine Hanrahan, Huber Moore, and Terry Taylor.

Scientific and common names and taxonomic order follow Hitchcock and Cronquist, 1973. Where applicable, the following symbols have been used in the text: **WP**: indicates plant is a food source for wildlife; **'E'**: an evergreen tree or shrub; **'D'**: a deciduous tree or shrub.

EQUISETACEAE. Horsetail Family

Equisetum arvense. **Common horsetail**. Native.

Common in wet and moist conditions throughout the park. Horsetails are very primitive plants, a relic of ancient times.

Equisetum telmateia. **Giant horsetail**. Native.

Partially circumboreal. Common in moist, low-lying areas in park.

URTICACEAE. Nettle Family

Urtica dioica. **Stinging nettle**. Native. WP.

Another sub-species grows in Eurasia. Found in many locations throughout the park, particularly near the railway tracks behind the recreation centre. If picked early in the spring when leaves are young it is edible when cooked. Nettles are extremely important to four local butterfly species which feed on this plant in their caterpillar stage. (*See* Special Features).

POLYGONACEAE. Buckwheat Family

Polygonum persicaria. **Spotted Ladysthumb**. Introduced.

Native to Eurasia. Also called heartweed, and lady's thumb. Found on moist sites in park, especially along GVRD pipeline.

Polygonum aviculare. **Doorweed**. Introduced.

Native to Eurasia. Frequently grows on very poor soil. In the park it is found along the GVRD pipeline.

Polygonum cuspidatum. **Japanese knotweed**. Introduced.

Also called false bamboo. Native to Asia. Found in only one location in park. However, once established in suitable conditions has a tendency to spread widely. Creates a large thicket of bamboo-like growth.

Polygonum hydropiperoides. **Waterpepper**. Native.

Grows on moist sites. Found in only a few locations in the park, but all of them along the GVRD pipeline.

Rumex acetosella. **Sheep sorrel**. Introduced.

Native to Europe. Also called red sorrel, cow sorrel, and field sorrel. Common in the region but grows in small numbers in the park, mostly along the boardwalk area at the head of the Inlet.

Rumex obtusifolius. **Broadleaf dock**. Introduced.

Native to Europe. Also called bitter dock and butter dock. All docks look superficially similar, but this one can be identified by its broad leaves and toothed seeds. Grows on moist disturbed sites throughout the park, particularly along the GVRD pipeline.

Rumex occidentalis. **Western dock**. Native.

This dock also grows on moist disturbed ground and is found mixed in with other dock species along the GVRD pipeline.

Rumex crispus. **Curly dock**. Introduced.

Native to Europe. Also called sour dock. Similar to the other docks, closer inspection reveals that the leaves are curled as suggested by the common name. Grows in disturbed areas throughout the park.

CHENOPODIACEAE. Goosefoot Family.

Atriplex patula. **Orache.** Native.

Occurs throughout North America and Europe. Also called spearscale and silverscale. Grows abundantly in saline conditions in park.

Salicornia virginica (S. perennis). **Saltwort**. Native.

Also called glasswort. Grows in scattered colonies along the beach area of the park.

PORTULACACEAE. Purslane Family

Montia sibirica. **Siberian miner's lettuce**. Native.

Also called western springbeauty and Siberian candyflower. A very common plant in our region, it is found in moist shaded places, where its pink-striped flowers (hence the name 'candyflower') stand out against the green of surrounding foliage. The leaves are edible. In the park it is found especially in the vicinity of Noon's Creek.

CARYOPHYLLACEAE. Pink Family

Cerastium vulgatum. **Mouse-ear chickweed**. Introduced.

Native to Eurasia. Well-established throughout North America. Found in a number of locations in park in open, drier areas.

Lychnis sp. **Campion** sp. Introduced?

Not identified as to species, and only one plant was found. Several of the more common species found in our region are introduced from Europe, and are also common garden plants both here and in the Old World. The other campions are native.

Stellaria media. **Common chickweed**. Introduced.

Native to Eurasia. One of the familiar creeping weed 'pests' of lawns in region. Found throughout park. The young leaves are considered good additions to salads by some.

Stellaria crispa. **Crisped starwort**. Native.

Low, creeping plant found in moist locations in park; prefers nitrogen-rich soils.

Stellaria humifusa. **Spreading starwort**. Native.

Regionally rare. According to botanist Terry Taylor, this plant of the saltmarshes is rarely found in the Lower Mainland, but a small population exists at the head of Burrard Inlet. Hitchcock and Cronquist (1973) note that it is only found "at a few places in Washington and Oregon."

RANUNCULACEAE. Buttercup Family

Actaea rubra. **Baneberry**. Native.

Found in only one location (to date) in park. Prefers moist, shady woods. Produces bright red (occasionally white) berries, which are generally thought to be poisonous.

Ranunculus repens. **Creeping buttercup**. Introduced.

Native to Europe but now widely established throughout the country. As its name suggests, it creeps along the ground, rooting easily. Produces attractive bright yellow flowers. Found very commonly throughout park in moist to wet areas.

Ranunculus acris. **Tall buttercup**. Introduced.

Native to Europe. Also called meadow buttercup and common buttercup. Found in smaller numbers than the above species in park, on moist to well-drained sites.

FUMARIACEAE. Fumitory Family.

Dicentra formosa. **Pacific bleedingheart**. Native.

This dainty pink-flowered plant is found in the park wherever there are moist, shady conditions, especially near streams.

CRUCIFERAE. Mustard Family

Barbarea sp. **Wintercress** sp. Introduced.

The species growing in the park is either *B. orthoceras* or *B. vulgaris*. Both are introduced European species, and both look very similar and grow in the same habitat: open disturbed areas.

Cardamine occidentalis. **Western bittercress**. Native.

Found in wet places throughout the park.

Cardamine oligosperma. **Little western bittercress**. Introduced. Native to Eurasia. Also called pepper cress. Several species of the genus *Cardamine* found in our area look alike. This species, like the above, prefers wet places.

Hesperis matronalis. **Sweet rocket**. Introduced.

Native to Europe. Also known as dame's rocket and dame's violet. Commonly grown garden plant in Europe and to a lesser extent, in North America. Found in only one location (to date) in the park. Generally thrives in open waste ground.

SAXIFRAGACEAE. Saxifrage Family

Tellima grandiflora. **Fringecup**. Native.

Common throughout park, particularly on moist slopes near streams, and along many sections of the trail. The leaves of this plant are very similar to *Tolmiea menziesii*, and can be confused with it. However, in spring the tall flower stalks contain tiny white flowers deeply fringed, which clearly identify this appropriately named plant.

Tiarella trifoliata. **Foamflower**. Native.

Also called trefoil foamflower, coolwort, false mitrewort, laceflower, and triple sugar scoop. This plant probably has more names than any other native wildflower, for these are only a few found during the course of researching plants for this project! Very common in the shaded coniferous woods where the spike of tiny white flowers looks like a drift of foam.

Tolmiea menziesii. **Youth-on-age**. Native.

Also called pig-a-back plant, and thousand mothers. The common names refer to the growth habits of this plant. As new leaves are formed they grow on top of the old which finally wither and die. Quite common in the park especially in the coniferous forest, but also along the northern portion of the Shoreline Trail.

ROSACEAE. Rose Family

Fragaria vesca. **Woods strawberry**. Native. WP.

Also native to Europe; common throughout North America. Also called European strawberry. Found in only a few locations, in lightly wooded moist areas in the park.

Geum macrophyllum. **Largeleaved avens**. Native.

This yellow-flowered plant is quite distinctive and easily found along wooded edges and the GVRD pipeline route in the park.

Potentilla pacifica. **Pacific silverweed**. Native.

Abundant on the edge of the mudflats along the length of the boardwalk. The leaves often look silvery, hence its common name, making them easy to identify.

LEGUMINOSAE. Pea Family

Lathyrus sp. **Sweet-pea** sp. Introduced?

Identification not positive, but probably the introduced garden plant. Found in several locations with open sunny aspects.

Lotus corniculatus. **Birdsfoot-trefoil**. Introduced.

Native to Europe. This attractive yellow flower is found in moist open areas, particularly along the GVRD pipeline. Well-known in ancient herbal remedies.

Medicago lupulina. **Black medick**. Introduced.

Native to Europe. Also called hop clover. This tiny dull-yellow flowered plant is easily overlooked. Prefers dry open sandy or gravelled sites. As the name suggests, it was used by herbalists for treating a variety of ailments.

Melilotus alba. **Sweet clover**. Introduced. WP.

Native to Europe. Also known as white sweet clover. Likes open sunny sites, and thrives on the Old Mill site. Foliage fragrant when dried, or on hot sunny days when the scent fills the air. Attracts bees.

Trifolium dubium. **Least hop clover**. Introduced.

Native to Europe. Also called suckling clover, and shamrock. Found mostly in vicinity of Old Mill site.

Trifolium repens. **White clover**. Introduced. WP.

Native to Europe. Also called Dutch clover. Found in disturbed open areas in park. Attracts bees.

Trifolium hybridum. **Alsike clover**. Introduced. WP.

Native to Europe. Differs from the above in having an upright growth habit, and in lacking the pale chevrons on the leaves of the *repens*. Grows in disturbed open areas, especially the Old Mill site. Swallowtail butterflies feed on the nectar of this plant, while the leaves appear to be favoured by some songbirds and small mammals.

Trifolium pratense. **Red clover**. Introduced. WP.

Native to Europe. This introduced species is often cultivated as forage, and has spread throughout North America. Fairly common in disturbed open areas in the park. Bees are attracted to the blossoms.

Vicia cracca. **Tufted vetch**. Introduced. WP.

Native to Europe. Also called bird vetch, cow vetch, cat peas, and tinegrass. Found frequently in park, especially in open areas such as along the boardwalk area. Bees eagerly seek out the rich nectar of this plant.

GERANIACEAE. Geranium Family

Geranium bicknellii. **Bicknell's geranium**. Native.

Found in only one location thus far, along the GVRD pipeline near Noon's Creek.

BALSAMINACEAE. Balsam or Touch-me-not Family.

Impatiens glandulifera. **Policeman's helmet**. Introduced.

Native to Asia. Also called touch-me-not. This striking, tall plant with its distinctive showy flowers ranging from deep purple to pale pink, is abundant in certain sections of the park. Seed pods 'explode' when ripe, scattering seeds in all directions. Found in moist, shady areas, especially along railway tracks, and GVRD pipeline.

HYPERICACEAE. St. John's-wort Family

Hypericum perforatum. **St. John's-wort**. Introduced.

Native to Europe. Also called klamath weed. Found in small numbers on dry disturbed sites in park. Spreads rapidly in favourable conditions. Attractive yellow flowers with purple dots on edge of petals are very different from the other plant of the same name widely sold in garden centres. This plant is reportedly mildly poisonous.

ONAGRACEAE. Evening-primrose Family

Epilobium watsonii. **Watson's willow-herb**. Native.

Found in a few places in the park, generally on moist areas on GVRD pipeline route.

UMBELLIFERAE. Parsley Family

Angelica lucida. **Seacoast angelica**. Native. WP.

Also called sea-watch angelica and wild celery. A coastal species in the northwest, but apparently grows inland in other regions. Several populations found near boardwalk area between Noon's Creek and Suter Brook. The Anise Swallowtail butterfly (*Papilo zelicaon*) feeds on the leaves of this plant when in its caterpillar stage. According to Ashton (1990) this once widespread species is now largely confined to Boundary Bay in the Greater Vancouver district.

Heracleum lanatum. **Cow-parsnip**. Native. WP.

Noticeable because of its size (up to six feet), this plant is found primarily in wet areas along the boardwalk between Noon's Creek and Suter Brook. Animals such as bears will forage on the leaves. In its caterpillar stage the Anise Swallowtail butterfly feeds on the leaves of this plant.

Oenanthe sarmentosa. **Water-parsley**. Native.

Found in only a few locations and in small numbers, in low-lying wet areas in the park. The stems of this plant are weak and have a tendency to sprawl.

CORNACEAE. Dogwood Family

Cornus canadensis (unalaschkensis). **Bunchberry**. Native. WP.

Also called dwarf cornel and puddingberry. Found sparingly in moist wooded areas in park. Birds eat the red berries.

PRIMULACEAE. Primrose Family

Glaux maritima. **Sea milkwort**. Native.

Also grows in Eurasia. This plant of coastal areas is found primarily near Old Orchard along the shore. The genus name, *Glaux*, comes from the Greek glaucos meaning blueish-green and refers to the colour of the plant (Hitchcock and Conquist, 1973), which should help to identify it. It is sometimes called saltwort, which can confuse it with the other coastal plant of the same common name, *Salicornia perennis.*

Trientalis latifolia. **Starflower**. Native.

This plant likes cool, damp conditions and can be found in the coniferous woods of the park.

APOCYNACEAE. Dogbane Family

Vinca minor. **Periwinkle**. Introduced.

European ornamental. This familiar groundcover of many gardens grows in one shady site, sprawling over a bank, on the north trail.

CONVOLVULACEAE. Morning-glory Family

Convolvulus sepium. **Hedge bindweed**. Introduced.

Native to Europe. Also called lady's nightcap and bell-bind. Found in small numbers in park's moister areas, especially near the shoreline.

BORAGINACEAE. Borage Family

Myosotis sp. **Forget-me-not** sp. Introduced?.

Probably the garden plant which is native to Europe. The few small patches of this plant found in the park, alongside the north trail, surely escaped from a nearby garden.

LABIATAE. Mint Family

Glecoma hederacea. **Ground ivy**. Introduced.

Native to Eurasia. Also called Gill-over-the-ground, field balm, and creeping Charlie. This attractive creeping member of the mint family is very common in moist locations throughout the park. In spring its tiny blueish-violet flowers catch the eye. Especially common in the boardwalk area.

Stachys cooleyae. **Cooley's hedge-nettle**. Native.

Also called woundwort and great betony. Two stands found in moist shaded locations near Suter Brook. Bruised leaves give off a very rank smell.

SOLANACEAE. Potato or Nightshade Family

Solanum dulcamara. **Climbing nightshade**. Introduced. WP.

Native to Eurasia. Also called bittersweet, felonwort, blue bindweed, and purple nightshade. A trailing vine of open woods and thickets, most commonly found climbing over shrubs near Suter Brook. The foliage of this plant is highly toxic, and the bright red berries are said to be so as well, yet they are apparently eaten by birds.

SCROPHULARIACEAE. Figwort Family

Digitalis purpurea. **Foxglove**. Introduced.

Native to Eurasia. Familiar garden plant which grows in small numbers along the banks of the north trail. Foxglove is the source of the heart drug digitalis.

Euphrasia officinalis. **Eyebright**. Introduced.

Native to Europe. Found in open disturbed areas, especially along the trail above the Old Mill site. The distilled juice was once used as an eye remedy, hence its name.

Veronica serpyllifolia. **Thyme-leaved speedwell**. Introduced.

Native to Europe. This small creeping plant with pale blue-flowers striped dark blue, is found in several open, grassy areas, particularly along the north trail near the Old Mill site.

Veronica americana. **American brooklime**. Native.

Common in very wet areas, particularly all along the route of the GVRD pipeline. Blue flowers in summer draw attention to this otherwise unremarkable plant.

PLANTAGINACEAE. Plantain Family

Plantago maritima var. juncoides. **Seaside plantain**. Native.

As the name suggests, this plant is found growing along the shoreline. In general appearance it is similar to the more commonly known plantains.

Plantago major. **Common plantain**. Introduced.

Native to Europe. Also called large-leaved plantain and nippleseed. Separated from the other common plantain (below) by its broad, large leaves. Found commonly in disturbed areas throughout the park.

Plantago lanceolata. **Ribwort plantain**. Introduced.

Native to Europe. Also called English plantain and buckhorn plantain. Long, slender leaves identify this familiar weed known from lawns and gardens. Widely distributed in open disturbed areas throughout the park.

RUBIACEAE. Madder Family

Galium triflorum. **Fragrant bedstraw**. Native.

Found trailing across the ground in the coniferous woods. Not readily noticed. Dried leaves give off a pleasant fragrant odour, and were used by early settlers to sweeten the indoors.

COMPOSITAE. Aster Family

Achillea millefolium. **Yarrow**. Introduced. WP.

Native to Europe. A common plant readily identifiable by its lacy, carrot-like leaves and tiny white flowers. Found primarily along the boardwalk area in open sunny sites. Once used as a medicinal plant. Bees and other insects feast on the pollen and nectar.

Anaphalis margaritacea. **Pearly-everlasting**. Native.

Also native to Eurasia. Found in small clumps in dry open areas in the park. Attractive white, papery flowers seemingly last forever when dried, hence its common name.

Arctium minus. **Burdock**. Introduced.

Native to Eurasia. Thistle-like flowers, leaves like rhubarb and the tall growth habit draw attention to this plant which grows along the GVRD pipeline in small numbers. The large spiny burs catch in clothing and are singlularly difficult to dislodge. There have been many reports of

small birds such as hummingbirds and kinglets becoming fatally entangled in the burs (Di Labio 1986; Taylor and Cameron 1985).

Aster subspicatus. **Douglas aster**. Native.

This aster grows in profusion all along the shore and around the mouth of Suter Brook and Noon's Creek. Purple flowers create a haze of colour in late summer.

Bellis perennis. **English daisy**. Introduced.

Native to Europe. This familiar little white daisy crops up on open grassy areas anywhere in the park, but especially on the playing fields.

Bidens cernua. **Bur-marigold**. Native.

Also called nodding bidens. Found in only a few locations in the park. Prefers moist locations.

Bidens frondosa. **Beggar-ticks**. Native.

Found in two locations in park, in moist open areas. This plant is listed in the 'Rare vascular plants of BC' as a category 4 rare plant (R4), which means that although widespread large populations are not found.

Chrysanthemum leucanthemum. **Oxeye daisy**. Introduced. WP.

Native to Europe. Also called moon-daisy and marguerite. Although a common and widespread plant throughout our region, it is not found as frequently as expected in the park. Grows in open, sunny disturbed areas, although it can tolerate a variety of conditions. Bees and butterflies feed on the nectar and pollen.

Cirsium arvense. **Canada thistle**. Introduced. WP

Native to Eurasia. Also called creeping thistle. Identified by its multi-branched growth habit and its small pale lilac flowers. A common and widespread plant in the region, in the park it is found in scattered patches, particularly along the GVRD pipeline. Considered an unwelcome weed, this plant feeds butterflies, bees and American Goldfinches.

Cirsium vulgare. **Bull thistle**. Introduced. WP

Native to Eurasia. Also called spear thistle. Found primarily along the GVRD pipeline. Although this thistle is generally regarded as a noxious weed, it is in fact an important wildlife plant. Butterflies and bees feed on its nectar, and the Painted Lady butterfly lays eggs on the leaves. American Goldfinches feed on the seeds and line their nests with thistle down.

Crepis capillaris. **Smooth hawksbeard**. Introduced.

Native to Europe. Although a common enough plant in our region, it has only been found in a few locations so far in the park. Grows in open disturbed areas. Found along the GVRD pipeline.

Erigeron annuus. **Annual fleabane**. Native.

This white-flowered plant, similar to the asters in form, grows in at least one location, on a moist disturbed site. However, this plant is not considered uncommon in the region.

Gnaphalium uliginosum. **Marsh cudweed**. Introduced.

Native to Europe. Also called low cudweed. This small plant with brownish-white flowers is not usually noticed in the park. It grows on moist disturbed sites and ditches and is especially found along the GVRD pipeline.

Grindelia integrifolia. **Gumweed**. Native.

Also called Puget Sound gumplant. Only one plant was found, growing on the shore edge by the Old Mill. Superficially resembles a yellow daisy.

