



Forest Stewardship Plan Point Defiance Forest

Forest name:	Point Defiance
# of acres plan covers:	560
Forest certification number:	SA-FM/COC-1394PDZ
Plan prepared by:	Katherine Sutalo, Metro Parks Tacoma
Date plan prepared:	June 30, 2010
County and state:	Pierce, Washington
Description:	Township 21 North, Range 2 East, Section 15 parcels 0221221011, 0221221021, part of 0221103000



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1. Introduction

Point Defiance is unique among urban parks on the north Pacific coast because of its old-growth forest joined to a massive sea cliff-wild beach system. The 560-acre Point Defiance forest includes about 500 acres of old-growth, which is an enormously valuable asset to the citizens of Tacoma and to the region, both for the ecosystem services it provides and for the unique recreational and educational opportunities it affords to park visitors.

Metro Parks Tacoma has developed this stewardship plan in hopes of meeting the requirements for certification by the Forest Stewardship Council. Although we have no plans to harvest timber from Point Defiance Park, certification helps assure the public that we are managing their resources in a reasoned and sustainable way, and also helps promote sustainable forest management world wide.

The purpose of this plan is to guide the management of the natural resources within Point Defiance Park, specifically within the Forest Zone. This forest has been owned and loved by the citizens of Tacoma since 1888. One of the strategic goals of Metro Parks Tacoma, the stewards of this park, is to “protect and restore the natural environment for conservation and learning,” and the broad goals for Point Defiance Park as a whole are to preserve and protect the park’s unique and valuable historic, cultural, recreational, and biological resources, and to promote the use and enjoyment of the park by the general public.

2. Forest Management Objectives

The guiding goal for the Point Defiance Forest Zone is to manage it as publicly accessible old growth: minimizing damage caused by invasive species and human impacts, while maintaining recreational access for people. Timber production for harvest is not one of our forest management goals.

Short-term management objectives for the forest:

- Develop and implement a forest monitoring program.
- Improve trail way-finding signs and map.
- Plan and implement repair of eroded areas on the eastern slope.

Long-term management objectives for the forest:

- Preserve the natural woodlands and shoreline; allow natural forest processes to proceed undisturbed where public safety and access will not be compromised.
- Protect public safety on roads and in developed activity areas.
- Protect the forest ecosystem from damage by such things as fire, erosion, invasive species or human activity.
- Protect any rare, threatened or endangered species or plant communities that exist within the park.

- Maintain 5-Mile Drive and existing developed activity areas for public recreational use.
- Maintain all sanctioned trails for public walking access with way-finding signage as appropriate; eliminate and re-vegetate unsanctioned trails.
- Make full use of the educational potential of both the natural and developed areas.

3. Maps

Maps on the following pages identify the property boundaries, activity areas, management stands, topography and soils of Point Defiance Park.

DRAFT

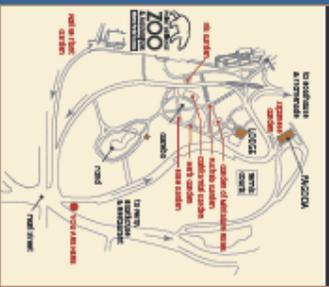
POINT DEFIANCE PARK



PUGET SOUND



Botanic Gardens



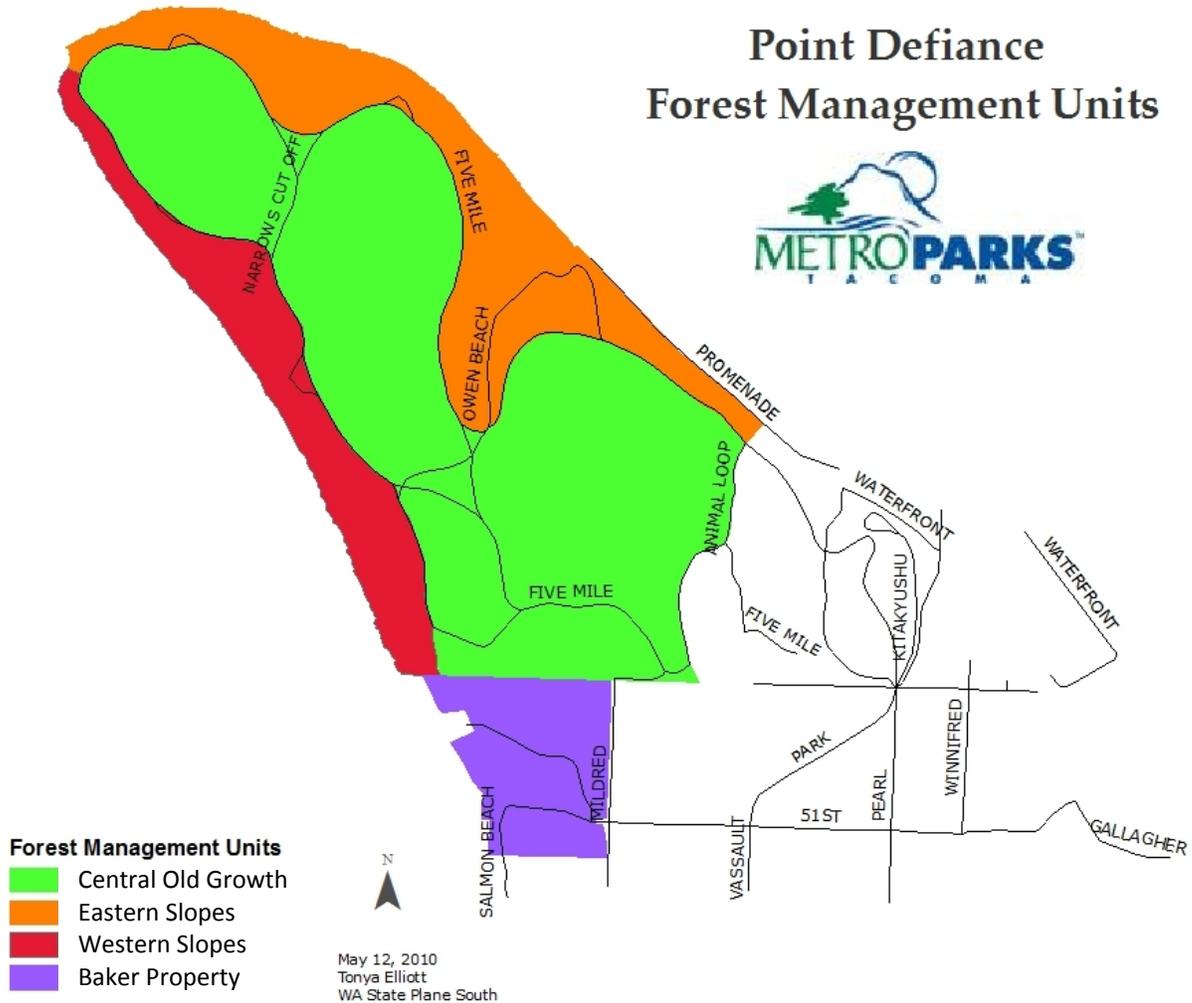
Map Legend

- Five Mile Drive
- Other Park Roads
- Park Boundary
- Primary Trails
- Secondary Trails
- Landmarks
- Food
- Bar Seeps
- Shelter
- Playground

For full accessibility information on Point Defiance Park attractions and facilities, please visit our website, www.metroParks.com/ogada

