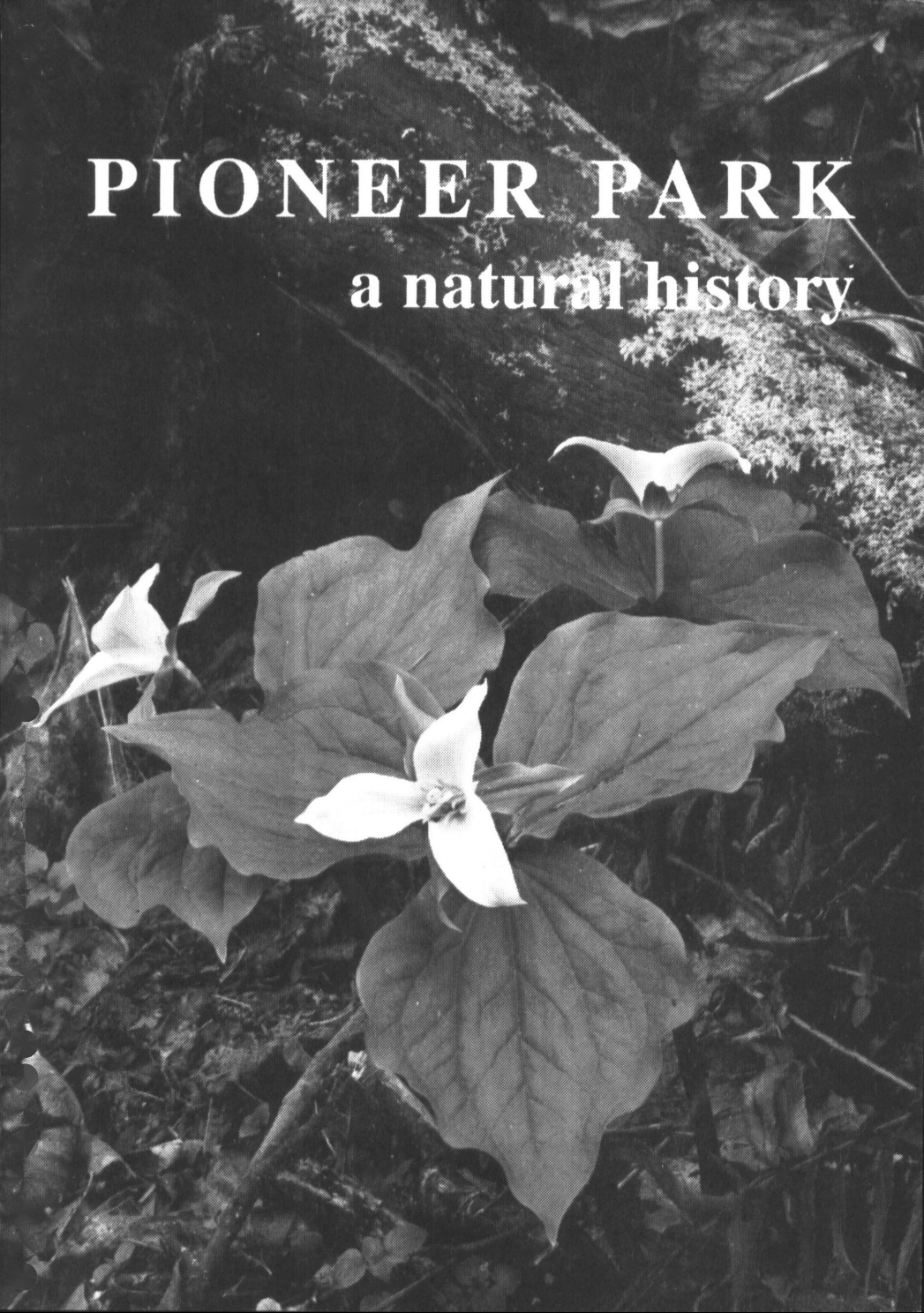

PIONEER PARK

a natural history

PIONEER PARK
a natural history

MERCER ISLAND PARKS AND RECREATION DEPARTMENT

1990

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CREDITS:

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Edited by Mary Kenady

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Preface

This book isn't just about 120 acres we call Pioneer Park. It's about us. Because Pioneer Park is us: our property, our lifestyle, our heritage.

When you read about Pioneer Park's soils, terrain, vegetation, birds and animals, you're learning the characteristics of your own property—or, what your land would be like had it not been cleared to build your home.

Pioneer Park is the last sizeable chunk of Mercer Island that looks, feels, and smells like the Mercer Island found by the early settlers 75 to 100 years ago. Tramp through those woods, let your eyes climb the trunks of the 100-foot Douglas fir and cedar trees, and cast your gaze downward through the Oregon grape and salal at the mosses, ferns and young trees growing out of the rotting stumps and windfalls. Here you have the living forest, at work.

Pioneer Park consists of three 40-acre woodlands on the northwest, northeast and southeast corners of the intersection of Island Crest Way and Southeast 68th Street. It is located in the south-central portion of Mercer Island: an hourglass-shaped land mass, five miles long and from one to three miles wide, that rises as high as 350 feet above the surrounding Lake Washington. Mercer Island, an incorporated city of almost 22,000, is only 15 to 20 minutes from two major urban centers: Seattle to the west, and Bellevue to the east.

Privately owned until 1931, when Mrs. Maud Walker-Ames willed the property to the University of Washington, Pioneer Park like the rest of Mercer Island had been logged of most of its virgin timber before the turn of the century. While a few old-growth trees have been identified, most of the park's tall trees, some by now more than 100 feet high are second-growth cedar, Douglas fir and hemlock.

Upon Mercer Island's incorporation in 1960, the new government and its citizens began planning for a park system. Learning the land then known as "the University properties" was available, Mercer Islanders in 1964 passed a bond issue to buy the property.

Citizens took a hand in 1969, when it appeared imminent that 80 acres would be cleared for a municipal golf course. On an advisory ballot, 64 percent of 6,000 voters—a whopping turnout for a by-election—opted to keep the park natural, virtually as it had been since the last century.

The issue of preservation or development at Pioneer Park resurfaces regularly, most recently early this year when some citizens asked the city for a 40-acre golf course on Pioneer Park. At this time, the issue of golf facilities for Mercer Island is again under study.

The park thus far has been touched but lightly, with trails around the periphery and through each section. You may walk the trails or ride horseback on certain trails so designated, but no bicycles or motorized vehicles are permitted. In a 1983 park bond issue, $100,000 was earmarked for Pioneer Park, to include trail improvements, signs, benches and interpretive material.

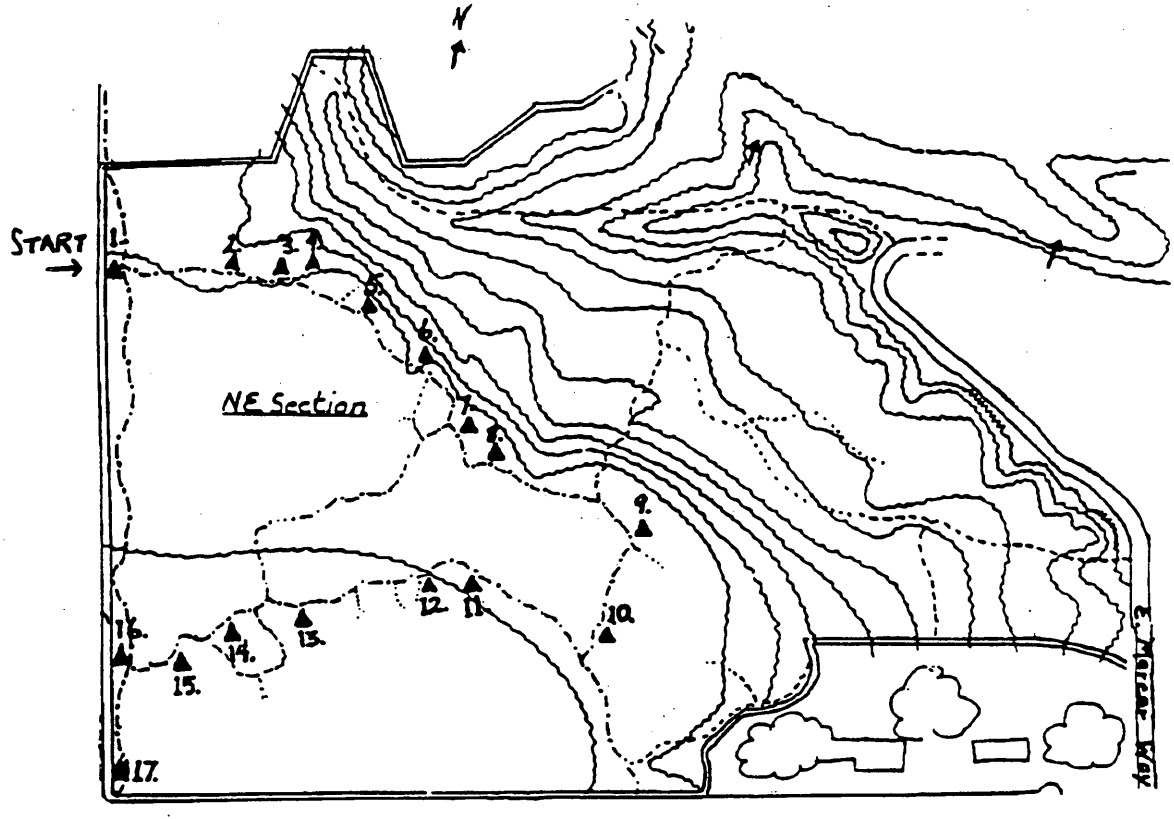
During the 1969 campaign for preserving the park, preservation's proponents discovered the public knew very little about their parkland. In 1970, the Mercer Island Park Board delegated a study to a committee of volunteers from the Mercer Island Environmental Council. Their work became the first edition of *The Natural History of Pioneer Park*, completed in 1972. Only a few hundred copies were printed; they sold out shortly after appearing at the community's book store.

Because all citizens on Mercer Island deserve to know Pioneer Park—and thereby their own land—a new group of old volunteers, most of those who brought out the original book, have revised and updated *The Natural History of Pioneer Park* for this second edition.

The book contains authoritative studies of the soils, topography, plants, fungi, birds, and animals of Pioneer Park. It provides illustrations, an orienteering map of the park, and an additional map, of the nature trail in the northeast section.

I recommend you first pore through these studies, and then take the book along on hikes through the park. It will provide a new dimension of knowledge to your path, through the park and throughout your life on Mercer Island.

Peggy Reynolds



PIONEER PARK – guide to A Walk Through the N·E Section
— Contour intervals = 5 meters.

A WALK IN PIONEER PARK

by Laura Dassow
and Mary Kenady

The purpose of this chapter is to allow Pioneer Park users to follow a numbered trail in the Northeast Section of the park, using the notes given here which are in sequence if the trail is followed from the farthest north entrance on Island Crest Way (see map).

1. The Forest Edge

The forest edge is like the wall of a fortress, protecting the inside by absorbing the impact of outside forces, such as weather. The front of dense vegetation springs up in response to light. This fortress wall of foliage is massed to capture as much light as possible. The plants are able to use strong light and to withstand quite severe temperature changes as well as to tolerate crowding. Each plant species has slightly different demands, expressed in its unique form and size, so many different species can fit themselves into the limited space available. We see a spectrum of plants: elderberry, hazel, blackberry, nettle, and dozens more, all growing together.

Take a look at the forest as a whole. It is a dynamic and changing community which looks different now from the way it looked twenty years ago, and will change again in the coming twenty years. Notice the patterns of growth—the canopy of mature trees, the understory of smaller and younger trees, which someday may grow to replace taller ones, and the tall shrubs which reach for whatever light escapes the trees above.

2. Behind the Walls

Behind the fortress wall of the forest, the inner character begins to emerge. The species clustered at the edge are here scattered across the forest floor, massed only where a break in the canopy of trees allows more light to enter. In the shelter of the deeper forest, shade-tolerant plants come into their own. Vanilla leaf and trillium

suffer if exposed to strong sunlight, and Oregon grape prefers forest shade.

Another characteristic shared by the plants along this part of the trail is a preference for moist places. Here, at the lower end of a long slope, drain-water collects, keeping the soil moist. Water is important to plants—they are composed largely of water, and what is continually lost by evaporation must be replaced. Also, the nutrients that plants require cannot be used by plants without the medium of water transport.

3. Natural Clearing

A very large big-leaf maple has created a subcommunity under its large spreading leaves. This is a phenomenon more notable 15 years ago than it is now, as time, good moist soil, and perhaps some natural pruning of the maple to let in more light have allowed a small thicket of elderberry to begin taking over the clearing. As the elderberry grows, small plants such as the vanilla leaf and trillium are crowded and their habitat is reduced.

One can still see the general pattern of the interior of the park here. Most of the area was logged about 65 years ago, leaving stumps scattered throughout the park. One such is the large Douglas fir stump near the trail, crowned with a healthy head of salal. Clearing the land opened it to new plant colonizers and disrupted the uniform pattern of the forest by leaving some spots undisturbed, piling slash in others and burning in still others. But the same forces which gave the original forest its pattern are working to restore it. Succession, the process which guarantees that one species of plant or one community will not normally continue indefinitely in any one spot, will bring a series of communities of plants to the park again, with the final great hemlock-cedar groves to come in some far future time.

4. Forces of Nature

A fine natural stand of young Douglas firs grows throughout the area here, especially to the south. Where trees grow in crowded conditions (as in the southeast section of the park) the competition

is so keen that they fight one another almost to a standstill, and you will see what is essentially a stagnant stand of trees. Eventually, however, some of the trees will fall, allowing more light to others, and the forest will continue to grow and mature, as we see here.

5. Beginning of Ravine Edge

Some time ago there was a tree house here, built by children who are adults now. Some remains of the tree house can be seen if you look up the trunks of the trees just to your left.

The slopes on the left here are becoming steeper as we get closer to the ravine, where flows the only year-around stream in the park.

The world of the ravine bottom is quite distinct from that of the upper forest, and it should be visited in a separate trip, going in from East Mercer Way, to view its moist, cool environment. Many wet-site plants grow only here: the skunk cabbage, rushes and horsetails and devil's club. Birds find a natural sanctuary here and the spot where we are now is a good place to watch for them as they fly back and forth below and to the trees above. Many native birds find protection in these deep woods—especially the woods-loving birds. Watch year-round for the pileated woodpecker, winter wren and song sparrow. Listen, in summer, for the rising trill of the Swainson's thrush. In spring and fall, migratory birds are attracted by the water and by the abundant fruits and seeds of elderberry, huckleberry, maple, Douglas fir, and other plants.

This stream exists mainly because of the layers of hardpan in the hillsides above. Ground water accumulates above and comes out in various springs to feed the ravine watercourse. The soils of the steep hillsides are extremely unstable and subject to erosion. Plants growing there help to keep the soil in place.

6. Continuation of Ravine

Looking outward and downward here, you can see huckleberry growing on a stump. Logs, stumps and even snags often provide rootholds for woodland shrubs, especially huckleberry and salal. Birds and mammals eat the berries and deposit the seeds, sometimes

high above the forest floor.

Green plants cannot take nutrients directly from dead wood. The nutrients are "trapped" in the dead trees, locked into complex molecules. The vital function of the agents of decay is to break down the cells into simpler elements. The agents of decay—water, bacteria, fungi, insects, worms—make the elements available as food to the roots of the living plants.

Decomposers most noticed are the fungi, which come in a variety of forms and shapes, from the perennial bracket fungus to the short-lived gilled mushrooms. Watch carefully for mushrooms, especially in the fall after the first heavy rains. They may appear anywhere, but not for long. The mushroom you see is the ephemeral above ground form that grows from the masses of mycelia existing underground. The body above ground exists only to release spores to create new mycelia and mushrooms. Fungi have no chlorophyll and cannot photosynthesize. They take their food by secreting enzymes which dissolve the material around them, then absorbing through their cell walls the products they need—a sort of external digestive system.

7. Twin Cedar Overlook

Here near the rim of the ravine is an interesting red cedar, probably formed when a single tree was bent over to the ground and two of its upper branches took over the job of being the treetop, or leader. The ground around this cedar is quite bare, indicating a heavy use of this part of the park.

The unique ravine ecosystem is apparent from this point. The upper slopes and their characteristic plants intergrade with those at the bottom. The trees vary the least here: mixed stands of maple, hemlock, red cedar, Douglas fir and alder grow throughout. Several old trees in the ravine bottom escaped logging and stand as relics of the virgin forest. The stumps of truly large old cedars show this species once flourished here and likely will again if the forest were left to proceed naturally.

One large stump below serves as a "nursery" tree for a hemlock,

which grows out of it. Hemlock seeds often take root in logs and snags, but if the roots do not reach the soil before their support rots away, the trees will not reach maturity.

The unstable slope supports quantities of sword fern, which likes to grow where seepage brings both water and nutrients from above. Ferns are found in moist, shady places usually, for a young fern requires moisture at just the right time if it is to grow. As they reproduce by tiny, light spores instead of seeds, ferns are found on tree trunks, rock walls, and other places where seeds would seldom lodge.

8. Ravine Overlook, continued

Curious root patterns of the tree at the left here show that this hemlock began its life on a nurse log, which has since fallen away to expose the twisting, groping roots.

Below, devil's club grows in spiny profusion. Avoid this plant at all costs, as it can not only be painful but sometimes causes itching and burning of the skin to those who are allergic to its spines.

Delicate green layers of algae are sometimes apparent on the trunks of trees here. This is a primitive plant sometimes seen in deep woods. Tree bark has special breathing pores through which oxygen and carbon dioxide pass, leaving powdery deposits of dead cells. Often these deposits are washed off by rain, but where the trunk is sheltered, a minute green alga is able to live on the bark, using the mineral residue from the dead cells as food. Algae, unlike fungi, are green plants which need some minimal amount of light to survive. Algae thrive best in the sea or in lakes, and are not so successful on land—those that live in the woods are weak and minor, occupying a very small niche where there is scant competition.

9. Battered Maple

A big maple below the trail shows signs of heavy pruning—perhaps by wind, or heavy snow loads, or, since maple fractures easily, limbs breaking from their own weight. The crown of an old maple often holds a large dead branch or two which may come

crashing down in a storm. High winds are detrimental to single trees, or to a few left of a large stand when logging is finished. Left together in a large stand, they offer one another protection, as well as becoming a wind barrier for other, smaller plants.

