



# LINCOLN PARK

8011 Fauntleroy Way S.  
Seattle, WA

## VEGETATION MANAGEMENT PLAN

**Draft**

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Chapter One  
**OVERVIEW**

**1.1 Lincoln Park Site Plan**



## 1.2 Plan Summary

### Introduction

Lincoln Park is one of Seattle's largest and most popular parks. Its 135 acres of open space provide a broad range of landscape types and a rich variety of recreational opportunities. Significant interactions between users and park vegetation, as well as the inherent needs of plants and wildlife, drive this Vegetation Management Plan. Lincoln Park offers a unique opportunity to manage stands of native and non-native trees in forested and open settings, for future generations of Park users to enjoy.

### Site Description

Lincoln Park is composed of approximately 64% forested natural area, 16% developed landscape area, 12% shoreline and 8% managed recreation space (playground, ballfields, etc). The large, fairly level upland area includes open and forested portions, and is bordered to the west by a steep bluff that drops a dramatic 100 feet to the saltwater shoreline below. Vegetation ranges from turf to open lawn with trees, to intact and invaded native forest, madrona groves, weedy slide slopes, wetlands, beach grass, and ornamental landscape beds.

### History

Lincoln Park was purchased by the city in 1922, for \$104,186. Although it was recommended for inclusion in the original 1903 Olmsted park system, the Olmsteds never were commissioned to complete a plan for Lincoln Park, nor a parkway linking it with Schmitz Preserve. The park landscape most likely evolved under the hand of various Parks gardeners, without benefit of an overall plan. As a result, an interesting mix of native and ornamental plant species conmmingle in the park today, but it lacks a clearly organized trail system. Bluff landslides are an important part of the park's past as well as an inevitable aspect of its future. Despite Lincoln Park's tremendous popularity, much of the park's native vegetation has been conserved over time, representing a significant legacy and key to its landscape character.

### VMP Goals

The following overall goals were established for the vegetation management plan, based on citizen comments and detailed resource evaluation:

- **Respect the unique landscaped character of the park**
- **Manage vegetation to support diverse and appropriate human uses**
- **Protect and enhance native vegetation**
- **Protect and enhance wildlife habitat**

### Public Process

As for all Seattle Department of Parks and Recreation projects, VMP development involves a prescribed Public Involvement Process (PIP). For the Lincoln Park plan, existing vegetation first was sampled in random plots, after which a public meeting was held to discuss initial findings and gather user concerns (April 2001). Citizen concerns are noted in Chapter 3 of the plan. At a second public meeting (May 2002), Urban Forestry staff presented key issues and a detailed overview of the draft VMP. This document then was posted to the Seattle Parks website and copies made available at local libraries for a three week review period. Final plan adoption incorporating public comment follows internal departmental review and signoff. The adopted VMP will be posted to the Web; limited bound copies will be distributed to libraries and parties directly engaged in its implementation (both staff and volunteers).

### Management Area Recommendations

For the purposes of vegetation management, Lincoln Park has been divided into seven distinct Management Areas. These have been defined based on analysis of existing resource characteristics, geographic features, and primary landscape uses. As delineated in Chapter 10, **Appendix F, Map F-6**, these Management Areas include:

Management Area A	Shoreline
Management Area B	Bluff
Management Area C	Forest
Management Area D	Passive Use Greensward
Management Area E	Lawn / Ballfields
Management Area F	Active Use Greensward
Management Area G	Native/Ornamental Landscape

Several key management recommendations recur among the Management Areas:

- Monitor potential hazard trees and protect trees from use-related damage.
- Eliminate or reduce the presence of invasive plants.
- Enhance vegetation quality and character, both native and ornamental.
- Mitigate compacted soils and eliminate further soil compaction.
- Reduce social trails that fragment native vegetation.

### 1.3 How to Use This Plan

The purpose of this plan is to direct ongoing vegetation management at Lincoln Park. Depending upon one's interests, particular chapters of this document will prove useful. The VMP is designed to be both broad in its perspective and specific enough to guide the practical care of Lincoln Park's vegetation. This section lays out the essential content and organization of the plan, so that readers may quickly access what is most relevant to their focus and needs.

**Chapters 1 – 5** provide baseline resource assessment and contextual information, and goal setting upon which the “working” VMP sections which follow are built. During resource assessment, fourteen existing Vegetation Zones were identified within the park, sorted by plant composition. These subsequently were distilled into seven distinct Vegetation Management Areas where particular actions are needed to maintain, enhance or restore targeted vegetation communities.

**Chapter 6**, Vegetation Management Recommendations provides clear direction regarding what should be done, where it should be done, and when it should be done. This chapter includes a seasonal schedule of tasks for each Management Area within the park. **Chapter 7**, Management and Maintenance Practices details how to perform tasks prescribed in Chapter 6. **Chapter 8**, Implementation describes who should undertake particular tasks, differentiating activities best performed by professional staff from those which present opportunities for citizen stewardship, volunteer and /or corporate involvement in coordination with park staff. Implementation priorities also are identified, and budget estimates provided.

**Chapter 9**, Monitoring Plan lays forth measurable means to determine if vegetation management goals and objectives are being met. **Chapter 10**, Appendices provides useful supplementary information, including site maps, photographs, references, public comment log and madrona management recommendations. The VMP may be read and used as a whole, or by tapping stand-alone elements to guide specific vegetation management projects; the document was conceived with flexibility and accessibility in mind.



## Chapter Two GOALS AND OBJECTIVES

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### 2.1 Overall Park Goals

No previously-articulated, overarching goals have been documented for Lincoln Park. This plan both acknowledges and respects the established patterns of use and apparent intent of numerous past Park improvement projects. It is not the role of this VMP to frame overall goals for Lincoln Park, only to set goals that pertain directly to management of park vegetation.

### 2.2 Urban Forestry Program Objectives

The following objectives were established to guide the Seattle Parks Urban Forest Restoration Program, established in 1994 to help protect the valuable natural area resource that encompasses approximately half of Seattle's 6000 acre park system. Vegetation management and reforestation plans generated by the Department support these objectives:

- Promote Native Character
- Assist natural processes
- Conserve soil and water quality
- Protect and enhance wildlife habitat
- Buffer land uses
- Insure public safety

### 2.3 Lincoln Park Vegetation Management Plan Goals and Objectives

The following Goals have been established for this plan, based upon the evaluation of existing resource condition and identification of key vegetation-related issues. Specific objectives are listed under each goal, many of which overlap and reinforce one another.