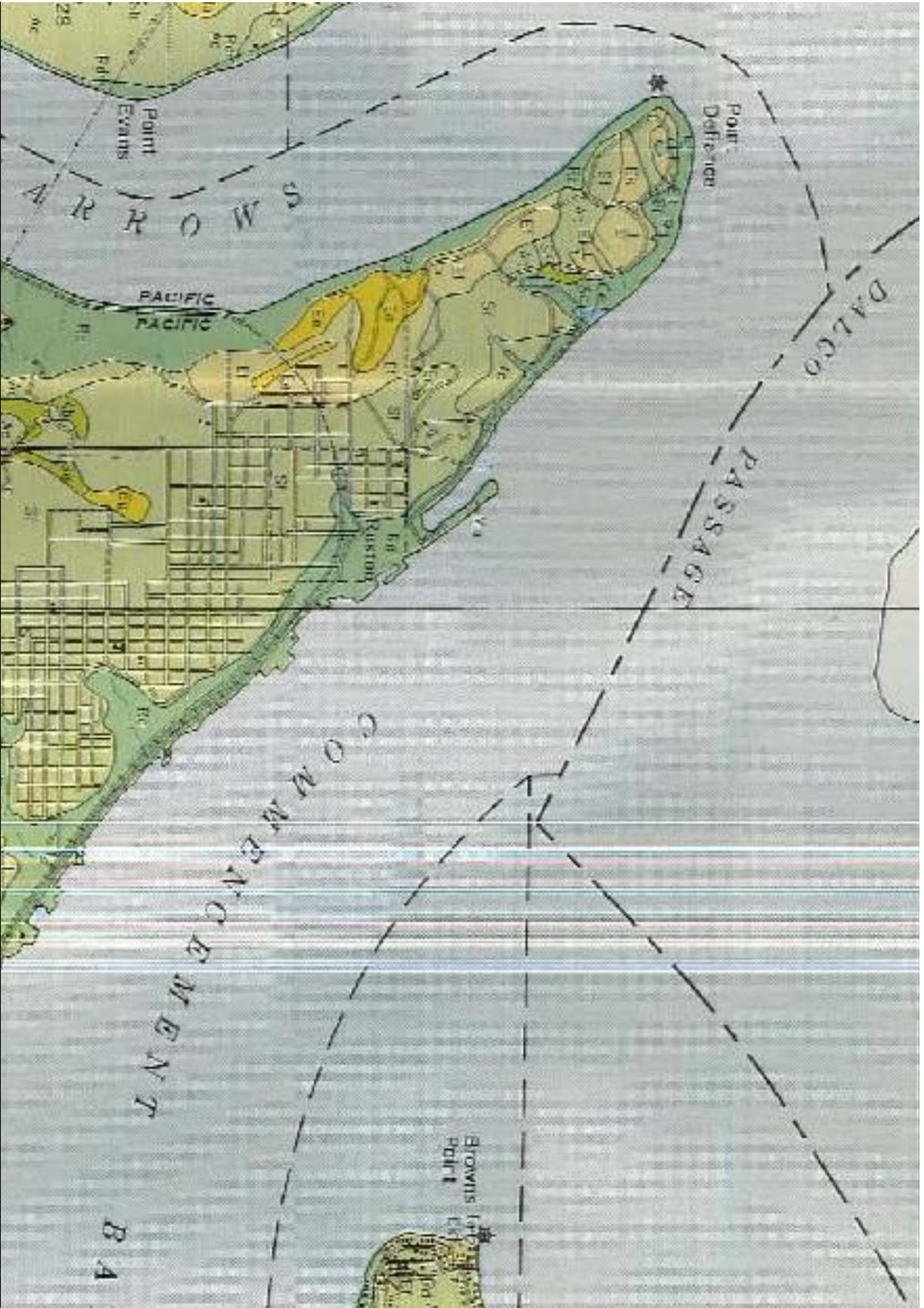
Point Defiance Park property boundaries, trails and Developed Activity Areas

Point Defiance Forest Management Units





Point Defiance Park topographic map
From the City of Tacoma's GovME maps on line



1955 Soils Map from the USDA Soil Conservation Service, Washington Agricultural Experiment Station and the Washington State Planning Council (USDA Series 1936, #27) Legend on reverse side.

4. Property Description

a. General Property Description

Point Defiance Park is located at North 54th and Pearl Street in Tacoma, Washington. The park is roughly triangular, bounded by Puget Sound on the northeast and northwest, and residential neighborhoods on the south. It contains about 700 acres within its present boundaries, of which about 550 acres are forested. Most of the forested area is accessible by the public during daylight hours via a paved road and extensive network of walking trails. Park features outside the forested area include a zoo and aquarium, a boathouse/marina, restaurant and ferry terminal, formal gardens, and maintenance shops. This Forest Stewardship Plan is concerned only with the forested portion of the park.

Within the forest zone are four developed picnic areas, three restroom buildings, two indoor/outdoor museum sites, a public beach, a Rhododendron garden and an off-leash dog area. Five Mile Drive, an asphalt paved road, loops through the forested area and includes five viewpoints with parking areas.

b. Ownership

The majority of the Forest Zone is owned by the City of Tacoma, and has been managed by the Metropolitan Park District of Tacoma (Metro Parks) since 1907. Forty-eight acres (parcel numbers 0221221011 and 0221221021: the Baker Tract) are owned by Metro Parks.

Property boundaries of the park are defined by Puget Sound on the northeast and northwest sides; much of the south boundary is defined by North Park Avenue/54th Street and North Mildred Street. Part of the south and southwest boundary abuts private properties: the south boundary is fenced, but the southwest boundary with the Salmon Beach community is not marked due to the shifting bluff edge on which the property line sits.

c. Historic land uses of the site

The forest type has not been significantly altered by human use, except in developed areas as described below, and in the Baker tract which may have been logged at some time before its acquisition by Metro Parks.

The property was held in reserve by the US military from 1866 to 1905; there is no record of permanent settlement at this site before government ownership. There were rich fishing waters below the point and then, as now, the point commanded long views to the north, west, and south. Access to the point was difficult, and though Indian trails ran through the forest and down the bluffs, there was no permanent settlement.

The park's immediate surroundings were developed for residential use, but there was a copper smelter nearby in the past which contaminated soil throughout the area with arsenic, lead and other heavy metals. A massive soil remediation project removed contaminated soil and replaced it with safe soil throughout the plume zone of the smelter's smoke stack, including parts of Point Defiance Park, though not the forest zone.

Within the Forest Zone are the Fort Nisqually Restoration and Camp Six historic areas. Fort Nisqually Restoration, a reconstruction of the historical Fort Nisqually from historic records and ruins, is classified as a site of military significance on the Washington Heritage Register. Camp Six, a logging museum created in 1964 to recreate the look and feel of a typical logging operation, contains a number of historic elements and is classified as a district by both National and State Registers.