Mild winds, of course, can have a beneficial effect. They prune out small dead branches and they help to pollinate the inconspicuous flowers of the forest trees in spring and disperse the seed in fall for further forestation.

From this spot there is another panoramic view of the second-growth forest. By now you are probably aware of certain patterns of growth: below the towering canopy of mature trees lives a varied selection of understory species including some young trees destined to reach the canopy, and others—such as dogwood—which will never grow as tall. A layer of tall shrubs, such as elderberry and ocean spray, takes its place below the trees, and underfoot grows the lowest layer, the ferns, Oregon grape and herbs. This principle of "layering" allows a maximum number of species to use the energy of the sun, and the entire ecosystem to be more productive.

10. Second-Growth Fir-Hemlock Forest

A change in the character of the forest, barely perceptible in this area, becomes more obvious as one follows the trail. The difference is most definite in the undergrowth, as salal begins to displace the sword fern. Trees change slightly, too, the emphasis shifting from maple and alder to Douglas fir and hemlock, with madrone and willow increasingly evident.

What causes the change? It is certainly not a climatic difference in such a short distance—all areas here receive much the same rainfall. Rather, it is the soil. Alderwood soils are replaced in this small corner of the park by more porous, sandy soils, which the water drains through more rapidly, taking nutrients along with it. This results in heavy competition for the available moisture and an edge is gained by those plants with deeper taproots or greater resistance to drought.

Competition is a relationship which occurs when the environment

does not supply all the needs of all the population (as of course it never can). Each individual and species is, to some extent, disadvantaged by the close presence of other individuals. We talk of a "limiting factor," which in this case is water. One element necessary to the entire population is in short supply—moisture—and all are competing for the amounts that are necessary to their survival. In a particularly moist spring many small seedlings may sprout that will never receive enough water later in the year to grow, and will be found withered and dead. This happens frequently with maples, which are prolific seeders.

11. Forest Clearing

Here and there in the woods a break in the canopy of trees allows full sunlight to come through and, freed from the dominion of large trees, numbers of smaller plants respond eagerly to the light. Many of the plants here are the very ones missing from the ravine—ocean spray, salal, bracken fern—indicating a drier environment. Surrounding and scattered through the clearing are smaller, second-growth trees—dogwood, willow, Douglas fir and madrone—eating away at the clearing in a process that will result in its complete disappearance before many years have passed.

The layers, or levels of plant growth, are clearly revealed. In the absence of the tall canopy the large shrubs crowd together, completely shading out the smaller herbs, which are displaced to the more open forest or to holes in the thick shrub cover. The smaller, faster-growing understory trees are the first to advance into the clearing; as the shrubs thin out under their shade, larger species will move in and grow to shade out the understory trees unless they, like the dogwood, can tolerate a lack of light.

Clearings like these provide an abundance of food for birds and small mammals, which are attracted to the fruits of salal, hazelnut bushes, blackberry, dogwood and madrone. Early in the year the air here will be humming with insects, brought out by the warmth of the sun and the richness of blossoms. Most flowering plants depend upon insects to spread pollen and thus fertilize the blossoms. Without

insects, hard times would fall upon birds and blackberry pickers.

12. Brush Field in Transition

Here not more than 15 years ago was a very clear opening with predominantly below-the-eye-level species. Today it is changing rapidly. Nettles are growing where they would have been hard put to survive only a few years back. The soil is still that sandy Indianola stuff, but over these intervening years more organic matter has been added to the soil as annual plants die back and needles and leaves from the trees fall. This has improved the quality of the soil. Nettles are lovers of good soil, and if they are not exactly the friendliest of plants, they do indicate the presence of organic matter and good growing material below.

As the trees above have closed in the canopy; less sun and more shade have also been factors in the now-changing environment. Again, we see the process of succession in the growth and evolution of the park.

13. Madronas

The Pacific madrone is found only in a narrow strip from southern British Columbia to northern California. Many of our local trees have taken on a scraggly, dark look. Compared to the glowing reddish bark and shiny leaves of a healthy tree, as seen on some of the San Juan Islands, ours are poor examples of their kind.

The Pacific madrone has a hard time of it, trying to survive encroaching disease. This is most apparent among the trees on Mercer Island. To the left of the trail is a surviving specimen, fighting to exist in the forest of other species, very much an isolated individual. Some trees are more resistant to disease than others. Perhaps at some time a few madronas will occur that are disease-resistant and produce a more hardy strain than now exists. This has happened to some extent with eastern elms and the virulent Dutch elm disease.

Notice how the salal, seen in the lower part of this section as a small, straggling bush, here grows into a tall, vigorous shrub virtually

smothering the forest floor. Salal is possibly our most abundant shrub, and its glossy evergreen leaves can be found nearly everywhere on the west side of the mountains at lower altitudes. The Indians used the dark, mealy berries for food, but today they are less popular with people—more popular with birds and other wildlife. Some salal is cut and shipped to florists across the country.

14. Old Soil Pit and Mountain Ash

Off to the left here was once a very visible soil pit where this Indianola type soil could be viewed. Shrubs have grown in over the pit so it is now a concealed trap to anyone who ventures into the brush. What could be seen was a thin layer of organic matter over layers of sand. Soil is rock, rock disintegrated by weathering, water, wind, et cetera, and the action of primitive plants. The top layer that could be seen here is reddish-brown, 9-12" deep, with the second "horizon" a yellowish sandy loam, mixed with some gravel. Much gravel is found in the deeper sublayers. The gravel-clay parent material was ground and dumped thousands of years ago by a glacier which also left rocks and boulders scattered throughout the area.

To the side of the soil pit is a tree rather rare here in the park, the mountain ash or rowan tree. This is not a native tree, but was once imported, probably as seed, from its native England. Birds are fond of the dark red-orange berries that form in late summer and have scattered seed of this tree throughout the Northwest. Other accidental species may be found throughout the park as well—especially small hollies and cotoneaster bushes, both of which are easily spread by birds.

15. Decomposing Log

Of all the soil layers, the most vital is the thin cover of topsoil built up very slowly by the decay of vegetable matter. Though in moist, temperate regions the rate of decay generally keeps up with the fall of litter, it takes about 300 years to build a single inch of new topsoil—a layer easily exposed and damaged.

Topsoil-building is continuous, going on quietly all around you.

Logs especially, such as the one before you, take a long time to decompose. It is a well-ordered process with a series of definite stages. At this stage the wood is still fairly well preserved, but the forces of decomposition are relentless and will eventually reduce it.

A weak and dying tree, or a healthy tree newly felled, is soon set upon by insects which burrow and chew their way beneath the bark and through the wood. Woodpeckers, chipping away at the surface, open it to further agents of decay. More insects find their way inside; the white mycelia of fungi spread through the tree; bacteria and micro-organisms do their own dismantling business. One fungus may follow another, each taking something different, further weakening the wood. Water percolates through and dissolves some substances; other plants take root and break up the soft mulch. Finally the log before you will have melted away into the dirt. Its substance will support generations of hemlock, salal and Oregon grape.

16. Natural Pruning

These trees are healthy, though all the dead lower limbs are misleading. As the upper branches filled out and took the light, the leaves of the lower branches had ever more difficulty maintaining themselves. Eventually these unproductive limbs died, leaving the water and nutrients to flow without interference between the healthy upper branches and the roots. Eventually the dead branches will fall, to decay on the forest floor.

In this area the character of the upper, drier forest is most fully developed. Most of the trees are conifers, and judging by the numbers of young trees, the succession of hemlock and cedar is well along. Notice that there is also a quite large western hemlock tree here in this area. The moisture– and light–dependent alders and maples are fewer in number, and the undergrowth is different from that in the lower forest. Elderberry is much sparser, and sword fern and huckleberry have decreased in importance. Here, instead, the forest supports quantities of Oregon grape, salal and ocean spray, with blackberry and bracken fern.

17. Mowed, Grassy Borders with Islands of Vegetation

The grassy borders are a long front where many introduced lawn and weed species can invade the Park. A few exotics, thrown out of gardens, thrive among the native plants along the residential borders. Aliens like English ivy, holly and Scotch broom have taken hold as if they belong here.

But the weeds here are mostly a different breed. Exceptionally hardy, they can withstand the most severe and variable conditions; small in size, their needs are not great; their seeds are light and abundant, easily carried far beyond their original range by wind, birds, humans, horses and other animals. Their spreading capabilities make these plants nearly universal, and it would be astonishing to find them absent here.

This "weed" tribe is first to pioneer a cleared area, and without these plants to begin the succession, hold the soil and add organic matter, other plants would have a difficult time establishing themselves. Roadsides and borders are frequently mowed, and so kept perpetually in the earliest stages of succession. The earth would look much barer without these "invisible" plants to cover it with green.

The clumps of vegetation along the mowed borders are "outpost representatives" of the woods, and fairly similar to them in composition. The abundant light and greater exposure are special conditions, and these clumps become explosions of the hardier native and introduced plants.

PLANT COMMUNITIES

by Mary Kenady

Acknowledgments

This study is not a complete evaluation of the vegetation of Pioneer Park, but is offered as a general view of those plants, bushes and trees most visible to the visitor and about which he or she might have the most curiosity. The original field work for this book was done in 1971 and 1972. Very fortunately the plants which were there then are mostly there now. At the time of the original study, I used some previous data gathered at the University of Washington on the park. I added my own observations and was fortunate enough to have the help of the other authors of this book, and their knowledge gained in studying the park helped me to formulate my own conclusions.

INTRODUCTION

The natural vegetation of Pioneer Park is representative of those dwindling forests of lowland western Washington where trees and underlying plants have been left essentially undisturbed by man for a considerable length of time. It is the result of many environmental factors — those of geology and soils, precipitation and hydrology, climate and microclimates. People are an environmental factor as well, in what is most often an unpremeditated or non-purposeful manner. As a whole, it is known by those who classify such things as typical of the Western Hemlock Zone of the Northwest Pacific slope. (See Fig. 1)

Western hemlock certainly does abide in Pioneer Park, as do its friends and cousins the Douglas firs and western red cedars, as well as the big-leaf maples and the red alders. The main reason for naming the kind of forest that makes up Pioneer Park a western hemlock forest is that if natural growth were to proceed according to the way tree experts assume a forest should go here, it would eventually end up as mostly western hemlock. But things seldom go the way the experts say they should and we have a much more

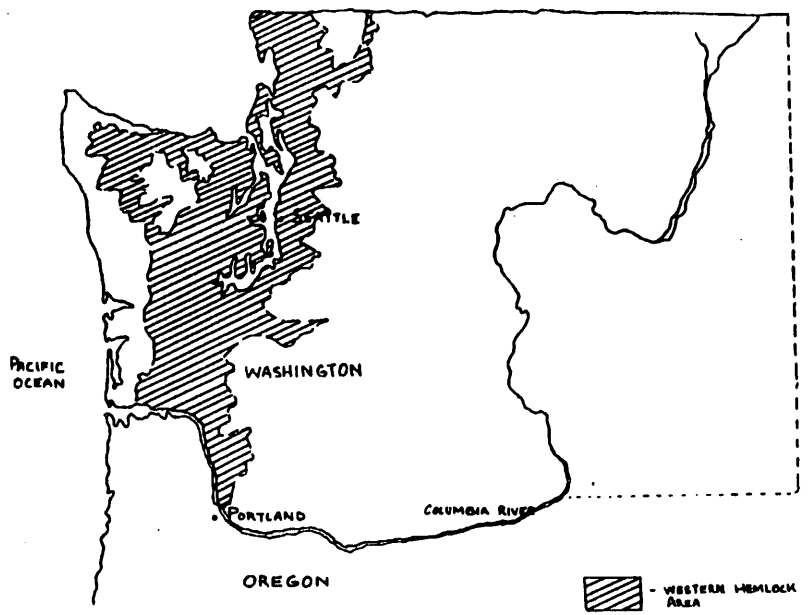


FIGURE 1
Distribution of Western Hemlock in Washington*

*after Franklin-Dyrness

diversified and pleasant environment—at least for the foreseeable future.

We have, as a community of humans living in this environment, been remarkably profligate with our western hemlock community of plants, spending it or sacrificing it as if it would go on forever. It has probably seemed to most people that it did go on forever. Nevertheless, it doesn't. In urban communities it is preserved only in small morsels as parks. In the countryside around Seattle it is laid to waste daily to provide space for endless grass lawns and millions of square feet of houses and driveways and streets, shopping malls and highways and schools for the growing population in the Puget Sound area.

We must pause and think carefully what we are doing. For the western hemlock forest is not just a group of trees. It is a whole ecosystem, a complicated habitat for many living things, and nature's best invention for clothing the earth where we now live. Destroying a western hemlock forest involves much more than cutting trees, it involves the destruction of literally hundreds of species of living organisms.

PREHISTORICAL AND HISTORICAL BACKGROUND

Soils: All of the soils and topography of the park are glacial in origin. Mercer Island is a high spot left when glaciers gouged out the troughs of Lake Washington and Puget Sound. Soils are mineral and the result of great outwashes during the melting of the glaciers during the end of the epoch. Pioneer Park is built upon bedrock, hardpan and huge deposits of gravel and sand, with heavy clays on the side slopes. Over a long period of time, the litter of the trees and plants growing in the park have built a layer of organic soil on the top of the relatively bare and puny material beneath. The trees themselves hold precipitation, add shade and wind protection, and generally ameliorate the environment so that other plants, birds, animals and insects may survive amongst them.

The section on soils in this book gives a more complete picture of the kinds of soils involved here. The variety of vegetation in the

park is almost wholly dependent on the soils in which it grows.

Topography and hydrology: The park has a narrow range of height, from about 150 feet to 350 feet above sea level. This is, however, enough to give character and definition to the land, and to determine drainage and run-off patterns. The steepest slope is that which falls into the ravine, a slope estimated at 25 percent at its maximum. The year-around stream in the ravine is located at the bottom of this slope and is fed by small sidestreams and drainage along hardpan layers with water emerging as springs along the lower slopes.

Figure 2 shows the topographic features of Pioneer Park.

Climate and microclimates: Prevailing winds during much of the year come from the south or southwest in the Puget Sound area, thus the south or west sides of the park get the oncoming gales. The northwest section will show the most effect, having no protection across its south end from winds sweeping across the shopping area and parking lots. Summer winds are often from the north, but have little effect, and except for the rare occasion when a cold east wind blows, the east sides of the park are usually most protected. Interiors of the park are little affected by winds and a person walking about inside the park during a vigorous windstorm will feel little of the wind directly. Still, the tops of the trees are being buffeted about and may drop small limbs, so it is not always the safest spot to be under the circumstances.

The park will be most dry during the months of July, August, and early September, and in some years may exhibit symptoms of severe drought, with early yellowing of leaves on shrubs and drooping of small plants. Nevertheless, the native vegetation can easily withstand these summer droughts, having evolved under just such conditions. Under no circumstances should fire be allowed in the park, however, as dry shrubs and grasses could easily ignite and the fire get out of hand.

Topography influences the availability of sunlight to plants in the park. On a sunny summer day the potential insolation (sunlight received) on the south edge of a level section will be nearly three times that of a north-facing slope in the ravine. At the same time, streets and houses reflect and absorb much more heat from the sun

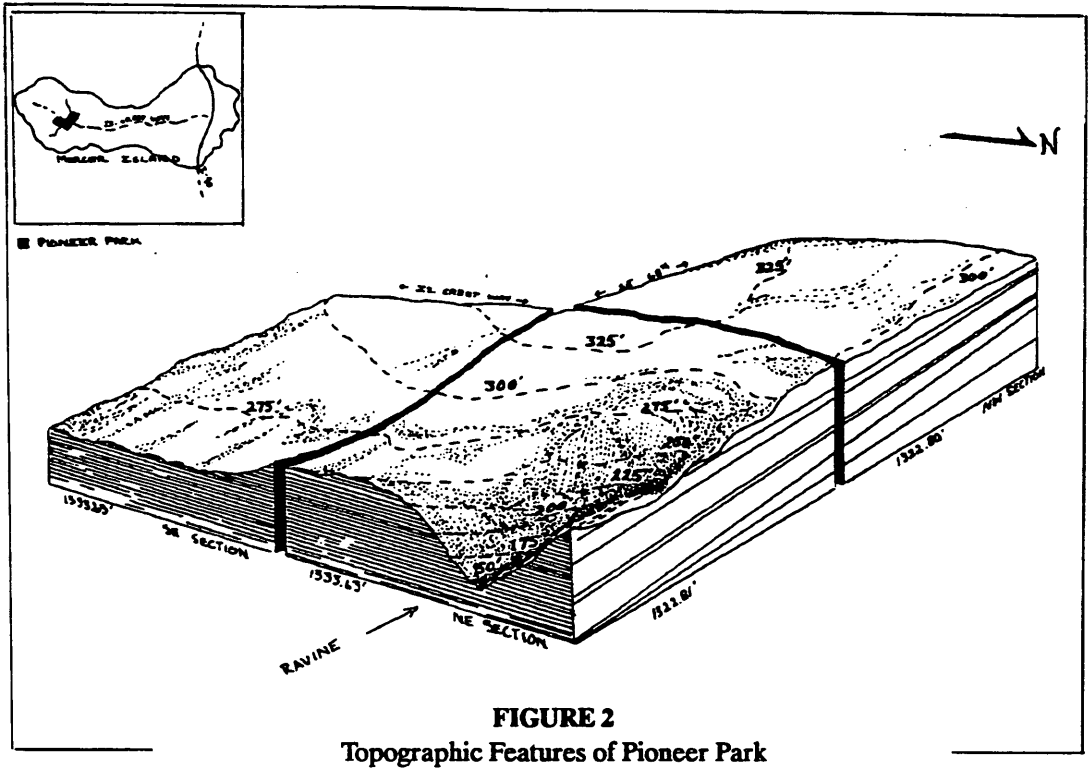


FIGURE 2

Topographic Features of Pioneer Park
showing generalized contour lines and approximate altitudes

and increase temperatures where these are close to the park.

It is possible to see in general how climatological patterns reinforce topographical and soil conditions and vice versa. The highest and driest soils are located where the most intense sunlight and strongest winds can be received (e.g., southwest corner of northeast section). Conversely, the wettest soils exist in those places where least evaporation by sunlight can take place, and where winds are generally much modified (e.g., interior northwest section). It is no surprise to find quite different associations of plants within these diversified environments of Pioneer Park.