Hypochaeris radicata. **Hairy cat's-ear**. Introduced.

Native to Europe. This dandelion-like plant is found throughout the park wherever there are open disturbed sites. A familiar plant to many from lawns and gardens.

Lactuca biennis. **Tall blue lettuce**. Native.

This very tall plant which can grow nearly 5 metres, has clumps of small blue aster-like flowers. Found along Suter Brook and along the GVRD pipeline.

Lactuca muralis. **Wall lettuce**. Introduced.

Native to Europe. This is one of the most common 'weed' species in local gardens. The tiny yellow flowers soon turn to numerous winged seeds which are dispersed by the wind. Grows throughout the park, particularly on moist sites.

Lapsana communis. **Nipplewort**. Introduced.

Native to Eurasia. Similar to many other yellow-flowered dandelion-like plants. The rounded leaves, however, help distinguish this fairly common plant. Found primarily along the GVRD pipeline.

Matricaria matricarioides. **Pineapple weed**. Native?

One source notes that this plant is an introduced species (Niehaus and Ripper 1976), while Hitchcock and Conquist (1973) calls it a native cordilleran weed. The common name refers to the pineapple scent of the crushed flowers. Grows in open disturbed sites, particularly near Old Mill site.

Solidago canadensis. **Canada goldenrod**. Native. WP.

Also called meadow goldenrod. Although common in the region, it is found in only one location near Slaughterhouse Creek. Prefers open, sunny sites. The abundant pollen produced by this plant attracts numerous insects, particularly bees.

Sonchus arvensis. **Field milk-thistle**. Introduced.

Native to Europe. Also called sow-thistle. Superficially resembles the *Lactuca sp.* but the leaf edges are very prickly. Grows in scattered clumps along the boardwalk area.

Tanacetum vulgare. **Common tansy**. Introduced.

Native to Eurasia. This late flowering species with rays of golden button-like flowers grows on open disturbed sites near the Old Mill. In medieval times this plant was much used by herbalists and healers. Tansy tea was said to treat worms and kidney problems, and other parts of the plant were used for a variety of complaints (Addison 1985).

Taraxacum officinale. **Common dandelion**. Introduced. WP.

Native to Europe. This is surely a most familiar 'weed'. It grows throughout the park in scattered stands. Dandelions have long been used as an herbal remedy and as a food source. Bees feed on pollen, and dandelion seeds are eaten by songbirds.

ARACEAE. Arum or Calla-lily Family.

Lysichitum americanum. **Skunk Cabbage**. Native. WP.

The large yellow sheaths glowing in the dark woods along wet boggy ground and by streams, are a common sight in the park. Some waterfowl will eat the seeds of this plant, while deer and bear feed on the enormous leaves.

LILIACEAE. Lily Family.

Clintonia uniflora. **Queen's cup**. Native.

Also called beadlily, bride's bonnet and blue-bead, this last in reference to the blue berry produced after the flower. Only one plant found, this near Noon's Creek.

Fritillaria camschatcensis. **Chocolate lily**. Native.

Regionally rare. Also called Indian rice and black lily.
Terry Taylor (personal communication) considers this plant to be very rare on the south coast where it is known from only a few locations. The more commonly expected species in this region is the *F. lanceolata.* Grows in only four locations within the park, in areas where it could be easily destroyed. Care should be taken to protect this species.

Maianthemum dilatatum. **False-lily-of-the valley**. Native. WP.

Also called deerberry, may-lily, and beadruby. This common plant forms a dense carpet of shiny, heart-shaped leaves across the forest floor, especially on moist sites. Its red berries are favoured by deer.

Streptopus amplexifolius. **Twisted-stalk**. Native.

Also called cucumber-root and clasping-leaved twisted-stalk. Found in small numbers on moist sites within the wooded areas of the park. Produces red berries underneath the leaves.

Trillium ovatum. **Western trillium**. Native.

Also called wake-robin. A legally protected species in BC, this readily identifiable species grows in moist woods, and is found in small numbers in the park. Locations to date include the coniferous woods and the Noon's Creek hatchery site.

ORCHIDACEAE. Orchid Family

Epipactis helleborine. **Helleborine**. Introduced.

Regionally rare. Native to Europe. Introduced as a garden plant and occasionally escapes. According to Hitchcock and Conquist (1973) this plant is established on Vancouver island; Terry Taylor (personal communication) confirms that this plant is rarely found outside of a small population on Vancouver Island. Approximately 12 plants grow in a shaded, moist location.

TREES AND SHRUBS

PINACEAE. Pine Family

Picea sitchensis. **Sitka spruce**. Native. E.

This conifer grows in coastal areas. In the park there are only about a dozen sitka spruce, scattered throughout. One quite large tree stands next to the trail near Pigeon Point.

Pseudotsuga menziesii. **Douglas fir**. Native. E. WP.

Douglas fir is not abundant in the park, but some of the trees found scattered throughout the coniferous woods have achieved a good size. Squirrels and finches such as Red Crossbills feast on the cones.

Tsuga heterophylla. **Western hemlock**. Native. E. WP.

Common throughout the coniferous forest. A few grow in other areas. Birds and squirrels feed on the small cones. Red-breasted Sapsuckers seem to favour this tree for drilling their sap 'wells'. Many hemlocks sport multiple bands of sapsucker holes. (See Special Features)

SALICACEAE. Willow Family

Populus tremuloides. **Trembling aspen**. Native. D.

Also called quaking aspen. One specimen (a sapling) found on the banks of Suter Brook. This tree commonly grows east of the Cascades and according to Straley and Harrison (1987), is rare on the coast.

Populus trichocarpa. **Black cottonwood**. Native. D.

This tall, distinctive deciduous tree with deeply-grooved bark generally grows on very moist to wet sites. It is common in the park, frequently mixed in with red alder. In spring it releases quantities of cottony seed masses.

Salix hookeriana. **Hooker willow**. Native. D.

This species generally grows along the seacoast. In the park it is found by the Old Mill. Wide leaves with woolly hairs on the underside are one identifying feature.

Salix scouleriana. **Scouler willow**. Native. D.

Found in small numbers mostly around the Old Mill. This small tree has wide rounded leaves and according to Straley and Harrison (1987), "its grey fuzzy catkins" usually begin to show in January or February.

BETULACEAE. Birch Family

Alnus rubra. **Red alder**. Native. D. WP.

This fast-growing tree is an interesting species (see Special Features). It is found throughout the park, particularly around the Old Mill where it is rapidly colonizing the open area. Pine Siskins eat the seeds, and the foliage is combed by chickadees and warblers for larvae.

Betula papyrifera. **Western white birch**. Native. D.

This species is common but scattered throughout the park system. Some trees have reached a good height. The species name, *papyrifera* means 'paper-like' or 'paper-bearing' and refers to its papery bark, a good feature for identifying this tree.

Betula pendula. **European white birch**. Introduced. D.

Native to Europe. Long-planted in gardens this tree is found in only a few locations in the park.

Corylus cornuta. **Hazelnut**. Native. D. WP.

Very common along the north Shoreline Trail and scattered elsewhere. Prefers well-drained sites. This multi-stemmed shrub is very distinctive, particularly in spring with its yellow catkins. The Douglas squirrels in the park gather the nuts so quickly that few remain.

FAGACEAE. Beech Family.

Quercus robur. **English oak**. Introduced. D.

Native to Europe. Only one tree has been found thus far, and judging from its spindly growth it is either a young tree or the growing conditions are not suitable.

MORACEAE. Mulberry Family.

Humulus lupulus. **Hop.** Introduced. D.

Native to Eurasia. This vine can be found creeping along the ground and over several shrubs and trees near Old Orchard Park.

BERBERIDACEAE. Barberry Family

Berberis (Mahonia) nervosa. **Dull Oregon grape**. Native. E. WP.

Similar to the native tall Oregon grape which many people grow as an ornamental. This plant is smaller and prefers somewhat shady conditions. The blueish berries are eaten by birds and bears. They apparently make a pleasant-tasting jelly and were gathered by native people.

GROSSULARIACEAE. Currant or Gooseberry Family

Ribes sanguineum. **Flowering red currant**. Native. D. WP.

This familiar shrub is found in only one location in the park, growing on a moist bank near the Inlet. Rufous Hummingbirds are readily attracted to its flowers which bloom early, usually in March just at the time when hummingbirds are returning.

JUGLANDACEAE. Walnut Family

Juglans sp. **Walnut** sp. Introduced. D. WP.

This species is probably *Juglans cinerea* which is native to eastern North America. A large specimen grows near Noon's Creek and several others grow in the midst of a stand of alder and cottonwood. The park's resident Douglas Squirrels relish the nuts of this tree.

ROSACEAE. Rose Family

Amelanchier alnifolia. **Serviceberry**. Native. D. WP.

Also called Saskatoon berry and shadbush. Only a few shrubs were found in the park and these were widely scattered. They are most easily found when their thick clusters of fragrant creamy flowers attract the eye. Prefers dry conditions and is shade-tolerant, although in the park it has been found in both shade and open sunny locations.

Aruncus sylvester. **Goatsbeard**. Native. D.

This plant which dies down each year like a perennial herb is usually classified with shrubs perhaps because of its vigorous growth habit which gives it a shrub-like appearance (Lyons 1991). It grows in moist, shaded sites and is found in only a few locations in the park, along the edge of the mixed woods.

Crataegus douglasii. **Black hawthorn**. Native. D. WP.

Also called black haw. This species grows on moist sites and in the park only a few hawthorns have been found, one near Noon's Creek. The purple-black fruits attract many wildlife species including waxwings and Band-tailed Pigeons. Native peoples used the berries as food, drying them into a cake of mashed fruit (Grass 1986).

Oemleria (Osmaronia) cerasiformis. **Indian plum**. Native. D. WP.

Also called osoberry and bird cherry. One of the first shrubs to flower on the coast, its clusters of small white flowers appear when most other plants are still dormant. Indian plum, which has a pungent odour in spring, grows abundantly in the park, particularly on moist sites in the deciduous woods and along the north Shoreline Trail. Birds eat the berries almost as soon as they appear.

Physocarpus capitatus. **Ninebark**. Native. D.

Found on wet sites, the two shrubs growing in the park are both along the edge of Noon's Creek. The leaves resemble those of squashberry, which also grows in the park, but are not as leathery.

Prunus emarginata. **Bitter cherry**. Native. D. WP.

Although a relatively common tree in the region, it is found less frequently in the park. It is scattered throughout, but can be looked for in the mixed woods. Birds eat its fruit.

Prunus avium. **Sweet cherry**. Introduced. D. WP.

Native to Europe. It is a widely grown garden tree, and the few found in the park probably came from seeds carried by birds who favour its sweet fruit.

Prunus domestica. **Plum**. Introduced. D. WP.

Native to Europe. Another garden plant which sometimes 'escapes' from cultivation. Only a few specimens were found in the park. Birds feed on the fruit.

Malus (Pyrus) fusca. **Pacific crabapple**. Native. D. WP.

This tree prefers moist sites and is found scattered throughout the park in favourable conditions, but it is best seen along the boardwalk where it forms a dense thicket which provides cover, nest sites, and food for birds. (See Special Features)

Malus domestica. **Domestic apple**. Introduced. D. WP.

Native to Europe. One of the many cultivated apple tree varieties, which have escaped from gardens or orchards. One fine specimen grows with a stand of crabapples along the boardwalk. Birds enjoy the fruit.

Rosa nutkana. **Nootka Rose**. Native. D. WP.

This wild rose of moist sites is very common in the park primarily along the boardwalk area where it grows with black twinberry and crabapples. The pink blossoms add a sweet fragrance along the trail in summer. The rosehips attract both humans and birds. High in vitamin C, the rosehips make a tart jelly and tea.

Rubus spectabilis. **Salmonberry**. Native. D. WP.

This familiar pink-flowered shrub of moist sites is abundant throughout the park. Bears and birds are attracted by its yellowish-red berries. Native peoples ate the fresh green shoots and berries.

Rubus parviflorus. **Thimbleberry**. Native. D. WP.

Not as common as the above, this plant is found along the edges of the deciduous woods. Grows on moist and dry sites in partially open areas. The flat, round red berry is edible but not very tasty, although birds and bears eat it.

Rubus ursinus. **Dewberry**. Native. D. WP.

Also called trailing blackberry and Pacific blackberry. This is the only native blackberry. Its slender twining growth is found throughout the park. The small berries are eaten by bears, birds, deer and humans.

Rubus laciniatus. **Evergreen blackberry**. Introduced. E. WP.

Native to Europe. Also called cutleaf blackberry. Common escape from cultivation, but not found as frequently in the park as the following. The berries are favoured by humans, bears and birds.

Rubus discolor. **Himalayan blackberry**. Introduced. E. WP.

Native to Eurasia. Very abundant plant in the park where its vigorous growth habit forms sometimes large dense thickets, especially in summy sites and particularly along most of the pipeline trail. The berries are much sought after by humans, birds and bears. In addition to food, these blackberry thickets provide safe roosting sites, especially in winter, for a variety of songbirds.

Rubus leucodermis. **Black raspberry**. Native. D. WP.

Also called blackcap. Not found as frequently as the other *Rubus spp.* in the park. This plant has whitish stems and grows in open sites along the trail edges. Berries eaten by bears and birds.

Sorbus aucuparia. **European mountain-ash**. Introduced. D. WP.

Native to Europe. Also called rowan tree. This attractive ornamental tree is widely grown in gardens and frequently naturalizes in other areas, primarily due to seed dispersal by birds. The berries are very attractive to many species of birds, especially after they have begun to ferment. There are stories of robins and Cedar Waxwings getting so 'drunk' on the

fermented berries that they fall to the ground unable to fly! In the park this tree is found scattered in small numbers, particularly in the mixed woods.

Spirea douglasii. **Hardhack**. Native. D. WP.

Also called Douglas' spirea. This plant of damp sites and bogs with its spikes of frothy pink flowers bears a resemblance to the garden plant, astilbe. It is found throughout the park wherever there is sufficient moisture, but particularly along the pipeline. Seed-eating birds such as juncos will feed on its brown seed-heads in winter.

LEGUMINOSAE. Pea Family

Cytisus scoparius. **Scotch broom**. Introduced. D.

Native to Europe. Often planted as an ornamental shrub. It is found in several open, sunny locations within the park, particularly along the Shoreline Trail through the Old Mill.

Robinia pseudo-acacia. **Black locust tree**. Introduced. D.

Native to eastern North America. Also called yellow locust and false acacia. One specimen was found near the Old Mill growing amongst alder. It is grown as an ornamental tree and frequently escapes cultivation.

ACERACEAE. Maple Family

Acer Macrophyllum. **Big-leaf maple**. Native. D. WP.

Also called broadleaf maple. This tall (up to 90 feet) tree is not abundant but grows throughout the park on moist sites. It is an attractive tree whose deeply-grooved bark holds moisture thus allowing a rich growth of mosses and, on some trees, licorice fern. Four trees growing in close proximity along the pipeline trail support the lichen *Lobaria pulmonaria* or lungwort (see Special Features). Squirrels and birds eat the maple seeds, and Evening Grosbeaks feed on the flower buds. The bark crevices hide insects sought after by nuthatches, chickadees and creepers.

Acer circinatum. **Vine maple**. Native. D. WP.

This small multi-stemmed maple is very shade-tolerant and is usually found growing underneath other trees. In the park it is quite common in the coniferous and mixed woods, where in fall, its scarlet leaves add a blaze of colour to the forest. Birds such as finches and siskins enjoy its seeds.

AQUIFOLIACEAE. Holly Family

Ilex aquifolium. **English holly**. Introduced. E. WP.

Native to Europe. This plant is widely distributed in the park, courtesy of birds which disperse the seeds through their droppings. Its bright red berries are very attractive to birds, especially thrushes. However, few of the trees in the park seem to bear berries.

RHAMNACEAE. Buckthorn Family

Rhamnus purshiana. **Cascara**. Native. D. WP.

This tree is more commonly found as a seedling in the park, but some mature specimens grow in the mixed riparian woods near Suter Brook. Birds such as Band-tailed Pigeons relish its blackish fruit. The bark of this tree is used in some laxative preparations.

ARALIACEAE. Ginseng Family

Hedera helix. **English ivy**. Introduced. E.

Native to Europe. Widely cultivated evergreen vine that is very common particularly along the north Shoreline Trail, where it clambers over trees and along the ground. Provides safe roosting sites for small mammals and birds. However, it can smother some of the less vigorous native groundcovers, and removal of some ivy could be considered.

Oplopanax horridum. **Devil's club**. Native. D. WP.

This shrub was found in only three locations, growing on very moist sites in the coniferous woods. The trunk, branches and leaves are extremely thorny and apparently can cause severe reactions if the skin is pierced. Some birds such as robins and Band-tailed Pigeons eat the fruits.

CORNACEAE. Dogwood Family

Cornus stolonifera. **Red-osier dogwood**. Native. D. WP.

Only a few of these moisture-loving shrubs were found in the park, one near Slaughterhouse Creek. The berries are so attractive to birds that they are quickly eaten. In winter the bright-red twigs identify this dogwood.

ERICACEAE. Heath Family

Gaultheria shallon. **Salal**. Native. E. WP.

This common plant of mostly moist woods forms a thick evergreen understory in the coniferous woods. It is also found on scattered sites in the mixed woods. Dainty pink bell-shaped flowers give way to dark edible berries once much-used by native peoples. Birds also favour these berries.

Menziesia ferruginea. **False azalea**. Native. D.

Also called fool's huckleberry, menziesia, and rusty-leaf menziesia. Fairly common in the moist coniferous woods. It superficially resembles some of the introduced azaleas.

Vaccinium parvifolium. **Red huckleberry**. Native. D. WP.

Also called red bilberry. Although usually found in moist conditions it also occurs on dryer sites. Often grows from a stump or log. Found scattered throughout the park, particularly in the coniferous woods and the cedar thicket along the north Shoreline Trail. Birds and bears enjoy the red fruit.

Vaccinium ovalifolium. **Tall blue huckleberry**. Native. D. WP.

Also called oval-leaf blueberry and oval-leaf whortleberry. Only two plants were found, both in the coniferous woods along the pipeline trail in moist shady conditions. Bears, birds and humans find the berries palatable.

CAPRIFOLIACEAE. Honeysuckle Family

Lonicera involucrata. **Black twin-berry**. Native. D. WP.

Also called bearberry honeysuckle. This shrub honeysuckle is fairly common in the

park, especially along the boardwalk where it grows with Nootka rose and crabapples. Its double yellow flowers are soon replaced by shiny twin black berries which are thought to be poisonous to humans. Birds, however, find them edible.

Sambucus racemosa. **Red elderberry**. Native. D. WP.

Not common in the park, found in only a few locations, one near Pigeon Point. Its red berries are greedily sought after by birds particularly Band-tailed Pigeons.

Symphoricarpos albus. **Snowberry**. Native. D.

Also called waxberry. Several plants grow just outside the park boundaries near the Hatchery on Noon's Creek. Thin opposite twigs and white waxy berries (hence both its common names) which often remain on the plant all winter, make this plant easy to identify. The very thin leaves are generally oval in shape but can be rounded or even lobed on some plants. The berries do not appear to attract wildlife.

Viburnum edule. **Squashberry**. Native. D.

Also called high-bush cranberry. Only one plant was found, this near Pigeon Point, growing on a bank over the Inlet. Generally grows in moist woods. The bright red berries are edible but apparently bitter.