Chronology of major known events

- 1840s Fire scorched much of the old growth.
- 1866 Point Defiance was claimed by the United States as a military reservation.
- 1888 Tacoma civic leaders persuaded Congress to allow park development at the Point. Tacoma proceeded to develop park features near the park entrance.
- 1902 A fire on the west side of Tacoma consumed 600 acres including some 50 acres of the park.
- 1905 Tacoma was granted full title to the park by the U.S. Congress. Zoo development underway.
- 1907 Metropolitan Park District of Tacoma was formed.
- 1911 Hare & Hare, landscape architects, prepared a master plan for the park in which the Forest Zone was to continue to remain undeveloped.
- 1930s Madrona Camp for WPA workers was established. Dead and dying trees were cut, and an area was cleared for Fort Nisqually. A sawmill was built to provide lumber for park structures. Park improvements by the WPA include the seawall and Owen Beach road.
- 1934 Historic Fort Nisqually structures were moved to the park.
- 1963 Aquarium was moved from the waterfront to the zoo site.
- 1964 Camp 6 and Never Never Land were opened. Native Garden and Rhododendron Garden were established.
- 1970 Mildred Street entrance to Point Defiance was created.
- 1975 48 acres added to the park (the Baker Property), adjacent to Salmon Beach.
- 1988 Bald Eagle Management Plan adopted.
- 1990 December wind storm of unusual direction and magnitude caused extensive damage to trees; particularly in the area from Owen Beach to Never Never Land.

5. Regional landscape

Point Defiance is situated within a city of 200,000 people, surrounded by water on two sides (and therefore included in both the Puyallup River watershed and the Chambers-Clover Creek watershed) and urban development on the third side. The Forest Zone is thus largely separated from other forests and natural areas. However, some of the west slope of Tacoma near Point Defiance remains partially forested. All of the steep slopes of northern Tacoma adjacent to the shorelines have been identified as habitat corridors in the City of Tacoma's Comprehensive Plan; these edge areas are not heavily developed due to their steepness and instability, and the City hopes to

maintain some habitat value in these areas while allowing some low impact development to occur.

Tacoma sits within a highly urbanized area along the I-5 corridor. Historically, this area was dominated by coniferous forests; native trees and shrubs are still common, but live now within urban and suburban landscapes. Point Defiance holds the largest of very few relatively undisturbed forest remnants in the Puget Sound area.

Point Defiance Park is considered a regional attraction; visitors come from throughout Pierce and adjacent counties. Park use has soared in recent years, creating the potential for increased impact on the forest zone, but volunteerism has also increased, giving us more resources to fight invasive plants and maintain walking trails.

6. Interaction with surrounding properties

Two sides of the park are bounded by Puget Sound (Commencement Bay on the east, the Tacoma Narrows on the west). To the south is residential development: a mix of single-family homes and small apartment buildings, as well as a large retirement community. Most of the park's southern border is separated from private properties by North 54th Street/Park Avenue. Two paved roads cross the Baker Tract to serve the adjacent Salmon Beach residential community, and are gated to prevent public use. The park is open to the public year-round during daylight hours.

7. Existing conditions and resources

a. Geological history

Tacoma lies in the southern portion of the Puget Lowland, an elongated topographic and structural depression filled with a complex sequence of glacial and nonglacial sediments that overlie bedrock. In general, the total thickness of the Quaternary-age basin fill varies from zero in scattered locations to greater than 3,000 feet. The depth to bedrock beneath Tacoma is approximately 1,000 to 1,700 feet.

The area has been glaciated six or more times in the past 2 million years. Each glacial event may have left a sequence of lacustrine, advance outwash, glaciomarine drift, till, and recessional outwash deposits distributed in a complex pattern, both stratigraphically and laterally. These glacial sequences were partially to completely eroded in some locations by either subsequent glaciations or erosion during nonglacial periods. The topography and near surface geology of the watershed is largely the product of the last glaciation (Vashon Stage of the Fraser glaciation), which receded from the area about 13,500 years ago. The Vashon glaciation left a layer of till and recessional sand and gravel deposits that mantle the upland plateaus north and south of the Puyallup River. The till and recessional deposits overlie Vashon outwash sand and gravel, and older glacial and nonglacial deposits that overlie bedrock at great depths. During interglacial periods, fluvial and lacustrine sediments were deposited in river valleys and depressions. In recent time, fill, colluvium, and beach sediments were also deposited in some locations.

The Vashon and older deposits in the Tacoma area form a sequence of sand and gravel layers separated by finer grained layers of clay and silt or tight, well-graded soils, which are exposed in places along the steep slopes that lie between the upland plateau

and the lowland floodplain. The Vashon and older deposits comprise several aquifers and aquitards within the subsurface, which control subsurface water movement from the upland to the lowland as well as to the locations of streams and creeks that occupy former outwash channels.

Coastal bluffs within the City of Tacoma are typically composed of materials deposited during several glacial and interglacial episodes. Variable stratigraphic layering of successive glacial and nonglacial deposits can result in different sediment delivery dynamics. The coarser outwash materials tend to be less resistant to erosion, and have lower strength, resulting in faster rates of bluff retreat. Bluffs that naturally contribute sediments and materials to the coastal zone, thereby supporting coastal processes and intertidal habitats, are referred to as feeder bluffs.

The city's bluffs were probably formed by coastal erosion following retreat of the ice sheet and regional drop in relative sea level (Shipman, 2004). Over time, the bluffs become oversteepened due to wave erosion at the base of the cliffs. Landsliding and mass wasting ensue, resulting in episodic retreat of the shoreline.

The movement of water through the hillslope also influences the potential for mass-wasting. The presence of a relatively impermeable layer (e.g. proglacial lake sediment) under a relatively permeable layer (e.g., recessional outwash) can increase hydrostatic pressures and focus the lateral flow of groundwater to the bluff face, resulting in instability at the interface between the two layers. This pattern often results in the stair-stepped bluff patterns observed within Puget Sound (Shipman, 2004).

Precipitation is especially important in mass wasting processes in the Puget Sound, as large mass wasting events, both shallow and deep-seated, are correlated with above-average rainfall years (e.g., the winter of 1997-8).

Wave action can also result in mass wasting of hillsides. Wave action can erode the toe of the slope, thereby destabilizing the upper portion of the slope via loss of toe support. This process results in episodic bluff retreat that can threaten structures on or above the slope. This process also serves to deliver significant volumes of fine and coarse sediment to the shoreline, thereby influencing the type and extent of landforms and habitats.

The Puget Sound is an active tectonic region, with the potential for both Cascadia Subduction Zone and intraplate (e.g., Tacoma Fault) movements. Tectonic activity, can both: (1) result in rapid uplift or subsidence of portions of the shoreline, and (2) destabilize hillsides by seismicity (Atwater, 1990; NOAA, 2003). The significant 1949 slope failure in the Narrows was likely at least partially due to a 7.1 magnitude earthquake three days prior to the failure. More recently, the 2001 slope failure on the bluffs above the community of Salmon Beach was attributed to the 6.8 magnitude Nisqually earthquake.

b. Topography

The majority of the forest zone is generally level, but the shorelines are for the most part very steep exposed bluffs. There is a ravine in the southeast corner of the forest zone which is interrupted by fill supporting 5-Mile Drive; a culvert carries seasonal water under the road to the beach. This ravine is sketched in on the topographic map.

The shoreline bluffs erode continually, due to their composition and steepness. Where the eastern slopes are less steep, off-trail human use has caused eroded areas.

c. Soils

Soils information was obtained from the 1955 survey of Pierce County done by the USDA Soil Conservation Service with the Washington Agricultural Experiment Station and the Washington State Planning Council (USDA Series 1939, No. 27). The soil types within the Forest Zone are generally well-drained soils derived from glacial drift or glacial till: Everett gravelly sandy loam and gravelly loamy sand; Alderwood gravelly sandy loam; Sinclair gravelly fine sandy loam; and a small area of Kitsap silt loam near the tip of the point. The specific soil descriptions listed under each stand are also derived from the 1955 document.