Human Use: Up until about 75 years ago, the forest on Mercer Island was complete and mostly undisturbed. At that time, loggers began taking out the big firs and cedars and hemlocks that grew there. Large stumps, some with interesting little gardens growing out of their tops, some hidden by brush, are witness to the great trees that inhabited the park once. A very few relics from that original forest can still be found scattered throughout.

After logging, plant colonizers began to take over, probably the weedy species that we associate today with recently disturbed land that has not been planted or paved. Pockets of vegetation left were free to spread out roots and/or reseed themselves. Those remainders themselves went ahead through successional growth, probably out of phase with the rest of the newly developing woods. No doubt maples, alders, and possibly willows were the first trees to make an effective comeback. With their ameliorating shade and protection, conifers again reseeded.

The ensuing years were needed for the necessary plant succession and development so that the forest could replace itself to the point it has reached today. Since that logging activity and accompanying fire to burn slash, no consistent human activity has taken part in Pioneer Park except that of recreation.

If left to itself, the park will go on developing in a generally predictable "western hemlock climax forest" fashion. If not left to itself, it can be managed to exist in an arrested fashion by humans who selectively cut the oldest trees for more open space, selectively cut the smaller trees and shrubs to allow more vistas beneath the big

trees, or it can be clearcut. It is a certainty that the more artificial the vegetational pattern imposed by the community, the harder and more expensive it will be to maintain. (See Fig. 3)

Pioneer Park can be described as a historically determined, somewhat competitive but also mutually beneficial association of plant species which is evolving and dynamic; plant succession is directed toward an equilibrium which would be dominated by a tolerant climax association of species with the western hemlock, and, to some extent, the western red cedar as dominant trees, if no further disruption occurs.

PLANT COMMUNITIES AND PARK SECTIONS

Selecting representative plant communities: In general, the same plants are found in all three sections of the park. Simply dividing the acreage by criss-crossing streets has not cut plant communication between the sections. But the observant park user who will familiarize him- or herself will soon be convinced that there are quite distinct areas or communities within the park, in both general appearance and in actual content of plant species. There are six categories of environments that are easily identifiable: forest edges, interior forest (two types), slopes and hillsides, the ravine, and a catch-all category that can be called special areas. These communities are briefly described here and will be referred to when we look at each section of the park in detail. Figure 4, page 21, is a graphic representation of the seven separate communities identified here.

Forest Edges. Since the park is divided into three sections, there are 12 forest edges in the park. Four of them are bounded by streets and have mowed, grassy areas with clumps of trees and shrubs. Four have residences adjacent to their borders. The remaining four have streets alongside them but are not mowed. The interface between human civilization and nature is held by hardy species of plants—some of them often what we call weeds: dandelions, plantain, sorrel and thistle. The wooded edges of the park are subject to more severe weather conditions than the interior and thus are

FIGURE 3
Diagram of Plant Succession Concept

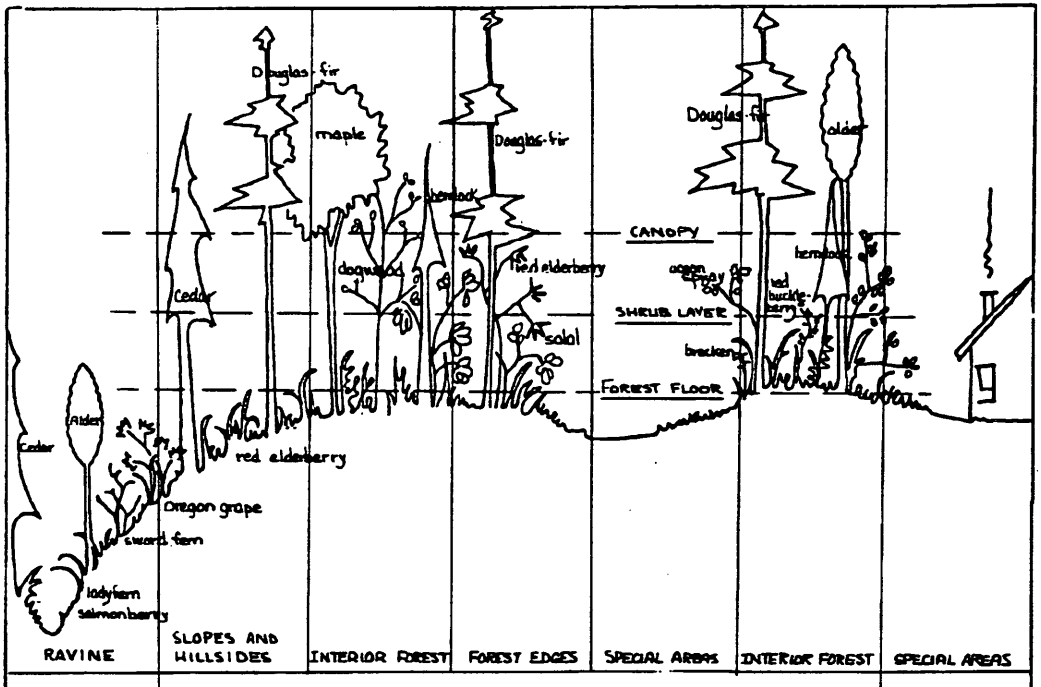


FIGURE 4

Abstract of Pioneer Park with Plant Communities

populated by the hardiest of the local species. On the whole, park edges are relatively dry and receive both more sun and more wind than the rest of the park. The most prevalent species are Douglas fir, bracken fern, and salal, all light-tolerant species of open or cut-over forests.

Figure 5 shows the tree and shrub species of the park edges in diagrammatic form.

Interior Forest, A. Except at the tops of the trees, direct sunlight is a rare commodity in the interior forest of Pioneer Park. Dappled light with little air disturbance except on the windiest days creates a mesic, or moderate, environment. Oregon grape and sword fern predominate on the forest floor. Layers of organic matter cover the soil, rotting remnants of down trees provide a moist protective mulch for the resident species. Red huckleberry reseeds itself on horizontal logs, while ferns, mosses, young trees and salal grow out of stumps. Red elderberry keeps its own company in scattered clumps and the omnipresent trailing blackberry climbs over all.

Many variations can be expected in this type of plant association, which is perhaps most widespread and can be found in all three sections of the park. The Northwest Section is most representative.

The Northwest Section is probably more homogeneous in character than the other two sections. The soil is much the same throughout, altitude varies only slightly, and no real water courses can be found. Plants change in species most from the outside edge to the center and, to a small extent, from south to north.

The peripheral trail along the four sides of this section takes the hiker or horseback rider through a great deal of tall, shrubby vegetation, with elderberry, blackberry, salmonberry, hazelnut, and blackcap noticeable. These are all food-bearing bushes and vines, providing nourishment for a number of birds.

Open spots off the main trails toward the middle of the section make ideal habitat for nettles, but also allow fine vistas of old moss-covered maples and drooping hemlocks.

Occasionally the close observer can find an unexpected patch or remnant of vegetation which stands out as being unique to the park. Such a spot might be filled with ginger root, a fine and unusual

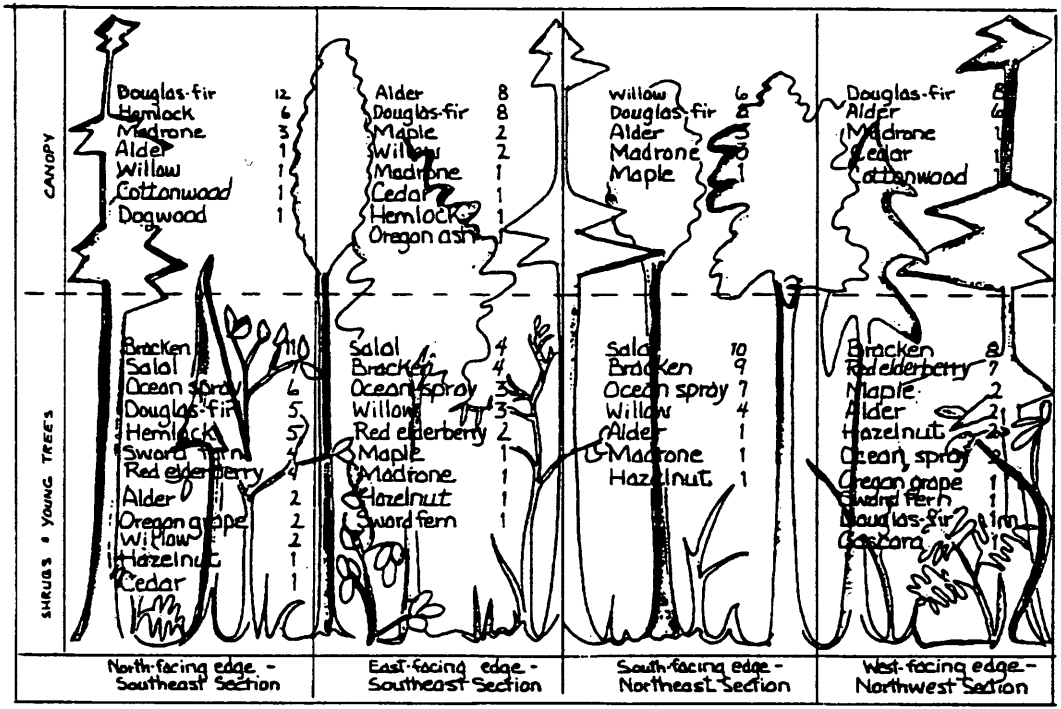


FIGURE 5

Tree and Shrub Species of Pioneer Park Edges

sampled at 50-ft intervals: numbers refer to frequency of occurrence in total samples for each edge

ground cover with a hidden dark purple flower. Other areas along the trails here are outstanding because of their particularly pleasant combination of species seen in bloom together, as a small patch of yellow violets with spring beauty and starflower, or large trillium and vanilla leaf in profuse company. A good walk for seeing changing vegetational patterns is down the central north-south trail.

Interior Forest, B. Found primarily on the relatively high plateau area of the Northeast Section, this type of interior forest is drier than type A. The soil, not the weather, creates this dryness. There is a high sand content to the soil, which creates a fast-draining and low-fertility growing environment. Madrona, honeysuckle, ocean spray, dogwood and wild rose grow here as well as bracken, trailing blackberry, salal, willow and Douglas fir.

In the southwest corner of this section a typical ocean spray–salal association exists, which indicates the driest subcommunity in the hemlock forest zone. Intermixed are trailing blackberry, wild rose and bracken. The character of the area changes as the topography slants north and west. Dogwood, willow, madrona, and Douglas fir are growing here but rather untypically far apart. Shallow-rooting herbaceous species such as bedstraw, sweet cicely and stinging nettle show the existence of surface moisture.

If one is able to make a way through the salal from SE 68th St., one can immediately notice the unusual aspect of this dry area. However, it is notable for its changing face over the past few years. A shadier and fuller canopy of trees and more organic matter added to the soil over those years have begun to give sustenance to more plants, and the existing ones are growing or modifying to adapt. See Fig. 6, page 25, for characteristic species.

Slopes and Hillsides. Those mostly east-facing areas of woods in the park which have a distinctive slope are similar to interior Forest A at the top and intergrade with the Ravine environment at the bottom; thus, characteristics of both can be found in this intermediate area. The eastern aspect, however, increases the amount of solar radiation received in the morning and during winter months when the sun's angle is low. At the same time, of course, insolation received at other times of day is less than in the rest of the

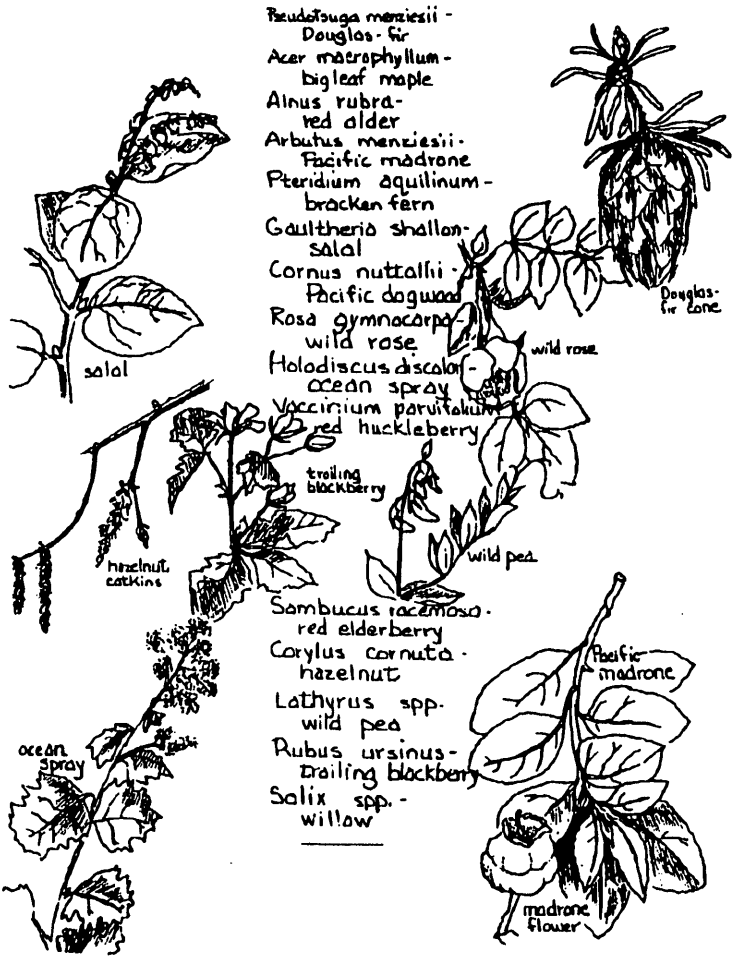


FIGURE 6
Characteristic Species of Interior Forest

park. Where the slope is more north than east there may be times of year when no direct sunlight is received. Winds will rarely be of sufficient force or of the right direction to influence the park slopes. Soils are not well consolidated on steeper slopes, probably containing progressively more organic matter as they decrease in altitude, and are usually moist.

Sword fern, shield fern, Oregon grape, hemlock, maple, Douglas–fir and cedar are dominant species, but it is difficult to characterize this area as a separate entity—it is varied and especially subject to local conditions.

Some characteristic plant species of Slopes and Hillsides: *Acer macrophyllum* (bigleaf maple), *Berberis nervosa* (Oregon grape), *Dryopteris austriaca* (shield fern), *Gaultheria shallon* (salal), *Polystichum munitum* (sword fern), *Pseudotsuga menziesii* (Douglas fir), *Rubus ursinus* (trailing blackberry), *Sambucus racemosa* (red elderberry), *Thuja plicata* (western redcedar), *Trientalis latifolia* (starflower), *Tsuga heterophylla* (western hemlock), *Vaccinium parvifolium* (red huckleberry).

Ravine. Generally speaking, the ravine environment is equable, relatively windless and cool year around. The small stream originates from many seeps and springs arising from the hardpan and clay layers of soil on the slopes above and its average temperature is that of the average soil temperature (probably 50 to 60 degrees). Plants are not subjected to stress conditions, unless excess moisture or flooding should cause some disturbance. The trees on the higher flats allow a gradual release of precipitation so that run-off is easily contained, and the stream is often running even in the driest part of the year. Plants are those which tolerate or enjoy wet conditions: skunk cabbage, devil's club, lady fern, salmonberry. Rushes, horsetail and alder follow the stream course and deer fern and maidenhair fern can be found. Huge old cedar stumps indicate the dominant species here before logging and point the way to what can be expected if the ravine is left to its natural evolution.There are some cedars and hemlocks that exceed 100 years of age in this area, which may indicate earlier or more sporadic logging in that part of today's park.

The ravine contains several plant species that are absent from or

more scarce in the other sections of the park, including enchanter's nightshade, youth-on-age, mitrewort. Nurse logs across the ravine slopes provide nurseries for young cedars, hemlocks, masses of trilliums, foamflower and vanilla leaf. Notably absent are dry-site species such as ocean spray, native rose, madrone and honeysuckle. Large concentrations of moisture-loving lady fern can be found near the bottom of the slope, Oregon grape is located mostly near the upper slopes, and sword fern is scattered throughout. These three make up about half of the total number of plants in the ravine environment.

Some notable species of the Ravine: *Adiantum pedatum* (maidenhair fern), *Athyrium filix-femina* (lady fern), *Epilobium watsonii* (willow herb), *Equisetum arvense* (horsetail), *Linnaea borealis* (twinflower), *Lysichitum americanum* (skunk cabbage), *Mitella caulescens* (mitrewort), *Oplopanax horridum* (devil's club), *Polypodium glycyrrhiza* (licorice fern), *Tiarella trifoliata* (foam flower), *Tolmiea menziesii* (youth-on-age), and *Typha/Juncus* (rushes/sedges).

Special Areas. The special-area section covers atypical small areas that cannot be easily incorporated in other types.These include:

1. Southeast Section, north-central portion, where there is an unusually dark, wooded patch. Ground cover is sparse to nonexistent.

2. Tree clumps along the edges of the park on Island Crest Way and the Northwest Section on S.E. 68th give an interesting and pleasing savannah effect to the grassy edges. Some of the clumps are quite small with only a tree and a few attendant undergrowth species; others are quite large outriding representatives of the main woods.

3. Grass boundaries and residential areas are or strongly resemble private lawns. Here and elsewhere, the legions of "lawn weeds" invade the park and add many new species that would not otherwise be found—whether we like them or not. There is varying use of these park edges by homeowners when they deposit their lawn clippings, bush and tree prunings, etc., and where children cut vegetation, dig pits, climb trees. It is possible to find an occasional exotic bush or clump of domesticated flowers thriving amongst the natives here.