ANNOTATED BIRD LIST: SHORELINE PARK SYSTEM

Data collected by Christine Hanrahan

The status (abundance and seasonal occurrence) of the birds in the Shoreline Park is defined as follows: Abundance: **COMMON**: should be easily found in suitable habitat; **UNCOMMON**: not easily found; present in limited numbers or secretive; **Rare**: can be present in low numbers; may be hard to find. Seasonal distribution: **Resident**: present all year; **Spring**: March-May; **Summer**: June-mid-August; **Fall**: mid-August-November; **Winter**: December-February.

Breeding evidence is indicated by an asterisk (*). Species which are neotropical migrants are indicated with the symbol NTM.

For more information about the bird data collected in the park, please refer to the Birds of the Shoreline Park System: an Introduction.

ORDER GAVIIFORMES

Gavia stellata. **Red-throated Loon.** Rare winter.

Observed infrequently. Best viewing point is Old Mill site.

Loons are fish-eaters and these divers feed on the smaller fish as well as aquatic invertebrates, some frogs and insects.

Breeds on southern Vancouver Island and north along the coast and the Queen Charlotte Islands (Campbell et al. 1990).

Gavia immer. **Common Loon.** Uncommon winter.

Not observed every visit. Can be found both near the boardwalk and out in deep water.

Like the above species, the Common Loon's primary food source is fish which are usually pursued underwater; aquatic invertebrates are also consumed.

This loon breeds throughout the province on fresh-water lakes (Godfrey 1986).

ORDER PODICIPEDIFORMES

Podilymbus podiceps. **Pied-billed Grebe.** Rare winter.

One bird observed near Old Orchard Park. This species prefers freshwater habitats.

This small grebe eats a variety of aquatic insects, small fish, snails, and sometimes, aquatic vegetation. Grebes, in particular this species and the Horned Grebe, consume great quantities of their own feathers, and up to 50% of their stomach content may be feathers (Ehrlich et al. 1988). It is believed that the gizzard of these birds is so inefficient at crushing fish bones, that feathers are swallowed to pad their stomachs, thus protecting against being punctured by the sharp bones. Ehrlich, et al. (1988) theorize that the feather balls slow down the "process of digestion so that the bones dissolve rather than pass into the intestine."

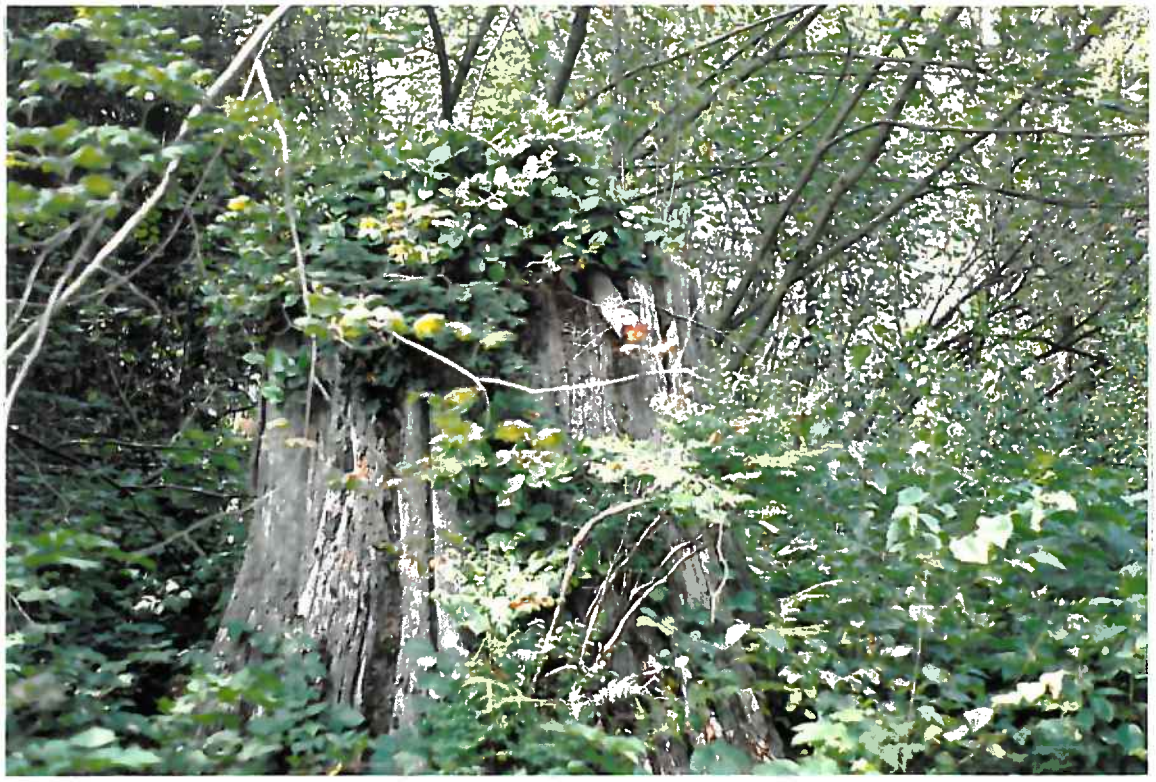
The Pied-billed Grebe nests in wetlands primarily from Quesnel southwards including in our region.

Exposed mudflats at low tide. In Fall and Winter, hundreds of shorebirds and waterfowl feed on these flats.

Suter Brook just before it enters the Inlet at the Shoreline Park. Notice the thick riparian vegetation on both sides

Pacific Crabapple thickets along trail at head of Inlet. Once common, crabapple thickets are not often seen in such abundance as shown here.

Chocolate lily in the Shoreline Park. There are at present, four known locations for this regionally rare species in the park.



An old stump found along the GVRD Pipeline Trail behind the Recreation Centre. Notice how it is crowned with a lush growth of salal.

Part of the GVRD Pipeline route and site of the new bicycle path. The entire route is rich in birds throughout the year.

Western trillium growing in woods at the Shoreline Park. This species is legally protected in British Columbia.

The thimbleberry shown here is very common in the park. Its berries provide food for birds and mammals.

Horned Grebe at the head of Burrard Inlet near the Shoreline Park. This small grebe occurs in flocks of 15-20 birds in the Fall and Spring.

Long-billed Dowitchers on the Port Moody mudflats. Large flocks of this species are present throughout the Fall and Winter.

Podiceps auritus. **Horned Grebe**. Common fall and winter.

Can be found in flocks of up to 20 birds in the fall. Usually observed on every visit in season. Best viewing point is from Old Mill or Old Orchard Park.

Primarily a fish eater, this medium-sized grebe in winter also feeds on crustaceans. Like the above species, its stomach usually contains a feather ball.

This grebe nests in the interior and northern portions of the province (Campbell et al. 1990).

Podiceps grisegena. **Red-necked Grebe**. Rare winter.

Observed infrequently. Best viewing point is Old Mill site.

The Red-necked Grebe was considered a "Blue List" species by the National Audubon Society from 1974-81. Lately it has suffered from shell-thinning caused by PCB's (Ehrlich et al. 1988). Feeds on fish and amphibians, in summer adds aquatic insects. Stomach contains a feather ball.

Like the above species, the Red-necked Grebe nests primarily in the interior of the province.

Podiceps nigricollis. **Eared Grebe**. Rare winter, uncommon spring.

Infrequently observed. Best place to see this species is near the Old Mill site.

Feeds on fish but seems to have a more varied diet than some grebe species, including mollusks and crustaceans; also has feather ball in stomach.

The Okanagan valley north through the Chilcotin-Cariboo forms the primary breeding range for this species (Campbell et al. 1990).

Aechmophorus occidentalis. **Western Grebe**. Blue List. Uncommon winter.

Usually found closer to Admiralty Point in Belcarra Regional Park, where flocks of 50 to 100 or more birds are easily observed. A few visit the head of Burrard Inlet.

This species is particularly vulnerable to oil spills on wintering grounds (MOELP Blue List information). The Audubon Society "Blue-listed" this species from 1973 to 1982, at which time it appeared to be "stabilizing at low numbers" (Tate 1986). In 1986 it was considered of Special Concern (IBID).

Primarily a fish-eater, this large long-necked Grebe will occasionally eat a few amphibians; has a feather ball in stomach.

This colonial nester is known to breed at only four sites in the province, around the Okanagan, Creston and Kootenay Lake (Campbell et al. 1990).

ORDER PELECANIFORMES

Phalacrocorax auritus. **Double-crested Cormorant**. Uncommon summer, common fall and winter resident.

More easily seen in fall and winter, smaller numbers in summer. Usually up to 6 birds counted every visit sitting on pilings near Old Orchard Park, with 14 birds or more found occasionally. Sometimes observed close to Rocky Point Park.

This species is almost exclusively a fish-eater. Double-crested Cormorants are usually colonial nesters, but none nest within the park system.

Phalacrocorax pelagicus. **Pelagic Cormorant.** Rare summer.

Occasionally found near Old Mill.

Like the above, this is primarily a fish-eating species, although a few marine invertebrates will be eaten.

Breeds along the coast to the Queen Charlottes, but the greatest concentration is on the south coast and Vancouver Island's west coast (Campbell et al. 1990).

ORDER CICONIIFORMES

Ardea herodias. **Great Blue Heron.** Blue List. Common resident.

Can be found all year feeding on the mudflats and perching on log booms in Burrard Inlet. However, numbers are highest in mid-summer. High count: 22 on 28 July, 1992.

Although fish are its favoured food, the Great Blue Heron will also take rodents and other birds, as well as reptiles, amphibians and insects (Bent 1926).

This colonial nester breeds in the region (DeBouville Slough, the Fraser River near Colony Farm and possibly at the foot of Burnaby Mountain near the Barnet Highway) but not within the park study area.

Butorides striatus. **Green-backed Heron.** Blue List. Uncommon summer.

Three birds observed regularly in the area, especially around the hatchery on Noon's Creek, from late June to early October. Probably a result of post-breeding dispersal from breeding sites in the region such as DeBouville Slough in Coquitlam. Usually favours the shoreline for feeding, but the hatchery provides potentially easy food. One bird was found dead, entangled in the nets covering the hatchery ponds. This species also used the woodlot adjacent to Suter Brook, by the Firehall.

In late summer the Green-backed Heron feeds mostly on fish, but will also take, at various times of the year, insects, and invertebrates.

ORDER ANSERIFORMES

Cygnus buccinator. **Trumpeter Swan.** Uncommon winter.

One bird has been regularly observed, however, year-round for several years. Apparently it has never been seen flying, although it disappears for weeks at a time. It is usually found near Old Orchard Park. On 9 March, 1992, 2 birds were observed together, but subsequently only the single individual was found.

Primarily feeds on aquatic vegetation, but will eat insects and crustaceans.

Trumpeter Swans were not recorded breeding in the province until 1976 (Campbell et al. 1990). It now breeds primarily in the Peace River Lowlands (IBID).

Branta canadensis. ***Canada Goose**. Common resident. Breeds.

Found on the grassy areas of Rocky Point and Old Orchard Beach Parks, and in the water of Burrard Inlet. Over 100 birds regularly observed from mid-summer, with numbers increasing to over 350 throughout the winter.

Geese feed largely on vegetation, particularly roots and grass shoots, and seeds, grain and berries; will also eat insects and crustaceans (Ehrlich et al. 1988).

Canada Geese nest on the ground near water, although nests have been found located on pilings. A few pairs nest in the park and have been observed with downy young along the shoreline.

Anas crecca. **Green-winged Teal.** Very common winter. Common spring and fall.

Over 400 birds observed from mid-October with numbers decreasing through March. Usually found near the boardwalk but can be found virtually anywhere along the shoreline.

An omnivorous feeder, this small duck eats grass, seeds, and aquatic vegetation as well as aquatic invertebrates.

The Green-winged Teal uses tidal mudflats more than any other duck (Campbell et al. 1990), and it is estimated that at least 6% of the "total Pacific Flyway population of 280,000 birds is found in south coastal British Columbia" in winter (IBID).

Breeds throughout the province, but primarily in the interior.

Anas platyrhynchos. **Mallard.** Common summer and winter.

High counts occurred from mid-August to mid-September when up to 120 birds were observed. Can be found anywhere along the Inlet shoreline from Rocky Point Park to Old Orchard Park.

This species feeds primarily on sedge shoots and seeds, grass, grain and aquatic vegetation, although it will take insects and aquatic invertebrates.

The Mallard is a common nester in the region, but apparently not at the park which does not provide its preferred nesting habitat of shallow pond, slough or flooded field and enough concealment for its nest.

Anas acuta. **Northern Pintail.** Common fall and winter.

Usually found near the boardwalk, frequently with Green-winged Teal.

The diet of this slender, elegant duck is about 90% vegetation (Ehrlich et al. 1988), although it will feed on insects and tadpoles.

The pintail nests locally in the region, but not in the park area.

Anas clypeata. **Northern Shoveler.** Uncommon fall and winter.

Favours the area near the boardwalk where a few can be seen feeding with Green-winged Teal.

One of the interesting features of this species is the large shovel-like bill, serrated along the edges, through which it strains vegetation, plankton and aquatic invertebrates. It also feeds on snails, clams and insects.

In winter this species is more commonly found around the Fraser River Delta and according to Campbell et al. (1990) approximately 1,930 birds have been observed wintering in the south coastal area. While it breeds in small numbers in the region, it does not nest in the park.

Anas strepera. **Gadwall.** Rare winter.

While this species is fairly common regionally, it is only infrequently found in the study area.

Classified as a dabbler, this species does in fact dive quite frequently for food. Its preferred diet is vegetation, but it also feeds on aquatic invertebrates and small vertebrates.

The Gadwall has only recently (since the 1960's) expanded its breeding range west of the Cascades (Campbell et al. 1990) and consequently is not a common breeder in the province. The Fraser Lowlands breeding population is estimated at approximately 100 pairs (IBID). Campbell et al. also note that hundreds of non-breeding birds gather on the Fraser River Delta in summer and believe that they are unable to find suitable nesting habitat in "the few remaining wetlands of this urbanized area" (IBID). None nest at the park.

Anas penelope. **Eurasian Wigeon.** Rare winter.

Two birds were observed on February 8, 1992, constituting the only known record for

the study area to date. However, this species is found more frequently in other parts of the VNHS Checklist area. In the last 40 years the Eurasian Wigeon has been found with increasing frequency on the pacific coast (Campbell et al. 1990).

It feeds primarily on vegetation including aquatic vegetation, as well as insects and aquatic invertebrates.

Anas americana. **American Wigeon.** Uncommon fall, common winter.

High count: 63 birds observed on March 9, 1992. Usually found with other dabblers close to the shore of the Inlet.

Feeds mostly on vegetation including grains, as well as mollusks and insects.

This species nests in the region, although the greatest nesting concentration occurs in the Chilcotin-Cariboo and Peace River areas (Campbell et al. 1990). It does not nest in the park.

Aythya valisineria. **Canvasback.** Uncommon winter.

This species is more commonly found along the Fraser River Delta which is the "centre of winter abundance along the coast" (Campbell et al. 1990).

This species was "Blue-listed" from 1975 to 1981 and considered of Special Concern in 1982 and 1986 because of a 30 year decline (Campbell et al. 1990; Tate and Tate 1982; Tate 1986). In the Shoreline Park System it is found primarily near the Old Mill.

This diving duck seeks out vegetation and aquatic invertebrates, including clams.

Canvasbacks breed in the central and southern interior, not on the south coast.

Aythya collaris. **Ring-necked Duck.** Rare winter.

The only observation was of a pair near the boardwalk. This species generally winters on inland ponds and marshes.

It feeds primarily on various aquatic invertebrates and some vegetation.

Breeds in the interior of the province.

Aythya marila. **Greater Scaup.** Common winter.

Observed in small to large flocks near Old Orchard Park and around the Old Mill site.Its diet is the same as that of the Ring-necked Duck. Breeds in Alaska and Yukon.

Aythya affinis. **Lesser Scaup.** Uncommon winter.

Usually found in small flocks but single birds may be observed with flocks of Greater Scaup. Most often found in vicinity of Old Mill site. This species prefers inland sloughs and ponds.

Like others of the genus *Aythya* this diving duck feeds on aquatic invertebrates and vegetation. It breeds primarily in the interior of British Columbia.

Melanitta perspicillata. **Surf Scoter.** Uncommon winter.

Usually found out in the Inlet between Old Orchard and Rocky Point Parks. This species occurs in greater numbers around Admiralty Point in Belcarra Regional park where it is regularly observed.

It appears that Surf Scoters feed mostly on mollusks and crustaceans (Ehrlich et al. 1988).

According to Campbell et al. (1990) this species occasionally breeds in "the Peace and Fort Nelson lowlands" on freshwater lakes.

Bucephala clangula. **Common Goldeneye.** Uncommon winter.

Can be found with large flocks of Barrow's Goldeneye off the Old Mill site.

In saltwater this diving duck feeds largely on mollusks and crustaceans.

Once an uncommon breeder in the province, this species has expanded its breeding range greatly of late and is now found breeding in the Columbia valley and Chilcotin-Cariboo as well as in scattered sites elsewhere (Campbell et al. 1990).

Bucephala islandica. **Barrow's Goldeneye.** Common winter.

Usually found near the Old Mill, but also occurs in large numbers further out in the Inlet. Occasionally found closer to the boardwalk. High count: 86 birds on 18 November, 1992.

Barrow's Goldeneye follows the same dietary pattern as the above species.

Breeds primarily in the interior.

Bucephala albeola. **Bufflehead.** Common winter.

Found throughout the Inlet from the boardwalk area to beyond Old Orchard Park.

In saltwater habitats this small diving duck feeds mostly on crustaceans and mollusks with some aquatic vegetation (Ehrlich et al. 1988).

Primarily breeds in the interior of the province.

Lophodytes cucullatus. **Hooded Merganser**. Common fall and winter.

Found throughout the Inlet from the boardwalk area to Old Orchard Park, but particularly favours the area around the Old Mill site, where the exposed mudflats at low tide provide a roosting site.

This small merganser feeds almost exclusively on fish, but it will take insects and crustaceans.

Hooded Mergansers nest in the region, and throughout the province south of Prince George (Campbell et al. 1990), often on wooded ponds or marshes. Does not nest in the park.

Mergus merganser. * **Common Merganser.** Common fall and winter.

Highest numbers found in September through October, but flock size can fluctuate from a few birds to upwards of 30. Found throughout the Inlet but especially around the Old Mill site where it roosts on exposed mudflats at low tide.

The diet of this species consists mostly of fish although it will apparently eat aquatic invertebrates.

Common Mergansers nest widely throughout most of the province, including in this region, and at least one pair have bred in the park. Birds begin to pair up in winter prior to breeding season.

Mergus serrator. **Red-breasted Merganser.** Uncommon winter.

Often with Common Mergansers, and appears to favour the Old Mill site, although sometimes found near the boardwalk.

This primarily fish-eating bird nests in only a few locations in the province, none in the southern half.

ORDER FALCONIFORMES

Pandion haliaetus. **Osprey.** Common summer.

Although this species does not breed at the Inlet, it is frequently observed fishing in the vicinity of the Old Mill where it perches on the remaining pilings.

While this raptor feeds almost exclusively on fish (hence its old name of Fish Hawk) it will apparently eat rodents and small birds and has been recorded as catching a turtle (Bent 1937).

Ospreys nest along Pitt River and Pitt Lake on pilings. A nest platform on pilings near Rocky Point or elsewhere in the vicinity could possibly attract Ospreys to nest.

Haliaeetus leucocephalus. **Bald Eagle.** Blue List. Common resident.

A pair of Bald Eagles was observed regularly throughout 1992, except for a six-week period during July and August when they were found only a few times. During fall and winter they can be recorded almost every visit. Usual perch is on a Sitka spruce snag overlooking Pigeon Point. Sometimes perch on pilings at Old Mill site.