The Washington State Department of Natural Resources does not have soil typing or site class listings for Point Defiance, but nearby sites across the water are site class III, which in western Washington means a site index range of 97-118.

d. Shorelines, streams, rivers and wetlands

The shorelines are natural, fed by the eroding bluffs above, except for a seawall that extends from Owen Beach southwards. There are no perennial streams within Point Defiance Park, only seasonal surface water flow in the ravine.

The eastern slopes contain seeps in some areas; maintenance practices in these areas are restricted by the City of Tacoma's critical areas code. There is an area of about 3.5 acres near the south end of Animal Loop Road which contains primarily small-diameter alders, salmonberry and Oregon grape, but is not shown on the City of Tacoma's wetlands maps and has not been delineated.

8. Stands

a. Central Old Growth

This stand comprises the 336-acre area within the 5-Mile Drive loop. The description and management of this stand exclude the Developed Areas that are listed separately below.

The Central Old Growth stand is characterized by fairly level, mesic forest disturbed occasionally by wind and rarely by small fires. Heavy logging has never occurred in this stand: clearing for roads and trails, and small-scale tree removal during the 1930s, are the only disturbances directly caused by humans.

There are several different soil types within the Central Old Growth stand, generally well-drained soils derived from glacial drift or glacial till: Everett gravelly sandy loam and gravelly loamy sand; Alderwood gravelly sandy loam; Sinclair gravelly fine sandy loam; and a small area of Kitsap silt loam near the tip of the point.

There are about 68 trees and 846 square feet of basal area per acre in this stand, with 39% of the trees under 18" DBH, and 31% over 31" DBH.

The predominant tree species are western hemlock (*Tsuga heterophylla*), Douglas fir (*Pseudotsuga menziesii*) and western red cedar (*Thuja plicata*), with red alder (*Alnus rubra*), and bigleaf maple (*Acer macrophyllum*). Madrona (*Arbutus menziesii*) is a

significant component of the north and west parts of this zone, including part of the Narrows Bluff Madronas, see description under High Conservation Value Areas. Large specimens of Pacific yew (*Taxus brevifolia*) are scattered throughout the forest zone, generally in moister areas; Pacific dogwood (*Cornus nuttallii*) also occurs here, but is rare. The understory contains predominantly evergreen huckleberry (*Vaccinium ovatum*), salal (*Gaultheria shallon*) and sword fern (*Polystichum munitum*).

The hemlocks in an area near Camp 6 are densely infested with western dwarf mistletoe (*Arceuthobium campylopodum*); many dead hemlocks in this area have fallen. In the vicinity of the ravine and the Rhododendron Garden, English ivy (*Hedera helix*) has spread across large areas. Thanks to continued support from Sierra Club volunteers, this is kept fairly well under control but is still present – ongoing vigilance is needed.

Large snags and fallen trees, greater than 4 feet dbh, are common throughout this stand, as is smaller debris. Most park visitors stay on the trails in this stand, and consequently there is a great diversity of micro-habitats in and near the ground as well.

Between 5-Mile Drive and Animal Loop Road, and from the exit road portion of 5-Mile Drive about 500 feet north is an area that is slightly concave and the soils have more moisture. Predominant tree species in this area are red alder and bigleaf maple, with some western hemlock and western red cedar. The predominant understory species are Scouler willow (*Salix scouleriana*), salmonberry (*Rubus spectabilis*), sword fern and dull Oregon grape. Invasive non-native plants are not present in significant numbers. There are a few large maple trees with hollows, and many fallen alders 4"-8" dbh.

b. Eastern Slopes

This 107-acre stand includes the area between 5-Mile Drive and the water from the start of 5-Mile Drive up to the far northwest end of the Point. The description and management of this stand exclude the Developed Areas that are listed separately below.

The Eastern Slopes stand is characterized by moderate to steep east-northeast-facing slopes, with seeps between layers of sand and clay soils. The area has never been logged, but disturbance is frequently caused by unstable soils near the shoreline and occasionally by small fires started on the beach. Human off-trail use has contributed significantly to erosion in some areas. The paved Promenade, developed at the foot of the slope, creates a need to manage the vegetation to help keep the pavement clear and try to prevent landslides.

Soils on the Eastern Slopes stand are shown as rough broken land, with a small area of Coastal Beach at Owen Beach; the soil types above the slopes are Everett, Sinclair and Alderwood gravelly sandy loams.

There are about 135 trees and 926 square feet of basal area per acre in this stand, with 64% of the trees under 18" DBH and 9% greater than 30" DBH.

The predominant tree species in this stand are Douglas fir, western hemlock and red alder, with some bigleaf maple and western red cedar. The understory contains

evergreen huckleberry, salal and sword fern, with significant amounts of hazel (*Corylus cornuta* var. *californica*) and ocean spray (*Holodiscus discolor*).

Tree failure due to unstable soils is fairly common in this stand, so the proportion of large trees is smaller than in the Central Old Growth stand. A rare windstorm from the northeast caused considerable windthrow in this stand in 1990, particularly in the valley of the Owen Beach parking lot, but natural regeneration was observed within two years. In some areas near Owen Beach and the Promenade, people have scrambled over the hillside often enough to destroy the understory plants and cause soil erosion. English ivy is prominent in only a few areas; volunteers help keep the ivy under control.

There are snags and trees with dead tops in this stand, though fallen trees are more common. Off-trail human use has disturbed the understory in some steep slope areas; where it is intact the understory is fairly diverse.

c. Western Slopes

This 69-acre area is made up of the steep, dry, exposed slopes at the north and west edges of Point Defiance, from the far northwest tip of the Point to the property line with the Salmon Beach community to the southwest. The description and management of this stand exclude the Developed Areas that are listed separately below.

The Western Slopes stand is characterized by dry, sandy soils and very steep slopes. The air temperature at the western slope can be as much as 26°F higher than the eastern slope. There is little to no beach below these slopes at high tide. This stand has also not been logged, but disturbance is frequent, caused by failure of portions of the unstable slopes, as well as off-trail human use in some areas and occasional small fires started on the beach.

Soils on the Western Slopes stand are shown as rough broken land; soil types above the bluffs are Everett and Sinclair gravelly sandy loams.

There are about 87 trees and 333 square feet of basal area in this stand, with 85% of the trees under 18" DBH, and less than 1% over 30" DBH.

The predominant tree species in this stand are Douglas fir and madrona, with red alder and western hemlock. Part of the Narrows Bluff Madronas are also within this stand, see description under High Conservation Value Areas. The understory is dominated by salal and evergreen huckleberry.

The madrona disease complex is affecting most madronas in this stand. Scots broom (*Cytisus scoparius*) and gorse (*Ulex europaeus*) are present in several areas though not dominant; there are two persistent stands of giant knotweed (*Polygonum* sp.).

Snags and downed woody debris are uncommon in this stand, due to its extreme slopes.

d. Baker Tract

This 48-acre stand sits south of the North 54th Street line and west of Mildred Street to the Salmon Beach community. There is a deep valley in the northwest part of the stand, which is a grassy meadow. The land drops off steeply on the west side, above the private Salmon Beach community. There is a power line corridor going east-west

on the service road between the Baker Tract and the Central Old Growth Stand, as well as another in the southern part of the stand, and a north-south corridor at the top of the western bluff. Two roads cross the property, more or less east-west. Just north of the north Salmon Beach access road is a Metro Parks maintenance yard, where gravel, rock or similar materials are sometimes stored.