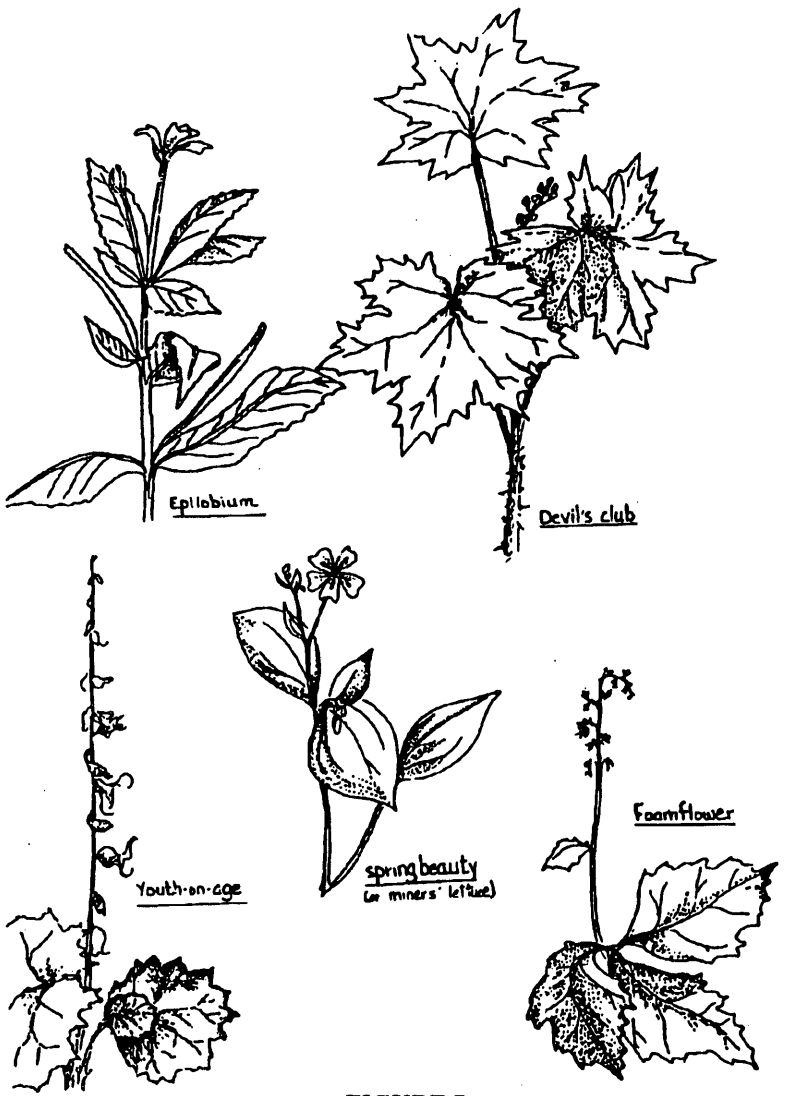


FIGURE 7

Some Typical Plant Species of Lower Hillsides and Ravine

FIGURE 8
Sketch of Residual Tree Clumps

FIGURE 9

Typical Weed and Lawn Species Found Along Grass Boundaries

SPECIES LIST
PIONEER PARK PLANT COMMUNITIES

Acer macrophyllum	bigleaf maple
Acer circinatum	vine maple
Achlys triphylla	vanilla leaf
Adiantum pedatum	maidenhair fern
Alnus rubra	red alder
Anaphalis margaratacea	pearly everlasting
Arbutus menziesii	Pacific madrone
Asarum caudatum	ginger root
Athyrium filix-femina	ladyfern
Bellis perennis	English daisy
Berberis (Mahonia) nervosa	Oregon grape
Blechnum spicant	deer fern
Cardamine oligosperma	bittercress
Cerastium viscosum	mouse-ear chickweed
Circaea alpina	enchanter's nightshade
Cirsium arvense	Canada thistle
Cirsium vulgare	bull thistle
Corallorhiza maculata	spotted coralroot
Cornus nuttallii	Pacific dogwood
Cornus stolonifera	red osier dogwood
Corylus cornuta	hazelnut
Crataegus oxyacantha	English hawthorne
Cytisus scoparium	Scotchbroom
Digitalis purpurea	foxglove
Dryopteris austriaca	spiney shieldfern
Epilobium angustifolium	fireweed
Epilobium watsonii	willow weed
Equisetum arvense	horsetail
Fraxinus oregana	Oregon ash
Galium aparine	bedstraw
Galium triflorum	bedstraw
Gaultheria shallon	salal

Geranium columbinum	crane's bill
Geum macrophyllum	bigleaved avens
Gnaphalium uliginosum	cudweed
Hedera helix	English ivy
Holodiscus discolor	ocean spray
Hypochaeris radicata	hairy cat's ear
Ilex spp.	holly
Juncus spp.	rush
Lapsana communis	Lapsana
Lathyrus spp. (2)	wild pea
Linnaea borealis	twinflower
Lonicera ciliosa	red honeysuckle
Lonicera hispidula	pink honeysuckle
Lotus micranthus	slender trefoil
Lychnis alba	white campion
Lysichitum americanum	skunk cabbage
Montia sibirica	spring beauty
Mitella caulescens	mitrewort
Nemophila parviflora	no common name
Oplopanax horridum	devil's club
Osmaronia cerasiformis	Indian plum
Osmorhiza chilensis	sweet cicely
Osmorhiza purpurea	sweet cicely
Philadelphia lewisii	mock orange
Plantago lanceolata	plantain
Plantago major	common plantain
Polystichum munitum	sword fern
Polypodium glycyrrhiza	licorice fern
Populus trichocarpa	black cottonwood
Prunus emarginata	bitter cherry
Prunus virginiana?	chokecherry?
Pseudotsuga menziesii	Douglas fir
Pteridium aquilinum	bracken fern
Ranunculus repens	creeping buttercup
Ranunculus uncinatus	buttercup
Rhamnus purshiana	cascara

Ribes spp.	currant
Rosa gymnocarpa	wild rose
Rubus laciniatus	evergreen blackberry
Rubus leucodermis	blackcap
Rubus parviflorus	thimbleberry
Rubus procerus	Himalayan blackberry
Rubus spectabilis	salmonberry
Rubus ursinus	trailing blackberry
Rumex acetosella	red sorrel
Rumex obtusifolius	sorrel
Salix spp. (2)	willow
Sambucus racemosa	red elderberry
Senecio vulgaris	senecio
Sisymbrium officinale	hedge mustard
Smilacina stellata	star-flowered false Solomon's seal
Solanum dulcamara	bittersweet nightshade
Solidago missouriensis	goldenrod
Sonchus uliginosus	sow thistle
Sorbus aucuparia	mountain ash
Spirea douglasii	hardhack
Stachys cooleyae	hedge nettle
Stellaria media	chickweed
Symphoricarpos albus	snowberry
Tanacetum vulgare	tansy
Taraxacum officinale	dandelion
Taxus brevifolia	western yew
Tellima grandiflorum	large-flowered fringecup
Thuja plicata	western redcedar
Tiarella trifoliata	foam flower
Tomiea menziesii	youth-on-age
Trifolium dubium	clover
Trifolium pratense	clover
Trifolium repens	clover
Tsuga heterophylla	western hemlock
Trientalis latifolia	starflower
Trillium ovatum	trillium

Typha spp.	cattail
Urtica dioica	stinging nettle
Vaccinium ovatum	red huckleberry
Vaccinium parvifolium	evergreen huckleberry
Veronica americana	speedwell
Viola sempervirens	evergreen violet

(There are 112 species of flowering plants, ferns, trees and shrubs in Pioneer Park.) * Taken from the 1972 complete species survey.

HYPOTHETICAL SPECIES:

(These plants occur elsewhere in open and wooded areas of south Mercer Island and are potential residents of Pioneer Park.)

Abies grandis	grand fir
Amelanchier alnifolia	serviceberry
Capsella bursa-pastoris	shepherd's purse
Chrysanthemum leucanthemum	oxeye daisy
Collomia heterophylla	no common name
Crataegus douglasii	black hawthorn
Euphorbia cyparissias	euphorbia
Fragaria vesca	wild strawberry
Lunaria annua	coin plant, honesty
Lupinus rivularis	lupine
Maianthemum dilatatum	false lily of the valley
Matricaria matricarioides	pineapple weed
Pyrus fusca	western crabapple
Ribes sanguineum	red-flowering currant
Smilacina racemosa	false Solomon's seal
Spergularia rubra	spurge
Streptopus amplexifolius	twisted stalk
Vinca major	periwinkle

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MUSHROOMS – A PIONEER PARK PRIMER

by Ethel M. Dassow

Our 120-acre Pioneer Park could be adapted to uses that would change its character forever, but as a forager's paradise it's admirably adapted just as it is. Nettles and dock, fireweed and fiddleheads in spring, berries in summer and fall, mushrooms . . .

Ah, yes! Let us consider mushrooms.

First, I should say that this isn't going to be a field guide. Mycologists write those. They're the botanists who specialize in the study of mushrooms and other fungi. I'm a mycophogist. That's Greek/Latin for pothunter. We gather for the cooking pot—and as much, perhaps, for an excuse to get out into the woods and the meadows, see what goes on out there, meet some of the species that share our planet.

No one could ever say for sure how many mushroom species grow in Pioneer Park, nor anywhere else, for that matter. Several thousand are known worldwide, and mycologists keep turning up more. Mutations? Crosses? Species that had so far escaped notice? Who knows? Some species are so big, or colorful, or both that you couldn't miss them. Some are so inconspicuous you have to look hard to find them. Some, in fact, live their entire life cycles underground and are found, if at all, by a swelling of the earth or by odor. Some are so short-lived that they can grow and go while your back is turned. Others are so durable you can take them home and use them for decorations.

All mushrooms get a bad press because a few species are toxic—so toxic that a mere taste could kill you. A larger few could make you sick, but wouldn't necessarily do you in. Most species probably wouldn't hurt you, but because of their looks, odor, texture and/or taste you wouldn't care to eat them. A few, maybe four or five dozen, are safe and appetizing. Those are the ones that grab the pothunter's attention.

Notes for the Novice

The quickest way to become a successful pothunter is to go hunting with an expert, not once but several times, in several areas,

and pay strict attention to what he says and does. But if there's no willing expert available, don't give up! Get a good field guide, preferably one written by a Northwest mycologist, and do some homework. You'll learn some things that may surprise you, such as:

Popular usage notwithstanding, edible and poisonous mushrooms are not differentiated as mushrooms and toadstools, respectively. The words are synonymous.

No simple, foolproof test will show you whether or not a mushroom is toxic. Nor is there any known way to render a toxic mushroom harmless. To believe otherwise could be fatal.

All mushrooms are fungi. They have no chlorophyll so they can't manufacture their own food by photosynthesis, as higher plants do, and they don't need light. They do need moisture and a food supply.

Most species are saprophytes. They recycle organic leftovers (if humus, they're terrestrial; if wood, lignicolous), and help reduce them again to soil. A few species (*Armillaria mellea*, the honey mushroom, for one) are parasites. They feed on living organisms, usually trees, and can eventually kill them.

Most of the mushroom plant is an extensive mycelium network under the ground or in the host body (wood, living or dead). When the mycelium develops to the point of reproduction, which may take as long as a decade, and when temperature, moisture and who-knows-what other conditions are right, the fruiting bodies emerge. These are the spore-producing (reproductive) parts of the plant, usually the only visible evidence of its existence and identity. They're also the parts we pothunters seek. So do squirrels, deer, elk, and no doubt other animals.

As I said, the fruiting bodies of some species don't emerge. They're the truffles, relatives of the puffballs. Even mycologists thought until recently that truffles didn't grow in North America. Now I'm hearing that they do, after all, so I suppose we'll start training pigs and breeding truffle hounds to smell them out for us, as they've long done in Europe.

The spore-bearing systems of the fruiting bodies divide mushrooms into *Basidiomycetes* (spores on club-shaped organs called *basidia*) and *Ascomycetes* (spores in minute sacs called *asci* [singular, *ascus*]), and subdivides them into gilled, pored, toothed or other.

Gilled mushrooms (*Agaricales*) bear spores on a series of platelike

extensions under the cap, called gills, which radiate from the stipe (stem) like spokes of a wheel. The thickness and spacing of the gills and their relationship to the stipe are important clues to identity.

Pore mushrooms, *Boletaceae* and *Polyporales*, have spongy tissue under the cap, perforated by tiny holes (pores), which excrete the spores. The character of this tissue—texture, resilience, color and change of color where bruised—is a visual aid to identification.

Never mind, for now, about the "toothed" and "other."

Mushroom spores are microscopic and multitudinous—millions to the fruiting body—and their color in the aggregate is a clue to identity. So are their structures and reactions to various chemicals, but let's leave the lab work to the mycologists.

Spores travel great distances on air currents and insects, on or in the digestive tracts of birds and mammals, on clothing. (How did those truffles get their spores out of the ground and across the North Atlantic? Darned if I know!) When spores come to rest in a suitable habitat, they'll settle in and start establishing mycelia. Presumably spores aren't needed to "re-seed" the immediate area, as the parent mycelium does that so long as the food supply lasts and other conditions are suitable. It seems prudent, however, to leave over-age specimens on the ground (you wouldn't take home tired lettuce or rotten potatoes, would you?) and leave the habitat as little disturbed as you can.

Those Tongue-Twister Names

Those multi-syllable Latin names, though troublesome to most of us, are to clarify, not confuse. Popular names vary from region to region, language to language. Scientific names are the same from Stockholm to San Francisco, Nova Scotia to New Zealand.

True, as mycology becomes more refined and species classification more precise, the old Friesian nomenclature is being superseded by a modern system. It's confusing to a novice collector when, for example, he finds the tasty blewitt designated *Tricholoma peronatum* in one text and *Lepista nude* in a more recent source. But that's nothing to the confusion that would arise if mushroom buffs, be they mycologists or pothunters, tried to communicate without scientific names for genera and species.

Besides, relatively few of the known species are of enough interest to the pothunter to have popular names.

How Toxic Is Toxic?

Mycologists, who write the handbooks, know very well what poisons lurk in the species known to be deadly, or even mildly toxic. Nonetheless they pay strict attention to any reports of illness or death associated with mushrooms. Maybe the mushrooms were innocent. In one widely publicized case in western Oregon awhile back, autopsy proved that carbon monoxide was the culprit. More often a bad reaction comes from individual sensitivity to a particular species. Name almost any food, and someone's sensitive to it! No one's likely to blame such well-known and well-liked species as *Cantharelles cibarius*, or *Boletus edulis*, or *Morchella esculente* (yellow chanterelles, king boletes, morels), but the suspect species may not be well-known, or the case may be one of mistaken identity. As mycologists are most cautious when lives may be at risk, the bad reaction will be dutifully translated to "doubtful" or "not recommended" in the next editions of the field guides. To ignore those warnings is to live dangerously.

If mycologists call a species toxic, don't try it unless you're tired of living.

If you must try a doubtful species, eat a very small amount and wait twenty-four hours. That's how long it takes some of the deadly toxins to act. If you're still healthy and curious, try a little more. Don't let a mouth-watering taste beguile you into rushing things. The most deadly of all mushrooms are said to be indescribably delicious. I wouldn't know first-hand, but if I'm ever asked what I want for my last meal on earth, I'll say *Amanita verna* or *A. phillоides* (destroying angel, death cup), and maybe I'll find out.

Meanwhile, though some amanitas are designated edible and choice, I can do without them all. Too many pothunters have become past tense because they *thought* they could tell the safe from the lethal.

Still speaking of amanitas: Never, but never add a white mushroom to your collection before you've checked to see whether its stem issues from a cup (volva). It may be eight or ten inches beneath

the surface of the ground, but if it's there, shun that mushroom.

Controlled Growing

Why not capture some spores and grow your own guaranteed-safe mushrooms? Well, lots of people have tried, and they'll keep on trying, but not many species cooperate. The most dependable so far is *Agaricus campestris*, the meadow mushroom. Its variants *bisporus* and *alba* are grown and sold in great quantities. Whereas the yield of other crops is usually reckoned in tons to the acre, the yield of commercial mushrooms is reckoned in pounds per square foot and ranges from 2.5 under benign neglect to 7.35 under TLC.

There's a lot to be said for store-bought mushrooms, if you don't know what's out there in the fields and woods. I'm reminded of a verse-or-worse the tooth fairy whispered to me one night in my sleep:

"We used to esteem *A. bisporus*
Commercially grown and picked for us.
Now we've found *Cantharelles*,
Boletes and *Morchellas*,
And now *A. bisporus* just bore us."

How to Get Started

Obviously we don't become successful pothunters by gathering some specimens, looking them up in our field guide, and cooking the "good ones" for dinner. Some species are readily recognized from the book's color photos and descriptions—*Cantharelles ciberius, Coprinus comatus, Morchella esculente, Sparassis radicata, Laetiporus sulphurous* (read that yellow chanterelles, shaggymanes, morels, cauliflower mushroom, sulphur shelf or chicken-of-the-woods). For others we need to determine spore color. To do that, simply break off a piece of the cap, lay it on a piece of paper—white if you expect dark spores, dark if you expect light, both if you don't know what to expect—cover it with a drinking glass and wait. In an hour or so you should have a spore print the size and shape of the cap scrap.

We need to recognize odors, structural characteristics, reactions to handling, in some cases association with other plants (mycorrhiza), and perhaps examine specimens from several different areas so

consistent species characteristics emerge from the extraneous intraspecific variations. It also helps to know what sort of habitat each species seems to prefer, so we'll have some idea where to look for what we want most.

We need a good knife (I carry a small hunting knife in a sheath on my belt), and a hand cultivator for an arm extension, the handles of both wrapped with red tape so they're easier to keep track of. We'll need things to carry things in. I like old flannel heating-pad covers, fuzzy side inside so some of the inevitable forest duff sticks to the flannel instead of the mushroom. Plastic bags aren't so good for mushrooms; they need to breathe, but I take a few produce bags along. You never know what you'll find out there—if only trash that some slob left behind. I also wear a whistle on a lanyard around my neck. Helps keep track of your partner, if you have one, and helps someone find you if you should get lost or hurt. (I haven't yet, but there could be a first time.)

So Let's Go Pothunting

Let's start with the southeast section of Pioneer Park. It varies in slope, residual moisture, forest growth and ground cover, and contains an old burn. Such a variety of habitat should support a variety of species, and here it does. On one short foray into this section, on a drizzly autumn day years ago, I found twenty-seven species. Those I could positively identify, some with help from a mycologist, are included in the species list that follows. A couple of weeks earlier, or later, and I might have found as many species with few duplicates.

The northwest section, being fairly level and moist and supporting much the same trees and ground cover throughout, should support the same relatively few mushroom species. My experiences there suggest that it does.

To the pothunter the northeast section is by far the most exciting of the three. The variety of habitat is greater, the number of species I've found there is in proportion, and (perhaps by happenstance), I've found more of the edible-and-choice species there than in the other two sections combined.