**Goal:** *Respect the unique landscape character of the park.*

**Objectives:**

- Protect distinctive stands of non-native trees, including Redwood, Golden Rain, Chestnut, Incense Cedar, Oak, Beech and others.
- Ensure maintenance of landscaped beds framing public access paths and forested areas.
- Provide enriching shoreline vegetation tolerant of challenging microclimate and heavy use.
- Maintain greensward (or savanna) character of tree stands linked by mowed grass expanses.
- Exchange invasive ornamentals for similar, noninvasive species to maintain landscape character.

**Goal:** *Protect and enhance native vegetation.*

**Objectives:**

- Eliminate invasive, non-native species from both forested and ornamental landscape areas.
- Supplement existing forest remnants with native trees and understory, to replicate original lowland forest.
- Replenish, foster and monitor health of Pacific Madronas in park.
- Protect native vegetation from invasive plant encroachment by surrounding private development.
- Protect native vegetation by eliminating invasive species from park ornamental landscape plantings.
- Establish native riparian plantings along existing, unbuffered drainage course in upper park.
- Reduce user-caused adverse impacts to native vegetation, including compaction, trampling, dispersal of weeds and spread of soil pathogens.

**Goal:** *Protect and enhance wildlife habitat.*

**Objectives:**

- Increase extent and diversity of native species in park, and improve vegetation structure for wildlife.
- Create habitat features where feasible: tree snags, brush piles, downed woody debris, water sources.
- Expand habitat by linking forested patches and reducing fragmentation caused by informal paths,
- Discourage dogs and cats from using park, except on leash.
- Encourage users to observe, document and foster abundant park wildlife.

**Goal:** *Manage vegetation to support diverse and appropriate human uses.*

**Objectives:**

- Minimize tree hazards in park through active monitoring, pruning, removal and protection of trees from preventable damage by users.
  - Discourage off -trail movement, through improved trail system signage, public education and selective elimination of social trails.
  - Establish and maintain specific view corridors from bluff, particularly at existing bench locations.
  - Maintain routine mowing and turf care for sportsfield activities and informal play and picnicking.
  - Encourage diverse users to participate in restoration efforts, cultivating a positive stewardship role.
- Enhance aesthetic and functional value of vegetation to improve environment for popular park activities (seasonal sunbathing, walking, formal sports, etc.).



## Chapter Three PLAN CONTEXT

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### 3.1. Lincoln Park History

*The following history of Lincoln Park is summarized from the “Sherwood Files” compiled by longtime Parks Department employee, Don Sherwood, who died in 1981. These files are now located in the City Archives. Portions pertinent to vegetation character and landscape development are highlighted.*

What today is known as **Lincoln Park was acquired by the City of Seattle in 1922. It was originally called Williams Point Park in 1909 and later Fauntleroy Park**, having been named after Ellinor Fauntleroy. She was the betrothed of Lt. George Davidson, who bestowed the name after he took soundings off the beach in 1857. Davidson also named Olympic Mountain peaks to honor her and her family: (Mt. Ellinor, and Mts. Constance & Rose and the Brothers, Arthur & Edward.)

**In 1904, realtor John F. Adams recognized the beauty of the saltwater location and developed a summer resort at the Fauntleroy beach**, and was soon joined by Laurence Colman who built the first year-round residence in 1907. They were followed quickly by others, and a small community grew up. An electric trolley line from Seattle provided access, across the Duwamish tidelands to the West Seattle Ferry landing. At this time the main hazards of rail travel were bear and deer in the right-of-way! **Conifers were logged from this area to supply masts for the growing shipbuilding industry.**

**Seattle City Council approved the acquisition of Fauntleroy Park on the recommendation of the Olmsted Brothers who designed major elements of Seattle’s Park system beginning in 1903, but unfortunately, they were never commissioned to develop a plan for this 130 acre wooded area. A 1908 Olmsted Report on Annexed Territory and General Development shows the Sound Bluffs Parkway running along the top of the bluff north to Schmitz Park.** This was to “preserve without interfering any more than necessary with valuable residential properties along the shore road.” **This proposal never was implemented, keeping cars out of Lincoln Park proper and helping secure a more natural character for the park.**

**It seems apparent that major elements of the work developing Lincoln Park over the years occurred without a particular design vision**, but nevertheless resulting in the wonderful West Seattle resource we know today.

A shelter house was completed in the park in **1925** ( north comfort station) inaugurating a tradition of band concerts, sponsored by the “All West Seattle, Picnic Committee” held yearly during the last week in July. This prompted the first parking lot to be built along Fauntleroy Ave. in **1928**, and in **1929 a tide-fed salt water pool was dug on the beach at Williams Point, a precursor to the Coleman Pool now in existence. Also, \$1000 water system was requested for new plantings.**

**There were 23 summer cottages along the beach until 1931, when the first work began on clearing and grubbing brush. Playground construction followed in 1930 and a shop area was built at the Park Caretaker’s Residence that lasted until 1970. In 1931 a project for unemployed workers began the seawall construction. 1932 was also the year that a Deodar Ceder was planted to commemorate the 200<sup>th</sup> anniversary of George Washington’s birth**, supposedly with a bronze marker. (They were big on presidents...the name Lincoln Park was chosen to “encourage



**patriotism in the children of Seattle.”) The WPA, in 1934, continued to clear weeds, planting, building trails, fireplaces and horseshoe courts.**

In 1941 a “Prominent Neighbor” donated \$152,539.00 in the memory of pioneer Laurence Colman, (Colman, 1860-1935, was the son of James M. Colman of Colman Park fame and Colman Ferry Terminal in Pioneer Square.) to build a concrete swimming pool. This ended neighbors’ concern over the original mud swimming hole that required periodic trips by the SFD to hose out debris. The Colmans also assisted in the building of the WPA tennis courts.

Also in 1941, Acting Mayor of Seattle, James Scavotto, issued a directive to the Parks Board of Commissioners to “discontinue the practice of denying Colman Pool access to racial minorities.” A follow-up letter from the Washington Commonwealth Federation states they were shocked to learn of the “denial of public bathing facilities to American Children of the Japanese and Negro races.” And that, “ In these critical times, with the very idea of freedom, equality and brotherhood threatened by the military forces of German Fascism, public authorities should be exceptionally vigilant in combating the dissention and disunity which Hitler has proved can arise so harmfully from irrational racial prejudices.”

**In 1962, an impassioned petition was circulated by neighbors that was “in strict opposition to the proposed campsite in Lincoln Park for transient tourists during the 1962 World’s Fair, or at any other time.”**

Lights were installed along the shore Promenade to the pool in 1963, and, says Sherwood, “A hobbit’s version of **an underground Comfort Station was built in 1971.**” **Apparently it was designed to have a vegetated roof -hence the cylindrical skylights-**, and its organic shape is somewhat reminiscent of a space ship.