The northern part of the stand, on the south-facing slope of the valley, is mainly Douglas fir and madrona; the understory here is primarily salal, with some evergreen huckleberry and dull Oregon grape (*Berberis nervosa*). West and south of the valley is primarily Douglas fir, with some madrona, and salal. South of the south Salmon Beach road is a very different forest, with Scouler willow, madrona and Douglas fir, with some bitter cherry (*Prunus emarginata*). The trees in this area are generally small; the understory here is also primarily salal.

There are few specimens of invasive species in this stand, except around the maintenance yard where giant knotweed and Scots broom are rampant. Other than the madrona disease, disease is not noticeable here; windthrow is also uncommon. There is little human use of this stand, so the ground is largely covered with dense salal and other native shrubs, as well as a good duff layer. The woody debris tends to be branches rather than fallen trees, and there are many mosses and lichens.

Soils on the Baker Tract are shown as Everett gravelly loamy sand.

There are about 152 trees and 463 square feet of basal area per acre in this stand, with 83% of the trees less than 18" DBH, and 1% greater than 30" DBH.

e. Developed Areas

The developed areas occur within other stands, so their descriptions here will include only those ecological factors that differ from the stand descriptions above. They are separated from the stands in which they occur because their uses give them special conditions and maintenance requirements. In general, the forest in or near the developed areas is edge; these areas are inspected regularly and trees are managed for public safety.

- Forest trails: a system of soft surface walking trails throughout the forest zone. Total trail length is about 20 miles. The trails are provided for walkers and runners and are closed to all motorized and non-motorized vehicles. They are surfaced with wood chips for the most part, though gravel is used in persistently wet spots.

Non-sanctioned trails exist in some areas: these are made by park visitors, and are not in appropriate locations, due to soil conditions, slopes or desired density of trails. Parks staff block these non-sanctioned trails with fallen wood, and sometimes re-vegetate them, but some are re-opened by park visitors.

- Five Mile Drive: an asphalt road that loops through the old-growth forest area, open to the public during daylight hours, and gated at night and during dangerous conditions. Vehicle traffic is restricted to one direction on Five Mile Drive; there are five paved viewpoints with parking off the road, but in many areas, drivers park their cars on the road shoulder as well. There is a walking and bicycling lane along the right side. There are fire hydrants along the road, at about 1,000-foot intervals.

Old photos show that this road was originally cut right up to large tree trunks; most of those trees have long since fallen or been removed. Several trees now standing have been damaged by motor vehicles that left the road; damage caused by the road itself appears minimal, probably because the road has been there for over 100 years. For the safety of the public using the drive, trees near the road that have a high risk of failing are cut to a safe height. There is soil erosion on the slopes below the viewpoints, likely exacerbated by the paving of the viewpoints. Trees within the view areas are cut when they begin to encroach on the views.

- Rustic Picnic area: about a half acre near the start of Five Mile Drive in the Eastern Slopes stand. It has parking and a clearing with picnic tables, but no shelters, water or restroom facility. There is a trailhead leading onto the eastern slope, but the rest of the picnic area edge is fenced at the top of the slope.
- The Rhododendron Garden: about 3 acres in the southeast part of the Central Old Growth stand, featuring a collection of mostly hybrid rhododendrons within a forest setting of native trees. There is a large picnic shelter, but no water or restroom facilities. This garden was begun in the 1960's by the American Rhododendron Society, Tacoma Chapter, and this group continues to manage the garden. Trees in the garden have had lower limbs removed to allow more light to reach the Rhododendrons, and dead limbs and trees are removed for public safety over the garden trails.
- Owen Beach/Promenade: a natural beach with a large parking lot in the Eastern Slopes stand. The Promenade is a paved walkway along the eastern shoreline of the park that extends from just north of Owen Beach to the Boathouse/Marina. Owen Beach has a restroom and picnic tables, with a large paved parking area. The parking lot and its exit road are in a NE/SW valley in which there was significant windthrow during a severe 1990 storm with NE winds. Parts of the slopes above Owen Beach are heavily eroded by park visitors walking off-trail.
- Gig Harbor Viewpoint Picnic Area: about 1.5 acres at the north end of the Central Old Growth and Western Slopes stands. It has parking, picnic shelters and a restroom facility. The shelter is used informally but can also be reserved for picnics and parties. There are some large Douglas fir trees near the edge of this area, one of which is dead but not hazardous. Several large madronas near the restrooms and shelters are severely affected by disease. There is a lawn area between the road and the bluff, with non-native hawthorn and horse chestnut trees. The horse chestnuts are spreading somewhat into the nearby forest edge, but not into the forest interior.
- Never Never Land Picnic Area: about 5 acres in the western part of the Central Old Growth stand, developed in the 1960's as a children's entertainment area with concrete and fiberglass replicas of nursery rhyme figures along a dense trail network within the forest. Most of the structures have deteriorated and been removed, however the area remains fenced and still has its trail system, a picnic area and playground. Several trees within Never Never Land have suffered significant dieback and been cut short for public safety.

This picnic area also has a large parking area adjacent to Fort Nisqually's parking, and there is a restroom facility and large picnic shelter between the two. There is a

49'X49'X4' water reservoir just off the parking lot, holding ~ 95,000 gallons to serve a supplemental fire hydrant at Fort Nisqually.

- Fort Nisqually: about 5 acres in the western part of the Central Old Growth stand. Fort Nisqually Restoration, a reconstruction of the historical Fort Nisqually from historic records and ruins, is classified as a site of military significance on the Washington Heritage Register. This area is a museum site and is not maintained as forest at all. The remaining buildings from the historic Fort Nisqually were moved from a prairie south of Tacoma to a clearing made in Point Defiance Park in 1934. Replicas of other buildings from the original site have since been added and the Fort is now a popular historic museum. Some forest thinning was performed in 2003 just east of the Fort to reduce the danger of fire spreading between the forest and the Fort by increasing the distance between trees.
- Off-leash Dog Area (Madrona Camp): about 7 acres in the southwest corner of the Central Old Growth stand. This off-leash area was opened in December of 2009 on Everett gravelly loamy sand at the site of Madrona Camp, where WPA workmen lived during the 1930s. The camp buildings have long since been removed, and the site was used through the 1970s as a day camp. There is still a storage building and large picnic shelter on this site, and a small clearing surfaced with wood chips. The trees here are predominantly madrona, Douglas fir and western hemlock, and are smaller and closer together than those in the surrounding forest, with less understory.
- Camp 6 Railroad Logging Museum: about 10 acres in the southwest part of the Central Old Growth stand. Camp Six, a logging museum created in 1964 to recreate the look and feel of a typical logging operation, contains a number of historic elements and is classified as a district by both National and State Registers. It consists of a collection of train cars, engines and equipment from the railroad logging era, with a small section of track, and a keeper's cottage. Managed by the Tacoma Chapter of the National Railway Historical Society, Camp 6 offers train rides to the public at Christmas time.

9. Stand Management Objectives and Practices

a. Forest Zone General

Protecting the natural forest processes for public recreation and education is the primary long term goal of our management of the Point Defiance forest zone. Timber production is not desired at this site; wood products may be removed from the forest zone only under specific conditions listed below.