The grass borders between the woods and the roads, converging on S.E. 68th and Island Crest Way, look enough alike that you'd

expect them to yield the same mushroom species, but they don't—not while I'm looking, anyway. On the west side of Island Crest, scattered through the grass and in the islands of trees, I've found huge specimens of *Russula xerampelina* (purple-capped russula), several common species of *Boletus* and *Suillus*, and my first specimens of *Suillus caerulesens* and *Russula pelagonium*. The mowed strip east of Island Crest produces a few boletes and russulas, but quantities of *Lycoperdon perlatum* and *L. pyriforme* (round and pear-shaped puffballs), some small, uninteresting "scrap" species and, close to the corner, from mid-autumn through a mild winter, a widespread growth of *Amanita pantherina* (Panther amanita—pale to dark brown cap with white veil remnants called warts). This species also grows abundantly in the southeast section, mostly within a hundred yards of the corner, and as it's quite capable of doing you in, better learn to recognize and avoid it.

Not so incidentally, some of those little brown "scrap" mushrooms, the *Galerina autumnalis* and *G. venenata*, are hallucinogenic and they contain deadly amatoxins. A tiny bit could send you on a trip. A tiny bit more, and it'll be a one-way trip.

Boletes and russulas grow in the tree-islands and grass bordering the southeast section, puffballs grow in the grass, and only there (within the park) have I found *Coprinus comatus*, the coveted shaggymane. Usually there'll be one here, one there, but once I came upon a near-solid circle some ten feet across of prime shaggymanes! I gathered gleefully, greedily, filled everything I had along, went after more things to fill, and gloated as I took them home. But shaggymanes are autodigestive. They'll turn into a puddle of black ink by tomorrow afternoon, so my loot had to be eaten or preserved within hours. I gave some away. I served some for dinner. Even so, I had about six hundred shaggymanes to clean, saute and freeze, and long before I'd finished I was hoping I would never be so lucky again!

Where To Find The Experts

One mycologist, I'm told, collects and consumes two hundred and fifty different species! I'll bet that includes some that wouldn't whet my appetite one bit. When you can recognize fifty to sixty species without checking a field guide, and can eat fifteen or twenty in safety,

with pleasure, you've achieved respectable pothunter status. You can speed up the learning process by going to the experts. There's usually one in the botany department at the University of Washington. Or join the Puget Sound Mycology Society, attend the meetings and the annual exhibits, go on the field trips. You will be welcomed. There'll be labeled specimens for hands-on study, experts to identify specimens and show you why they are, or aren't, what you thought you had. The experts care about mushrooms and mushroom gatherers. They're generous with their knowledge and patient with the novice.

Just don't expect the experts to tell you exactly where to look for the choice edible species. They don't want competition on their favorite gathering grounds, and you won't, either, after you've prospected and found productive places.

When the first edition of this book was in preparation, I was strongly tempted to leave some of my favorites off the species list. Why encourage competition? Let'em do their own bush-whacking. But I had agreed to write what I knew, and so I did.

Sure enough, shortly after the book was published I went into the northeast section of the park, my taste buds tingling at the thought of blewitts for dinner. Out of the woods swarmed six or eight of my 'teenage friends, calling, "You're the very person we want to see! Do we have what we think we have?" and each showed me a mouth-watering collection of prime blewitts. Though I'll admit to a fleeting moment of disappointment, I was pleased. Those youngsters were putting the park to constructive use, and using our book to do it! I congratulated them and went off to see what else I could find.

After all, we foragers aren't competing for food, per se. The calories in mushrooms—about ninety to the pound (not gram, pound!) wouldn't fuel anyone for long. True, they're loaded with vitamins and minerals, so they could help to keep you healthy if you're lost in the woods—but in that case you'd better know what else Nature offers you to eat.

We pothunters are primarily interested in tastes, and among the dozens of mushroom species accorded choice status in this country, there's a wide variety of delicious flavors. And by gathering when they're in season and using the methods of preservation best suited to each species, we can please our palates every day of the year.

We could also impress our friends with our exotic cuisine, though I seldom try that. Some people have such a powerful prejudice against wild mushrooms that the thought of eating one would make them sick. Maybe they'd think it wonderful if I didn't tell them what it was, but then I'd be guilty of deception. And if anyone were to get sick after eating mushrooms at my table, I and my mushrooms would get blamed no matter what the real cause of the malaise. So why take a chance? And why waste fabulous food on someone who can't or won't enjoy it?

Some foragers gather (not, I think, in Pioneer Park) for wholesalers who ship to gourmet markets on the East Coast and in Europe. I frown on that, but it's their right to do so.

Some collect for mycologists who can't take time from their lab work and teaching. Theirs is a relatively young science with information gaps still to be filled. Even I once found a specimen that had never been classified. It didn't happen in Pioneer Park, but it easily could have and someday it may.

Some collect for medical researchers. Consider how many of our pain-relieving and life-saving medicines come from fungi. How many more cures are out there, waiting to be found? Maybe some Mercer Island student, out in Pioneer Park working on a botany assignment, or some housewife out for exercise, will come up with a mushroom that can cure cancer, or arteriosclerosis, or AIDS. It could happen. Who's to say it won't?

Whatever our immediate motive when we go out collecting, I think we foragers are out there for the same fundamental reason. We're following a primitive instinct, gratifying an atavistic urge. We were gatherers before we were herdsmen and farmers, before agribusinesses and supermarkets. We can't go back—not now that we've proliferated into the billions and altered much of the environment to suit our needs and our whims—and who wants to go back?

But the instinct is still strong in some of us, and when we can take advantage of what Nature produces, harvest her annually renewed resources, we feel a little less dependent upon technology, a little more in control of our lives.

Acknowledgments

Warmest thanks to the mycologists and expert amateurs who have helped me with species identification and general mushroom know-how. They include the late Dr. Daniel E. Stuntz, Professor of Mycology, University of Washington, and long-time scientific adviser to the Puget Sound Mycology Society; Charles D. Voltz, George W. Rafanelli, Howard C. Melson, Victor J. Nendza, Benjamin Woo, Morrill A. Gatcomb, the late Ralph M. Nolan, and Joy Spurr. All of them have spent countless hours at the meetings, field trips and annual exhibits of the Mycology Society, identifying specimens, explaining species characteristics and patiently answering the endless questions of novice collectors.

Thanks, also, to my husband, John, who is permissive if not enthusiastic about my "mushroom hang-up," and to my daughter, Laura Walls, who helps me collect, identify and clean mushrooms, draws them, and addresses my culinary creations with an unprejudiced palate.

Species List

All of the species listed here, I have found in Pioneer Park and identified, with some help of experts. I've found but failed to make positive identification of at least as many, and no doubt there are still others that I've failed to find. [A hundred and twenty acres is a lot of ground to cover.] Maybe the same species will fruit at the same times and places next year, and the next, or maybe they won't. Mushrooms follow their own rules, rules that vary with the species. We can't predict their behavior with certainty because we don't yet know all their rules. But trying to second-guess the fungi is part of the pothunter's fun.

Former names of genera and species are in parentheses.

Agaricus silvicola—isolated specimens in undergrowth, NE section.

Aleuria aurantia—orange fairy cup, SE section, usually in lately disturbed earth. Look like scattered mandarin orange peelings. Nibble on'em, raw.

Amanita gemmata—jonquil amanita. Isolated specimens, SE section. Typical amanita form, yellow with white "warts." Beautiful but deadly.

Amanita pantherina—panther amanita. Northwest kin to *A. muscaria*, the deadly fly amanita. Typical form (see drawing), pale to dark brown with white warts. Very young specimens could be mistaken for puffballs, so check for volva (cup) at base of stem. Prolific in NE and SE sections, near corner. Toxic.

Armillariella (Armillaria) mellea—honey mushroom. Abundant in NE section, on north-south trail closest to Island Crest Way, and in ravine. Also in SE section. In dense clusters, on wood. Parasitic.

Cantharelles clavatus—pig's ears, NE section. Typical chanterelle shape but in dense purple-brown clusters. Tasty.

Clytocybe nebularis—graycap.

Coprinus artramentarius—inky cap. Scattered clusters throughout. Autodigesting. Turns to a puddle of black "ink" but more slowly than *C. comatus*. Delicious, but incompatible with alcohol.

C. comatus—shaggymane. White with some grayish-brownish, hairy scales, pink gills, 2 inches to 2 feet tall (see drawing). Autodigest-

ing. Sometimes prolific in grass strip of SE section. Delicious.

C. micaceus—another of the "inky cap" group. Fragile, brittle, has golden glint; small but abundant in NE and SE sections, woods and grass. Tasty.

Crucibulum vulgare—bird's nest fungus. Grows on dead wood, all sections. Not strictly a mushroom, but fun to find.

Dacrymyces palmatus—orange jelly. SE section. Small orange blobs on dead wood. Another oddity.

Galerina autumnalis—little brown "scrap" mushrooms that could kill you.

G. venenata—also looks inconsequential but is deadly.

Gomphididius oregonensis

G. subroseus

Gyromitra infula—hooded helvella. Quaint saddle-shape you can't believe until you see it. Toxic.

Hygrophoropsis (*Cantharelles*) *aurantiaca*—false chanterelle.

Laccaria amethystina

L. laccata—looks like the *Lactaria* but has no "milk."

Lactarius luculentus (*aurantiacus*)—orange milky cap. Exudes white "milk" where cut or broken.

L. rubrilacteus (*sanguilfluus*)—exudes dark red milk.

L. rufus—red milky cap. Exudes white milk. Toxic. (You have to be really curious to sort out the eight or ten species of *Lactaria*!)

Laetiporus (*Polyporus*) *sulphureus*—sulphur shelf, chicken-of-the-woods. Yellow to orange-red "shelves" on snags or logs. Conspicuous, attractive, edible raw or cooked.

Lepista nuda (*Tricholoma personatum*)—NE section. Purplish cap and stem. Delicious. (Popular name a corruption of "blue hat," comes from England and the tricorner hat.)

Lycoperdon perlatum—round puffball. White to brown, singly or in clusters. Formless mass of white spores inside when young; skin of old specimens breaks to release a cloud of yellow-brown powder, the mature spores.

L. pyriforme—like the above but pear-shaped. Both edible when young and firm but must be distinguished from button-stage amanita, which shows mushroom form in cross-section.

Naemetaloma capnoides—smoky-gilled woodlover. Yellow cap with red blush, gray gills. In clusters on dead wood. Abundant

throughout in late fall and most of a mild winter. Mild flavor, nontoxic.

N. fasciculare—clustered woodlover. Much like the above but green-gilled. Toxic.

Pleurocybella (*Pleurotus*) *porrigens*—angel wings. White, thin and delicate; short lateral stipe, on fallen logs or stumps, NE and SE sections. Another to nibble on, or cook. Dries easily.

Pleurotus ostreatus—oyster mushroom. Lateral stipe, shelflike, on dead alder. Meaty and tasty.

Pluteus cervinus—deer mushroom. Scattered, all sections.

Russula pelagonium—smells like geraniums.

R. rosacea—rose-red russula. Intensely peppery taste. Not recommended.

R. xerampelina—woodland or purple-capped russula. Smells like shrimp. (Dr. Ammirati lists eight species of this genus in his field guide, some allegedly edible, some toxic. One expert told me, "Nobody eats russulas!" so I never bothered to sort them out.)

Sparassis crispa (*radicata*)—cauliflower mushroom. Cream-white, like a mass of bleached ribbon kelp. Grows from a single base at the foot of a spruce. Cut it off at the base, and it should grow again next year. May weigh 5 to 40 pounds—and one may be all you'll ever find. Excellent. Keeps well, dries easily.

Strophoria ambigua—questionable strophoria. Yellow cap, lacy margin, tall and graceful (see drawing). Abundant in woods, NE and SE sections. Said to be edible.

Suillus caerulescens—blue-staining boletus. Grass strip west of Island Crest Way. (The *suillus/boletus* genera contain other blue-stainers, generally regarded as doubtful. Any bolete/suillus with red pore mouths is dangerous if not lethal. Other species are edible and choice. Once you've learned to recognize them, the trick is to beat the worms to them.)

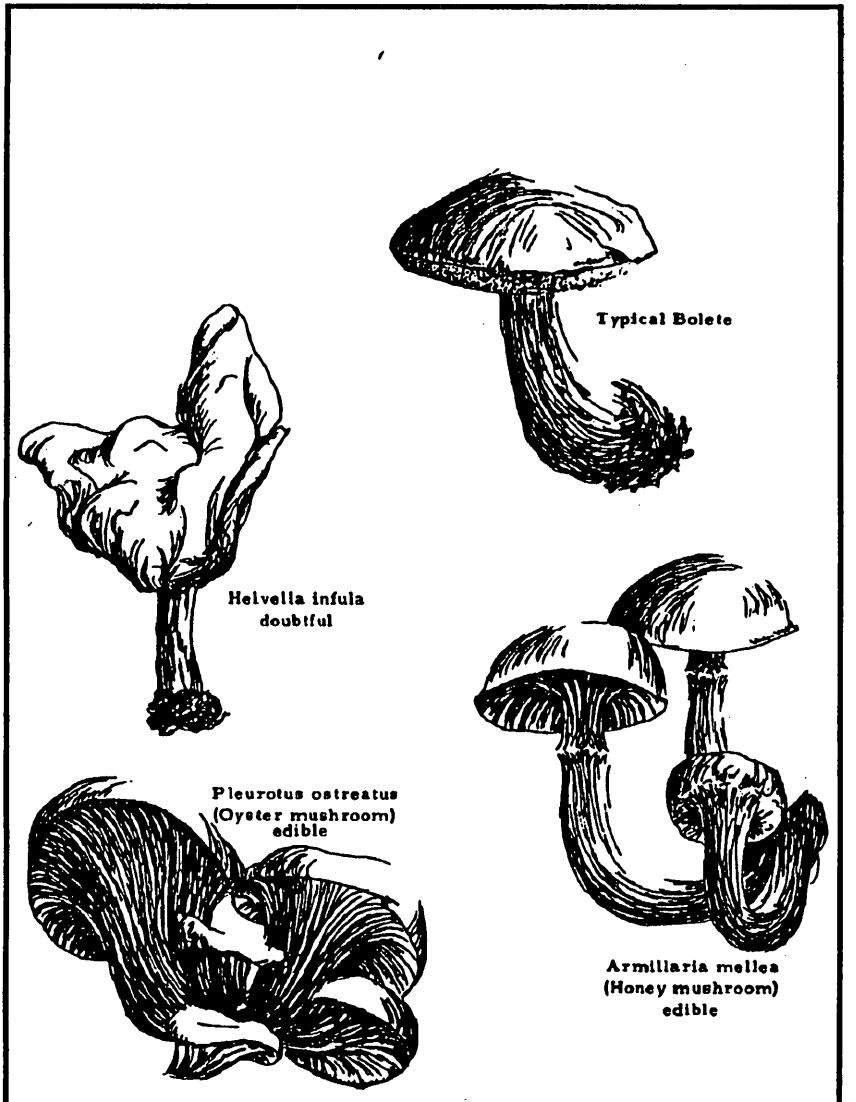

FIGURE 10
A Few Common Fungi

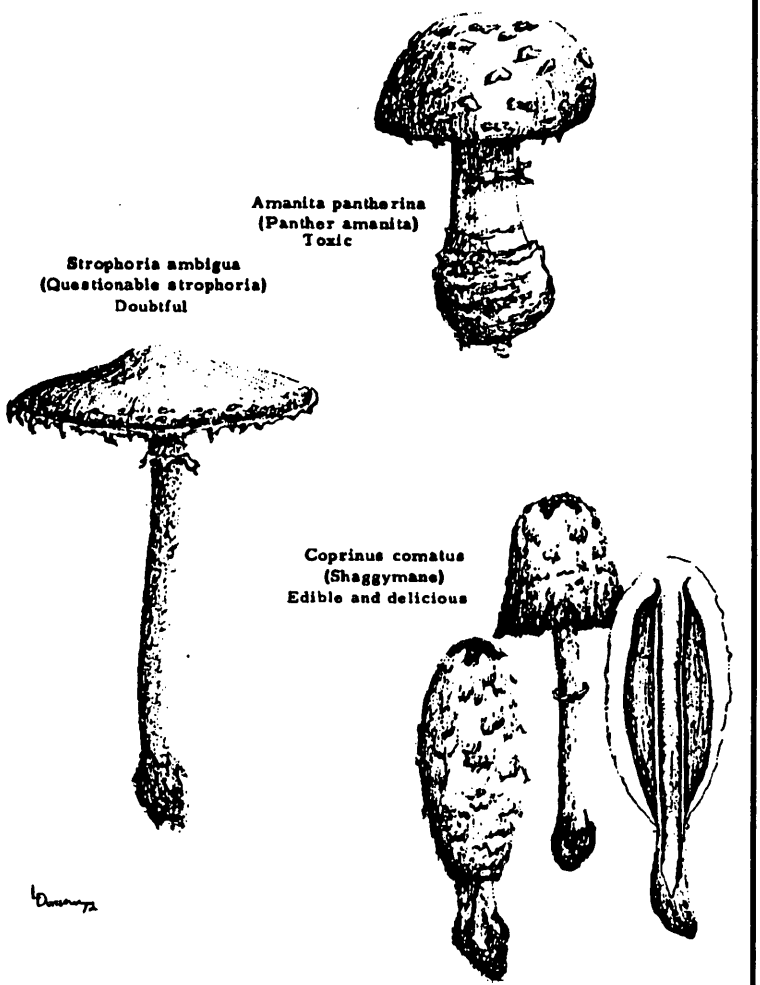

FIGURE 11
More Common Fungi

RECOMMENDED HANDBOOKS, FIELD GUIDES, COOKBOOKS

Audubon Society *Field Guide to North American Mushrooms*, by Gary Lincoff, Alfred E. Knopf, Inc. 1981. ISBN 0-394-51992-2. L of C 81-80827.

Guide to Common Mushrooms of British Columbia, R.J. Bandoni and A.F. Szczawinski, British Columbia Provincial Museum Handbook N. 74, Victoria, B.C., Canada; A. Sutton, 1964.

Guide to Mushrooms, Giovanni Pacioni; American edition edited by Gary Lincoff; Simon & Schuster; ISBN 0-671-4284-97. Originally published in Italy. Recommended for general coverage.