Feeds on carrion, fish (especially salmon), and will take birds and small mammals.

Nests in Pitt Meadows and near Colony farm, and may nest on the escarpment on Port Moody's north shore.

Accipiter striatus. **Sharp-shinned Hawk.** Rare fall and winter.

Has been observed near the Old Mill and in the mixed woods behind the boardwalk, as well as the woodlot by Suter Brook near the Firehall.

Small birds form the greatest part of this small hawk's diet, and it has been found feeding on Dunlin in the park.

Sharp-shinned Hawks are rare in summer in this region and because they usually nest in higher elevation coniferous forests, the park clearly doesn't provide suitable habitat for them.

Accipiter cooperii. **Cooper's Hawk**. Vulnerable (COSEWIC). Rare fall and winter.

This slightly larger version of the Sharp-shinned Hawk occupies similar habitat although more tolerant of mixed woodlands. In winter can be found around birdfeeders and in woodlots. Observed hunting over the mudflats, near the Old Mill, and in the woods behind the boardwalk and the woodlot adjacent to Suter Brook by the Firehall. Appeared on the "Blue-list" from 1972-1981 and 1986 (Tate, 1986).

While this species also eats a high proportion of birds, it will also take small mammals and reptiles more frequently than the Sharp-shinned (Ehrlich et al. 1988). Has been observed eating Long-billed Dowitchers in the park.

Although this species nests in coniferous and mixed woods across the southern half of the province, the park offers little suitable habitat for nesting.

Buteo jamaicensis. **Red-tailed Hawk.** Uncommon resident.

One or two Red-tailed Hawks can be found roosting or hunting almost anywhere in the area. Seems to particularly favour the woodlot by Suter Brook near the Firehall.

Feeds on rodents, small birds and mammals and reptiles. Nests in a variety of habitats but always near open areas where it can hunt for prey.

While this species nests commonly in the region it does not appear to nest in the park.

ORDER CHARADRIIFORMES

Charadrius vociferus. **Killdeer.** Common fall and winter, uncommon spring and summer.

One bird was observed giving a 'broken-wing' display which is an indication of nesting. No nest or young were found, however. Can be observed anywhere on the mudflats around the Inlet.

Primarily an insect eater, this familiar shorebird nests throughout the province on dry, rocky or gravelled sites. May nest in the park (see above) where suitable habitat does exist.

Tringa melanoleuca. **Greater Yellowlegs.** Uncommon fall and spring transient. NTM.

Small numbers of this species rest and feed on the mudflats during fall and spring migrations. Most readily observed near boardwalk.

Diet consists mainly of insects, snails, small fish.

The Greater Yellowlegs nests in the central part of the province in "swampy forested land" (Campbell et al. 1990).

Tringa flavipes. **Lesser Yellowlegs.** Uncommon fall and spring transient. NTM.

This species can be found with the Greater Yellowlegs around the boardwalk area feeding on the exposed mudflats.

The Lesser Yellows feeds on much the same food items as the above species.

This shorebird breeds in the far north of the province in "semi-open coniferous woodland" (Campbell et al. 1990).

Actitis macularia. **Spotted Sandpiper.** Common spring, summer and fall, rare winter. NTM.

Prefers sheltered areas especially rocky mudflats; according to Guiget (1955, *in* Campbell et al. 1990) this species frequents areas on the coast where "small streams drain across tidal mud". Near the Old Mill is such an area and this is where Spotted Sandpipers are most frequently found. One bird spent the winter of 1992/93 near the Old Mill.

This common shorebird feeds largely on flying insects, but also consumes fish, mollusks, and even carrion (Ehrlich et al. 1988).

Although this species breeds in the region, it does not appear to nest within the study area. It prefers open areas near water but will use a wide variety of habitats.

Calidris mauri. **Western Sandpiper.** Common fall. NTM.

Usually found on mudflats in the vicinity of the boardwalk, often with other shorebird species such as Least Sandpiper. It is well-known that almost the entire world population of this species migrates along the British Columbia coast in spring and fall (Campbell et al. 1990), and protection of the entire Boundary Bay area is essential to their conservation (Butler and Campbell. 1987).

During the nonbreeding season this small shorebird feeds largely on marine invertebrates. The abundant Western Sandpiper nests on the tundra of northern Alaska and "the north-eastern tip of Siberia" (Campbell et al. 1990), in dense breeding colonies.

Calidris minutilla. **Least Sandpiper.** Blue List. Uncommon fall. NTM.

A few birds usually observed with the more common Western Sandpiper. Occupies same habitat as the above.

Feeds on mollusks, worms and crustaceans on the coast (Ehrlich et al. 1988).

Breeds in only a few locations in the province, in bogs in subalpine areas.

Calidris melanotos. **Pectoral Sandpiper.** Rare fall. NTM.

One bird was observed with Western Sandpipers feeding near the boardwalk.

Will eat insects, spiders, worms, and seeds.

Nesting habitat is the tundra of Alaska and Siberia.

Calidris alpina. **Dunlin.** Common fall and winter.

Large flocks (350 or more birds) can be observed on exposed mudflats around the entire Inlet, but appear to particularly favour area around boardwalk and the Old Mill. During high tides it can be found perching on exposed logs and pilings near Old Mill.

Along with many other sandpipers this species feeds on crustaceans and mollusks in winter.

Breeds in Alaska and Northwest Territories on tundra.

Limnodromus griseus. **Short-billed Dowitcher**. Blue List. Rare spring. NTM.

This species is less frequently observed than the Long-billed Dowitcher, which it closely resembles. May be present more often than recorded due to difficulty of identification, especially in winter plumage.

Feeds on mudflats where it probes for marine invertebrates.

There are only a few nesting locations for this species in the province, all of them in the northern portion.

Limnodromus scolopaceus. **Long-billed Dowitcher.** Common spring and fall, uncommon winter.

Forms flocks of from 50 to 120 birds and can be found anywhere on the exposed mudflats around the Inlet. Food source same as Short-billed Dowitcher.

Breeds on tundra in Alaska and Siberia.

Capella gallinago. **Common Snipe.** Rare winter. NTM.3

This shorebird looks similar to the dowitcher species above but generally prefers marsh and bog habitat. However, during the cold weather when many ditches and sloughs were frozen at least one bird fed along the grassy edges near Suter Brook.

Primarily feeds on insects and mollusks.

Nests throughout the province, including the Lower Mainland, when fen or bog habitat is available.

Larus pipixcan. **Franklin's Gull.** Rare fall. NTM.

This species is considered regionally uncommon in fall, and casual the rest of the year. One bird was found on August 6 (and remained for over a week) near Rocky Point Park with a large flock of Bonaparte's Gulls.

This prairie nester feeds primarily on fish during migration.

Larus philadelphia. **Bonaparte's Gull.** Common fall, rare winter.

Although this species migrates through the region in great numbers, much smaller flocks visit the Inlet. During August it is easy to observe 40 to 60 birds at one time, but the numbers decrease during September. Only the occasional bird is recorded during the winter months.

Bonaparte's Gulls feed mostly on insects, but during migration eat fish and aquatic invertebrates. Campbell et al. (1990) report that a Vancouver Island study showed Bonaparte's Gulls to be an exceptionally efficient predator on hatchery released salmonid fry, in contrast to 8 other piscivorous birds. In addition, peak numbers of Bonaparte's Gulls "corresponded closely to fish density" (IBID).

Bonaparte's Gulls breed in the interior of British Columbia.

Larus canus. **Mew Gull.** Uncommon summer, common spring, fall and winter.

Can be found in good numbers at the mouths of Noon's Creek and Suter Brook when salmon are spawning. Also found throughout the Inlet along the shore and on log booms.

In addition to fish, the omnivorous Mew Gull eats mice, grain, garbage, and insects.

It breeds along the coast, and on Vancouver Island on freshwater lakes, and in marshy areas, beaches, "other wetlands" in the interior (Campbell et al. 1990).

Larus delawarensis. **Ring-billed Gull.** Blue list. Common summer and fall, uncommon spring and winter.

Usually found around Rocky Point Park near Slaughterhouse Creek.

The species is an omnivorous feeder including in its diet, fish, rodents, birds eggs and garbage (Ehrlich et al. 1988).

According to Campbell et al. (1990) this species has only recently expanded its range into the province. However, its population appears to be rapidly increasing, with breeding colonies established in the interior.

Larus californicus. **California Gull.** Blue list. Common late summer and fall. Uncommon rest of year.

As with all of the gull species listed for the Inlet Park, California Gull is more commonly found on the coast, with smaller numbers finding their way into the head of Burrard Inlet. Can be found anywhere along the Inlet, but more often observed near Slaughterhouse Creek and the boardwalk area.

Feeds on fish, garbage, carrion (especially fish) and sometimes small rodents such as mice.

Nests only in Okanagan Lake on Grant Island (Campbell et al. 1990).

Larus thayeri. **Thayer's Gull.** Rare fall.

This Arctic breeder is more commonly found on the coast in winter although it also inhabits coastal estuaries, sewage lagoons, and garbage dumps (Campbell et al. 1990). Thayer's Gull was observed once at the Inlet Park near Slaughterhouse Creek. This species certainly occurs more frequently than this one record suggests. Difficulty in separating immatures and winter-plumaged birds from other large gulls means precise identification is not always possible.

Thayer's Gulls are omnivorous, eating just about anything that comes their way (Ehrlich et al. 1988).

Larus glaucescens. **Glaucous-winged Gull.** Very common resident.

It is especially abundant in the fall when the salmon return and can be found by the hundreds around the Inlet, at the mouth of Noon's Creek, and roosting on log booms or pilings.

Will eat almost anything, but prefers fish. It will 'pirate' (that is, steal) food from other gulls or crows.

Although a common breeding species in the region the preferred nesting sites for this gull are small islands (Campbell et al. 1990), and it is unlikely that it nests within the study area.

ORDER COLUMBIFORMES

Columba livia. **Rock Dove.** Introduced. Uncommon.

Although this resident species is common to abundant throughout the region, including

the industrial sites and bridges adjacent to Rocky Point Park, within the study area itself lack of preferred roosting and nesting sites means it is not always encountered, Usually observed flying over Rocky Point Park in small flocks.

Primarily feeds on grain and seed; young are fed a nutritious 'milk' from the crop of both adults.

Nest sites located in a variety of places, but usually around human habitation.

Columba fasciata. **Band-tailed Pigeons.** Uncommon spring, summer and fall.

Usually found in the coniferous trees at Pigeon Point overlooking the mudflats, or in the mixed woods directly across the Inlet from Pigeon Point. (See Special Features).

ORDER STRIGIFORMES

Aegolius acadicus. **Northern Saw-whet Owl.** Rare fall.

The tangled Pacific Crabapple (*Malus fusca*) thickets along the trail at the head of the Inlet, provide excellent roosting habitat for this species. Only one observation was made during the study period; however, a "small owl" observed in the same crabapple thicket area one fall several years ago (M. Haddock, personal communication) was probably of a Saw-whet. It is quite probable that this species occurs more frequently in the area than recorded. The dense thickets that protect the owl also obscure it from even the most diligent scanning from the trail. Only when it is being 'mobbed' by small passerines is its location given away.

This small owl feeds primarily on rodents but will take insects when available.

A cavity nester, the Saw-whet owl seeks out abandoned woodpecker holes in wooded areas, but it will use nest-boxes. No evidence that it nests in the park.

ORDER APODIFORMES

Chaetura vauxi. **Vaux's Swift.** Blue list. Rare summer. NTM.

Observed twice, both times on days of low cloud when flying over the Inlet catching insects. It is unlikely that Vaux's Swift bred in the study area.

Exclusively an insect eater, it feeds on the wing taking flying insects.

The Vaux's Swift is, to some extent, the western equivalent of the eastern Chimney Swift, seeking nesting places in man-made structures such as chimneys, although it also uses hollow trees. Nests are affixed to the side of cavity or chimney with the bird's saliva.

Selasphorus rufus. **Rufous Hummingbird.** Uncommon spring and summer. NTM.

Rufous Hummingbirds are one of the earlier migrants and by early April were regularly heard and seen in the thickets along the railway tracks northwest of the recreation centre. However, they largely disappeared during the nesting season and were not found again until July when they began passing through the area as part of a post-breeding dispersal.

Hummingbirds are often thought of as feeding solely on nectar, but they require insects for protein. Feeds on the flowers of salmonberry and flowering red currant, as well as other plants.

Does not appear to nest in the park, but further study may disprove this.

ORDER CORACIIFORMES

Ceryle alcyon. **Belted Kingfisher.** Common spring, fall and winter; uncommon summer.

Two kingfishers, a male and a female, were observed regularly, but always feeding

separately, one near the south side boardwalk, the other in the vicinity of the Old Mill. Although feeding separately, they didn't appear to stick to defined territories, since sometimes the male was at the boardwalk, sometimes the female. Usually observed every visit except during the summer when they appear to be largely absent from the area.

Fish form the bulk of the kingfisher's diet, but they will also occasionally take young birds, reptiles, insects, and mice (Ehrlich et al. 1990). There is no suitable nesting habitat in the park.

ORDER PICIFORMES

Sphyrapicus ruber. **Red-breasted Sapsucker.** Rare summer and fall.

During late July a family of sapsuckers was observed feeding on Cascara (*Rhamnus purshiana*) berries along with American Robins and Cedar Waxwings. A single adult was observed in November on a Western Red Cedar (*Thuja plicata*).

While fruit supplements its diet when in season, the sapsucker prefers insects especially ants. It also, as its name suggests, feeds on sap and drills small distinctive holes in trees called 'sap wells' to get at the sap.

Although this species nests in the region, there is no evidence of breeding in the park.

Picoides pubescens. ***Downy Woodpecker.** Common resident. Breeds.

Can be observed on most visits anywhere in the Shoreline Park System (including the woodlot by Suter Brook adjacent to the Firehall), but particularly favours the riparian growth along the boardwalk and the north trail.

Downy Woodpeckers feed largely on insects but will eat fruit, seeds and sometimes sap (Ehrlich et al. 1988).

This cavity nester prefers dead trees for nest purposes and it is essential that snags be left standing in order to accommodate species such as the Downy Woodpecker. Family groups with newly fledged young were found in 2 different locations.

Colaptes auratus. **Northern Flicker.** Uncommon summer and fall.

Most records were from the mixed woodland between the railway track and the boardwalk east of the recreation centre.

This large, attractive woodpecker will eat seeds and fruit but ants form the majority of its diet. Flickers can often be seen on the ground feeding on ants.

One adult and two immatures were noted feeding on Pacific Crabapple (*Malus fusca*) fruits in summer, and several sightings of individual adults occurred in the fall. Although resident in the region, this species does not appear to nest in the park since the only observations were after the nesting period. Like the above species, the flicker is a cavity nester.

Dryocopus pileatus. **Pileated Woodpecker.** Uncommon year round.

Evidence of this large, crow-sized woodpecker can be found wherever snags exist in the park, and in the woodlot by Suter Brook near the Firehall.

Feeds mostly on insects, but will eat fruit, seeds and sap.

The habitat is too restricted for breeding purposes and it is likely that it nests in the large coniferous tracts north of Ioco Rd. where large standing snags allow the excavation of deep cavities. Pileated Woodpeckers feed, at least partially, in the Shoreline Park System. It is not known whether more than one bird uses the area.

ORDER PASSERIFORMES

Contopus sordidulus. **Western Wood Pewee.** Rare spring. NTM.

One bird was sighted in May foraging in the alder-dominated woods near Suter Brook.

The pewee is a flycatcher and as this suggests, its diet consists almost exclusively of insects.

Pewees nest in the region but no breeding evidence noticed in the park.

Empidonax traillii. ***Willow Flycatcher.** Common summer. Breeds. NTM.

Found in several locations but always in riparian habitat.

Insects and some berries and seeds form this small flycatcher's diet.

The riparian thickets at the head of the Inlet near the boardwalk are typical of the preferred breeding habitat for this species. The cup-shaped nests are usually placed less than a metre above the ground but can be as high as three metres. They are usually in the fork of a shrub, made of weeds, bark, and grass, and lined with feathers or other downy material.

Empidonax hammondii. **Hammond's Flycatcher.** Rare spring. NTM.

The one bird observed was foraging in the cedar dominated coniferous woods. These woods provide important stopover sites allowing migratory birds to forage and rest.

Hammond's Flycatchers appear to be exclusively insect eaters (Ehrlich et al. 1988).

This species nests in higher elevation coniferous forests.

Empidonax difficilis. **Pacific-slope Flycatcher.** Uncommon spring and summer. Breeds? NTM.

Birds were observed during the breeding season in suitable habitat in the moist cedar-hemlock woods with their understory of salmonberry and huckleberry.

Insects and a few berries and seeds form the diet of this flycatcher.

Pacific-slope Flycatchers (formerly called Western Flycatcher) construct cups-like nests of moss, grass, leaves and bark, which they place in a variety of situations. They have been found nesting in cavities, behind flaps of bark, on ledges, under stumps, and among tree roots (Harrison 1978).

Tachycineta bicolor. **Tree Swallow.** Uncommon spring and summer. NTM.

Breeds outside the study area. Usually observed catching insects over the Inlet, especially near the Old Mill.

Insects are the favoured food of this common swallow but they will feed on berries.

Nest boxes would probably induce this cavity nester to nest in the study area.

Tachycineta thalassina. **Violet-green Swallow.** Uncommon spring and summer. NTM.

Although a very common spring and summer bird in the region this species was not frequently observed in the study area.

Catches insects on the wing.

This swallow will also nest at higher elevations, choosing a variety of cavities including holes in cliffs, old woodpecker holes and nest boxes. No evidence of nesting in the park was found but nest boxes could encourage it to breed. It is a common breeder throughout the region.

Hirundo rustica. **Barn Swallow.** Common spring and summer. NTM.

Most frequently observed flying over the water catching insects, especially around Old Mill.

Berries and seeds sometimes form part of the Barn Swallow's diet which consists mostly of insects taken on the wing.

The nest of mud pellets stuck under eaves of buildings or under bridges is familiar to most people. Although no evidence of nesting was found in the park, it certainly breeds commonly in the area.

Cyanocitta stelleri. **Steller's Jay.** Uncommon fall and winter.

Steller's Jays, B.C.'s provincial bird, prefer large stands of conifers for nesting and are not usually observed during the breeding season in the park. Post-breeding dispersal brings small flocks to the area in late July and August and thereafter sightings of from one to three birds can be expected through the fall and winter.

Anyone who maintains a feeder knows the preference these birds have for nuts of any sort. They also relish seeds, fruit, and will take nestlings, bird eggs and insects.

Corvus caurinus. ***Northwestern Crow.** Common resident. Breeds.

The park is well-used by this gregarious species for roosting, feeding, and nesting, and nests may be found throughout the study area. Several hundred crows can be counted at one time in the fall and winter. Many of these birds use the park daily as a stopover on their way to communal roost sites elsewhere in Port Moody.

This omnivorous feeder particularly favours the mudflats, and feasts on dead salmon during the spawning season. Crows also eat carrion, nestlings, fruit, and birds eggs.

Their large untidy nests are easy to find once the leaves are off the trees. Roughly cup-shaped, they are lined with mud and leaves. Crows have been known to build their nests on the ground under overhanging boulders (Harrison 1978).

Corvus corax. **Common Raven.** Uncommon.

Occasionally observed flying over the park, or roosting on the tops of coniferous trees.

Ravens are another omnivorous bird, feeding on carrion, nestlings, eggs, fruit and garbage. A fairly common breeder in the region, ravens do not nest in the park.

Parus atricapillus. ***Black-capped Chickadee.** Common resident. Breeds.