Plant cutting and removal

While the risk of trees or branches falling on roads and trails in forested areas cannot be eliminated, Metro Parks strives to keep that risk low. Trees along road edges and near park structures have regular visual assessments by an urban forester trained in tree risk assessment. Action is taken only when trees or parts of trees can be shown to have a high risk of damaging people or structures. Forest trees may also be pruned or removed if necessary as part of a program to reduce risk of fire, disease or pest problems to acceptable levels. Tree work, except in emergencies, should be performed between August 1 and January 1, to avoid disturbing nesting bald eagles.

If a tree has a high risk of causing damage, abatement may consist of removing limbs, cutting the tree short or removing the tree altogether. In conditions of high hazard, such as high winds or severely damaged trees, the first staff action is to keep people away from the hazard area until the hazard is abated.

Tree pruning is necessary along designated trails, roadways and in picnic areas. Five Mile Drive should have an overhead clearance of 14 to 17 feet; trails should have 7 to 9 feet of overhead clearance. Shrubs within 5 feet of trails or 10 feet of roads or parking lots may be pruned hard or removed to provide clearance for park users; that distance may be increased at road curves where sight distance for drivers is an issue. Similar clearance standards are used for park buildings and shelters. Outside of these developed areas, tree pruning should not be performed unless the part being removed poses a hazard or the pruning is recommended as part of specific fire control or pest control program.

Cut or fallen wood is left in place as a valuable component of the ecosystem: snags, tall stumps and cut logs and branches are all important. Branches may be left whole on the ground, unless the fallen material creates a pile that could be flammable. Where there are large amounts of brush, that brush is chipped and the chips blown back into the forest; when it is more efficient to do so, brush may be hauled to another site before it is chipped, and those chips may be used elsewhere.

Cut or fallen trees lying in roadways or public use areas are removed from the forest zone. When trees fall over trails, only the portion of the tree blocking the trail should be cut away and deposited in the forest nearby.

Pest management

Insects and plant diseases are important parts of the natural ecology of the forest. Control of native or introduced pests will only be undertaken where the pest threatens to overwhelm the forest's ability to adapt, or where regional control is undertaken by the government, i.e. gypsy moth.

Not all exotic plant species are damaging to the forest, but some spread so aggressively that they reduce plant diversity on the site and therefore reduce habitat diversity and the forest's adaptability. Included in this category at this time are: English ivy, giant knotweed, Scots broom, non-native blackberries, holly, English laurel and gorse. These invasive plants should be controlled as much as possible. Pulling, cutting, mulching and re-planting are the preferred control methods, but herbicides may be used where other methods are ineffective.

Planting

Leave re-vegetation/reforestation to natural forces in naturally-formed gaps and after storm or fire damage. This includes allowing the dominant species to change over the course of time, though invasive plants should be kept under control.

Where erosion, removal of invasive plants or former trails have eliminated plant growth, re-vegetation should be accomplished with plants native to Point Defiance Park, preferably from a local source, though non-invasive non-native plants may be used within the Developed Areas.

b. Central Old Growth

Follow the general management practices for the forest zone. Control English ivy and other invasive weeds. Close off and re-vegetate unnecessary trails. Use current research and best practices to try to maintain the Douglas fir/madrone/huckleberry ecosystem.

c. Eastern Slopes

Follow the general management practices for the forest zone. Control English ivy and other invasive plants. Close off and re-vegetate unnecessary trails. Develop and implement plans for protecting and re-vegetating eroded areas.

d. Western Slopes

Follow the general management practices for the forest zone. Control giant knotweed and other invasive plants. Use current research and best practices to try to maintain the Douglas fir/madrone/huckleberry ecosystem.

e. Baker Tract

Follow the general management practices for the forest zone.

f. Developed Areas

• **Forest Trails**

Maintain all desirable walking trails with soft surfacing and proper drainage. The Spine Trail and some accesses to that trail are kept wide enough for small maintenance vehicles to travel; other trails are kept 5 feet wide. Brush and limbs should be kept clear from the trails for at least the full 5-foot width, and 7 to 9 feet high. "Volunteer" trails that appear need to be blocked off and re-vegetated to avoid damage to the forest, and to prevent dead ends where park visitors could get disoriented and firefighters could be trapped. Some formerly sanctioned trails have become unsafe due to changing slopes or fallen trees, and these should also be re-vegetated and removed from trail maps.

Short term goals:

Improve the wayfinding signage on the trail system, adding directional and distance signing keyed to a park trail map.

Long term goals:

Add interpretive features, such as trail markers keyed to an interpretive brochure.

• **Five Mile Drive**

The tree tunnel effect is an intrinsic part of Five Mile Drive and should be preserved. However, roads need to have branches pruned back and up and brush pruned along the road edge for clearance as well as visibility of signs, hydrants and road intersections. Road shoulder areas should be maintained for 3 to 10 feet on either side of the road, within which shrubs, brush and fallen trees may be removed. Vehicle height clearance should be maintained at 14 to 17 feet over the road. Parking lots will be treated the same as the road.

Maintain the five viewpoint pullout areas as well as the viewpoint at the Fort Nisqually parking lot by selective removal of growing trees obstructing the view. The recreational and aesthetic value of the viewpoints is extremely high and these areas must be maintained in similar fashion to main roads or picnic areas. In

addition, the bluff is eroding away along some of these viewpoints and should be managed to keep the banks from eroding completely. Viewing problems become more pronounced with time; trees growing on or below the banks become tall and block the scenic vistas. Removal of some trees may become necessary to maintain views and stabilize the bank.

- The Rustic Picnic area will gradually open up as declining trees on the edge are removed. Re-planting may not be necessary, since park use is increasing and the size of the area is constrained by the road and the slopes. If at some point the fence needs replacing, consider moving it further from the slope edge to allow more shrubby vegetation to help stabilize the soil at the edge.
- Rhododendron Garden: Continue to manage the trees for safety over the trails and to allow filtered light to the Rhododendrons. Do not plant non-native trees or any non-native plants that could spread into the surrounding forest. Sustained removal of emerging trees is resulting in a lack of younger trees to make up the forest canopy when the older trees are lost; some of the young native trees should be protected and allowed to develop to form the future canopy of the garden.
- Owen Beach: Manage as part of the Eastern Slopes stand, recognizing the need to manage the road and Promenade edges for public safety.
- Gig Harbor Viewpoint Picnic Area: Monitor snags and diseased madronas, and treat as needed to protect public safety. Consider removal of the horse chestnut trees from the picnic area and surrounding forest edges.
- Never Never Land Picnic Area: Manage trees in this area for safety over the trails, play structure and picnic tables.
- Fort Nisqually: The Fort is a non-forested area. The forest around Fort Nisqually should be managed to keep fire danger low, due to the high value of the buildings and artifacts of the Fort.
- Off-leash Dog Area (Madrona Camp): Many dead and dying madronas were removed here in early 2010 in response to higher use since it became an off-leash dog area. More trees are diseased, and dead wood will need to be managed in this high-use area. The effects of dog use on this area are not yet known – twice-annual monitoring should be done to gauge the dogs' impact on the forest and to check for unsafe conditions.
- Camp 6 Railroad Logging Museum: The track area and parking lot should be managed like Five Mile Drive.