Guide to the Mushrooms and Toadstools, M. Lange and F.B. Hora, E.P. Dutton & Co., N.Y. 1961. Originally published in Denmark. Recommended for general coverage.

The Mushroom Handbook, Louis C.C. Krieger, Dover Publications, Inc., N.Y. 1967.

The Mushroom Hunter's Field Guide, A.H. Smith, University of Michigan Press, Ann Arbor, Michigan, 1964.

Mushrooms, Molds and Miracles, Lucy Kavaler, The New American Library, Inc., N.Y., 1966.

The New Savory Wild Mushroom, M. McKenny and D.E. Stuntz, University of Washington Press, Seattle and London, 1971. Revised and enlarged by Joseph F. Ammirati, 1987. ISBN 0-295-96480-4, paperback; -96491-X, cloth. Especially recommended for the Northwest.

Toxic and Hallucinogenic Mushroom Poisonings, A Handbook for Physicians and Mushroom Hunters, Gary Lincoff and D.H. Mitchel, M.D. Van Nostrand Reinhold, N.Y. 1977.

Wild Mushroom Cookery, Oregon Mycological Society, Inc., 6548 S.E. 30th Ave., Portland, OR 97202.

Wild Mushroom Recipes, Puget Sound Mycological Society, Globe Pequot Press, Seattle; ISBN 0-914718-04-5.

For information about mycological societies in the Northwest, write: Puget Sound Mycological Society, Monroe Center, Rm. 104, 1810 N.W. 65th St., Seattle 98117.

A BIRD STUDY

by Merilyn Hatheway

INTRODUCTION

In 1971-72, when the first edition of the *Natural History of Pioneer Park* was presented, a general species list of birds was compiled. Observations made in this bird study are emphasized, bird species are identified, and correlations with food supplies, cover and nesting areas are pointed out. This edition also includes modifications to the checklist made during the breeding season as well as for wintering birds and migratory visitors which use the Puget Sound Basin flyway.

Observers in the park will notice a seasonal influx of birds, especially in late April, May and June, when the numbers of species increase so enormously that the area seems overpopulated with birds singing from every bush and tree. On the other hand, the fall migration is almost silent, for the birds are mainly concerned with storing up food to provide the energy needed to sustain them on their return to wintering grounds.

Central to any bird study is a consideration of plumage differences. These include the marked differences between males and females of the same species as well as seasonal changes. Plumage changes result from the loss and regrowth of feathers, called molt, and are related to the age of a bird as well as to breeding activity and wintering patterns. Breeding plumage is almost always more colorful than the drab post-nuptial molt, which reflects the more silent winter season.

A knowledge of bird songs and calls is essential to any dedicated birdwatcher and this is never more evident than when locating species in Pioneer Park. Due to its dense tree canopy and undergrowth many species are more often heard than seen. Skill in this method of identification comes with experience and practice in distinguishing the repetitive calls of the various species known to inhabit the park.

The sequence of presentation of bird species in this report follows that of recent ornithological books. Birds are considered in order of their probable evolutionary development. Relatively primitive birds

are presented first, more advanced birds last. The basic unit of classification is the species. For further details of the classification of birds, the reader is referred to books such as *A Field Guide to the Birds of North America*, published by the National Geographic Society. For very specific information, refer to *Birding in Seattle and King County*, a site guide and annotated list written by Eugene S. Hunn and published by Seattle Audubon Society.

The original manuscript for this book resulted from contributions from the following people who worked during the period from September, 1970 to August, 1971: Jenny Conway, Merilyn Hatheway, Mary Kenady, Bruce and Judy Peterson, with Zella M. Schultz as principal investigator. Principal contributor to this edition was Eugene Hunn.

BREEDING BIRD CENSUS

The method employed in this study was to walk through the three sections of the park defined as the northeast, northwest, and the southeast sections, listing the different species. In addition to those birds that were seen, all birds heard singing were recorded. The principal months for breeding birds are May, June and early July, during which time a census was made. Birds not indicated as nesting species have been identified throughout the remainder of the year.

Since the females build their nests only in a territory defended by a singing male, the presence of the male is regarded as an indication of at least one pair of breeding birds. In some species, more than one female may nest in a territory of a singing male. Males defend territories against encroachment of other males of the same species which would compete with them for the food resources provided by the habitat. In general, different species utilize different resources. It is not surprising, therefore, that a male generally does not defend his territory against incursions by birds of other species, except predators such as jays and crows. Strong, dominant males establish territories which are especially rich in resources, and weak males in territories that are poorer.

DESCRIPTION OF BREEDING BIRDS

Band-tailed Pigeon

This bird is commonly seen perching in small flocks at the tops of the tallest trees, often in an upright position, with head tucked into breast. The name "band-tailed" is apparent when the pigeon sails down towards the perch and spreads its tail showing a light gray border across the end. Frequently heard are the flapping of wings along with a familiar "hoo-hoo" call.

Nests are usually in the middle canopy layer, in small firs, alders or other trees, and consist of loose arrangements of sticks balanced on a horizontal branch.

The favorite foods of this bird are elderberries, and the fruits of madrona, mountain ash and dogwood. For this reason, birds follow ripening fruits to higher elevations.

Northern Flicker

Prime habitat is semi-open wooded areas where trees and open ground are available, flickers forage for ants on the ground that make up the diet, along with bugs taken from tree trunks. A familiar ground bird, it can be observed bobbing its head or standing alert before hopping about, with its brownish back and distinct speckled breast bordered by a black collar and the unmistakable heavy, longish bill of the woodpecker family. When seen in trees, it may be clinging to a branch or trunk, or often perched on a dead limb high in the tree top uttering long, very loud "flicker" calls.

Nests in holes, primarily in dead trees.

Pileated Woodpecker

A large, black, crow-sized bird with distinct white patches on the underside of wings and a bright red tuft along the top of the head, with white stripes down side of neck.

When the bird is observed clinging to a tree trunk, one sees a long head with slim neck working back and forth with powerful strokes opening up holes and trenches in the trunks. Chips fly and fall to the base of the tree, often in large flakes. When trunks are those of dead

trees it is a noiseless operation. On the other hand, in the depths of forests on a living trunk it is like a hammer blow. Sometimes fallen logs offer loose bark and soft wood where grubs and other insects can be found.

In most written accounts, the pileated woodpecker is said to favor heavy timber stands of Douglas fir, yellow pine or other, and "does not take well to living by man's habitations. . . mostly a bird of the wilderness and to the wilderness you must go if you wish to see it." (Larrison, *Washington Birds*, 1968). Although this author has not located an active nest of pileateds on Mercer Island, large, somewhat oval holes, often at considerable heights on tall trees, are indirect evidence of nesting success.

Their foraging habits have been observed by many on the Island and in the park; they even frequent feeding stations. During the winter, pileateds are more evident as they forage on dead and dying tree trunks, leaving behind piles of chips and long, vertical trench-like openings in the decaying heart-wood.

The call is not unlike that of the flicker, except the series of notes is shorter and ends abruptly.

Hairy and Downy Woodpeckers

These woodpeckers are very close "look-a-likes." The main difference is in the size, with the *hairy* equivalent to a robin, and the *downy* to a sparrow. Their color patterns are black and white—a white area down the middle of the back, with black wings spotted with white, and black and white markings on the head. Males in both species have a small red patch on the back of the head.

Like most other woodpeckers, these birds are hole nesters. They will visit backyard suet feeders or inch up a trunk or along a limb to hammer and dig for an insect. Their rapping noise may be deceptively loud. Both of these species are common in heavily wooded and recently burned-over areas. The *hairy* is less abundant on residential Mercer Island.

The *downy woodpecker* shows a preference for medium-sized deciduous growth such as willows and alders yet can often be found

near streams where cottonwoods grow. The *hairy* must have conifers present, and generally is found in more mature, extensive forests.

Flycatchers

Flycatchers are most commonly seen in spring and summer time, more often perching upright on snags or ends of dead branches which serve as observation posts from where they dash about seizing passing insects. Four members of this family of insect-eating birds were found during breeding season in Pioneer Park. They are separated as follows:

Willow [formerly Traill's] — prefers dense brushy areas and forages in the short air-spaces between trees. Some water near the territory is required. It was formerly heard more frequently in Pioneer Park than now.

Western — prefers dark, rather dense coniferous woods with nests made of bark and moss, near the ground or on the tree roots. Often it perches in the shadows of the forest and one only catches glimpses as it sallies quickly to capture an insect, returning to the leafy cover. As in the case of most flycatchers, hearing them is easier than seeing them.

Western Wood Pewee — exhibits another characteristic of this family, a twitching of the tail or jerking motion when seen on perch, and more often than not the perching position is very upright. Like other flycatchers, the *wood pewee* dashes from its perch, swoops up the insect in flight, then sweeps back to its observation post. Since the *wood pewee* forages among the crowns and upper parts of the trees, they may be seen sitting fairly high in the canopy.

Olive-sided Flycatcher — selects the highest lookout on a tall dead tree, often a cedar or fir located on a hill or ridge from where it forages over the highest parts of the forest. Its call, often described as "quick-three-beers" is very easily recognized once learned and when compared to other flycatchers, this bird is noticeably larger than the others. Twiggy nests are generally placed fairly high up in the conifers.

Swallows

Perhaps because of their graceful flight, this family of insectivorous birds is easily recognized. They arrive early in spring. Another characteristic is their tendency to choose wires rather than tree branches for perches.

Barn Swallow — nesting material used by this swallow is mud; therefore, they require water to construct their nests on beams in buildings, under bridges, and the like. Because their low swooping flight takes them skimming over grassy areas, one has a good opportunity to see this swallow, as well as those listed below, in the boundary areas of the park.

Violet-green Swallow — this is our most common swallow, being thoroughly adapted to associating with man. This species nests in holes, either in trees, buildings, or nesting boxes.

Tree Swallow — although uncommon, since it prefers more rural habitats, these birds which show a preference to foraging over water have been observed over the park. Some experience is needed to separate its identification markings from the similar Violet-green Swallow.

Steller's Jay

Very common wherever coniferous forests exist, this jay is especially noted for harsh calls and bold manner, often alarming other birds. This strikingly handsome bird with brilliant blue body and dark crested head is sometimes a destroyer of nesting smaller birds, eating the eggs and even the young. It is omnivorous, however, and its food varies from frogs and mice to berries and hazelnuts.

Nests are a mixture of twigs and mud and are located in the zone of tall shrubs and medium-sized trees, usually in evergreens.

Common Crow

This familiar all-black bird of farming areas is also found frequently in second-growth woods near population centers having large parks. Often crows are seen in fairly large numbers, and this is especially true in early evening hours when they flock to communal

roosts. During the day they fly back and forth over the more open areas surrounding our park but it isn't uncommon to hear their harsh, often angry "caw" deep inside the woods. This bears investigation by the observer since crows are well-known molesters of hawks and owls.

Completely omnivorous, the crow feeds on the ground and at all levels of the forest, wherever it can find eggs, small mammals, frogs, garbage and the like.

It constructs bulky nests of twigs generally in the middle layer of the forest trees.

Black-capped Chickadee
Chestnut-backed Chickadee

Small, "busy" birds, both species are common on Mercer Island, both in the Park and at feeders. They prefer slightly different habitats, the *black-capped* in deciduous trees and brush, often associated with streams, and the *chestnut-backed* in denser coniferous woods. However, it isn't uncommon to see mixed flocks in Pioneer Park, and one can be quite successful in attracting them by imitating their calls with pursed lips or blowing on the back of the hand. The response is a familiar "tee-dee."

Nests are usually placed in holes in tree stumps or snags.

Common Bushtits

Tiny gray birds with disproportionately long tails, usually seen in flocks of threes to twenty or more. Their thin twittering and busy manner of insect hunting while hanging at any angle from a branch in bushes or trees attract the bird watcher to follow their movements, and often as not lead to the discovery of a nest incongruous to their tiny size. The bulky stocking-like pouch is about eight inches long, a mixture of moss and lichens, with a small opening on the side near the top where it is attached to a drooping branch of a tall shrub or tree. Both parents share in the feeding, carrying insects and disappearing completely inside the long sleeve which wiggles and shakes as the babies, perhaps 5 to 9, vie for the food.

Red-breasted Nuthatch

This is the only member of this family found in Pioneer Park. It is attracted to conifers. A small bird with stubby tail, this insectivorous species works close to the bark, either on tree trunks or limbs, over, under, and upside down.

It prefers to dig nest holes in dead snags and stumps.

The recognizable thin, nasal "yank-yank" call distinguishes it from those of chickadees, creepers, and kinglets with which it often flocks, especially in the winter season.

Brown Creeper

Another meticulous inspector of tree bark, this small, often silent, bird is seen crawling up trunks, in contrast to the headfirst downward pattern of the nuthatch. The relatively long, spiny tail adds stability as the slim curved bill probes into cracks for insects. It has a habit of starting from the base of a conifer working upwards encircling the trunk. When it reaches the highest branch it flies off to another tree and repeats the process.

Its nest is somewhat unusual, being located behind strips of loose bark, which more often than not readily peel off dead or decaying trees, especially alders.

Wrens

The melodic bubbling song of the two local species may be heard year–round in Pioneer Park. A beginning birder can often distinguish the song of the *winter wren* for its thin, rapid-fire notes go on and on as if they would never cease. In comparison, the song of the *Bewick's* wren (pronounced "Buick") is a musical variation of a three-note theme, "sweet-sweet-sweet." Very often this bird will trill in an opening in the woods and this offers the observer the opportunity to check the field marks, namely the conspicuous white stripe over the eye and the sharp contrast between the brown back and white underparts of this small bird.

The *Bewick's wren* nests in the tall shrubby layer or lower reaches of the canopy where it places its nest in cavities of trees. Active and

nervous in its search for insects, it moves rapidly about the woods, but never without vocal accompaniment.

The smaller wren of the two, the *winter wren* prefers the darker, wetter coniferous woods where ferns and mossy logs mix with the underbrush. But such a loud and joyous song while it works its territory! Nests are made of moss and twigs, placed on roots and tree stumps in the interior forest floor.

Robin

Certainly the commonest of all, this great worm-eater fully enjoys our year-round moist soil. More closely associated with lawns and open grassy stretches, it is also seen and heard wherever soft ground yields the earthworms for food and low trees and shrubs for nest building. Since mud binds together nesting material of twigs and grasses, the suitability of our wet environment is obvious.

The song is rather easily learned since it is a repetitious series of similar notes.

Swainson's Thrush

Closely related to the Robin is this member of the same family. With its spotted breast and complete brown-back appearance, it is our commonest "spot-breasted" species. One learns its call to make identification easier, since this shy bird tends to remain under the dense cover of branches and bushes, especially alders and maple woods. The song is a "rolling series of rapid flute-like notes rising up the scale" (Robbins, *Birds of North America*, 1966). Also a ground-feeder enjoying the products of the damp earth, it nevertheless is closely associated with red elderberry thickets and Indian plum, and as summer matures these fruits, it spends much time higher in the vegetation.

Nests are also mud-lined, of twigs, moss and grass, and placed at medium height in small trees and bushes.

Varied Thrush

A winter visitor, this thrush resembles the robin, but with distinct orange eyebrow and wing bars and a breast band; it prefers moist coniferous woods. It has a distinguishable call described as a long quavering whistle followed by a pause, then repeated on another note, often higher in pitch than the first. It is usually observed feeding on the ground but with colder weather it may appear at feeders.

Golden-crowned Kinglet

Tiny, greenish-toned, hyperactive insect feeders, woodland birds prefer tall conifers in our wooded park. Because they flit about incessantly, often high in the canopy, one needs to follow their motions with binoculars to be rewarded with the sight of the bird's bright yellow crown bordered with black and white stripes, and in the case of the male, a bright orange center on the middle of the yellow crown.

The call often mingles with that of chickadees but it is recognized as a thin "see-see-see."

The kinglet forages for insects through branchlets of firs and hemlocks, and constructs a mossy nest in the dense cover of similar conifer branches.

Cedar Waxwing

Although this species appears irregularly in Pioneer Park, more often in winter and spring, it is generally found in flocks at berry-bearing shrubs, which it may strip clean. Its pleasingly silky appearance is of grays and browns, the distinct black face-mask topped by a pointed crest, and with a bright yellow band at the tip of the tail. Before fruits are ripe, cedar waxwings feed on insects and near bodies of water display like flycatchers.

It shows a preference for stands of madronas and mountain ashes, as well as dogwood and hawthorne.

The nest is placed in trees, within the middle canopy layer.

Starling

This short-tailed, dark-colored introduced species is generally associated with inhabited areas, where it finds foraging for food more convenient. It is much less common in the wilderness. Perhaps the starling is best known as a pest bird, often invading tree trunk holes of woodpeckers, and it is aggressive enough to drive off the larger birds.

Two other habits are perhaps less known to the beginning birder. The starling is an excellent imitator of other bird calls, and may even learn to repeat human sounds. It is also a gregarious bird which spends the night in large communal roosts, although during breeding season it is a cavity nester.

Vireos

This family of birds is similar in its habits to warblers but moves more deliberately through the foliage in searching for crawling insects. Another distinction is the markings about the eyes, and a heavier bill. Vireos have a joyous song and since their notes are repeated frequently, one can soon learn to distinguish them.

Nests are principally cup-shaped, made from strips of bark and moss, and hung between two branches at a fork. For the three species we compare here, there are distinct locations for these nests.

Solitary Vireo — frequents a forest of mixed deciduous and coniferous trees. After one learns its song it is possible to locate this rather sluggish bird, often on the lower, more open branches of conifers and sometimes deciduous trees. During the breeding season, one might find the nest hanging from a low twig of a cedar or fir, relatively near the ground.

Red-eyed Vireo — The song may be confused with that of the *solitary*; it nests in the canopy and is more often heard than seen.

Hutton's Vireo — prefers dense mixed woods. Quite uncommon in Pioneer Park, it may be confused with the *ruby-crowned kinglet*, which may overlap with *Hutton's* during migration and the winter season. Nests are hung on low branches.

Warbling Vireo — prefers alders and big-leaf maples. This bird is more easily heard than seen, as it forages and nests in the middle to upper reaches of dense foliage. It has a similarly constructed nest, that is the hanging type, but near the canopy. Often during breeding season, while sitting on the nest, the male may be heard singing.