Found throughout the park using a variety of habitats. During the fall at least 30 birds may be regularly observed. Often flocks with kinglets and Bushtits in winter. Also found in the woodlot adjacent to Suter Brook by the Firehall.

The familiar Black-capped Chickadee seeks insects and insect larvae in tree crevices and bark, but also eats seeds and some fruit.

The nest cavity is often located in a snag or a living deciduous tree and is frequently excavated by the birds. The nest itself is a small cup lined with moss, feathers and spider cocoons.

Psaltriparus minimus. ***Bushtit.** Common resident. Breeds.

Several pairs nest within the Shoreline Park System, particularly in the alder-dominated thickets. In winter found in large flocks throughout the park and in the woodlot by Suter Brook near the Firehall.

Spiders, insects, seeds and some fruit form the diet of the Bushtit.

For such a tiny bird their gourd-shaped nest is disproportionately large. A delicate

looking structure of lichens, moss, twigs, cocoons, grass and flowers, it is secured to twigs and bound round with spider webs. Several nests have been found in young alder about 2 metres above the ground.

Sitta canadensis. **Red-breasted Nuthatch.** Rare fall.

Although the coniferous woods appear to provide suitable habitat for this species, it has only been observed rarely. Are the woods of an insufficient size to support this species?. The sightings in August may have been the result of a post-breeding dispersal.

This small bird creeps down the trunks of trees searching for insects and larvae in the bark. In winter it feeds more frequently on seeds.

Certhia americana. **Brown Creeper.** Uncommon resident. Breeds?

Observed infrequently throughout the year, but usually in the coniferous woods and the woodlot adjacent to Suter Brook by the Firehall. In winter will occasionally be found in habitat other than its preferred mature coniferous or mixed woods.

Feeds on insects, seeds and some fruit which it seeks by creeping up a tree trunk, unlike the above species which moves downward. When it has finished with one tree it flies to the bottom of another and begins its upward movement again.

The very well-concealed nest is built of bark, moss, leaves and twigs beneath a loose flap of bark on the trunk of a tree, usually a snage, either deciduous or coniferous. Sometimes builds its nest in a clump of ivy (Harrison 1978).

Thryomanes bewickii. ***Bewick's Wren.** Common resident. Breeds.

Needs shrubby thickets near open woodlands for breeding. The Shoreline Park System provides enough of this habitat type to support at least 3 families of Bewick's Wrens. Found throughout the park.

Spiders and insects are the chief items in this wren's diet.

A cavity nester, the Bewick's Wren will use a variety of holes in which to place its nest, including holes in walls, nest boxes, natural tree cavities, and just about any hollow object. The cup-shaped nest is bulky and composed of a variety of plant material as well as sticks and bark.

Troglodytes troglodytes. **Winter Wren.** Common resident. Breeds?

During breeding season this species is less commonly recorded and generally only in the coniferous woods and in the woodlot adjacent to Suter Brook by the Firehall. However, throughout fall and winter when birds from other areas move into the Shoreline Park System to overwinter, this wren can be found virtually anywhere in the park in almost all habitats. Found on most visits during fall and winter.

Feeds on insects and spiders; in winter may take cedar berries (Ehrlich et al. 1988).

Nests in cavities, old stumps, brush piles, and even in mossy banks (Godfrey 1986).

Cinclus mexicanus. **American Dipper.** Uncommon winter.

At least one dipper can be found on Noon's Creek during late fall and winter.

One of the most fascinating and unusual songbirds, this small plump bird forages underwater for its food of small fish and aquatic invertebrates.

Dippers do not nest in the park but can be found in suitable habitat on the slopes of Burke Mountain on fast flowing streams.

Regulus satrapa. **Golden-crowned Kinglet.** Common resident. Breeds?

Found most commonly in the coniferous and mixed woods, but in winter recorded in all habitats including the woodlot adjacent to Suter Brook by the Firehall. Forms large mixed feeding flocks with Ruby-crowned Kinglets and Black-capped Chickadees.

This tiny bird with the orangey-yellow crown patch feeds on insects, spiders, seeds and some fruit.

The nest is nearly always in a coniferous tree, usually quite high up. Constructed of moss, grass, lichens and bound together with spiders' webs, this elongated cup-like nest usually hangs from the end of a branch but sometimes straddles the branch.

Regulus calendula. **Ruby-crowned Kinglet.** Uncommon fall and winter.

Found in all habitats during the fall and winter where it feeds with mixed flocks of Golden-crowned Kinglets and chickadees.

Like the above, this species feeds primarily on insects, with a few seeds and fruit.

Almost always breeds in coniferous forests. Does not appear to breed in the park.

Catharus ustulatus. ***Swainson's Thrush.** Common summer. Breeds. NTM.

Found primarily in the alder-dominated woods and mixed woods where undergrowth forms the dense thickets it needs for breeding.

Insects and fruit form the diet of this common thrush.

Mosses, twigs, lichens, grass, mud and soft bark are used to make the compact and tightly-woven nest of this species. It is usually placed fairly low to the ground in shrubby thickets.

Turdus migratorius. ***American Robin.** Common summer, uncommon winter. Breeds.

Found throughout the park and the woodlot by Suter Brook and the Firehall.

Robins are one of the most familiar of all songbirds and many people know them as visitors to pyracantha and mountain ash whose berries they greedily consume. In addition, they eat numbers of earthworms and some snails.

Will nest in a variety of locations offering support for its bulky, mud-lined nest. Usually double-brooded.

Ixoreus naevius. **Varied Thrush.** Common winter.

Found throughout the park and in the woodlot by Suter Brook and the Firehall, but primarily at Old Orchard and near the boardwalk.

Feeds on snails, worms, insects and especially in winter, berries and seeds.

Nests at slightly higher elevations.

Anthus spinoletta. **American Pipit.** Uncommon fall.

The grassy foreshore along the Inlet near the boardwalk serves as a feeding area for this species during migration.

In migration this species seeks out aquatic insects and crustaceans on the foreshore.

The pipit breeds in the Arctic.

Bombycilla garrula. **Cedar Waxwing.** Uncommon summer and fall.

Found almost anywhere in the park, particularly around fruit-producing trees.

Summer fruits and berries attract this species to the Shoreline Park in late summer when it can be found feeding on crabapples and other fruits.

While it nests commonly in the region, Cedar Waxwings do not appear to breed in the park.

Lanius excubitor. **Northern Shrike.** Blue list. Rare fall.

One immature bird was observed at the Old Mill. Shrikes need open areas with scattered trees and shrubs to provide lookout perches. Rodents are the primary food source of this species, but shrikes will also eat small birds and insects. The open areas around the Old Mill attract numerous songbirds which in turn can provide food for the Northern Shrike.

This attractive bird nests in extreme northern British Columbia and the Yukon.

Sturnus vulgaris. **European Starling.** Introduced. Common resident. Breeds?

Found in small numbers on most visits, usually around the Old Mill site. There is no evidence (e.g. adults carrying food to possible nest sites) that this cavity nester breeds in the park. Family groups found there undoubtedly came from just outside the Shoreline Park boundaries.

The introduced starling eats berries, seeds, and small invertebrates.

A cavity nester, this adaptable species can be found in a wide variety of locations, although it shuns deep woods. The nest is a loosely formed cup of moss, grass, and twigs. It competes successfully with other cavity nesters.

Vireo gilvus. ***Warbling Vireo.** Common summer. Breeds. NTM.

The deciduous woods near Murray St. and the railway tracks are the nesting site for this small insectivore. At least two pairs nested. During migration found throughout the park except in the coniferous woods.

Almost exclusively an insect eater, but will take spiders and a few berries.

This small vireo constructs a tidy, compact nest of grass, leaves, twigs, and sometimes string, bound with spiders' webs. It is suspended from a horizontal branch, usually up to 10 metres above ground, but sometimes as low as 1.5 metres.

Vireo olivaceus. ***Red-eyed Vireo**. Common summer. Breeds. NTM.

Inhabits the same deciduous woods as the above species. At least one pair nested in the park.

Like the above, almost entirely an insect eater.

The deep cup-like nest made of grass, cocoons, and soft bark is hung from a horizontal branch from 1 to 10 metres above the ground.

Vermivora celata. ***Orange-crowned Warbler.** Common spring and summer. Breeds. NTM.

Found chiefly in the deciduous and mixed woods.

In addition to insects, this species eats fruit, nectar and tree sap and frequently feeds at Red-breasted Sapsucker wells (Ehrlich et al. 1988).

Bark strips, grass and plant down are used to form a bulky cup-like nest which is usually placed on or near the ground. Because of this it is very important that park users are discouraged from going off-trail.

Dendroica petechia. **Yellow Warbler.** Uncommon summer. Breeds? NTM.

Riparian thickets such as those found along the several streams in the park provide suitable habitat for this species and it is quite probable that it breeds in the park. Further studies next year may bear this out. All observations were made in the riparian habitat near the boardwalk.

This bright yellow warbler feeds mainly on insects but will occasionally take a few berries.

The small, strongly made cup-shaped nest of grass, weeds, and fine bark is usually placed in the fork of a shrub or small tree, often in riparian thickets. This species is a frequent cowbird host but normally buries the cowbird egg in the bottom of the nest where the egg cools and thus never hatches.

Dendroica coronata. **Yellow-rumped Warbler.** Uncommon spring and fall.

Found during migration in small flocks especially in the coniferous and mixed woods.

Primarily an insectivore, in winter it will take berries, and Godfrey (1986) notes that it "it is one of the few warblers that can subsist on berries and seeds over protracted periods."

Does not breed in the park, but does nest in the region.

Dendroica nigrescens. **Black-throated Gray Warbler.** Common summer and fall. NTM.

All observations are from late summer and early fall, and are presumably a result of (1) post-breeding dispersal from nest sites outside the study area and, (2) migration through the area. Primarily found in the coniferous and mixed woods, although some sightings were made in the deciduous woods.

Mostly an insect eater. Nests elewhere in the region but not, apparently, in the park.

Oporornis tolmiei. **MacGillivray's Warbler.** Uncommon fall. NTM.

Found in riparian thickets near boardwalk and in low shrubs under cottonwoods near railway tracks.

Apparently primarily insectivorous (Ehrlich et al. 1988).

Does not appear to breed in the park.

Geothlypis trichas. **Common Yellowthroat.** Uncommon fall. NTM.

Although suitable nesting habitat for this species occurs at the Shoreline Park, it was not observed until early fall, when it was found in the riparian thickets near Noon's Creek and Suter Brook. Further observations during nesting season may find that this warbler does breed in the park, if only sporadically.

Feeds largely on insects but will take a few spiders and seeds.

Suitable habitat exists for this species, but it does not appear to nest in the park.

Wilsonia pusilla. **Wilson's Warbler.** Common spring and summer. Breeds? NTM.

Although no direct evidence of nesting was found, this species was recorded in suitable habitat during nesting season in the park. Usually observed in the riparian thickets between Noon's Creek and Suter Brook.

Primarily insectivourous but will occasionally eat berries.

Dead leaves. moss and fine twigs are bound into a bulky cup-like nest which is placed on or near the ground in riparian thickets.

Piranga ludoviciana. **Western Tanager.** Uncommon fall. NTM.

Observed in Red Alders (*Alnus rubra*) and Black Cottonwoods (*Populus trichocarpa*) along the pipeline trail.

This striking yellow and red visitor feeds on buds, insects and fruit.

Breeds in nearby areas of coniferous woodland at somewhat higher elevations than the park such as Mundy Park and probably along the escarpment above the Inlet.

Pheuticus melanocephalus. ***Black-headed Grosbeak.** Common summer. Breeds. NTM.

At least two, but possibly three pairs of this species nest in the Shoreline Park. Most birds were observed in the deciduous woods near Murray Street, and the mixed woods near Suter Brook and Noon's Creek.

Spiders, seeds, fruit and insects are eaten by these grosbeaks.

A bulky nest of twigs, weeds, and rootlets is constructed within a few days usually in the fork of a twig about 2 to 4 metres above the ground.

Pipilo erythrophthalmus. ***Rufous-sided Towhee.** Common resident. Breeds.

Found throughout the park, particularly in brushy thickets.

Seeds, berries, and insects form the towhees' diet.

The strong cup of bark, grass and dead leaves is frequently placed on the ground in a slight depression so that the rim is level with the ground. Sometimes the nest is located in a low shrub. Because towhees nest on or close to the ground, often near the trail system, people must be encouraged to remain on the trail to avoid destroying nests and eggs or young birds.

Passerculus sandwichensis. **Savannah Sparrow.** Uncommon fall. NTM.

A preference for grassy open areas limits the available habitat for this species. However, several birds were regularly observed for three weeks in the fall, in the open area by the trail at the Old Mill.

Feeds primarily on grass seeds but will eat spiders.

Where suitable habitat occurs, such as at Colony farm, the Savannah Sparrow nests in large numbers.

Passerella iliaca. **Fox Sparrow.** Uncommon winter.

This overwintering sparrow probably occurs more commonly than records show. Its habit of remaining silent and its preference for thick brushy thickets such as blackberry tangles, makes it more difficult to observe than some of the other sparrow species.
Found throughout the park wherever dense thickets and undergrowth occur.

Insects, berries, seeds and buds form the diet.

Breeds outside of our region in coniferous or deciduous forest edges, thickets or riparian vegetation (Godfrey 1986).

Melospiza melodia. ***Song Sparrow.** Common resident. Breeds.

This is one of the more abundant songbirds in the area, found primarily in brushy thickets along water.

Seeds of grass and other plants along with some insects and berries form the majority of the Song Sparrow's diet.

Their nest of grass, weeds, twigs and bark is located on or close to the ground, often under shrubs or brushpiles (Ehrlich et al. 1988). Again, protection should be afforded this species by preventing people from leaving trails.

Melospiza lincolnii. **Lincoln's Sparrow.** Uncommon fall.

This unobtrusive species frequents riparian thickets in the park where it can be found during migration with other sparrow species including the resident Song Sparrows.

Lincoln's Sparrows feed upon insects, berries and the seeds of various plants.

Bogs and other moist areas with stands of alder and willow or small conifers (Godfrey 1986), north of this region, are where this sparrow breeds.

Zonotrichia atricapilla. **Golden-crowned Sparrow.** Rare spring.

Recorded only once when two individuals were found in thickets close to Old Mill site.

Flowers, seeds, insects, berries are all part of the diet of the Golden-crowned Sparrow.

Nests in montane areas in thickets and shrubs, as well as streamside thickets in our region, but not in the park.

Zonotrichia leucophrys. **White-crowned Sparrow.** Uncommon spring, summer and fall.

Found in various locations throughout the park but always in brushy thickets.

White-crowned Sparrows feed on blossoms, moss capsules, seeds, berries, fruit and insects (Ehrlich et al. 1988).

Wet meadows, thickets, parks, brushy woodland edges, parks are the habitats occupied by this species. Although it nests in the region it was not found in the park during breeding season.

Junco hyemalis. **Dark-eyed Junco.** Common fall and winter.

Found throughout park, especially in brushy thickets.

Juncos are primarily seed-eaters and will consume a wide variety of seeds; they will also eat insects.

Dark-eyed Juncos nest in our region at a number of locations including Burnaby Mountain, but not in the park.

Molothrus ater. ***Brown-headed Cowbird.** Common summer. Breeds.

This parasitic species prefers edge habitat where it finds host species for its eggs. Found throughout the park but particularly in the deciduous woods.

Seeds, insects, grain and sometimes snails and spiders form the diet of this common species. The cowbird does not build a nest, but lays its eggs in the nests of other species, especially certain warblers, finches, vireos and flycatchers.

Carpodacus purpureus. **Purple Finch.** Uncommon.

Although not found regularly, this species can occur at any time of year. Usually observed in the coniferous and mixed woods including woodlot by Suter Brook and the Firehall.

Finches are generally seed eaters, but will feed on fruit in summer as well as insects.

Purple finches breed in the region but not in the park.

Carpodacus mexicanus. **House Finch.** Common resident. Breeds?

This species is similar to the above but more commonly found. It occurs throughout the park, but especially in brushy thickets near the boardwalk.

Like the above, the familiar House Finch feeds almost exclusively on seeds, but sometimes adds sap and buds to its diet, rarely insects.

House Finches will nest in urban areas as well as parks and orchards. Usually place their nest in cavities including nest boxes, but also in vines, shrubs and even old nests of birds such as robins (Godfrey 1986).

Loxia curvirostra. **Red Crossbill.** Rare.

Like many 'winter' finches, this species is erratic, occurring commonly in some years and infrequently in others. Therefore, our definition of it as 'rare' reflects only the status of this species for 1992. Found anywhere in park, although it favours coniferous woods.

The unique crossed bill of this species is designed to allow easy removal of seeds from cones, their preferred food. Will also consume some buds, berries and insects.

Habitat is primarily coniferous forest. Unlike most other species, crossbills will nest at any time of year. Their movements are linked to cone crop production which dictate the relative scarcity or abundance of this species in a given area.

Carduelis pinus. **Pine Siskin.** Common fall and winter, uncommon spring and summer.

Like the above species, this species too is considered 'erratic', occurring more in some years than in others. 1992 was a particularly good year for siskins and they were found in large flocks (up to 100 birds) throughout the park, feeding especially on cones of red alder (*Alnus rubra*).

In addition to alder cones siskins feed on a variety of other seeds including those of conifer cones. Will also eat tree sap and nectar.

Although they do nest in the region, no evidence of nesting in the park was found.

Carduelis tristis. **American Goldfinch.** Uncommon spring and summer.

Although this species can occur year round in the Lower Mainland, it was not observed in the Shoreline Park outside of the spring and summer seasons. Usually observed in riparian thickets.

Like most finches primarily a seed eater, but will include some buds and berries in its diet.

This species nests commonly in the region but not in the park. It prefers weedy fields and open riparian woods.

Coccothraustes vespertinus. **Evening Grosbeak.** Uncommon.

This winter finch is, like the crossbills and siskins, 'erratic', occurring at any time of year. During the survey period it was most frequently observed in late summer and early fall, and always in the mixed woods near Suter Brook.

Seeds of trees and shrubs are the primary source of food, but Evening Grosbeaks will also eat tree buds and insects. They obtain minerals and salt from consuming dirt and gravel (Ehrlich et al. 1988).

Nesting generally takes place at higher elevations in its preferred habitat of coniferous forest although it will nest in mixed woods.

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ANNOTATED LIST OF FISH SPECIES FOUND IN PORT MOODY ARM OF THE BURRARD INLET

Contributed by Elaine Golds

The initial list of fish species was compiled by Rick Simpson, Past President of the Port Moody Ecological Society from reports which were provided to him by (1) Lee Harding, Environment Canada (Regional Data Report DR 87-03, and DFO/MOEP Fish Habitat Inventory and Information Program Stream Information Survey); (2) Jason Hwang, Fisheries and Ocean Canada (DFO April 1992, Two Beach Seines, Port Moody Arm); (3) Judy Russell, Reed Point Marina (Official Catch Records of the 8th Annual Fishing Derby); (4) Ken Berry, Westcoast Energy (Westcoast Energy, Land, Right of Way and Environmental Files, May 19, 1992); (5) Wilda Booth and Bill Harris, Pacific Coast Terminals (Environmental Evaluation for an Expansion of the Pacific Coast Terminals at Port Moody); (6) Mark Johnson, Fisheries and Ocean Canada (Log Book, Electroshocking Noons Creek, November, 1992).

A highly-recommended introductory guide to local fish is a book by Andy Lamb and Phil Edgell, "Coastal Fishes of the Pacific Northwest. Not only is the photography excellent, but you get a good idea of what you might be lucky enough to observe in the water while strolling along the shore.