10. High conservation value areas; rare, threatened or endangered species

Narrows Bluff Madronas

Two areas in the western part of the Forest Zone, totaling about 25 acres, have been designated as Washington Natural Heritage sites. These communities are on a west-southwest facing aspect, with soils composed of sandy glacial drift. The primary and

most significant natural feature at this site is the occurrence of a very rare type of old-growth Douglas fir dominated forest: the Douglas fir/Pacific madrona/evergreen huckleberry plant association. The majority of the site contains this rare association, which was once a much more common forest type throughout Puget Sound. Due to land use changes since Euro-American settlement, virtually all of the original native forests in the lowlands of the Puget Trough have been lost or altered. This Narrows Bluff madrona forest is today one of only three known sites where examples of this native association still remain in good ecological condition, the others being Penrose Point and Maury Island.

The dominant firs at this site measure up to three feet in diameter at breast height and are over 250 years in age. Large madronas co-dominate at a lower level in the canopy. There are multiple age classes of both the fir and the madrona.

Bald eagle habitat

Protection and retention of bald eagle nesting sites, including nest trees, perch trees, and snags in our forest and conservation areas is a very high priority. Protected areas surrounding bald eagle nesting sites must be established in accordance with the requirements of the U.S. Fish and Wildlife Service and the Washington Department of Fish and Wildlife (WDFW). Eagle activity should be evaluated on a yearly basis by the WDFW with new nest sites and observed perch and forage trees reported to WDFW. The 1988 Bald Eagle Management Plan shall be adhered to (April, 1988 Bald Eagle Nest Territory Management Plan for Point Defiance is on file at MPD Headquarters). Habitat management practices should include snag retention, danger tree management, and encouragement of low impact use in this area of the park.

Unusual activity too close to the nests from January through August may have adverse effects on the nestlings and the viability of the nesting site. Any disturbing or cutting in the vicinity of an active eagle nesting site should take place between August 1 and January 1 to minimize impact to the eagles. Other activities or land use changes proposed within the protected areas should be assessed by the WDFW.

11. Management concerns

a. Road & trail safety

Five Mile Drive is patrolled daily to look for conditions that might be unsafe for public access. During high winds or other potentially dangerous times, the gates to the Drive are closed.

Main trails are kept wide enough to travel with a small service vehicle; this enables frequent inspections and efficient hauling in of wood chips and removal of fallen debris. Smaller side trails are patrolled less often.

While Parks staff try to maintain as high a standard as possible for public safety, the natural character of the area necessarily features some inherent risk from tree limbs, unlevel surfaces and other natural hazards.

b. Fire prevention & Suppression

The Point Defiance Forest Zone has a water line with fire hydrants all along Five Mile Drive. This line has become corroded to the point that to maintain full hydrant function, the entire water line should be replaced. Due to the high cost and disruption

necessary to replace the entire water line, Metro Parks met with a wildfire consultant and the Tacoma Fire Department to consider alternatives. The result is the Forest Zone Fire Management Plan (January 2008).

From the Introduction: *“Because of the uniqueness and value of this forest in an urban setting, excluding wildfire from the park is a reasonable course of action. This plan describes what fire prevention steps are compatible with ecological forest management. Some changes to MPT’s forest management will be made to reduce fire risk and make fire suppression easier. But it is understood that the natural characteristics of the forest make firefighting difficult, and some portions of the forest may be lost if a wildfire does occur.”*

Metro Parks has eliminated brush piles, put up fire danger signs in the summer, and outlawed smoking in parks. Metro Parks is also committed to building a new water line to Fort Nisqually for fire protection (the reservoir is a temporary safety measure), and ensuring a full-flow hydrant near the entrance to Five Mile Drive, so that pumper trucks may be quickly filled if needed. The remaining fire line is likely to be abandoned when it can no longer be repaired. The firefighters’ strategy will be to fight any structural fires, but in the forest itself, containing the fire is more reasonable than trying to put it out. Given the damage to soils that can occur from the use of water at 300 gallons per minute, firefighters will use smaller-diameter hoses in forested areas, and therefore will need less water flow.

c. Exotic Invasive Plants and Animals

In some areas of the Forest Zone, English ivy has become thick enough to threaten both existing native vegetation and the natural process of forest succession. The Sierra Club Tatoosh Group works with Metro Parks and the Green Tacoma Partnership to train and lead volunteers in controlling primarily the ivy, as well as Scots broom, gorse, holly and laurel. The Rhododendron Garden and adjacent ravine have been largely freed of ivy through the efforts of volunteers, though ongoing maintenance must continue, and the Sierra Club has lately focused its efforts on the eastern slopes.

There are two patches of giant knotweed (*Polygonum sp.*), a non-designated noxious weed in Pierce County, established in the Western Slopes stand. The most effective means of controlling the dense and spreading giant knotweed is with chemical herbicide treatments, which must be performed by Metro Parks staff or licensed contractors. Herbicide sprays have been used and have weakened the plants, but eradication may require injection of each stem with herbicide.

Most other non-native plants are causing little effect on the natural forest. There is some European mountain ash (*Sorbus aucuparia*), but it is widely scattered. Some Norway and sycamore maples (*Acer platanoides* and *A. pseudoplatanus*) and horse chestnuts (*Aesculus hippocastanum*) are re-seeding along the edges of Five Mile Drive, but do not appear to be penetrating the forest interior or disrupting natural processes. Scots broom, gorse, blackberry and herbaceous weeds likewise appear mostly along road and bluff edges.

While feral cats have been seen near the southeast corner of the park, and Canada Geese are a problem in the developed part of the park, the Forest Zone appears to host a wider variety of birds than the surrounding urban area. Metro Parks does not manage wildlife in our parks; should animals appear to be causing problems in the

Forest Zone, Parks staff will work with the Washington Department of Fish and Wildlife to develop appropriate responses.

d. Insects and Diseases

The hemlock woolly adelgid is established in the Forest Zone but appears to cause little damage. No damaging infestations of insects have been seen or recorded in the Forest Zone.

Hemlock dwarf mistletoe is well-established in the Forest Zone, and is particularly concentrated near Camp 6. The hemlock losses from dwarf mistletoe and root rot are not making significant changes in the forest ecosystem, so control is not planned.

Root rots are present within the Forest Zone, but not concentrated in any one area or causing ecosystem changes. Control is not planned.

Most of the park's madronas show symptoms of disease; it is unknown whether the madrona disease complex is wholly or partly native, and no effective controls in natural areas are known.

The Forest Zone has staff who monitor the park for safety every day, as well as regular park visitors who also notice and report significant changes. Should an insect or disease infestation become a threat to the diversity of the forest ecosystem, staff may consult with experts and park users to arrive at the most effective response to protect the long-term ecosystem function. Infestations that do not threaten the ecosystem of the Forest Zone will be left to proceed as part of the interactions that make up that ecosystem.

12. Cultural/historic resources

The property was held in reserve by the US military from 1866 to 1905; there is no record of permanent settlement at this site before government ownership. There were rich fishing waters below the point and then, as now, the point commanded long views to the north, west, and south. Access to the point was difficult, and though Indian trails ran through the forest and down the bluffs, there was no permanent settlement. Permanent indigenous settlements were nearer the south end of Commencement Bay; there are no indigenous claims on Point Defiance at this point.