**Lincoln Park Seawall Renovation and Beach Restoration report was completed in 1985, to study erosion and structural deterioration of the seawall, and the Lincoln Park Shoreline Study was completed in 1988, addressing some of the issues of picnic shelters and circulation, as well as hillside erosion. Apparently most of the plantings for the slide area south of Williams Point failed due to lack of irrigation. Beach grass and a wetland planting north of Colman Pool exist from this time.**

### 3.2 Previous Plans and Policies

This VMP acknowledges and incorporates information from the following Plans and Policies, previously adopted by the Seattle Department of Parks and Recreation:

#### Seattle Department of Parks and Recreation Tree Policy (2001)

The Tree Policy was officially adopted in June 2001. As stated, the purpose of the Tree Policy is: “To maintain, preserve, and enhance the urban forest within parks. To increase overall tree canopy, tree health, and tree longevity within parks. To ensure that parks trees are managed in such a manner that is consistent with other departmental and municipal policies.” The Tree Policy includes guidance for what is to be included within a Vegetation Management Plan (VMP) for a City Park:

- Site inventory and assessment including a site map illustrating topography and vegetation.
- Trees that are proposed for removal and/or pruning must be designated.
- Planting design showing species, size, location and any needed erosion control/slope stabilization methods.
- Public involvement plan, if applicable in compliance with Parks Department Public Involvement Procedures (PIP).
- Maintenance plan including tasks, and frequencies.

Seattle Department of Parks and Recreation Urban Wildlife and Habitat Management Plan (2000 Update)

- Continue and increase wildlife habitat protection and enhancement efforts.
- Protect and enhance wildlife populations.
- Provide environmental education, using wildlife resources.
- Develop and maintain a wildlife resource inventory.
- Promote volunteer involvement in wildlife and habitat protection and enhancement.
- Promote internal education and consistency in Department actions.
- Promote interdepartmental and interagency cooperation to protect wildlife.

Lincoln Park Shoreline Planning Study (1988)

Work recommended included picnic shelter and circulation improvements along the promenade, improved lighting and of interest for vegetation management, erosion control methods. A significant portion of this work was completed.

Lincoln Park Seawall Renovation and Beach Restoration Report (1985)

This report addressed beach erosion and seawall deterioration.

### 3.3 Summary of Citizen Concerns

Public meetings held on April 24, 2001 and May 22, 2002 generated citizen comments and questions relevant to vegetation management at Lincoln Park. Appendix B (Chapter 10) records the concerns raised at these respective meetings, in addition to comment received by other means (written, phone, email). Citizens identified the following summary concerns, which the VMP seeks to address:

- Viability of madronas and conifer tree species showing signs of stress
- Stability of bluff and potential for mitigation through plantings and drainage
- Removal of invasive plant species and control of Park edge plantings
- Increasing forested patches within lawn areas
- Trails: reducing social trails, improving signage, future overhaul for better continuity
- Protecting unique, non-native tree stands
- Developing beach edge and wetland plant communities in shoreline area.
- Enhancing upper park riparian corridor (current drainage way)
- Maintaining defined view corridors from bluff trail
- Enhancing park security
- Establishing a Friends of Lincoln Park group for ongoing stewardship

### 3.4 Vegetation-related Uses

As the map, Human Use at Lincoln Park found in Appendix F (Chapter 10) indicates, there are many recreational opportunities that entice a constant stream of visitors to Lincoln Park. Human activity in the park generates both direct and indirect pressures on the landscape. Colman Pool is Seattle's only saltwater pool, and one of only three outdoor public pools in the city. Colman Pool hosts regional swim meets as well as regular seasonal users. Beach and lawn areas adjacent to the pool consequently are subject to heavy use throughout warm months of the year.

Picnicking has been extremely popular at Lincoln Park since the early 1900's, and continues to be so today. Supporting facilities include numerous shelters and comfort stations, as well as horseshoe pits, an exercise course (now in disrepair), a concession stand and tennis courts. A wading pool located in

the northeast corner of the park lies adjacent to a frequently-used picnic area, a playground, and heavily scheduled ballfields. A newer playground at the south end of the park draws many families with children. Activity magnets like these contribute to vegetation trampling and breakage, weed dispersal, tree root compaction and other adverse effects on vegetation. Concentrated use also dictates a higher level of management than informal, lower use portions of the landscape require.

Summer day camps utilize formal facilities as well as the overall park landscape. Nearly constant informal recreational uses at Lincoln Park include bike racers, cross country runners, dog-walkers, hikers, bluff sunset viewers and beachcombers along the Promenade. An area known as the “Wedding Meadow” is the site for numerous nuptials every year. Park vegetation provides the setting this broad array of human users, and in turn the landscape is significantly affected by visitors. The distribution and degree of impacts in part direct vegetation management strategies for the park.



## Chapter Four

### ASSESSMENT OF EXISTING RESOURCE

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#### 4.1 Soils of Lincoln Park

Varied soil types are found in Lincoln Park, due to the park's size, its breadth of terrain types, and alterations due to building construction, active management and human use. Natural forces have resulted in deposits of Seattle series soil in the flat area above the shore bluff that makes up most of the Park. Seattle series soil is characteristically poorly drained, being composed of mucky organic material. The beach is composed of deposits of coastal beach coarse soil common along much of Puget Sound. The bluff area is predominantly Seattle series soil overlying coarser till and hardpan, which are exposed through erosion and landslides. See Map F-4, Appendix F.

#### 4.2 Slope Stability and Erosion

Landslides are a regular and inexorable part of Lincoln Park's bluff history. See Map F-3 – Critical Areas, Appendix F. The most recent major slide occurred in the mid-1990's. Large landslides result from inherent geological conditions of a site, reflecting the interaction of moisture with soil physical properties. Where slides occur, vegetation generally is lost and poorly developed subsoils become exposed. Surface erosion and colonization by weedy herbaceous and woody species often ensue. Such consequences are evident along Lincoln Park's bluffs. Revegetation can be difficult, if not impossible to achieve, and the risk of loss through subsequent mass waste event remains.

Large woody vegetation such as trees can contribute somewhat to slope instability, particularly where found growing in Seattle series soil. This poorly-drained soil typically generates shallow root systems in most species, and potentially leads to failure when coupled with severe wind and/or heavy precipitation. Resident bluff vegetation, whatever its composition, can neither cause nor prevent large-scale landslides; these are attributable to far more deepseated geological and hydrological conditions.