A total of 48 species have been identified as residing at least part of the time in the Port Moody Arm of the Burrard Inlet. Other fish may be present but do not appear on this list since they have not, as yet, been found in this area. The size of most species is included for interest since many readers are not likely to have seen most of these fish. In most instances, the size given is the largest recorded. Average sizes are usually considerably less.

Class Chondrichthyes (Cartilaginous Fishes)

SQUALIDAE. **Shark Family**

Squalas acanthias **Spiny dogfish**

Adults, up to 1.5 m length and 9 kg in weight, can live for as long as 30 years. Young are born alive. Dogfish congregate in places where, by smell, they determine the fishing to be good. Their diet, which is extremely varied, includes herring, hake, sand lance, smelts, eulachon, crabs and euphausiids. Contrary to commonly-held beliefs, there is little evidence that dogfish are serious predators of salmon. During the middle of the 20th century, dogfish livers were harvested as a source of Vitamin A. Overharvesting led to a serous decline in their population in the 1950s.

Class Osteichthyes (Bony Fishes)

CLUPEIDAE. **Herring Family**

Clupea harengus pallasi **Pacific herring**

Herrings are a small silvery fish which can reach 46 cm in length but average only about half that. Many commercially important species of fish feed upon the Pacific herring.

Herring spawn in late winter, usually around March. Spawning occurs in shallow waters from high tide down to depths of 11 m. Their sticky eggs adhere in masses to eelgrass, kelp and rockweed. In areas where herring are abundant, the spawning grounds may become white with milt from the males. After 10 days, the eggs hatch and the juveniles remain in shallow water until they grow to a length of 7-10 cm. These young fish provide an excellent source of food for many predators including fish and birds. The herring is probably the most widely-used source of protein food in coastal waters.

Some people feel that the herring roe industry in British Columbia is an example of the human species fishing "too far down the food chain". Excessive harvesting of herring only for their roe is not only wasteful but can threaten other fish populations by removal of an essential food source. The aboriginal people harvested herring roe by submerging hemlock branches in water and retrieving them laden with eggs. This method is obviously a much less wasteful way to collect roe than our current practices.

ENGRAULIDAE. **Anchovy Family**

Engraulis mordax. **Northern anchovy**

Up to 24 cm in length, anchovies form a vital link in the food chain. They feed on plankton and, in turn, are consumed by many other species, including salmon. Northern anchovy spawn in the upper layers of protected bays. According to Tom Howie, a member of the Port Moody Ecological Society and long-time fisher, anchovies were once sufficiently abundant in Indian Arm in the 1940s to support a commercial fishery. Overharvesting is thought to have contributed to a dramatic decline in their population. Recent anecdotal reports suggest that the anchoy population may be slowly increasing.

SALMONIDAE. **Salmon and Char Family**

Probably our most well-known fish family, the salmonids mainly are anadromous fish which characteristically spawn in fresh water where the juveniles remain for variable times before migrating to the ocean. After a number of years, the mature adults return to their home stream to spawn and, usually, die.

Because of enhancement efforts and habitat protection and rehabilitation, some salmonid populations are increasing in abundance in the Burrard Inlet. The Port Moody Arm provides excellent estuarine rearing habitat for juvenile salmon. Salmonid enhancement projects on the Port Moody Arm include hatcheries on Mossom and Noons Creeks as well as stream rehabilitation on Suter Brook. Within the Shoreline Park, the three species of salmonids most likely to be encountered are coho, chum and cutthroat.

Oncorhynchus gorbuscha. **Pink salmon**

The Indian River at the end of Indian Arm has a significant pink salmon run. This likely accounts for their occasional presence in the Port Moody Arm of Burrard Inlet. Adult pinks have an average weight 2 kg. Pink salmon have a two year life cycle and migrate downstream soon after hatching. Breeding fish usually spawn not too far above tidal water.

Oncorhynchus keta. **Chum salmon**

Chum salmon can reach up to 1 m in length. In the Lower Mainland, they have a 3 year life cyle. The young migrate to sea immediately after hatching. Spawning occurs in the

fall. The mature adults, which are not known for their ability to fight their way upstream, typically spawn in fresh water not far above salt water. Within the Shoreline Park, chum have been released in both Noons and Suter Brook Creeks as well as from nearby Mossom. In the fall of 1992, a large population of chum, estimated to be approximately 400 adults, returned to fight over spawning habitat in the lower part of Mossom Creek.

Oncorhynchus kisutch. **Coho salmon**

Coho average in size from 3 to 6 kg. The fry hatch in streams where they remain for approximately a year before migrating to salt water. After 2 years at sea they return to their home streams. The upper reaches of Noons and Suter Brook, beyond the Shoreline Park, have good rearing habitat for coho. After heavy autumn rains, mature adults which have returned to spawn can sometimes be observed resting in the pools of Noons Creek by the skating rink.

Oncorhynchus nerka **Sockeye salmon**

Sockeye, which can grown to 4 kg, spend up to 3 years in fresh water lakes before migrating to the sea. No suitable habitat for sockeye exists in the Port Moody Arm so the specimen found here must have been slightly off course.

Oncorhynchus tashawytscha **Chinook salmon**

Chinook are large salmon which can grown up to 40 kg. Although they normally spawn further inland, chinook have been fed and released from pens at the Reed Point Marina. According to Tom Howie of the Port Moody Ecological Society, there were good historical runs of Chinook up Indian River.

Oncorhynchus clarki clarki **Coastal cutthroat trout**

Although cutthroat can grow to be 75 cm in length, the ones that remain in fresh water reach only a fraction of this size.. They spawn in small streams from February to May. Unlike most species of salmonids, they do not die after spawning. The young remain in fresh water for varying periods, some apparently indefinetely. Cutthroat, much more than the other salmonids, appear to be tough survivors and have persisted, albeit in reduced size and numbers, in many of our small urban streams. The people observed fishing along the shore in the Shoreline Park are likely casting for searun cutthroat trout. In the interests of conservation, many of these fishers utilize "catch and release" techniques. Enhancement for cutthroat is planned for Noons Creek.

Oncorhynchus mykiss **Steelhead/Rainbow trout**

These trout commonly reach 4 kg in size but can be much larger. Unlike most salmonids, they spawn in late winter or early spring. The young can spend up to 2-3 years in fresh water before migrating to the sea. Not all of these trout migrate to the sea. Sea-run fish are referred to as steelhead. They may spawn more than once.

OSMERIDAE. **Smelt Family**

Hypomesus pretiosus pretiosus **Surf smelt**

Suft smelt migrate into Burrard Inlet to spawn along the shores. Adults can be up to 16 cm in length. Smelt populations have suffered from habitat loss and degradation. They require clean pea-sized gravel for spawning. Silt from uran runoff can smother their eggs.

Between May and October, spawning occurs on spring tides at two week intervals. Egg laying takes place on a falling tide preferably in the evening in order to avoid predators such as blue herons. Several decades ago, smelt fishing was a popular sport along the beaches of the Greater Vancouver area but few fish are left because of habitat loss.

Spirinchus starksi **Night smelt**

Night smelts which can be up to 12 cm in length spawn in the surf at night.

BATRACHOIDIDAE. **Toadfish Family**

Porichthys notatus **Plainfin midshipman**

These fish which are usually about 20 cm in length They spawn in the spring in shallow water or the intertidal zone. They are known as "singing fish" because of the grunting sound the male makes when disturbed. They are most likely to be found under rocks near low tide where the female lays her eggs in late sping and early summer. Most of the year, midshipmen are found on the muddy botton of deeper water.

GADIDAE. **Codfish Family**

Gadus macrocephaus **Pacific cod**

Pacific cod can be up to 1 meter in length. They spawn in late winter. The eggs float on ocean currents. Cod usually feed along the soft bottom on fish such as herring and sandlance as well as crustaceans. They are common enough to be an important commercial fish.

Merluccius productus **Pacific hake**

Hake can up be to 1 meter in length. They are a sluggish fish which rise from the bottom to shallow waters after dusk to feed on plankton. Hake used to be thought of as a nuisance fish but are now becoming an important commercial species.

Theragra chalcogramma **Walleye pollock**

Slightly smaller than the other two codfishes found in Port Moody Arm, walleye live on sandy or muddy bottoms. The young form mixed schools with Pacific tomcod.

ZOARCIDAE. **Eelpout Family**

Lycodopsis pacifica **Blackbelly eelpout**

This eelpout lives on the muddy bottom and grows up to 19 cm in length in the Burrard Inlet. Spawning occurs between August and January. They are a common fish which moves into shallow water at night to feed on small polychaete worms and shrimps.

AULORHYNCHIDAE. **Tube-snout Family**

Aulorhynchus flavidus **Tube-snout**

Up to 15 cm in length with an extremely elongate body, the tube-snout can be found around pilings. It feeds on crustaceans and plankton. Eggs are laid in April on kelp. Males guard the nest.

GASTEROSTEIDAE. **Stickleback Family**

Gasterosteus aculeatus **Threespine stickleback**

This very common small fish, rarely more than 10 cm in length stakes out territory in brackish water where it may compete for food with young salmon. Food appears to be mostly small crustaceans. It is one of the few fishes that can live equally well in salt and fresh water. Both seals and garter snakes have been reported to catch and eat sticklebacks.

EMBIOTOCIDAE. **Surfperch Family**

Cymatogaster aggregata **Shiner perch**

These perch, which can grown up to 14 cm in length, congregate around pilings and rocky outcrops in the summer months. In the winter, they return to deep water. Young are born alive.

Embiotoca lateralis **Striped seaperch**

Up the 28 cm in length, the seaperch can be found around pilings in the summer months. The young, which are born live, rear in shallow bays.

Rhacochilus vacca **Pile perch**

Up to 40 cm in length, these perch feed on mussels, algae, barnacles and other small organisms. It has developed pharyngeal teeth for crushing the shells of its food. It is more likely found offshore in winter and inshore during the summer months. Young are born alive.

STICHAEIDAE. **Prickleback Family**

Xiphister atropurpureus **Black prickleback**

This small eel-like fish is normally no larger than 18 cm and is often found beneath rocks in intertidal zone. It seems to be able to remain ouside of water for some time in moist cavities. It feeds on plants and smaller crustaceans.

PHOLIDAE. **Gunnel Family**

Apodichthys flavidus **Penpoint gunnel**

Up to 46 cm in length, the colour of this gunnel will vary according to its diet. It is usually found hiding among seaweed in shallow waters.

AMMODYTIDAE. **Sand Lance Family**

Ammodytes hexapterus **Pacific sand lance**

Sometimes called "needlefish", the sand lance, which can be up to 20 cm in length, is commonly found in shallow waters in spring and summer where they may bury themselves in the mud. They are a plankton feeder and are, themselves, an important source of food for larger fish such as salmon and shorebirds such as blue heron. Seals also eat sand lances. Sand lances form an extremely important link in the food chain in inshore waters.

GOBIIDAE. **Goby Family**

Lepidogobius lepidus **Bay goby**

Up to 10 cm in length, the olive green bay goby is often found in tidal estuaries resting among the eel grass.

SCORPAENIDAE. **Scorpionfish and Rockfish Family**

Massive commercial harvesting of several species of the rockfish family has recently caused serious declines in their abundance. These fish, commonly marketed as "red snapper", are often long-lived fish which may be 50 years old by the time they reach which is considered an suitable size for our dinner plates. Commercial harvesting was well below 200 tons annually before 1976 but soared to over 2000 tons in the 1990s. Now, rockfish are reported to have disappeared from some areas and fishing quotas are in effect. However, it may take a long time for such long-lived species to rebuild to their original numbers. Mankind has an ominous tendency to exploit any natural food resource of the ocean to the point of extinction.

Sebastes caurinus **Copper rockfish**

This rockfish, which can up up to 50 cm in length is commonly called rock cod although it is not related to cod. It is found in the shallow waters of the Strait of Georgia. Their spines can release a mildly toxic chemical. Young are born alive in April and May. In the summer, young juveniles may be found hiding in eelgrass beds.

Sebastes maliger **Quillback rockfish**

Up to 60 cm in length, the adult rockfish is most likely found lurking on the bottom at depths of 15m.. Juveniles seek protection in shallow waters along the shore.

HEXAGRAMMIDAE. **Greenling Family**

Hexagrammos decagrammus **Kelp greenling**

This colorful fish of up to 60 cm is commonly found around rocks and kelp beds along the coast.

COTTIDAE. **Sculpin Family**

Commonly known as bullheads, these sluggish bottom dwellers may be found in both fresh and salt water.

Cottus asper **Prickly sculpin**

The prickly sculpin, up to 30 cm in length, usually is found in fresh water around the mouths of streams. Spawning, however, occurs in brackish, not fresh, water. Adults may prey on migrating salmon fry.

Enophrys bison **Buffalo sculpin**

These sculpins, with a characteristic large head, are up to 37 cm in length and are commonly found in shallow waters. The young seek refuge in eelgrass beds.

Leptocottus armatus **Pacific staghorn sculpin**

These sculpins, up to 46 cm in size but more often only a third that large, are common thoughout Burrard Inlet. They bury themselves in sand or under rocks for concealment.

Myoxocephalus polycanthocephalus **Great sculpin**

Found up to 76 cm in size, these fish normally rest on the silt-covered bottom at depths of up to 20m. Juveniles are usually found hiding in eelgrass.

Oligocottus maculosus **Tidepool sculpin**

Probably the most common intertidal fish, these small territorial sculpins range only up to 9 cm in size.

Rhamphocottus richardsoni **Grunt sculpin**

These colourful fish with an orange tail, up to 8 cm in size, are so-named because of the grunting sound made when removed from water. They are found in shallow water along rocky shores but also on sandy bottoms in deeper water.

CYCLOPTERIDAE. **Lumpfish and Snailfish Family**

Careprocus sp. **Snailfish**, species not identified

Snailfish are mostly deep water fishes except for the tidepool snailfish (*Liparis floroe*), The tidepool snailfish is up to 20 cm in length and can be found in beds of seaweed, clinging by a ventral sucker.

BOTHIDAE. **Lefteye Flounder Family**

In the flounder family, the young swim upright like normal fish but as the animal matures, the right eye migrates to the same side of the head as the left eye and the body flattens. The mature animal spends its time resting on the bottom on its right (blind) side with the left side facing up.

Citharichthys sordidus **Pacific sand dab**

Up to 40 cm in lenghth, the sand dab is commonly marketed as sole. It is fairly common at depths greater than 15m.

Citharichthys stigmaeus **Speckled sand dab**

Up to 17 cm in length, this well-camouflaged sand dab is more likely found at depths of less than 15m

PLEURONECTIDAE. **Righteye Flounder Family, i.e., Sole**

Adults of the righteye flounder family have both eyes on the right side of the body-in most instances.

Eopsetta jordani **Petrale sole**

Adults, which can be up to 70 cm in size are found on the bottom in deep water. Only juveniles are found in shallow water. Overharvesting appears to have caused a decline in the numbers of this species.

Hippoglossoides elassodon **Flathead sole**

Up to 46 cm in size, this sole can be found on muddy bottoms as shallow as 5 m but is more commonly found as deeper depths.

Inopsetta ischyra **Hybrid sole**

This sole is thought to be a hybrid between the English sole and the starry flounder. However, it is common enough to have been given proper scientific name.

Lepidopsetta bilineata **Rock sole**

Adults, up to 60 cm in size, are found at all depths. Young can often be found around wharves.

Lyopsetta exilis **Slender sole**

Up to 35 cm, this small sole can be found in shallow water.

Microstomus pacificus **Dover sole**

Adults as large as 76 cm are found at great depths as much as 1100 m. However, young fish may swim at the surface of the water for up to a year before the left eye completely migrates.

Parophrys vetulus **English sole**

Adults are up to 57 cm in size and can reside on the bottom in quite deep water. However, juveniles may often be found on tidal flats resting on the bottom. A recent study of bottom pollutants in the Burrard Inlet found that up to 75% of the English sole found in Port Moody Arm had precancerous liver lesions. Other species of sole and flounder in the Burrard Inlet are likely also affected.

Platichthys stellatus **Starry flounder**

Up to 90 cm in size, this flounder lives in shallow water and is very tolerant of brackish water. It can even be found in fresh water. It spawns in late winter or early springs. Sometimes, a specimen is found with the left side uppermost. It feeds on crabs, shrimps, worms and small fish.

Pleuronichthys decurrens **Curlfin sole**

The curlfin is one of the less abundant soles. It dwells mainly at depths of greater than 20 m.

Psettichthys melanostictus **Sand sole**

Up to 63 cm in size, the sand sole is uncommon but prefers shallow water.

Rick Simpson wishes to thank the following people for their assistance in compiling the list of fish species: Peter Caverhill, Maurice Coultier-Boisvert, Ruth Foster, John Gregson, Elaine Golds, Al Grist, Lee Harding, Wendy Hessler, Jason Hwang, John Jordan, Mark Johnson, Alan Kolok, Tim Lissamore, Elmer (Al) Rudolph, Judy Russell, Louis Rzen, Fred Smallenberg, Al Sawchuck, Gary Taccogna, Chris Tullock, Rob Way and Ian Whyte. Copies of the full report submitted by Rick Simpson to the Burke Mountain Naturalists may be obtained from the Port Moody Ecological Society, 300 loco Road, Port Moody BC, V3H 2V7 (Ph. 944-7020, Fax 937-5300).

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MAMMALS OF THE SHORELINE PARK SYSTEM

Mammals are generally more difficult to find than birds, and the identification of smaller rodents can present problems because several very similar species may inhabit the same area. The following is a list of mammals found during 1992. Two were found dead and one was identified by its tracks in the mudflats.

For more detailed information on mammals we recommend Mammals of the Canadian Wild by Adrian Forsyth.

Data collected by Christine Hanrahan, Elaine Golds, Peter Hulbert..

Canis latrans. **Coyote**. Coyotes range throughout the entire region including the Shoreline Park System. However, these intelligent and wily members of the dog family are sighted only infrequently, but large numbers of scats along the trails are good indicators of their presence.

Opportunistic feeders, Coyotes will eat whatever they can get, including berries, carrion, frogs, acorns, fish, and especially small rodents (Forsyth 1985; Burt 1964).

Coyotes can live in pairs, small packs, or even alone. Once an animal of open plains and grasslands, they now inhabit open woods (where they will den up in this region) and agricultural areas. Their flexibility allows them to adapt to a number of environments including man-made. An average of six young are born each spring.

Lutra canadensis. **River Otter**. One River Otter was observed in early summer entering the Inlet at the Old Mill. A pair of Otter were reported near Old Orchard Park also in the summer of 1992.

While superficially similar to their sea-going cousins the Sea Otter, River Otters differ in some significant ways. Although mostly aquatic, they den up on land and can, if necessary, travel long distances over land. Their preferred habitat is wooded streams and marshes, but they will use estuaries and marine environments (Forsyth 1985).

River Otters are considerably smaller than Sea Otters (which can weigh up to 99 pounds), weighing in at between 10 to 30 pounds, with the males being heavier. From a distance they are very similar to Mink and Weasels, having a long sleek body, dark brown glossy fur and narrow head.

Diet consists of fish, aquatic invertebrates, small mammals and birds, and they are known to "launch submarine attacks on floating waterbirds, and plunder birds' nests" (IBID).

River Otters are highly intelligent animals and Forsyth (1985) says that "their ingenuity is sometimes remarkable" noting that they have been observed punching holes in beaver dams "and then as the waters recede, they wade in to feast on the trapped fish and frogs."

Myotis sp. (Probably *Myotis lucifugus*). **Bat species.** Small bats were observed flying over the Inlet at dusk in mid-summer. Little Brown Bats, the most common species, prefer roost locations near water and it is probable that the observed species were these. Little Brown Bats will use abandoned buildings and hollow trees for roosting. This species consumes "seven to eight insects per minute" and can eat "billions" of insects during the summer season (Forsyth 1985). The use of bat boxes to encourage these beneficial mammals should be considered.