Fort Nisqually was originally located near the Nisqually River, but was transported to Point Defiance for use as a museum. Two new buildings were recently added to the Fort, which hosts many artifacts from pioneer families as well as events demonstrating pioneer life. Camp 6 was also established as a public museum demonstrating the equipment used during the railroad logging era.

The current use of the Forest Zone is for public walking, running, bicycling, dog walking and swimming, as well as for drives around the forest and visits to the Rhododendron Garden, Fort Nisqually and Camp 6. Point Defiance has far fewer incidents of illegal camping or dumping than other public natural areas in the city. Common problems include the use of bicycles on trails, establishment of unnecessary trails and occasional use for after-hours parties and associated littering; illegal camp fires on the beaches often scorch the bluffs above. Some harvesting of mushrooms and greens may be taking place, though removing anything from parks is against the law; such harvesting has not caused a noticeable impact to the forest.

The beauty, tranquility and ecological function of the Forest Zone are much appreciated by most Tacoma citizens. The majority of park visitors stay on the roads and trails or in picnic areas, and many pick up litter left behind by others.

13. Fish & Wildlife

Wildlife using the Point Defiance forest include deer, Douglas squirrel, mink, fox, raccoon, bats, newts, pileated woodpecker, bald eagles, juvenile great blue heron in fall, winter seabirds, owls, red crossbills, kinglets, brown creeper, winter wrens, neotropical migrants who need summer nest sites safe from predators such as cats, and crows. The bald eagle nesting sites are protected.

There is a rich assortment of habitat features within the Point Defiance forest zone, including very large live, dead and damaged trees; many food-producing plants and fungi; brush piles and thickets; den areas in sandy soils, stumps and logs.

Metro Parks abides by all restrictions relating to management activities in bald eagle habitat, but does not actively manage any wildlife. Signs are posted reminding visitors not to feed or disturb wild animals, but unfortunately the feeding of wildlife by park visitors is very common.

14. Forest products

Harvest of either timber or non-timber products are undesirable in Point Defiance's Forest Zone. The park is under such potential stress from the large number of visitors that Metro Parks chooses to keep as much natural production as possible on site. Trees or parts of trees falling within the road or other developed areas may be removed, and either used elsewhere, sold or given away; but trees that fall into the forest are left there. Where possible, high-risk trees are felled into the forest and left there.

If brush piles, either naturally occurring or resulting from trail management, are large enough to constitute a fire hazard, brush may be either chipped on site or removed from the park. Invasive plant materials are harvested and removed from the park.

15. Recreation/public access

The main park entrance is at the north end of Pearl Street (State Route 163); there is also an entrance at the north end of Mildred Street. From both entrances, motorists, cyclists and pedestrians can access the formal gardens, zoo and aquarium, and Five Mile Drive during daylight hours.

There are walking trails throughout the developed portion of the park, as well as about 20 miles of trails through the old-growth forest.

Point Defiance Park continues to be one of the more appealing outdoor recreation features in the Tacoma metropolitan area, visited by about 2 million people each year. Many people want to use the park and yet want to enjoy its quiet, natural environment—a dichotomy and a challenge to resource planning and management. The Park is used as a place to run, walk, bicycle, drive, picnic, view scenery and wildlife.

Metro Parks has developed a master plan for Point Defiance Park. Suggested additional uses of the forest zone include use as a living laboratory to stimulate ecological

awareness by the general public. Possibilities include self-guided education materials, guided walks, and outdoor education experiences.

16. Monitoring

There are two types of monitoring that will occur in the Point Defiance Forest Zone: safety monitoring and ecosystem monitoring. In the Developed Areas, safety monitoring is conducted on a regular basis, but because of the intensive recreational management of these areas, only minimal ecosystem data such as plant cover, plant health and erosion will be monitored.

In the Central Old Growth, Eastern Slopes, Western Slopes and Baker Tract stands, permanent plots will be established to monitor forest health and function. These plots should be assessed at least every ten years; we hope to assess them every 5 years. Data to be collected and monitored include the number of live trees/acre, live crown ratio, tree diameter distribution and basal area, wildlife trees/coarse woody debris, regeneration, understory cover and composition, and invasive plant cover. There should be a minimum of 15 permanent plots in the Central Old Growth stand (A), 8 in the Eastern Slopes stand (B), 5 in the Western Slopes stand (C), and 6 in the Baker Tract (D).

17. Management Timetable

List below the primary management activities that should be implemented over the next 10 - 100 years.

<u>Year</u>	<u>Season</u>	<u>Stand #</u>	<u>Management Activity</u>
2010	Spring - Fall	A, B, C	Invasive plant control: volunteer work parties to pull English ivy; targeted chemical control of knotweeds by staff.
2010	Fall - Spring	A	Establish permanent monitoring plots, collect baseline data.
2010	Fall	Developed Areas	Monitor for public safety and access; prune or remove trees to reduce risk, cut back brush on road and trail edges.
2011	Spring - Fall	A, B, C	Invasive plant control: volunteer work parties to pull English ivy; targeted chemical control of knotweeds by staff.
2011	Fall - Spring	B	Establish permanent monitoring plots, collect baseline data.
2011	Fall	Developed Areas	Monitor for public safety and access; prune or remove trees to reduce risk, cut back brush on road and trail edges.
2012	Spring - Fall	A, B, C, D	Invasive plant control as needed
2012	Fall - Spring	C	Establish permanent monitoring plots, collect baseline data.
2012	Fall	Developed Areas	Monitor for public safety and access; prune or remove trees to reduce risk, cut back brush on road and trail edges.
2013	Spring - Fall	A, B, C, D	Invasive plant control as needed
2013	Fall - Spring	D	Establish permanent monitoring plots, collect baseline data.

2013	Fall	Developed Areas	Monitor for public safety and access; prune or remove trees to reduce risk, cut back brush on road and trail edges.
2014	Spring - Fall	A, B, C, D	Invasive plant control as needed
2014	Fall - Spring	A	Re-assess permanent plots.
2014	Fall	Developed Areas	Monitor for public safety and access; prune or remove trees to reduce risk, cut back brush on road and trail edges.
2015	Spring - Fall	A, B, C, D	Invasive plant control as needed
2015	Fall - Spring	B	Re-assess permanent plots.
2015	Fall	Developed Areas	Monitor for public safety and access; prune or remove trees to reduce risk, cut back brush on road and trail edges.
2016	Spring - Fall	A, B, C, D	Invasive plant control as needed
2016	Fall - Spring	C	Re-assess permanent plots.
2016	Fall	Developed Areas	Monitor for public safety and access; prune or remove trees to reduce risk, cut back brush on road and trail edges.
2017	Spring - Fall	A, B, C, D	Invasive plant control as needed
2017	Fall - Spring	D	Re-assess permanent plots.
2017	Fall	Developed Areas	Monitor for public safety and access; prune or remove trees to reduce risk, cut back brush on road and trail edges.
2018	Spring - Fall	A, B, C, D	Invasive plant control as needed
2018	Fall - Spring	A	Re-assess permanent plots.
2018	Fall	Developed Areas	Monitor for public safety and access; prune or remove trees to reduce risk, cut back brush on road and trail edges.
2019	Spring - Fall	A, B, C, D	Invasive plant control as needed
2019	Fall - Spring	B	Re-assess permanent plots.
2019	Fall	Developed Areas	Monitor for public safety and access; prune or remove trees to reduce risk, cut back brush on road and trail edges.