Vegetation can help reduce erosion which might otherwise occur as a result of natural processes. Plants serve to reduce the erosive action of rainfall by means of direct rain interception, ground water transpiration, and improved soil drainage. Trees, shrubs and herbs intercept and slow the rate at which storm water hits the ground. Plant roots absorb water from the soil and release it into the atmosphere during photosynthesis. Roots create channels in soil that facilitate oxygen and water infiltration. Organic matter from mulch, leaves, needles and branches acts like a sponge on the ground, slowing ground water movement. Decaying plant parts, together with soil microorganisms (bacteria, fungi, etc.) and macrofauna (earthworms, ants, etc.) , create pore space and improve soil aggregation. Conversely, lack of vegetation and compacted bare soils contribute to erosion.

#### 4.3 Vegetation Plot Inventory Methods

A plot survey of Lincoln Park vegetation was conducted between March and May of 2001. Forty 1/10acre circular plots were selected to represent the variety of vegetation types present at Lincoln Park. The location of the survey plots is shown in **Figure 4-1**. **Table 4-1** provides a sample of the field survey sheet utilized.

Tree species and physical structure were recorded for each plot, and coded as follows: 1 = <1-4" dbh (diameter at breast height, or 4.5' above ground), 2 = 5-8" dbh, 3 = 9-20" dbh, 4 = 21-31" dbh, 5 = 32+” dbh, and 6 = “Multi-storied canopy.” All visible shrub, herb and fern species were



noted, and percentage of a plot covered by a given species also recorded (% Cover). The percent tree canopy cover was approximated for each plot.

Estimated overall seral stage of each plot was recorded as follows: 1 = old growth (180+ years), 2 = late mature (120-180 years), 3 = mid-mature (60-120 years), 4 = early mature (30-60 years), 5 = sapling - small tree <1" to 5" dbh), and 6 = shrub pioneer (less than 10% tree canopy closure).

The soil was sampled and its general composition recorded for each plot, based on dominant particle size. Soils dominated by clay were recorded as "clay"; those dominated by sand were recorded as "sand", etc. The percent slope and aspect were recorded for each plot. Finally, counts of downed woody debris and snags were recorded.

Supplemental, qualitative vegetation sampling was performed in April of 2002. Park vegetation not been previously assigned random sample plots or amenable thereto was visually assessed. Plant species present, plant health problems and unique landscape features were recorded. Developed landscape areas in particular were evaluated in this manner, in addition to gaps in previous coverage.

#### 4.4 Vegetation Inventory Analysis

On the basis of dominant vegetation recorded by plot inventory, Lincoln Park has been divided into thirteen distinct Vegetation Zones (Zones A-M). Zones largely correlate to geographical location within the park, but were not delineated by that means. A map depicting the area of each can be found in **Figure 4-2**. Lincoln Park Existing Vegetation Zones include:

Zone A	Beach Vegetation
Zone B	Bigleaf maple/red alder/Douglas-fir Forest
Zone C	North Mixed Native/Non-native Landscape
Zone D	Grand Fir/ Western Red Cedar Forest
Zone E	Turf and Ballfields
Zone F	Central Greensward
Zone G	Bigleaf Maple/Red Alder Forest
Zone H	Douglas Fir/Red Alder Forest
Zone I	Pacific Madrone/Red Alder/Douglas Fir Forest
Zone J	Pacific Madrone/Douglas Fir Forest
Zone K	Forest Clearing
Zone L	Lawson Cypress/Western Red Cedar Forest
Zone M	South Greensward

Zones vary in composition from highly managed landscapes and lawns to native forest remnants. The character of vegetation in individual zones has been influenced by microclimate and related plant demographics, by active landscape management by Parks employees and volunteers, by presence of disease pockets, and by nature and intensity of human use. Detailed descriptions of individual zones follow.

In forested zones, the most common and oldest tree species are noted as the "dominant tree species", while shrub species covering over 10% of forested zones are recorded as "dominant shrub species." For partially-forested zones, dominant species percentages refer to only the forested portions of such zones. Common herbaceous species present within zones are recorded as "significant herbs." Invasive species, which either cover large portions of a zone or are capable of doing so, are noted as "significant invasive species."



All percentages recorded above were derived from the 2001 park vegetation plot survey. Where percentages are absent, it is the result of supplemental, non-quantitative surveys conducted by Seattle Parks staff. A category which does not apply for a given zone is designated “n/a”, for example “dominant tree species” for the Beach Vegetation Zone.

#### 4.5 Existing Vegetation Zones

##### **Zone A - Beach Vegetation**

Acreage:	9.3
Aspect:	West
Slope:	0-40%
Soils Present:	Sand
Canopy Closure:	0-40%
Dominant Trees:	n/a
Dominant Shrubs:	n/a
Significant Herbs:	Some beach grasses present
Significant Invasive Plants:	Some scotch broom and gorse present
Down Woody Debris (average/acre):	High (driftwood)
Snags (average/acre):	0

The Beach Zone harbors only periodic pockets of vegetation along the lengthy Puget Sound beach itself. Existing grasses likely were planted by Seattle Parks as part of past beach reclamation/naturalization efforts.

The landscape immediately surrounding Colman Pool consists of ornamental shrubs (rose, rhododendron) and lawn punctuated by mature, non-native black locust trees (*Robinia pseudoacacia*). Probably as a result of lawn mowing, invasive plants have been largely unable to achieve significant populations in this area. This ornamental landscape is slated for renovation in 2003.

A linear row of maple trees planted along the Promenade southward from Colman Pool contrasts with the more enclosed, natural character of vegetation along the rest of the beach walkway. An exception to this overarching vegetation is an open slide swath re-vegetated in grasses and being invaded by unwanted species. For additional information, see the 1988 Parks Dept. planning study titled “Lincoln Park Shoreline.”

##### **Zone B - Bigleaf Maple/Red Alder/Douglas Fir Forest**

Acreage:	11.1
Aspect:	West
Slope:	40%
Soils Present:	Highly variable
Canopy Closure:	40-80%
Dominant Trees:	Bigleaf maple, Red alder, Douglas fir
Dominant Shrubs:	English ivy (21%), Western hazel (12%), Indian plum (10%), Low Oregon grape (4%).
Significant Herbs:	Sword fern (33%), Moss (6%), Fringecup (3%), Stinging nettle (3%)
Significant Invasive Plants:	English ivy (21%), English holly (5%), Himalayan blackberry (1%).
Downed Woody Debris (average/acre):	500
Snags (average/acre):	30





Zone B is a natural wooded area originating at the top of a bluff and transitioning downward to the beach. The eastern portion is upland and essentially flat and western portion is steeply sloped. The steep slope poses erosion and landslide risk. Invasive plants cover significant portions of this zone. Removal of evergreen invasive plants may exacerbate erosion and slide risk.