Odocoileus hemionus. **Black-tailed Deer (Mule Deer).** Deer use the park area, although not frequently, and are best observed early in the morning, especially in the area between Noon's Creek and Suter Brook. The woodlot near Suter and the Firehall is an important resting and hiding place for Deer. They undoubtedly travel the Noon's Creek corridor down from Eagle Mountain.

Deer are browsers, feeding largely on shrubs, twigs, grass, forbs, and less so on lichens and nuts.

They inhabit open coniferous forest, shrubby areas and river valleys (Forsyth 1985). One or two young are born every year.

Phoca vitulina. **Harbour Seal.** The log booms in the Inlet provide hauling out areas for Harbour Seals which congregate there in large numbers. Resting usually occurs at low tide while feeding is normally done during an incoming tide (Forsyth 1985). According to Peter Hulbert, old-timers recall that harbour seals hauled out on the mudflats to rest and give birth. Human intrusion has prevented this from happening in more recent times. However, the log-booms provided by the Flavelle-Cedar Mill have made an excellent substitute.

The seals can usually be observed at close range in the Inlet from a canoe. Harbour seals have been protected in British Columbia since 1970 and are becoming increasingly abundant. Salmonid enhancement projects may also be helping to sustain an increase in the seal population. Although it is not known exactly how much the seals depend upon the salmon as a food source, local residents have noticed a huge increase in seal numbers in the fall when the salmon are known to be gathering in the Inlet. In 1992 the local seal population was estimated to be about 300 at the height of the season.

Procyon lotor. **Raccoon.** Although this species was not observed, its unmistakeable prints were found on the mudflats, particularly near the boardwalk area.

This familiar 'masked bandit' is, like the Coyote, a highly adaptable and intelligent species and its willingness to try new foods means that it is not dependent on a limited food source. Forsyth (1985) says that the list of food items eaten by Raccoons "would run into the thousands". It will eat anything, from fish, eggs, reptiles, small mammals and birds to insects, grubs and fruit and berries.

The natural habitat of this animal is along wooded waterways, but it can now be found throughout suburbs and cities. Raccoons den up in hollow trees or logs (Burt 1964), or in dense thickets of vegetation such as ivy, well up in a tree. Females give birth to an average of four young in early summer.

Rattus norvegicus.? **Rat species.** One rat species, probably the introduced Norway Rat, was found dead in early fall on the north side trail near the Old Mill.

Found wherever there is human settlement, this large (7-10 inches) grayish-brown rat with a long (5-8 inches) naked tail, is colonial and lives in burrows near or under buildings. It is highly adaptable and can survive on a variety of food items.

Scapanus sp. **Mole species**. (probably the Coast Mole (*S. Orarius*). One specimen was found along the Pipeline trail. Coast Moles can occur in forested habitat and are fairly common in the region. They construct tunnels and the familiar 'mole-hills'. Diet consists of small invertebrates. This species rarely comes above ground and is active day and night (Burt, 1964).

Sorex sp. (Possibly *Sorex cinereus*). **Shrew species**. Two shrews were found dead along the north side trail near Noon's Creek and near the Old Mill. Those found were probably the Common Shrew (also called Masked Shrew), but positive identification was not made. The Common Shrew as its name suggests, is one of the more common of the many shrew species in the province. It occurs in this region, inhabiting moist margins of woods, fields and brushy thickets, habitat also found along the north trail. Like most shrews, the Common Shrew is primarily insectivorous.

Tamiasciurus douglasii. **Douglas Squirrel**. Sometimes called Chickaree. Found in small numbers in the Shoreline Park System. This small dark red squirrel with rusty underparts, prefers the coniferous woods but can also be found in the mixed woods and brushy thickets.

Several walnut trees (*Juglans sp.*) and many Hazelnut shrubs (*Corylus sp.*) provide a good supply of nuts to supplement its diet of conifer cones, ferns and fungi (Forsyth 1985).

As noted, coniferous woods are the preferred habitat of this squirrel. It nests in cavities or builds bulky nests of leaves, and may also use the abandoned nests of crows. Females have one litter a year, usually producing about four young.

Ursus americanus. **Black Bear**. These large animals frequent the surrounding hillsides and wooded areas such as Minnekhada Park. When the food supply runs out they sometimes wander down to populated areas along ravines and wooded streams such as Noon's Creek. During the 1992 study at least one bear (possibly two) was noted in several locations in the park.

Although classified as carnivores, Black Bears are really omnivorous, eating just about anything, including berries, carrion, fish, small mammals, nuts, insects and vegetation. In spring it is not uncommon to see bears grazing on fresh grass, just like cattle. They den up in the cold winters under fallen trees, in hollow stumps, or even in holes they have excavated themselves (Forsyth 1985). Females produce one or two young every other year. Preferred habitat is forest, but they will occur in marshes, swamps, thickets and on tundra (IBID).

Whales: The sighting of a gray whale and false killer whales in Port Moody Arm in April of 1993, was an exciting event and was taken by many as a sign that our waters are again becoming hospitable to large sea mammals who once made this area their home.

REPTILES AND AMPHIBIANS OF THE SHORELINE PARK SYSTEM:

PORT MOODY

The information below is derived from Gregory and Campbell (1984) and Stebbins (1985). Data collected by Jake Klaver.

Bufo boreas. **Western Toad**

Representatives of the family **Bufonidae** are the true toads. The fairly common Western Toad frequents a wide variety of habitats. It is most active at night in warmer, low-lying areas, but diurnal in the north and in higher elevations. Walks rather than hops most of the time.

Gerrhonoyus coeruleus. **Northern Alligator Lizard**

A number of Alligator Lizards inhabit the area from southwestern Canada to Panama in Central America. The only one in our area is the Northern Alligator Lizard, a shy and secretive species, hard to find. It inhabits moist, cool woods, denning up under logs, rocks and bark. Spiders and insects form the main part of its diet. Gregory and Campbell (1984) note that it is fairly sparsely distributed although it can be locally abundant.

Hyla regilla. **Pacific Tree Frog**

This tiny (1.9-5cm) frog is readily identified by its size and by the dark eyestripe. Although colour varies from green, reddish, brown, gray or black, it is usually green. According to Stebbins (1985), the tree frog "may change from dark to light phase in a few minutes but its basic hue doesn't change."

Can be found in a variety of habitats from sea level to mountains. Although it can climb using its adhesive toe pads, this species is generally a ground-dweller. Breeds in slow-moving streams in the park. This is the most commonly heard frog in the area.

Taricha granulosa. **Rough-skinned Newt**

Unlike many salamanders, the Pacific Newts (Genus *Taricha*) can be found moving about in bright daylight. The Rough-skinned Newt inhabits both woods and grassland and breeds in slow-moving streams, such as many of the small ones in the park. Hides under rocks, logs and bark.

All newts are poisonous, and while they can be handled safely, it is best not to do so, for their sake and yours. If you do pick one up, make sure you wash your hands afterwards (Stebbins 1985).

Thamnophis sirtalis **Common Garter Snake**

One of the most familiar of all reptiles, garter snakes come in a variety of colours and sizes. According to Gregory and Campbell (1984) there are three subspecies in British Columbia, all of which are so similar that they "may be difficult to tell apart". The two most likely to occur in this area are *T. s. fitchi* and *T.s. pickeringi*.

Garter snakes can be found in a wide range of habitats although they seem to be "most abundant near marshes, small lakes, rivers and ponds, and fairly humid forests " (Gregory and Campbell 1984). In the park they have been found on the shore of Noon's Creek, along the pipeline trail, and in open, sunny sections of the main trail.

Amphibians, particularly frogs, and earthworms are their main prey items, although they also feed on freshwater fish and occasionally small birds (Gregory and Campbell 1984).

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PLANTS OF THE SHORELINE PARK SYSTEM: PORT MOODY

Data collected by: Barry Gibbs, Christine Hanrahan, Huber Moore, and Terry Taylor

Herbacious Plants

Achillea millefolium	Yarrow
Actaea rubra	Baneberry
Anaphalis margaritacea	Pearly Everlasting
Angelica lucida	Seacoast Angelica
Arctium minus	Burdock
Aster subspicatus	Douglas Aster
Atriplex patula	Orache
Barbarea sp.	Wintercress sp.
Bellis perennis	English Daisy
Bidens frondosa	Beggar-ticks
Bidens cernua	Bur-marigold
Cardamine occidentalis	Western Bittercress
Cardamine oligosperma	Little Western Bittercress
Cerastium vulgatum	Mouse-ear Chickweed
Chysanthemum leucanthemum	Oxeye Daisy
Cirsium arvense	Canada Thistle
Cirsium vulgare	Bull Thistle
Clintonia uniflora	Queen's Cup
Cornus canadensis (unalaschkensis)	Bunchberry
Convolvulus sepium	Hedge Bindweed
Crepis capillaris	Smooth Hawksbeard
Dicentra formosa	Pacific Bleeding Heart
Digitalis purpurea	Foxglove
Epilobium watsonii	Watson's Willow-herb
Epipactis helleborine	Helleborine
Equisetum arvense	Common Horsetail
Equisetum telmateia	Giant Horsetail
Erigeron annuus	Annual Fleabane
Euphrasia officinalis	Eyebright
Fragaria vesca	Woods Strawberry
Fritillaria camschatcensis	Chocolate Lily
Galium triflorum	Fragrant Bedstraw
Geranium bicknellii	Bicknell's Geranium
Geum macrophyllum	Large Leaved Avens
Glaux maritima	Sea Milkwort
Glecoma hederacea	Ground Ivy

Gnaphalium uliginosum	Marsh Cudweed
Grindelia integrifolia	Gumweed
Heracleum lanatum	Cow-parsnip
Hesperis matronalis	Sweet Rocket
Hypericum perforatum	St. John's Wort
Hypochoeris radicata	Hairy Cat's Ear
Impatiens glandulifera	Policeman's Helmets
Lactuca biennis	Tall Blue Lettuce
Lactuca muralis	Wall Lettuce
Lapsana communis	Nipplewort
Lathyrus sp.	Sweet pea sp.
Lotus corniculatus	Birdsfoot-trefoil
Lychnis sp.	Lychnis sp.
Lysichitum americanum	Skunk Cabbage
Maianthemum dilatatum	False Lily-of-the-Valley
Matricaria matricarioides	Pineapple Weed
Medicago lupulina	Black Medick
Melilotus alba	White Sweet Clover
Montia Sibirica	Siberian Miner's Lettuce
Myosotis scorpioides	Forget-me-Not
Oenanthe sarmentosa	Water Parsley
Plantago lanceolata	Ribwort Plantain
Plantago major	Common Plantain
Plantago maritima	Seaside plantain
Polygonum aviculare	Doorweed
Polygonum cuspidatum	Japanese Knotweed
Polygonum hydropiperoides	Waterpepper
Polygonum persicaria	Spotted Lady's Thumb
Potentilla pacifica	Silverweed
Ranunculus acris	Tall Buttercup
Ranunculus repens	Creeping Buttercup
Rumex acetosella	Sheep Sorrel
Rumex crispus	Curly Dock
Rumex obtusifolius	Broadleaf Dock
Rumex occidentalis	Western Dock
Salicornia perennis	Saltwort
Solanum dulcamara	Climbing Nightshade
Solidago canadensis	Canada goldenrod
Sonchus arvensis	Field milk-thistle
Stachys cooleyae	Cooley's Hedge Nettle

Stellaria crispa	Crisped Starwort
Stellaria humifusa	Spreading Starwort
Stellaria media	Common Chickweed
Streptopus amplexifolius	Twisted Stalk
Tanacetum vulgare	Common Tansy
Taraxacum officinale	Common Dandelion
Tellima grandiflora	Fringecup
Tiarella trifoliata	Foamflower
Tolmiea menziesii	Youth-on-Age
Trientalis latifolia	Star Flower
Trifolium dubium	Least Hop Clover
Trifolium hybridum	Alsike Clover
Trifolium pratense	Red Clover
Trifolium repens	White Clover
Trillium ovatum	Western Trillium
Urtica dioica	Stinging Nettle
Veronica americana	American Brooklime
Veronica serpyllifolia	Thyme-leaved Speedwell
Vicia cracca	Tufted Vetch
Vinca minor	Periwinkle

Trees and Shrubs

Acer circinatum	Vine Maple
Acer macrophyllum	Big-leaf Maple
Alnus rubra	Red Alder
Amelanchier alnifolia	Saskatoon Berry
Aruncus sylvester	Goatsbeard
Betula papyrifera	Western White Birch
Betula pendula	European White Birch
Cornus stolonifera	Red Osier Dogwood
Corylus cornuta	Hazelnut
Crataegus douglasii	Black Hawthorn
Cytisus scoparius	Scotch Broom
Gaultheria shallon	Salal
Hedera helix	English Ivy
Humulus lupulus	Hop
Ilex aquifolium	English Holly
Juglans sp.	Walnut sp.

Lonicera involucrata	Black Twinberry
Mahonia nervosa	Dull Oregon Grape
Malus domestica	Domestic Apple
Malus fusca	Pacific Crabapple
Menziesia ferruginea	False Azalea
Oplopanax horridus	Devil's Club
Oemleria cerasiformis	Indian Plum
Physocarpus capitatus	Ninebark
Picea sitchensis	Sitka Spruce
Populus tremuloides	Trembling Aspen
Populus trichocarpa	Black Cottonwood
Prunus avium	Sweet Cherry
Prunus domestica	Plum
Prunus emarginata	Bitter Cherry
Pseudotsuga menziesii	Douglas Fir
Quercus robur	English Oak
Rhamnus purshiana	Cascara
Ribes sanguineum	Flowering Red Currant
Robinia pseudoacacia	Black Locust Tree
Rosa nutkana	Nootka Rose
Rubus discolor	Himalayan Blackberry
Rubus laciniatus	Evergreen Blackberry
Rubus leucodermis	Black Raspberry
Rubus parviflorus	Thimbleberry
Rubus spectabilis	Salmonberry
Rubus ursinus	Trailing Blackberry
Salix hookeriana	Hooker Willow
Salix scouleriana	Scouler willow
Sambucus racemosa	Red Elderberry
Sorbus aucuparia	European Mountain Ash
Spirea douglasii	Hardhack
Symphoricarpos albus	Snowberry
Thuja plicata	Western Red Cedar
Tsuga heterophylla	Western Hemlock
Vaccinium ovalifolium	Tall Blue Huckleberry
Vaccinium parvifolium	Red Huckleberry
Viburnum edule	Squashberry

Ferns

Athyrium filix-feminia	Lady Fern
Blechnum spicant	Deer Fern
Dryopteris assimilis	Spiny Wood Fern
Polypodium glycyrrhiza	Licorice Fern
Polystichum munitum	Sword Fern
Pteridium aquilinum	Bracken

Queen's Cup found by Elaine Golds.

Grasses, Rushes, Sedges

Agropyron repens	Couch grass
Agrostis alba	Red-top Grass
Anthoxanthum odoratum	Sweet Vernal Grass
Carex lyngbyei	Lyngby's Sedge
Carex stipata	Sawbeak Sedge
Dactylis glomerata	Orchard Grass
Echinochloa crus-galli	Barnyard Grass
Elymus mollis	Dune Grass
Festuca rubra	Fescue
Glyceria occidentalis	Western Manna Grass
Holcus lanatus	Velvet Grass
Hordeum brachyantherum	a wild barley
Juncus acuminatus	Tapered Rush
Juncus articulatus	Jointed Rush
Juncus balticus	Baltic Rush
Juncus effusus	Common Rush
Juncus tenuis	Path Rush
Lolium multiflorum	Italian Ryegrass
Lolium perenne	Perennial Ryegrass
Luzula cf. campestris	
Phalaris arundinacea	Reed Canary Grass
Phleum pratense	Timothy Grass
Poa pratensis	Kentucky Bluegrass

Scirpus cernuus	Low Club Rush
Scirpus microcarpus	Small Flowering Sedge
Trisetum cernuum	Nodding Trisetum
Triglochin maritimum	Arrowgrass
Typha latifolia	Cat-tail

Data collected by: Huber Moore and Terry Taylor.

MOSSES, LICHENS, FUNGI OF THE SHORELINE PARK SYSTEM

Moss data collected by: Dr. W. Schoefield.

Mosses

Antitrichia curtipendula
Atrichum selwynii
Atrichum undulatum
Aulacomnium androgynum

Barbula convoluta
Barbula cylindrica?
Brachythecium asperrimum
Brachythecium plumosum
Brachythecium sp.
Bryum capillare

Calliergonella cuspidata
Ceratodon purpureus
Claopodium crispifolium
Climaciaum dendroides

Dichodontium pellucidum
Dicranella heteromalla
Dicranella sp.
Dicranoweisia cirrata
Dicranum fuscescens
Dicranum scoparium
Dicranum tauricum

Eurhynchium oreganum
Eurhynchium praelongum
Grimmia apocarpa

Heterocladium macounii
Homalothecium fulgescens
Homalothecium nutallii
Hylocomium splendens
Hypnum circinale
Hypnum dieckii
Hypnum subimponens

Isothecium stoloniferum

Leucolepis acanthoneura

Orthotrichum consimile
Orthotrichum lyellii

Philonotis fontana
Plagiomnium insigne
Plagiomnium venustum
Plagiothecium laetum
Plagiothecium undulatum
Pogonatum urnigerum
Pogonatum sp.
Pohlia annotina
Polytrichum commune
Polytrichum formosum
Polytrichum juniperinum
Pseudoscleropodium purum
Pseudotaxiphyllum elegans

Rhacomitrium aciculare
Rhacomitrium canescens
Rhacomitrium occidentale
Rhacomitrium varium
Rhytidiadelphus loreus
Rhytidiadelphus squarrosus
Rhytidiadelphus triquetrus
Rhizomnium glabrescens
Rhizomnium sp.

Scleropodium obtusifolium
Sphagnum henryense

Tetraphis pellucida

Ulota obtusiuscula

Liverworts

Calypogeia azurea
Cephalozia bicuspidata

Lepidozia reptans
Lophocolea cuspidata
Lophocolea heterophylla

Pellia neesiana
Porella navicularis
Ptilidium californicum

Scapania bolanderi
Scapania uliginosa

Lichens

Candelaria concolor	a lichen
Cladonia fimbriata	a fruticose lichen
Evernia prunastri	a foliose lichen
Hypogymnia physodes	a foliose lichen
Lobaria pulmonaria	Lungwort
Ochrolechia sp.	a crustose lichen
Parmelia hygrophila	a foliose lichen
Parmeliopsis ambigua	a foliose lichen
Platismatia glauca	a foliose lichen
Usnea subfloridana	a fruiticose lichen

Fungi

Leccinum scabrum	Roughstem Boletus
Melampsora sp.	rust on populus
Melampsora epitea?	rust on willow
Pleurotus sp.	
Rhytisma arbuti	tarspot fungi on Menziesia
Rhytisma punctatum	tarspot on Acer macrophyllum

Additional data: Huber Moore and Terry Taylor; Lungwort found by Marjorie Griffin. Compiled by Heather Washburn.