Warblers

Bright colors, small size, active insect hunters—these phrases describe this family better than the impression that a "warbler" should necessarily be a good "singer." Although undoubtedly other warblers have nested from time to time in Pioneer Park, only three representatives were observed in this study.

Black-throated Gray Warbler — for its food and nesting requirements, this bird prefers conifers, especially Douglas fir, with fairly dense, dry foliage. It builds its nest in the middle to top of the trees.

Wilson's Warbler — this warbler prefers brushy, moist parts of the woods where it may nest in salal or sword ferns common to the ground cover of our coniferous woods. But its habit of foraging within a few feet of the ground offers the birder an opportunity to learn its call and observe the black cap perched on the head.

Orange-crowned Warbler — prefers forest edges, thickets, brushy woodlands, generally in the lower branches; its call is a slow, low trill. This warbler probably nests in the park.

House Sparrow

Abundant wherever humans live, this introduced species is a weaver finch which resembles our native sparrows. It was observed only in the boundary area of Pioneer Park where dwellings occur. Essentially a scavenger and seed-gatherer, it relies mainly on civilization for its food and nesting sites, and is non-migratory. It competes with native birds for bird houses.

Brown-headed Cowbird

This bird has two unique habits that are worthy of mention. First, it is generally associated with cattle and horses, using their particular pastures and pathways where it forages for insects that accompany them. Obviously, this fits in our picture of the park.

Perhaps even stranger, however, is the habit of the female cowbird to lay her eggs in the nests of other birds, often in those of warblers, vireos, and sparrows. Since the cowbird nestling is larger and the foster parents are unable to distinguish it from their own young, it may demand a disproportionate share of food and attention given nestlings. This relationship is continued until, when independent of the foster parents, the cowbird begins to associate with its own kind.

Western Tanager

This is a bird one should learn, for it has a spectacular appearance and an easy song to remember. Bright yellow and black plumage is the conspicuous markings of both male and female birds, with the male displaying a brilliant reddish-orange head.

The habitat for this species is high in open Douglas fir or cedar, or mixed coniferous-deciduous forest.

The song may be confused with that of the robin, but the call of this bird is identifiable as "prit-tick," "prit-it," or "pit-er-ik."

The nest is placed on horizontal branches, usually in conifers.

Black-headed Grosbeak

A loud, clear robin-like song indicates the presence of this bird, usually stationed at the forest edge where brush mingles with big-leaf maples and other deciduous trees. It feeds on both insects and fruits, the latter attraction being those of elderberry, blackberry and dogwood.

It has a loosely constructed nest of twigs placed in small trees and bushes.

Purple Finch
House Finch

Since birds exhibit different plumages depending on age and sex, these two species are often misidentified until the bird-watcher has learned the variations in their songs. To be sure, they are generally associated with different habitats, but this rule does not apply in areas where backyard feeders are the attraction.

In general, the *purple finch* prefers the moister, darker coniferous-mixed woods, while the *house finch* accommodates itself better to populated areas, especially if water is available. The *house finch* visits drier open areas to seek the seeds of grasses as well as fruits and berries.

The *purple finch* tends to nest quite high, usually in coniferous trees, whereas the *house finch* may locate in bushes and dense shrubbery, also in vines such as ivy, often on buildings.

American Goldfinch

Some people refer to this bird as a "wild canary," because of its bright yellow plumage. It is indeed a strikingly handsome species which may often be seen in numbers as a flock works the more open areas for dandelion, thistles and other composites. When this food supply is not available, alders and cedars provide buds and seeds.

Goldfinches make neat, cuplike nests in low trees or tall bushes, especially in willows.

Rufous-sided Towhee

A very common bird in Pioneer Park, this ground-feeding species is readily observed in the brush and undergrowth throughout the park. It has several variations to its call and song but is never silent for long. In the quietness of the woods it is not uncommon to hear a scratching among the leaf litter accompanied by a whining "chee-ee."

The nest is constructed with shreds of bark and plant fibers, and is placed on or close to the ground, with preference for blackberry, wild rose and salmon-berry thickets.

Song Sparrow

This bird is very common, and our most persistent singer. It inhabits backyards and just about every area in our park, always near the ground.

This is an easy bird to "call up" into view with lip noises; it may be identified as a brownish bird with striped breast containing a dark center patch.

Nesting locations correspond to the similar habitat of the towhee, especially blackberry, wild rose, salmonberry thickets, and brush piles.

CONCLUSION

No attempt was made to list the bird species in each of the specific areas of Pioneer Park. Instead, the intent was to show approximate strata and types of vegetation in the woods that each bird utilizes.

Nevertheless, special mention should be made of that area in the Northeast section known as the ravine, which harbors large populations of several species of birds. Bordered by dense coniferous-deciduous woods within the park, by still undeveloped woods to the north, and by East Mercer Way and a continuation of the ravine eastward toward Lake Washington, and including a year-round stream, this magnificent area has many attributes for attracting birds. Observations made from the south bank, at vantage points above many of the shrub-layer and understory trees, but still below the canopy, disclosed numerous species. This has been especially true in the spring season when migratory birds, particularly grosbeaks, warblers, vireos and hummingbirds, are attracted by the combination of the water plus the fruits and seeds of maples, alders, Douglas fir, hemlocks, as well as those of the well developed shrubby vegetation which consists mainly of elderberry, red huckleberry, salmonberry and the like. During the breeding season, still other species are found, including thrushes, wrens, and *pileated woodpeckers*, to mention only a few.

Attention should also be called to the presence of the *pileated woodpecker* on Mercer Island which comes as a surprise to those who

regard it as a bird of undisturbed old-growth forests. Study of its behavior, however, suggests that conditions in Pioneer Park and the remaining wooded ravines of Mercer Island are, in fact, ideal for this species. The necessary food supply such as carpenter ants, beetle larvae and similar bugs occurs abundantly in slowly decaying trees. These may be standing trees or downed rotting stumps or logs. The park and other wooded ravines that have not been "tidied up" show abundant evidence of the presence of this species. It is also suggested that rarely more than one pair inhabit a single woods. It is probably true that the numbers of pairs have declined in the last decade, since nesting trees are found in heavily timbered, often second-growth, mixed deciduous and conifers.

A nest-tree may be successfully used for several years. Holes are excavated in either dead trees or dead limbs of live trees; the height of the cavity ranges from 15 to 70 feet above ground. Both parents participate in digging the hole, with the average cavity being 15 inches deep, 8 inches wide, with the entrance approximately 3-4 inches in diameter. Usually 3-4 eggs are laid, with only one brood per season. In general, nest-trees are fairly large, perhaps 100 feet tall, with diameter of upwards to 3 feet.

The essential point seems to be that birds such as the *pileated woodpecker* have certain habitat requirements, including large conifers for nesting and decaying stumps and logs together with berry trees for foraging. Moreover, they can be encouraged to live and reproduce in densely populated areas, provided (1) that their habitat requirements are included, and (2) that these birds are not molested by hunters as they frequently are in more rural areas. There seems little doubt that other "wilderness" birds such as *great horned owls, screech owls* and certain hawks can be induced to colonize on Mercer Island if we maintain some wooded areas in a semi-natural state.

APPENDICES

A general species list of seventy-four birds found in Pioneer Park during the study period is present in Appendix 1. This list is modified from the original 1972 publication. A breeding bird census was made and each species is described in the text with an explanation of its habits and habitats. Some preliminary observations are indicated which correlate Pioneer Park characteristics with certain bird species. Finally, an attempt to identify certain birds with the habitats in which they are found most frequently is shown in Appendix 3, the profile study of Pioneer Park.

APPENDIX 1

General Species List for Pioneer Park

[* indicates probable nesting species]

Sharp-shinned hawk
Cooper's hawk
Red-tailed hawk
*Band-tailed pigeon
Great Horned owl
Barred owl
Screech owl
Anna's hummingbird
*Rufous hummingbird
*Northern flicker
Red-breasted sapsucker
*Pileated woodpecker
*Downy woodpecker
*Hairy woodpecker
*Olive-sided flycatcher
*Western Wood pewee
*Western flycatcher
*Violet-green swallow
*Cliff swallow
*Barn swallow
*Steller's jay
*Common crow
*Black-capped chickadee
*Chestnut-backed chickadee
*Bushtit
Red-breasted nuthatch
*Brown creeper
*Winter wren
*Bewick's wren
*Golden-crowned kinglet
Ruby-crowned kinglet
Townsend's solitaire
*Swainson's thrush
Varied thrush
Hermit thrush
*Robin
*Cedar waxwing
Starling

*Hutton's vireo
*Solitary vireo
Warbling vireo
Orange-crowned warbler
*Yellow-rumped warbler
*Black-throated Gray warbler
*Wilson's warbler
Black-headed grosbeak
*Rufous-sided towhee
*Song sparrow
Chipping sparrow
Dark-eyed junco
White-crowned sparrow
Golden-crowned sparrow
Fox sparrow
*Brown-headed cowbird
Northern oriole
*Western tanager
*English sparrow
American goldfinch
*Purple finch
*House finch
*Pine siskin
Red crossbill
Evening grosbeak

OCCASIONALS

Killdeer
California quail (formerly)
Mourning dove
Bald eagle
Northern pygmy-owl
Common nighthawk
Red-winged blackbird
Hammond's flycatcher
Tree swallow
Yellow warbler
MacGillivray's warbler

APPENDIX 2: GLOSSARY

Habitat — "the place where an organism lives"
Ecological Niche — "the role that the organism plays"
in conclusion, "the habitat is the 'address' . . .
the niche is the 'profession.'"

Ecology,
Eugene P. Odum

Territory — an area "staked out" by a male and defended against other males of the same species.

Song — a group of sounds repeated in a pattern at intervals; to warn off males of the same species; in effect, attracts females.

Calls — mainly used as a device to warn other birds of the presence of an enemy; to rally a flock; food call; location determiner.

Common — a bird seen most of the time, sometimes in numbers.

Uncommon — may occur seasonally or under appropriate conditions, sometimes in numbers, but irregular in its appearance.

Rare — infrequent visitor, often noticed only by an experienced observer.

Occasionals — appearing on Mercer Island infrequently and at irregular intervals.

Probable Nesters — species for which we have no positive record of nesting in Pioneer park, but which are known to nest in similar situations in the Puget Sound Basin.

Family — a group of related birds; includes one or more genera and species; as an example, robins and thrushes are all members of a single family, *Turdidae*.

Species — an individual member of a family; i.e., robin or varied thrush.

APPENDIX 3

Explanation for Strata in the Forest Profile.

I. **Grassy areas**, including lawns and other open areas bordering the wooded areas of the Park; includes lawns separating residences from the Park boundary.

II. **Forest edge**. Areas which serve as a buffer between the grassy areas and trees; characterized by low shrubs and low vegetation, principally salal, Oregon grape, and sword fern.

III. **Tall shrubs**. Both shrubs and small trees are included up to an arbitrary height limitation of approximately 30 feet. Examples of this vegetation are red elderberry, holly, dogwood, and naturally regenerating trees.

IV. **Canopy**. All trees, including trunks and branches, above the 30-foot level to the top of the forest stand.

V. **Interior forest floor** designates the ground layer vegetation within the forest. Examples are Oregon grape, ferns and salal.

VI. **Boundary areas**. Streets, driveways, houses, and other built-up areas surrounding the Park.

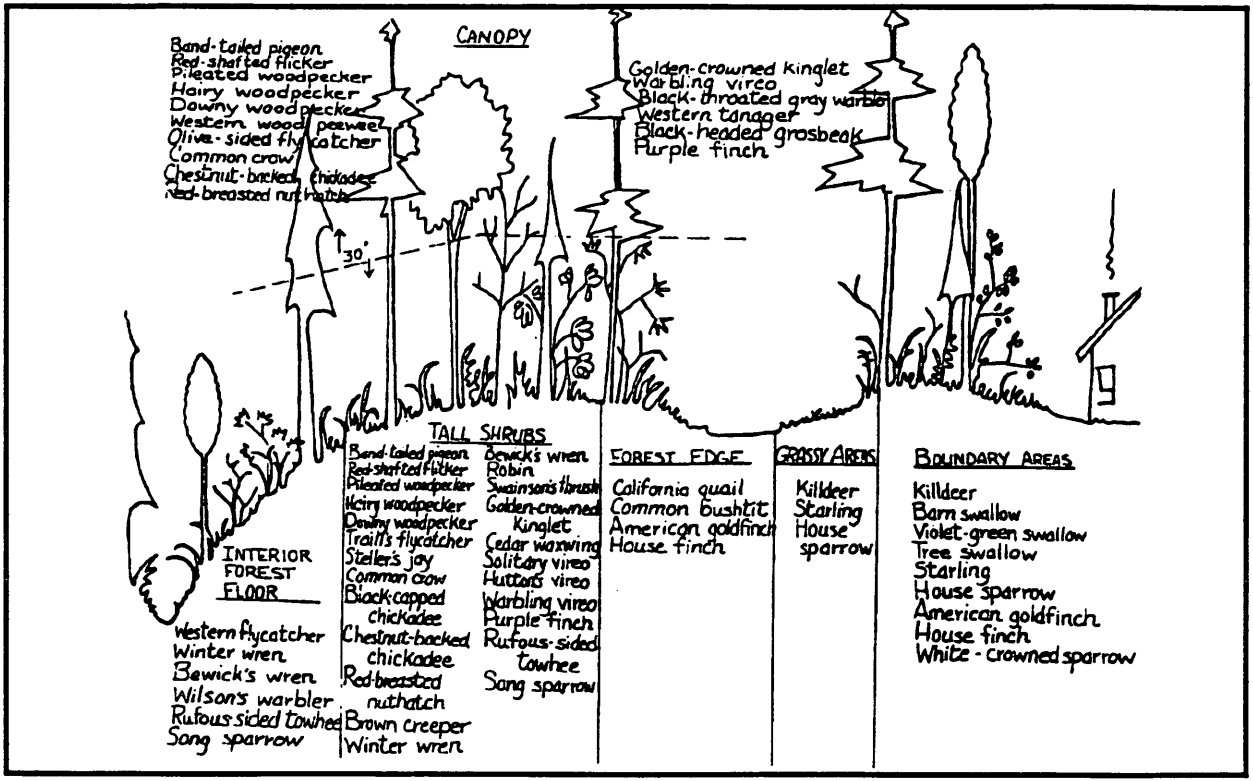

FIGURE 12
Profile of Bird Species and Forest Strata

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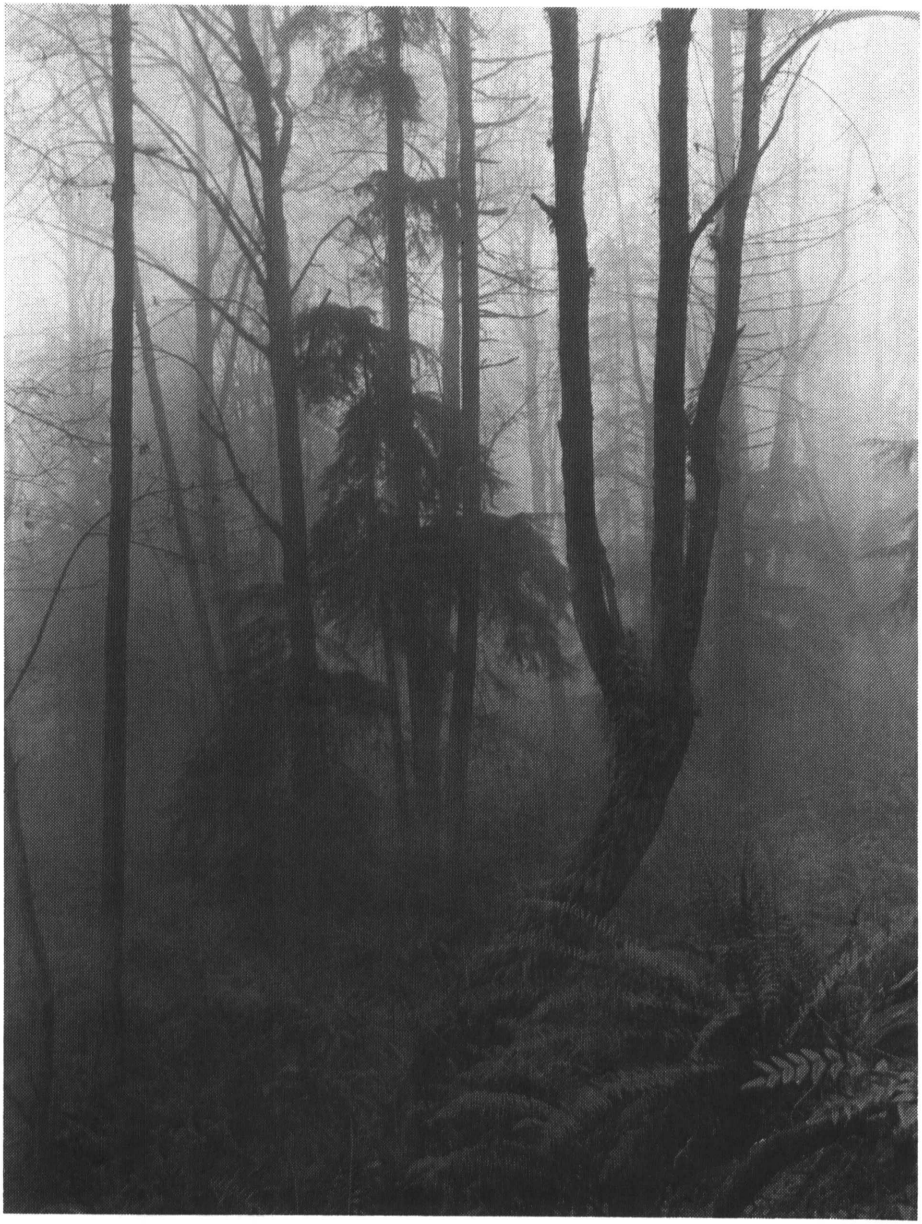

MAMMALS OF PIONEER PARK

by Gerry Adams

Several species of mammals have been observed in Pioneer Park. With 120 acres and a variety of habitats, the park has the potential to support a greater diversity of mammals than has been recorded. If you observe wildlife in the park, please report your sightings to the Mercer Island Park Department. The data you provide is important for keeping updated wildlife statistics.