### **Zone C - North Mixed Native/Non-native Landscape**

Acreage:	10.4
Aspect:	East, North
Slope:	0-15%
Soils Present:	Not sampled
Canopy Closure:	40-60%
Dominant Trees:	Mixed native & non-native species, including Lawson cypress, Japanese cryptomeria, Douglas fir, Bigleaf maple and others.
Dominant Shrubs:	Mixed native & non-native species, including Rhododendron, Skimmia, European cranberry bush, Japanese camellia, English holly cultivars, Parney cotoneaster and others.
Significant Herbs:	Mixed native & non-native species, including Primrose, Sword fern and moss.
Significant Invasive Plants:	English ivy is common, often climbing up tree trunks.
Downed Woody Debris (average/acre):	Not sampled
Snags (average/acre):	Not sampled

Zone C contains a mixture of native, non-native and invasive plants. A Seattle Parks facilities maintenance compound is located in the northwest portion of this zone. A dozen or more Lawson cypress trees in this zone, mostly adjacent to crew headquarters, show signs of root disease (flagging patches on foliage). Removals due to presumed *Phytophthora lateralis* have occurred in the recent past, but without confirming lab culture.

### **Zone D - Grand fir/ Western red cedar forest**

Acreage:	5.8
Aspect:	Flat
Slope:	0-15%
Soils Present:	Highly variable
Canopy Closure:	60-80%
Dominant Trees:	Grand fir, Western red cedar, Bigleaf maple
Dominant Shrubs:	Salal (24%), Hazelnut (24%), Ocean spray (9%)
Significant Herbs:	Sword fern (38%), Moss (6%), Bracken fern (4%)
Significant Invasive Plants:	English holly (2%)
Downed Woody Debris (average/acre):	60
Snags (average/acre):	30

The eastern edge of this zone contains significant stands of Coast redwood trees (*Sequoia sempervirens*). Social trails run through this zone on a north south axis. A large patch of English ivy (*Hedera helix*) runs along the zone's eastern edge.

**Zone E - Turf and Ballfields**

Acreage:	6.5
Aspect:	Flat
Slope:	0-15%
Soils Present:	Clay
Canopy Closure:	0%
Dominant Trees:	n/a
Dominant Shrubs:	n/a
Significant Herbs:	Non-native grass
Significant Invasive Plants:	Probably as a result of lawn mowing, invasive plants have not been able to achieve significant populations.
Downed Woody Debris (average/acre):	0
Snags (average/acre):	0

Zone E consists of a south and north athletic field. The north field is surrounded by a mixture of native and non-native conifers and madronas. Grass grows right up to the trunk on most of these trees. Mixed native and non-native conifers also surround the south field. Some large Western red cedars near the south field are exhibiting symptoms of water stress (flagging).

**Zone F - Central Greensward**

Acreage:	8.3
Aspect:	Northeast
Slope:	0-15%
Soils Present:	Clay
Canopy Closure:	0-60%
Dominant Trees:	Douglas fir, Lawson cypress, others
Dominant Shrubs:	Western hazel (associated with tree clumps)
Significant Herbs:	Sword fern (at tree clumps), Non-native grasses, Moss
Significant Invasive Plants:	Probably as a result of lawn mowing, invasive plants have not been able to achieve significant populations.
Downed Woody Debris (average/acre):	Not sampled
Snags (average/acre):	Not sampled

Zone F is predominately a lawn with individual trees or small islands of trees and shrubs interspersed throughout. Grass lawns in this area are poorly drained and soggy in wintertime; soils have a high clay content. Coast redwood trees over seventy feet tall border the adjacent athletic field. On the western edge is a significant grove of European beech trees (*Fagus sylvatica*). Significant downed woody debris is present in some portions of this zone despite its predominantly open, developed landscape character.

**Zone G - Bigleaf maple/Red alder forest**

Acreage:	9.2
Aspect:	West
Slope:	15-40%
Soils Present:	Highly variable
Canopy Closure:	40-80%
Dominant Trees:	Bigleaf maple, Red alder
Dominant Shrubs:	Hazelnut (17%), Red elderberry (10%), Ocean spray (8%), Trailing blackberry (6%)



Significant Herbs:	Sword fern (21%), Moss (17%)
Significant Invasive Plants:	Himalayan blackberry (14%), English ivy (7%), English holly (6%)
Downed Woody Debris (average/acre):	210
Snags (average/acre):	10

This zone consists of an eastern portion that is essentially flat, and a steeply-sloped western portion that levels off near Colman Pool. There exist panoramic views, windowed through trees along the western edge of the bluff trail. Walking trails and benches are highly used by visitors. Large numbers of invasive plants are found on the sloped forest in this zone. Many are evergreen species, dictating caution regarding any removals, to minimize risk of slope erosion and destabilization. Portions of this zone consist of small islands of trees and understory plants surrounded by lawn.

### **Zone H - Douglas fir/Red alder forest**

Acreage:	23.4
Aspect:	Northeast, South, West
Slope:	0-15%
Soils Present:	Sand, Duff, Gravel
Canopy Closure:	40-80%
Dominant Trees:	Douglas fir, Red alder, Western red cedar
Dominant Shrubs:	Hazelnut (24%), Salal (6%), Ocean spray (7%)
Significant Herbs:	Sword fern (33%), Moss (25%), Enchanter's nightshade - <i>Circaea alpine</i> (11%)
Significant Invasive Plants:	Himalayan blackberry (6%), English ivy (6%), English holly (3%)
Downed Woody Debris (average/acre):	187
Snags (average/acre):	7

Zone H encompasses essentially healthy, native forest of varied density, composed primarily of conifers with significant numbers of deciduous trees. Several trails run through this zone, linking the bluff trail with other parts of Lincoln Park. Significant populations of invasive plants are found, and in some areas lawn grows right up to small islands of trees and understory shrubs. The southwestern edge of this zone contains significant populations of Pacific madrona (*Arbutus menziesii*) and salal.

### **Zone I - Pacific madrona/Red alder/Douglas fir forest**

Acreage:	12.2
Aspect:	Southwest
Slope:	0-15%
Soils Present:	Sand, Duff, Gravel
Canopy Closure:	60-80%
Dominant Trees:	Pacific madrona, Red alder, Douglas fir
Dominant Shrubs:	Hazelnut (45%), Salal (26%), Red elderberry (17%), Trailing blackberry (15%), Ocean spray (%)
Significant Herbs:	Moss (20%), Sword fern (15%), Enchanter's nightshade - <i>Circaea alpina</i> (3%), Lady fern (1%)
Significant Invasive Plants:	English holly (9%), English laurel (2%), English ivy (1%)



Downed Woody Debris (average/acre): 254  
Snags (average/acre): 26

Zone I is a natural forested area with a mixture of deciduous and evergreen species. Portions are poorly drained and contain plant species indicative of wetland conditions, such as Salmonberry (*Rubus spectabilis*) in the western half. Snags in the zone show evidence of use by primary cavity-nesting birds like woodpeckers.