BIRDS OF ROCKY POINT PARK/PORT MOODY INLET AREA

ORDER GAVIIFORMES

Family Gaviidae
Red-throated Loon *Gavia stellata*
Common Loon *Gavia immer*

ORDER PODICIPEDIFORMES

Family Podicipedidae
Pied-billed Grebe *Podilymbus podiceps*
Horned Grebe *Podiceps auritus*
Red-necked Grebe *Podiceps grisegena*
Eared Grebe *Podiceps nigricollis*
Western Grebe *Aechmophorus occidentalis*

ORDER PELECANIFORMES

Family Pelecanidae
Double-crested Cormorant *Phalacrocorax auritus*
Pelagic Cormorant *phalacrocorax pelagicus*

ORDER CICONIIFORMES

Family Ardeidae
Great Blue Heron *Ardea herodias*
Green-backed Heron *Butorides striatus*

ORDER ANSERIFORMES

Family Anatidae
Trumpeter Swan *Cygnus buccinator*
Canada Goose *Branta canadensis*
Green-winged Teal *Anas crecca*
Mallard *Anas platyrhynchos*
Northern Pintail *Anas acuta*
Northern Shoveler *Anas clypeata*
Gadwall *Anas strepera*
Eurasian Wigeon *Anas penelope*
American Wigeon *Anas americana*
Canvasback *Aythya valisineria*
Ring-necked Duck *Aythya collaris*
Greater Scaup *Aythya marila*
Lesser Scaup *Aythya affinis*
Surf Scoter *Melanitta perspicillata*
Common Goldeneye *Bucephala clangula*

Barrow's Goldeneye *Bucephala islandica*
Bufflehead *Bucephala albeola*
Hooded Merganser *Lophodytes cucullatus*
Common Merganser *Mergus merganser*
Red-breasted Merganser *Mergus serrator*

ORDER FALCONIFORMES

Family Accipitridae
Osprey *Pandion haliaetus*
Bald Eagle *Haliaeetus leucocephalus*
Sharp-shinned Hawk *Accipiter striatus*
Cooper's Hawk *Accipiter cooperii*
Red-tailed Hawk *Buteo jamaicensis*

ORDER CHARADRIIFORMES

Family Charadriidae
Killdeer *Charadrius vociferus*

Family Scolopacidae
Greater Yellowlegs *Tringa melanoleuca*
Lesser Yellowlegs *Tringa flavipes*
Spotted Sandpiper *Actitis macularia*
Western Sandpiper *Calidris mauri*
Least Sandpiper *Calidris minutilla*
Pectoral Sandpiper *Calidris melanotos*
Dunlin *Calidris alpina*
Short-billed Dowitcher *Limnodromus griseus*
Long-billed Dowitcher *Limnodromus scolopaceus*
Common Snipe *Capella gallinago*

Family Laridae
Franklin's Gull *Larus pipixcan*
Bonaparte's Gull *Larus philadelphia*
Mew Gull *Larus canus*
Ring-billed Gull *Larus delawarensis*
California Gull *Larus californicus*
Thayer's Gull *Larus thayeri*
Glaucous-winged Gull *Larus glaucescens*

ORDER COLUMBIFORMES

Family Columbidae
Rock Dove *Columba livia*
Band-tailed Pigeon *Columba fasciata*

ORDER STRIGIFORMES

Family Strigidae
Northern Saw-whet Owl *Aegolius acadicus*

ORDER APODIFORMES

Family Apodidae
Vaux's Swift *Chaetura vauxi*

Family Trochilidae
Rufous Hummingbird *Selasphorus rufus*

ORDER CORACIIFORMES

Family Alcedinidae
Belted Kingfisher *Ceryle alcyon*

ORDER PICIFORMES

Family Picidae
Red-breasted Sapsucker *Sphyrapicus ruber*
Downy Woodpecker *Picoides pubescens*
Northern Flicker *Colaptes auratus*
Pileated Woodpecker *Dryocopus pileatus*

ORDER PASSERIFORMES

Family Tyrannidae
Western Wood Pewee *Contopus sordidulus*
Willow Flycatcher *Empidonax trailii*
Hammond's Flycatcher *Empidonax hammondii*
Pacific Slope Flycatcher *Empidonax difficilis*

Family Hirundinidae
Tree Swallow *Tachycineta bicolor*
Violet-green Swallow *Tachycineta thalassina*
Barn Swallow *Hirundo rustica*

Family Corvidae
Steller's Jay *Cyanocitta stelleri*
Northwestern Crow *Corvus caurinus*
Common Raven *Corvus corax*

Family Paridae
Black-capped Chickadee *Parus atricapillus*

Family Aegithalidae
Bushtit *Psaltriparus minimus*

Family Sittidae
Red-breasted Nuthatch *Sitta canadensis*

Family Certhiidae
Brown Creeper *Certhia americana*

Family Troglodytidae
Bewick's Wren *Thryomanes bewickii*
Winter Wren *Troglodytes troglodytes*

Family Cinclidae
American Dipper *Cinclus mexicanus*

Family Muscicapidae
Golden-crowned Kinglet *Regulus satrapa*
Ruby-crowned Kinglet *Regulus calendula*
Swainson's Thrush *Catharus ustulatus*
American Robin *Turdus migratorius*
Varied Thrush *Ixoreus naevius*

Family Motacillidae
American Pipit *Anthus spinoletta*

Family Bombycillidae
Cedar Waxwing *Bombycilla garrula*

Family Laniidae
Northern Shrike *Lanius excubitor*

Family Sturnidae
European Starling *Sturnus vulgaris*

Family Vireonidae
Warbling Vireo *Vireo gilvus*
Red-eyed Vireo *Vireo olivaceus*

Family Emberizidae
Orange-crowned Warbler *Vermivora celata*
Yellow Warbler *Dendroica petechia*
Yellow-rumped Warbler *Dendroica coronata*
Black-throated Gray Warbler *Dendroica nigrescens*
MacGillivray's Warbler *Opopomis tolmiei*
Common Yellowthroat *Geothlypis trichas*
Wilson's Warbler *Wilsonia pusilla*
Western Tanager *Piranga ludoviciana*

Black-headed Grosbeak *Pheuticus melanocephalus*
Rufous-sided Towhee *Pipilo erythrophthalmus*
Savannah Sparrow *Passerculus sandwichensis*
Fox Sparrow *Passerella iliaca*
Song Sparrow *Melospiza melodia*
Lincoln's Sparrow *Melospiza lincolnii*
Golden-crowned Sparrow *Zonotrichia atricapilla*
White-crowned Sparrow *Zonotrichia leucophrys*
Dark-eyed Junco *Junco hyemalis*
Brown-headed Cowbird *Molothrus ater*

Family Fringillidae
Purple Finch *Carpodacus purpureus*
House Finch *Carpodacus mexicanus*
Red Crossbill *Loxia curvirostra*
Pine Siskin *Carduelis pinus*
American Goldfinch *Carduelis tristis*
Evening Grosbeak *Coccothraustes vespertinus*

Data collected by: Christine Hanrahan, with additional sightings by Tom Hanrahan and Jeff Rosen.

BIRDS OF THE SHORELINE PARK SYSTEM: PORT MOODY
1992 OBSERVATIONS

Red-throated Loon
Common Loon

Pied-billed Grebe
Horned Grebe
Red-necked Grebe
Eared Grebe
Western Grebe

Double-crested Cormorant
Pelagic Cormorant

Great Blue Heron
Green-backed Heron

Trumpeter Swan

Canada Goose

Green-winged Teal
Mallard
Northern Pintail
Northern Shoveler
Gadwall
Eurasian Wigeon
American Wigeon
Canvasback
Ring-necked Duck
Greater Scaup
Lesser Scaup
Surf Scoter
Common Goldeneye
Barrow's Goldeneye
Bufflehead
Hooded Merganser
Common Merganser
Red-breasted Merganser

Osprey
Bald Eagle
Sharp-shinned Hawk
Cooper's Hawk
Red-tailed Hawk

Killdeer
Steller's Jay
Northwestern Crow

Greater Yellowlegs
Lesser Yellowlegs
Spotted Sandpiper
Western Sandpiper
Least Sandpiper
Pectoral Sandpiper
Dunlin
Short-billed Dowitcher
Long-billed Dowitcher
Common Snipe

Franklin's Gull
Bonaparte's Gull
Mew Gull
Ring-billed Gull
California Gull
Thayer's Gull
Glaucous-winged Gull

Rock Dove
Band-tailed Pigeon

Northern Saw-whet Owl

Vaux's Swift

Rufous Hummingbird

Belted Kingfisher

Red-breasted Sapsucker
Downy Woodpecker
Northern Flicker
Pileated Woodpecker

Western Wood Pewee
Willow Flycatcher
Hammond's Flycatcher
Pacific Slope Flycatcher

Tree Swallow
Violet-green Swallow
Barn Swallow

Common Raven

Black-capped Chickadee

Bushtit

Red-breasted Nuthatch

Brown Creeper

Bewick's Wren
Winter Wren

American Dipper

Golden-crowned Kinglet
Ruby-crowned Kinglet
Swainson's Thrush
American Robin
Varied Thrush
American Pipit

Cedar Waxwing

Northern Shrike

European Starling

Warbling Vireo
Red-eyed Vireo

Orange-crowned Warbler
Yellow Warbler
Yellow-rumped Warbler
Black-throated Gray Warbler
MacGillivray's Warbler
Common Yellowthroat
Wilson's Warbler

Western Tanager

Black-headed Grosbeak

Rufous-sided Towhee
Savannah Sparrow
Fox Sparrow
Song Sparrow
Lincoln's Sparrow
Golden-crowned Sparrow
White-crowned Sparrow
Dark-eyed Junco

Brown-headed Cowbird

Purple Finch
House Finch
Red Crossbill
Pine Siskin
American Goldfinch
Evening Grosbeak

BIRDS OF THE SHORELINE PARK SYSTEM: PORT MOODY
COMBINED HISTORICAL/CURRENT LIST

The following list represents all species known to have been recorded in the Inlet area. In addition to species found during the 1992 Inventory, Christmas Bird Count data, published reports and observations from individuals prior to 1992 are included. The following key identifies the sources for records other than those collected in 1992.

AP - Allan Poynter
CBC - Christmas Bird Count data, 1984-1991.
LIP - Local Initiatives Program, Burrard Inlet Resource Survey (1972).
WW - Wayne Weber

Red-throated Loon
Common Loon

Pied-billed Grebe
Horned Grebe
Red-necked Grebe
Eared Grebe
Western Grebe

Double-crested Cormorant
Pelagic Cormorant

Great Blue Heron
Green-backed Heron

Trumpeter Swan

Canada Goose

Wood Duck **CBC, LIP**
Green-winged Teal
Mallard
Northern Pintail
Blue-winged Teal **WW**
Cinnamon Teal **WW, LIP**
Northern Shoveler
Gadwall
Eurasian Wigeon
American Wigeon
Canvasback
Ring-necked Duck
Greater Scaup
Lesser Scaup
Surf Scoter
White-winged Scoter **LIP**
Common Goldeneye
Barrow's Goldeneye
Bufflehead
Hooded Merganser
Common Merganser
Red-breasted Merganser
Ruddy Duck **CBC**

Osprey
Bald Eagle
Sharp-shinned Hawk
Cooper's Hawk
Red-tailed Hawk

Merlin **CBC**

Ring-necked Pheasant **LIP**

American Coot **CBC, LIP**

Killdeer
Greater Yellowlegs
Lesser Yellowlegs
Spotted Sandpiper
Sanderling **LIP**
Western Sandpiper
Least Sandpiper
Pectoral Sandpiper
Dunlin
Short-billed Dowitcher
Long-billed Dowitcher
Common Snipe

Franklin's Gull
Bonaparte's Gull
Mew Gull
Ring-billed Gull
California Gull
Herring Gull **CBC, LIP**

Thayer's Gull
Glaucous-winged Gull

Rock Dove
Band-tailed Pigeon

Northern Saw-whet Owl

Vaux's Swift

Rufous Hummingbird

Belted Kingfisher

Red-breasted Sapsucker
Downy Woodpecker
Northern Flicker
Pileated Woodpecker

Western Wood Pewee
Willow Flycatcher
Hammond's Flycatcher
Pacific Slope Flycatcher

Purple Martin **AP**
Tree Swallow
Violet-green Swallow
Barn Swallow

Steller's Jay
Northwestern Crow
Common Raven

Black-capped Chickadee
Chestnut-backed Chickadee **CBC**

Bushtit

Red-breasted Nuthatch

Brown Creeper

Bewick's Wren
Winter Wren

American Dipper

Golden-crowned Kinglet
Ruby-crowned Kinglet

Swainson's Thrush
American Robin
Varied Thrush

American Pipit

Cedar Waxwing

European Starling

Warbling Vireo
Red-eyed Vireo

Orange-crowned Warbler
Yellow Warbler
Yellow-rumped Warbler
Black-throated Gray Warbler
Townsend's Warbler **LIP**
MacGillivray's Warbler
Common Yellowthroat
Wilson's Warbler

Western Tanager

Black-headed Grosbeak

Rufous-sided Towhee
Savannah Sparrow
Fox Sparrow
Song Sparrow
Lincoln's Sparrow
Golden-crowned Sparrow
White-crowned Sparrow
Dark-eyed Junco

Red-winged Blackbird **CBC, LIP**
Brewer's Blackbird **CBC**
Brown-headed Cowbird

Purple Finch
House Finch
Red Crossbill
Pine Siskin
American Goldfinch
Evening Grosbeak

House Sparrow **CBC**

TOTAL: 131 SPECIES

* * *

LIST OF FISH SPECIES FOUND IN PORT MOODY ARM OF THE BURRARD INLET

Contributed by Rick Simpson

This list of fish species was compiled from reports provided by (1) Lee Harding, Environment Canada (Regional Data Report DR 87-03, and DFO/MOEP Fish Habitat Inventory and Information Program Stream Information Survey); (2) Jason Hwang, Fisheries and Ocean Canada (DFO April 1992, Two Beach Seines, Port Moody Arm); (3) Judy Russell, Reed Point Marina (Official Catch Records of the 8th Annual Fishing Derby); (4) Ken Berry, Westcoast Energy (Westcoast Energy, Land, Right of Way and Environmental Files, May 19, 1992); (5) Wilda Booth and Bill Harris, Pacific Coast Terminals (Environmental Evaluation for an Expansion of the Pacific Coast Terminals at Port Moody); (6) Mark Johnson, Fisheries and Ocean Canada (Log Book, Electroshocking Noons Creek, November, 1992).

Class Chondrichthyes (Cartilaginous Fishes)

SQUALIDAE. **Shark Family**
Squalas acanthias **Spiny dogfish**

Class Osteichthyes (Bony Fishes)

CLUPEIDAE. **Herring Family**
Clupea harengus pallasi **Pacific herring**

ENGRAULIDAE. **Anchovy Family**
Engraulis mordax. **Northern anchovy**

SALMONIDAE. **Salmon and Char Family**
Oncorhynchus gorbuscha. **Pink salmon**
Oncorhynchus keta. **Chum salmon**
Oncorhynchus kisutch. **Coho salmon**
Oncorhynchus nerka **Sockeye salmon**
Oncorhynchus tashawytscha **Chinook salmon**
Oncorhynchus clarki clarki **Coastal cutthroat trout**
Oncorhynchus mykiss **Steelhead/Rainbow trout**

OSMERIDAE. **Smelt Family**
Hypomesus pretiosus pretiosus **Surf smelt**
Spirinchus starksi **Night smelt**

BATRACHOIDIDAE. **Toadfish Family**
Porichthys notatus **Plainfin midshipman**

GADIDAE. **Codfish Family**
Gadus macrocephaus **Pacific cod**
Merluccius productus **Pacific hake**
Theragra chalcogramma **Walleye pollock**

ZOARCIDAE. **Eelpout Family**
Lycodopsis pacifica **Blackbelly eelpout**

AULORHYNCHIDAE. **Tube-snout Family**
Aulorhynchus flavidus **Tube-snout**

GASTEROSTEIDAE. **Stickleback Family**
Gasterosteus aculeatus **Threespine stickleback)**

EMBIOTOCIDAE. **Surfperch Family**
Cymatogaster aggregata **Shiner perch**
Embiotoca lateralis **Striped seaperch**
Rhacochilus vacca **Pile perch**

STICHAEIDAE. **Prickleback Family**
Xiphister atropurpureus **Black prickleback**

PHOLIDAE. **Gunnel Family**
Apodichthys flavidus **Penpoint gunnel**

AMMODYTIDAE. **Sand Lance Family**
Ammodytes hexapterus **Pacific sand lance**

GOBIIDAE. **Goby Family**
Lepidogobius lepidus **Bay goby**

SCORPAENIDAE. **Scorpion fish Family**
Sebastes caurinus **Copper rockfish**
Sebastes maliger **Quillback rockfish**

HEXAGRAMMIDAE. **Greenling Family**
Hexagrammos decagrammus **Kelp greenling**

COTTIDAE. **Sculpin Family**
Cottus asper **Prickly sculpin**
Enophrys bison **Buffalo sculpin**
Leptocottus armatus **Pacific staghorn sculpin**
Myoxocephalus polycanthocephalus **Great sculpin**
Oligocottus maculosus **Tidepool sculpin**
Rhamphocottus richardsoni **Grunt sculpin**

CYCLOPTERIDAE. **Lumpfish and Smailfish Family**
Careprocus sp. **Snailfish, species not identified**

BOTHIDAE. **Lefteye Flounder Family**

Citharichthys sordidus **Pacific sand dab**
Citharichthys stigmaeus **Speckled sand dab**

PLEURONECTIDAE. **Righteye Flounder Family, i.e., Sole**

Eopsetta jordani **Petrale sole**
Hippoglossoides elassodon **Flathead sole**
Inopsetta ischyra **Hybrid sole**
Lepidopsetta bilineata **Rock sole**
Lyopsetta exilis **Slender sole**
Microstomus pacificus **Dover sole**
Parophrys vetulus **English sole**
Platichthys stellatus **Starry flounder**
Pleuronichthys decurrens **Curlfin sole**
Psettichthys melanostictus **Sand sole**

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Copies of the full report submitted by Rick Simpson to the Burke Mountain Naturalists may be obtained from the Port Moody Ecological Society, 300 Ioco Road, Port Moody BC, V3H 2V7 (Ph. 944-7020, Fax 937-5300).

INSECTS AND SPIDERS

The following is a list of insects found in drift samples done in Mossom Creek. The data collection was performed by Louis Rzen and Tim Lissimore of the Burrard Inlet Marine Enhancement Society (BIMES). Louis notes that not all of the insects listed are aquatic; some may have fallen in and others may have been trapped on the surface. He feels that although the drift samples were done in nearby Mossom Creek, most of the insects would be found in Noon's Creek.

Class	Order	Family
Arthropoda		
Amphipoda	Sow Bug	
Chelicerata		
Arachnida	Aransae	
	(Non-Aransae)	Aranea
		(Ticks and miscellaneous)
Mandibulata		
Insecta	Coleoptera	Ciidae
		Pselaphidae
	Colleombola	Entomobryidae
		Isotomidae
		Onychiuridae
		Poduridae
		Sminthuridae
	Diptera	Blephariceridae
		Cecidomyiidae
		Chironomidae
		Culicidae
		Dixidae
		Emphididae
		Mycetophilidae
		Phoridae
		Psychodidae
		Tanyderidae
		Tipulidae
		(Pupae)
	Ephemeroptera	Baetidae
		Ephemerellidae
		Heptageniidae
		Leptophlebiidae
		(Larvae: unknown)
	Hemiptera	Ortheziidae
	Homoptera	Aphidae

	Coccoidae
Hymenoptera	Formicidae
Lepidoptera	(Caterpillar: unknown)
Plectoptera	Leuctridae
	Perlidae
	Perlodidae
	Tainiopterigidae
	(juvenile: unknown)
Thysanoptera	Phlaeothripidae
Tricoptera	Hydroptilidae
	Leptoceridae
	Limnephilidae
	Polycentropodidae
	Ryacophilidae