Watching mammals can be combined with other activities such as birdwatching or hiking. Since mammals are often elusive and hard to see, look for their signs: tracks in mud, dirt or snow; scat in runways, on mounds, or on trails; and bits of fur or hair on the ground or caught on vegetation. The greatest diversity of mammals is seen during the twilight periods of morning and evening.

To identify mammals and their evidence requires a good field guide such as *Mammals of the Northwest* by Earl Larrison, or *Mammals of the Pacific States* by Lloyd Ingles. A handy guide to tracks is *Animal Tracks of the Pacific Northwest* by Karen Pandell and Chris Stall. In addition, good binoculars are essential.

INSECTIVORES

Two families, shrews and moles, make up the order Insectivore whose members eat invertebrates such as worms, insects and insect larvae.

Vagrant shrew — (*Sorex vagrans*)

Look for this brown shrew in damp areas like wet meadows or ditches, among ferns and in the runways of voles.

Trowbridge's shrew — (*Sorex trowbridgii*)

This small shrew prefers dry coniferous forests. It is dark colored with a distinctly bicolored tail. Foraging on the forest floor, it prefers a diet of insects and other invertebrates but will also eat the seeds of the Douglas–fir.

American shrew-mole — (*Neurotrichus gibbsii*)

This creature is the smallest mole in North America. It can be distinguished from shrews by its shovel–like front feet. It is found under the forest leaf mat but also forages on the surface.

Townsend mole — (*Scapanus townsendii*)

The Townsend mole is the largest mole in North America. Its presence is indicated by large mole hills in open areas.

Coast mole — (*Scapanus orarius*)

Smaller than the Townsend mole the coast mole is found in drier brush and forest areas.

BATS

Bats are the only mammals capable of sustained flight. They hunt insects during twilight periods and sometimes fly with swallows and swifts when feeding. Even though they are not considered insectivores, they eat a higher percentage of insects than shrews and moles. Bats found in Pioneer Park hibernate under neighborhood roofs during the winter when insects are not available.

Little brown bat — (*Myotis lucifugus*)

This bat is the most common bat in Pioneer Park and can be seen feeding on insects at dawn and dusk over open areas.

Big brown bat — (*Eptesicus fuscus*)

Larger than the little brown bat, the big brown bat feeds high above the ground along the tree tops.

RODENTS

Over one-half of the mammals on the earth are rodents. Their high reproductive capacity is balanced by their high rate of loss to predation.

Mountain beaver — (*Aplondontia rufa*)

The mountain beaver is the oldest known living rodent, going back to the late Paleocene, about 60 million years ago. The animal's burrows can be seen in banks in moist open forest areas. It is not a relative of the dam-building beaver (*Castor canadensis*) common in rivers and ponds.

Townsend chipmunk — (*Eutamias townsendii*)

This dark brown chipmunk lives in underground tunnels with openings about one inch in diameter. In the Pacific Northwest, chipmunks are the only true hibernators.

Eastern gray squirrel — (*Sciurus carilinensis*)

This squirrel, common to cities throughout the U.S., was introduced into the Puget Sound area in the 1920s.

Douglas squirrel — (*Tamiasciurus douglasii*)

Also known as "chickaree" this native squirrel has been on the decline in recent years due to competition with a newcomer, the Eastern gray squirrel.

Northern flying squirrel — (*Glaucomys sabrinus*)

Unlike other squirrels, flying squirrels are almost completely nocturnal and somewhat carnivorous, occasionally eating bird eggs. They are generally more common than we think because they are seldom seen. You can hear them at night, however. Their chirps can be heard from the wooded canopy, but you usually hear the sound of their bodies as they slap against tree trunks when they glide from tree to tree.

Deer mouse — (*Peromyscus maniculatus*)

Mostly nocturnal, deer mice live in the woods. They dash for protection at the slightest noise. Their fur is dark above and white on the belly, extending the length of the tail.

Oregon vole — (*Microtus oregoni*)

Sometimes called Creeping vole or Meadow mouse, their runways are sometimes found in the forested and grassy areas of Pioneer Park. Their runways are often used by the Vagrant shrew.

Norway rat — (*Rattus norvegicus*)

Also known as Common rat, Brown rat, Water rat. This European species has thrived since it was accidentally introduced, probably with some of the first human immigrants from the Old World. The saving grace of this otherwise vile creature is that it is the preferred food of the Great Horned owl in urban areas. Owl predation will probably prevent any rat population explosions.

CARNIVORES

While most carnivores eat only other animals' flesh, carnivores such as raccoon and coyote also eat berries and plants. Their offspring are usually born blind and require extended parental care.

Coyote — (*Canis latrans*)

This relative of the wolf looks like a medium-sized domestic dog. Coyotes are not a danger to people but are known to mistake small

dogs and cats for wild food. Although coyotes are still common in the Snoqualmie Valley and some other eastside locations, they have not been seen in Pioneer Park for many years.

Raccoon — (*Procyon lotor*)

The "mask" on a raccoon makes this common resident easy to recognize. Its feet make human, hand-like prints in soft mud when near water where it likes to feed. After a snowfall its prints may be seen along the park trails. Although raccoons are primarily nocturnal, those that live in urban areas are often seen during daytime looking for more available food around human habitation.

HOOFED MAMMALS

Our native hoofed mammals have an even number of toes on each foot. Cattle, bison, elk and deer are examples.

Mule deer — (*Odocoileus hemionus*)

Another common name for this deer is Black-tailed deer. Formerly considered a separate species, our local variety indeed has a tail that is basically black on the upper surface. Mule deer usually only have black on the tip of their tail. Although once common at Pioneer Park and elsewhere on Mercer Island, they have now been extirpated from the area.

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SOILS —THE PARK'S FOUNDATION

by Henry Seidel

Three major soil types occur in Pioneer Park. They differ greatly in texture and thus in drainage characteristics. Formerly soils with poor internal drainage, such as the *Alderwood* series, supported stands of western red cedar. Nowadays, cutover lands on such soils are colonized by red alder and bigleaf maple. The much better drained to dry *Indianola* and *Everett* series are usually colonized by conifers, especially Douglas fir, but the broadleafed evergreen Madrona is almost always found on very well drained soils.

Alderwood Series

The major soil series found in Pioneer Park is the *Alderwood* series. The soils of the *Alderwood* series have two main types, known as the *Alderwood gravelly sandy loam* and *Alderwood gravelly loam.* The predominant soil in this area is the gravelly loam. The *Alderwood* soils are covered with 3 to 4 inches of forest litter and have a reddish brown friable surface soil. The profile of the soil shows that the soil grades to a yellow brown and finally to a slate-like color at 30 to 36 inches, where it is underlain by a heavy cemented drift. This cemented drive continues to great depths. Gravel and occasional stones are scattered throughout the profile. This indurated, cemented substratum is composed mostly of sand with a small percentage of clay, making the soil slowly permeable to water. As a result, these soils have poor internal drainage. The cemented substratum also has the same effect on plant roots which can only penetrate the cemented layers to shallow depths.

The Alderwood gravelly loam is a cold soil which takes a long time to warm up. When this soil occurs on slopes ranging from 0 to 3 percent, there is a tendency for the soil to puddle and stay wet because of its poor internal drainage. This condition occurs predominately in the NW section along the trails and cleared areas. The continual walking or riding of horses on these trails if no vegetative cover is provided tends to compact the soils so that even the fair drainage in the surface soil is destroyed.

The *Alderwood gravelly loam* occurs in the NW and NE sections. The major drainage of the park is to the northeast. The steepest slopes in the park are found in the NE section. When cleared the *Alderwood* soils on steep slopes are subject to very intensive sheet erosion and if a great deal of water accumulates, they have a tendency to slip. The *Alderwood gravelly loam*, because it has its heavy cemented substratum, is a prime candidate for soil slides. In this area particularly, the forest cover above the slope and the vegetative cover on the slope should not be disturbed. Rain falling on unprotected soils of this type penetrates the shallow topsoil vertically and then, on reaching the compacted subsoil, moves laterally down the slope. If the surface soil becomes saturated, the hazard of slippage is immediate and can be disastrous. In general, these soils should not be cleared if their position is such that a slip of more than 15 percent is created. With special precautions, the soils have been cleared in the 15 to 25 percent gradient. Over 25 percent slopes represent a hazard. Usually the best method of reducing the hazard is to leave the native cover as is.

Indianola Series

The *Indianola* series of soils occurs in the upper areas of the park. This series is closely associated with the *Alderwood* series. The predominant type is the *Indianola fine sandy loam*. The soil has a more developed surface soil, and in virgin area is covered with partially decomposed vegetative material. The surface soil will range in depth from 9 to 12 inches. The soil is moderately acid and is reddish brown in color. The upper subsoil is a yellowish brown sandy loam containing some gravel. The deeper substrata are stratified and contain a high content of gravel.

The *Indianola* soils have good surface and internal drainage. They are generally easy to work. Their fertility is low, particularly when the surface organic matter is removed. The nutrients of these soils are easily washed and leached through the profile. The predominant cover of these soils consists of Douglas fir with a few hemlock. When cleared, these soils can produce fairly good pasture and hay crops if carefully managed. These soils are not as subject to

erosion as the *Alderwood* series, primarily because of their position in the park.

Everett Series

The *Everett* series intrudes into the *Indianola* series in the park. This series and the *Indianola* series are generally associated with the *Alderwood* soils. The *Everett* soils are moderately acid, gravelly, porous and droughty. They have a pale, reddish brown gravelly surface soil with a thin layer of organic material in their surface. There is little textural or structural development in this series. These soils, like the *Alderwood*, are derived largely from granite but include some basaltic material.

The *Everett* series of soils should not be cleared. If these areas are cleared in the park, legumes and grasses should be planted to maintain a permanent cover.

Soil and Forest Development

Soils develop as the product of the interaction between parent materials—the underlying rocks and other geological deposits—with their environment. Important environmental factors include climate, slope and other factors affecting drainage, the activities of living organisms, such as plants, earthworms, and bacteria, and age. The Pioneer Park soils are young, having developed on materials deposited during the last ice advance, about 10,000 years ago.

The *Alderwood* soils developed on relatively fine-textured glacial till which became much compacted at various depths below the surface. Roots are generally unable to penetrate these cemented layers, and drainage is impeded during the wet season. Because of poor aeration, organic matter is slow to decompose and builds up as a dark brown mat in old, undisturbed forests.

The *Indianola sandy loams* and the *Everett gravelly sands* developed on coarse-textured glacial deposits called eskers and kames. These deposits of gravel and sand were formed by water flowing through tunnels or depressions in the ice or along its borders. As already noted, the *Indianola* and *Everett* soils are very well to excessively drained. Because aeration is good, microorganisms

decompose dead organic matter quickly and thick layers do not build up.

The pre-settlement forests of Mercer Island were dominated by conifers: Douglas fir, western red cedar, western hemlock, and, to a lesser extent, grand fir. When these forests were removed around the turn of the century, much of the organic matter at the surface of the soils was lost, because of increased rates of decomposition and, occasionally, fires which started in the dry logging debris. Seeds of remnant conifers, principally Douglas fir, germinated quickly in the exposed mineral soil. Seedlings of red alder also became established along with the conifers. Red alder is a short-lived tree which because of its inability to compete with the giant conifers had been virtually restricted to sites along streams and in other wet places in the pre-settlement forests.

In the competition on the logged-over lands Douglas fir seedlings outgrew those of the other conifers and alder in well drained and dry situations, that is, on the *Indianola* and Everett soils. Red alder seedlings, however, generally outgrew the conifers and shaded them out on the wetter *Alderwood* series. Since alder trees live only seventy to ninety years and their seedlings are unable to survive long in the shade, the Pioneer Park alders which have dominated the NW section since it was logged are now dropping out. They will gradually be replaced by longer-lived species adapted to relatively wet forest conditions, such as red cedar, grand fir, and big-leafed maple. On the drier *Indianola* and *Everett* soils Douglas fir dominance will continue indefinitely, but conifers such as western hemlock and red cedar, which are able to persist in shade, will become increasingly abundant in the understory.

NOTE: Soil descriptions taken from *Soil Survey of King County*, 1952.

Gerry Adams of Duvall is Vice President of the Seattle Audubon Society. His interests as a naturalist include extensive studies of the effects of urbanization on wildlife. Among his recently publications is *Mammals of Discovery Park.*

Ethel Dassow is an editor with Alaska Northwest Publishing Company, and was a magazine editor for twenty years. An amateur naturalist, she is an outdoor forager of fungi, berries and fish. With her husband, John, now retired from the U.S. Fish and Wildlife Service, she has lived on Mercer Island thirty-four years.

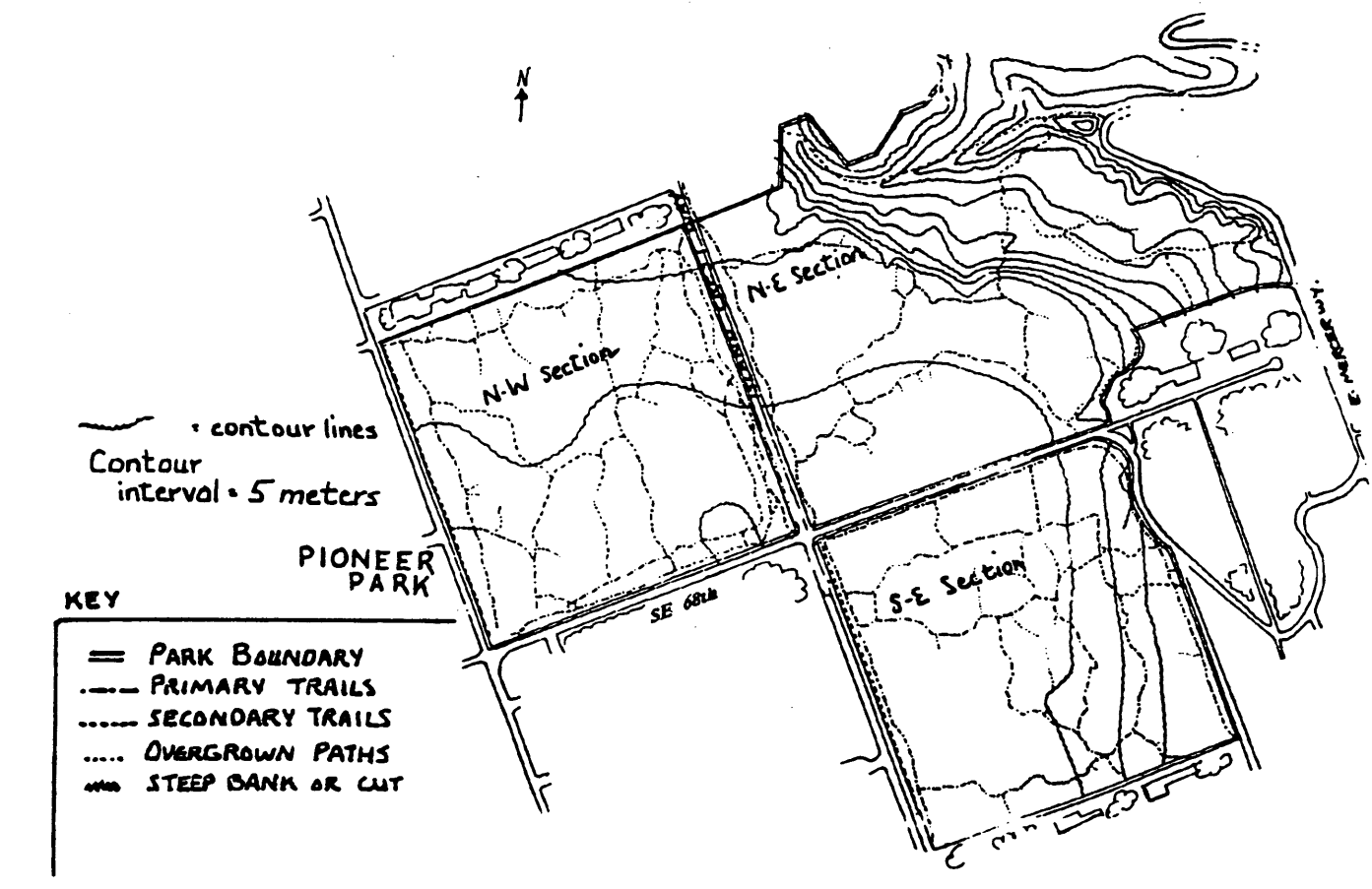
Merilyn Hatheway has been a birdwatcher since the mid-60s. She has taught classes for birders on Mercer Island, at the UW Arboretum and for the Seattle Audubon Society. Along with Dassow, Kenady and Seidel, Hatheway wrote the first edition in 1972. She operates a small desk-top publishing business and produced the manuscript for this book.

Mary Kenady has extensive interest and experience in Pacific Northwest plant identification and study, as well as work with ornamental and vegetable gardens. She is the author of *Pacific Northwest Gardener's Almanac* and is presently at work on two other regional books. She lives on the west slope of the Snoqualmie Valley near Duvall and professionally is co-owner and co-manager of a company which presents training courses for natural resource managers.

Henry Seidel, Univ. of Idaho, B. S., Soil Scientist-Conservationist; Budget Director, King County; AA Administrative Assistant to Cong. Brock Adams; School Director, So. Kitsap Schools; Trustee, Bellevue Community College; resident of Mercer Island for twenty-six years.

Henry Steinhardt, who made the photographs, has lived on Mercer Island since 1963. He was for many years an architect and has been a full-time photographer for eleven years. His work has been published in several magazines and is in numerous collections. Exhibits of his works locally were held in 1986 at the Mercer View Community Center and in 1989 at the Seattle Chapter of the AIA. He claims to have taken over 3,000 walks in Pioneer Park, a statistic confirmed by his dog, Nora.

Laura Dassow Walls studied art with Mercer Island's Ren Haugland and at Cornish Institute of the Arts in Seattle. She currently is teaching 19th Century American literature and working on her Ph.D. at Indiana University in Bloomington. The daughter of Ethel and John Dassow, she has been married to Robert Walls since 1982.


N
N-W Section
N-E Section
S-E Section
SE 68th
E. MARKET ST.
= contour lines
Contour interval = 5 meters
PIONEER PARK
KEY
PARK BOUNDARY
PRIMARY TRAILS
SECONDARY TRAILS
OVERGROWN PATHS
STEEP BANK OR CUT