#### **Zone J - Pacific madrone/Douglas fir forest**

Acreage: 8.3  
Aspect: Southwest  
Slope: 0-80%  
Soils Present: Highly variable  
Canopy Closure: 0-80%  
Dominant Trees: Pacific madrona, Douglas fir  
Dominant Shrubs: Western hazel (43%), Salal (37%), Orange honeysuckle - *Lonicera ciliosa* (9%), Snowberry (9%)  
Significant Herbs: Moss (8%), Bracken fern (10%), Riverbank lupine - *Lupinus rivularis* (6%)  
Significant Invasive Plants: English ivy (10%), Himalayan blackberry (6%)  
Downed Woody Debris (average/acre): 81  
Snags (average/acre): 23

Zone J is a forested area containing a mixture of native and non-native tree species. The eastern portion is a flat area adjoining the bluff trail. Picnic tables are scattered among many trees in this part of the zone; trees in picnic areas are potentially hazardous. At least half of madrona trees in this zone exhibit severe cankers, most likely caused by *Natrassia mangiferae*, a highly-virulent, non-native fungal pathogen. Other factors such as compacted soils and lawn fertilization may also be adversely affecting the madronas (see Appendix C). A small seasonal stream runs through this zone and disappears under a staircase connecting bluff trail and beach.

The western portion is a steep slope that levels off near the beach trail. Landslides have occurred recently in the northwestern portion of this zone. The rest of the slope has the potential for further erosion or landslides. Invasive plants cover large portions of both flat and sloped areas. The removal of evergreen invasive plants may exacerbate erosion and slide risk on steep slopes.

#### **Zone K - Forest Clearing**

Acreage: 1.0  
Aspect: East  
Slope: 0-15%  
Soils Present: Sand, Duff, Gravel  
Canopy Closure: 0-40%  
Dominant Trees: n/a  
Dominant Shrubs: Himalayan blackberry  
Significant Herbs: Non-native grass  
Significant Invasive Plants: Himalayan blackberry  
Downed Woody Debris (average/acre): 200  
Snags (average/acre): 0



A small seasonal stream runs through this zone and is essentially unbuffered except by grass and a patch of blackberry. Although small, this drainage could become a valuable asset for wildlife habitat enhancement. It continues southwest from this zone through adjacent Zone J, where it disappears in the vicinity of the bluff. A large lawn area with picnic benches is present in this zone. The area is also used by park visitors as a non-designated dog run. Most of the lawn is poorly drained, resulting in a wet soggy field during the rainy season. A large (45' tall) dead pine tree is located at the eastern edge of this zone, among other pines in varying condition from vigorous to nearly dead. Shading, poor drainage and root rot are potential contributing causes.

#### **Zone L - Lawson cypress/Western red cedar forest**

Acreage:	1.7
Aspect:	Flat
Slope:	0-15%
Soils Present:	Sand, Duff, Gravel
Canopy Closure:	60-80%
Dominant Trees:	Lawson cypress, Western red cedar
Dominant Shrubs:	English ivy (46.3%), Western hazel (26.8%), Western mock orange (25.5%), Trailing blackberry (13%)
Significant Herbs:	Sword fern (10.5%), Non-native grass (9.4%)
Significant Invasive Plants:	English ivy (46.3%), English holly (5%), Himalayan blackberry (3%)
Downed Woody Debris (average/acre):	50
Snags (average/acre):	20

Zone L is the southerly portion of the edge at Fauntleroy Street. This Zone contains a mixture of native forest species and non-native, ornamental trees and shrubs planted along the eastern edge of this zone. Invasive plants are present in large numbers. Some trees have been removed from this zone because of probable *Phytophthora*-caused fungal disease. This often-fatal plant pathogen can spread to other trees in the area via runoff or mud carried on shoes and by animals.

#### **Zone M - South Greensward**

Acreage:	5.6
Aspect:	Southwest
Slope:	40%
Soils Present:	Sand, Gravel
Canopy Closure:	0-40%
Dominant Trees:	Bigleaf maple, Pacific madrona
Dominant Shrubs:	English ivy (37.5%), Himalayan blackberry (20.5%), Gorse (8%)
Significant Herbs:	Non-native grass (10.8%), Orchard grass - <i>Dactylis glomerata</i> (10.5%), Bracken fern (5%)
Significant Invasive Plants:	English ivy (37.5%), Himalayan blackberry (20.5%), Orchard grass (10.5%), Gorse (8%), English holly (3.8%)
Downed Woody Debris (average/acre):	130
Snags (average/acre):	0

Dominant trees and shrubs listed pertain only to forested areas. Over half of this zone consists of lawn with scattered clumps of native and non-native trees. A play area is located in this zone, surrounded by large Douglas fir and Madrona trees. High human use has resulted in vegetation



trampling and compaction around root zones of these late-mature trees. Coarse-textured soils like those present in this zone can resist compaction and successfully prevent oxygen-deprived root environments from developing. Most madronas in the area show signs of attack by *Natrassia mangiferae*, particularly severe where bark on lower trunks has been wounded either by visitors or maintenance operations. Madronas protected by understory vegetation or peripheral to active use areas are somewhat less affected by cankers. Some trees may be hazardous due to their large size and failure potential coupled with the area's high frequency of human use.

#### 4.6 Wildlife Habitat ....

The Seattle Parks Urban Wildlife and Habitat Management Plan was updated in 2000 and defines its purpose as:

“to provide the framework and guidelines for integrating natural and human systems in Seattle's parks and open spaces. The overall goal of the plan is to benefit both the people and the native wildlife that use these lands...and is intended to be an ongoing and dynamic part of the resource management efforts.”

Stated goals, which the Lincoln Park VMP will support, are as follows:

- Continue and increase wildlife habitat protection and enhancement efforts
- Protect and enhance wildlife populations
- Provide environmental education, using wildlife resources
- Develop and maintain a wildlife resource inventory
- Promote volunteer involvement in wildlife and habitat protection and enhancement
- Promote internal education and consistency in Department actions
- Promote interdepartmental and interagency cooperation to protect wildlife

The plan describes the network of habitats in Seattle, which range from sub-tidal marine to old-growth conifer forest, and include terrestrial, marine estuarine and freshwater environments. In addition to this plan, the Seattle Urban Nature Project has completed a comprehensive inventory assessing the city's public habitat resources; this inventory will be updated in 2005 to reflect dynamic change in the direction of both habitat restoration and degradation or destruction. Both types of forces clearly are at work simultaneously.

Lincoln Park has stands of coniferous and deciduous forest large enough to support an array of wildlife species. The more complex plant communities, that is, those with multiple layers of vegetation, will provide the greatest variety of wildlife habitat. Diversity of bird species in particular increases with a greater volume of foliage and more vegetative cover.

Lincoln Park also has a large area of saltwater beach providing intertidal habitats for a great variety of mammals, marine fauna and birds including gulls, crows, shorebirds, harbor seals and waterfowl. Dogs and humans using the beaches often disturb the wildlife, forcing them to more quiet areas.

No detailed lists of wildlife species confirmed to inhabit Lincoln Park have been compiled. The documented range of habitat types within the park do give a good indication of likely fauna, present or potential. The Urban Wildlife plan contains a list of vertebrate animal species known to occur in Seattle Parks, by habitat type. In addition, Washington Department of Fish and Wildlife maintains a list of fauna meriting priority for protection due to their sensitivity to habitat alteration. Several frequent Lincoln Park The State list includes:



- Bald Eagles (known to nest in Lincoln, Discovery and Seward Parks)
- Chinook Salmon
- Northern Red Legged Frog
- Hooded Merganser
- Peregrine Falcon
- Great Blue Heron
- Green Heron
- Pileated Woodpecker

Unfortunately, habitat degradation is occurring in all Seattle Parks due to human use impacts on the natural system. Lincoln is no exception. Where non-native plants crowd out native species, the resulting lack of diversity yields habitat both less functional and less attractive to most wildlife. Uncontrolled cats and dogs constitute unnatural predators and further threaten terrestrial species. Additionally, wildlife corridors are being broken apart by land development, fragmenting existing habitat and making it less viable for many bird and animal populations. Lincoln Park currently provides refuge and opportunities for high-quality habitat preservation and creation. Appropriate vegetation management directly serves goals of wildlife enhancement.

#### **4.7 Encroachments**

There are no known encroachments to Lincoln Park boundaries.



## Chapter Five FINDINGS

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### **5.1 Role of Findings in Plan Development**

Information gathered to define VMP context and to assess the existing resource reveals key themes which vegetation management at Lincoln Park needs to address. While none is particular only to Lincoln Park, the combination of factors is unique. The findings listed below raise focal issues, which in turn corroborate established goals and define vegetation management objectives for the plan. Chapter 6, which follows, provides specific recommendations to fulfill these objectives, area by area within the park.

### **5.2 Specific Findings and Issues**

#### ***Finding: Native Character***

Lincoln Park's vegetation includes a dominant component of high quality, beautifully-sited native forest which provides significant wildlife habitat and rich user experiences.

#### ***Issue:***

Preservation and enhancement of this valuable natural legacy in the face of disturbances affecting a heavily-visited urban forest.

#### ***Finding: Non-native Plants***

Native and exotic plant species commingle extensively in the park, notably as groves of introduced trees and beds of mixed shrubbery.

#### ***Issue:***

Preserving the unusual experience non-native trees in a forested setting and a rich palette of shrub species, while dealing with growth environment and invasiveness problems.

#### ***Finding: Invasive Species***

Invasive plants occupy significant understory area, primarily as blanketing/climbing ivy and shrub-trees like holly and English laurel; additional invasive and noxious weed species have infested the park less extensively or in open areas only.

#### ***Issue:***

Elimination of invasive plants which outcompete native understory, and noxious weed eradication.

#### ***Finding: Compacted Soils***

Soil compaction is severe in heavily-used park areas, with increased hazard tree potential.

#### ***Issue:***

Reversing compaction and managing tree population to minimize failure risk in high use areas.

#### ***Finding: Tree Disease***

Disease has visibly affected – and in several cases killed – existing trees in diverse areas of the park, most notable Lawson cypress, Ponderosa pine and Madrona.

#### ***Issue:***

Disease management to minimize loss of desirable mature canopy and replenish gaps.

#### ***Finding: Drainage Problems***

Drainage deficiencies exist in lawn areas as well as along bluff edge where limited erosion from overland flow is visible.

#### ***Issue:***

Remediating poor drainage in turf and water flowing onto steep, unstable slopes.

***Finding: Social Trails***

Social trails are numerous throughout forested park areas, with likely consequences including vegetation fragmentation, wildlife disturbance, increased invasive plant and soil-borne disease introduction, and user disorientation.

***Issue:***

Preserving intact blocks of native vegetation, repairing discontinuities and identifying ways to foster utilization of official trail system.

***Finding: User Safety***

Safety and security problems are perceived to exist by certain park users, and corroborated by staff; confusing trails and dense vegetation may contribute to such perceptions.

***Issue:***

Discerning whether and how vegetation management can reduce actual and perceived danger, in concert with trail system evaluation.



## Chapter Six

### VEGETATION MANAGEMENT RECOMMENDATIONS

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Seven Management Areas have been delineated for the purposes of this plan, based on distinctive vegetation characteristics and management requirements. Management Areas are not in all cases physically continuous; in addition, some span multiple Vegetation Zone boundaries. Whereas Vegetation Zones document existing park vegetation, several share similar management requirements and thus have been grouped together. The seven Management Areas are mapped in Chapter 10, Appendix F, Map F-6 and include: Shoreline, Bluff, Forest, Passive Use Greensward, Active Use Greensward, Lawn/Ballfield and Native/Ornamental Landscape.

This chapter provides specific management and maintenance recommendations for each respective area, in a consistent, accessible format. Included for each Management Area are a brief description with guiding management objectives, a customized annual calendar for management and maintenance practices, and a narrative discussion of practices by calendar category, as relevant: Weeding and Invasive Control (Trees, Shrubs, Herbs), Removing Plants, Planting (Trees, Shrubs, Herbs), 3-Year Establishment Care, Lawn Care.

#### 6.1 Shoreline Management Area

Area: 16.2 acres. Boundary corresponds to Vegetation Zone A. The Shoreline is a long, thin strip along Lincoln Park's western edge where it borders Puget Sound. A sandy beachfront stretches the entire length of this area along the salt water. Wind, spray and solar exposure are highly variable, in many parts seasonally quite intense. A service road divides the beach from the remainder of the area, which is flat upland. Colman Pool is located near the westernmost point, surrounded by an ornamental landscape and lawn. Shrubs here feature rhododendron and rose, plus a grove of black locust trees.

The eastern edge consists of many small lawn areas that abut the base of steep bluffs. Some ornamental trees and limited shrubbery distinguish this portion as a developed landscape, in contrast with unmaintained slope and sparse beach vegetation just beyond. Picnic tables, benches, grills and other structures are present in some of the upland lawn areas, and much used by Park visitors. Passive recreation is a major characteristic of this Management Area, including beachwalking, promenade strolling and skating, sunbathing, swimming, picnicking, and enjoying panorama views of water and mountains.

#### Objectives:

- Monitor potential hazard trees
- Maintain ornamental plantings
- Manage lawn areas for high use
- Create a vegetation buffer along the shoreline
- Monitor for invasive, non-native plant species



**Management and Maintenance Annual Calendar  
Lincoln Park – Shoreline Management Area**

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
<i>Management and Maintenance Practices</i>												
Removing Plants	X	X	X	X				X	X	X	X	X
Pruning	X	X	X	X				X	X	X	X	X
Planting												
Trees												
Shrubs												
Herbs												
3 Yr. Establishment Care							X	X	X	X	X	
Monitor Invasive plants												

■ Indicates range of time to perform action as needed  
 X Indicates specific time to perform action

**REMOVING PLANTS**

Other than invasive plants, removals should be limited to ornamentals in poor condition and hazard trees. When possible, removals should be done between August and March to avoid disruption of nests and peak seasons of human use. Felling hazard trees and grinding on site for use in beds as coarse woody mulch is preferable to complete removal of the material.

**PRUNING**

Pruning of trees should be performed only by a certified arborist or plant health care professional. Tree pruning should be limited to removal of limbs that pose a hazard to human safety or infrastructure, or compromise a tree’s structural framework. Shrub pruning should be as limited as possible to maintain plant vigor and beauty, and reflect species-appropriate timing and techniques.

**PLANTING**

Planting should be done only if at least three-year establishment care can be assured, particularly in harsh shoreline conditions. Species selection should consider the potential invasiveness of species, microclimate conditions at each planting site and the historic landscape character of Lincoln Park. Herbs and shrubs adapted to salt spray and sandy soil should be planted along the beachfront to create a vegetation buffer, and to enhance wildlife habitat. Trees should not be planted along the shore itself, and replacements carefully chosen to balance provision of shelter with sun and view preservation. Plants adapted to sunny, windy exposures should be planted along the southwestern edge of this area; those more suited to moderate wind and sunshine should be used at the northwestern margin.

**MULCHING**

The ground immediately surrounding newly installed plants should be covered with woody mulch. Trees and shrubs growing in lawn areas should have a portion of their root zones mulched, taking care not to pile mulch on root crowns or against plant stems. Where practical, a mulch circle one foot in diameter per inch of plant stem diameter should be spread around trees and shrubs. Best professional judgement should be used in deciding how large of a circle is practical to apply and maintain. Grass should be killed or removed before placing chips.



## LAWN CARE

Lawn areas along the shoreline should continue to be managed for high levels of use by Park visitors. Lawns should not be allowed to grow directly up to stems of individual trees and shrubs without a protective buffer of coarse woody mulch.

## THREE YEAR ESTABLISHMENT CARE

Establishment care will be necessary for any newly installed woody plants added to enhance this area; practices include watering, replenishing mulch, weeding, training pruning, monitoring for vigor and survival, and possibly, replacement planting.

## MONITORING INVASIVE PLANTS

Invasive plants do not currently exist in significant populations in the shoreline area. The movement of invasive plants into this area should be closely monitored and arrested where discovered. Adjacent sources of invasive species abound, due to the near-impossibility of maintaining bluff vegetation.

## 6.2 Bluff Management Area

Area: 18.7 acres (not including slope factor which significantly increases area). Boundary encompasses Vegetation Zones B and G, most of Zone J and NW portion of Zone M. The Bluff runs north to south along the length of Lincoln Park's western edge, bordered to the west by the Shoreline and to the east by the blufftop trail, where the grade becomes relatively level. Vegetation on the bluff slope varies with microclimate and as a result of recent landslides. The northern portion of the bluff has a northwestern exposure and subsequently a moderate microclimate compared with the harsh southerly end.

Canopy: Dominant trees on the northern bluff include Bigleaf maple, Red alder and Douglas fir. The southern portion, which has more solar exposure, is dominated by Pacific madrona and Douglas fir.

Understory: In the northern portion of the bluff, common native shrubs include Ocean spray, Indian plum, Low Oregon grape, Western hazelnut, and Red elderberry. The southern slope has an understory dominated by Western hazel, Salal, Orange honeysuckle (*Lonicera ciliosa*) and Snowberry.

Invasive plants: Species vary in abundance throughout this area. The most abundant invasives are English ivy (0-21%), Himalayan blackberry (0-14%), English holly (0-16%) and Tree lupine - *Lupinus arboreus* (0-6%). English ivy is most abundant in the northern portion of the bluff. Himalayan blackberry and English holly are most common in the central part of the bluff. Portions of the southern central bluff area have dense populations of Tree lupine and Scotch broom. English laurel is common along the top of the bluff, although the population is low for the overall bluff area. Gorse and other invasive species are present, but have not yet achieved significant population sizes.

### Objectives:

- Monitor potential hazard trees.
- Reduce erosion of bluff soils.
- Maintain views from top of the bluff.
- Prevent spread of invasive species to other areas.
- Enhance wildlife habitat.

**Management and Maintenance Annual Calendar  
Lincoln Park – Bluff Management Area**

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
<i>Management and Maintenance Practices</i>												
Weeding and Invasive Control												
Trees												
Shrubs												
Herbs												
Removing Plants	X	X	X	X					X	X	X	X
Pruning	X	X	X	X					X	X	X	X
Planting												
Trees												
Shrubs												
Herbs												
3 Yr. Establishment Care								X	X	X	X	X

■ Indicates range of time to perform action as needed  
 X Indicates specific time to perform action

**WEEDING AND INVASIVE CONTROL**

Invasive plant species should only be removed from edges of the bluff in such a way as will not contribute to soil erosion. Any vegetation removals on steep slopes should immediately be followed by installation of jute netting. Weeding and removal of woody and herbaceous species should take place as needed during the growing season. Small woody debris of species unlikely to resprout from cuttings may be left on site in modest brush piles to improve wildlife habitat. Large woody debris, which is capable of sliding down slope, should not be left on site after cutting. Root systems of large woody invasives like English laurel, English holly and horsechestnut should not be removed; suckers should be repeatedly recut or spot treated with herbicide to reduce or eliminate recurrence.

**REMOVING PLANTS**

Other than invasives, removals should be conducted only in the case of hazard trees. When possible, removals should be done between August and March to avoid disruption of nests. Large, dead trees capable of sliding down slope should not be left as snags or downed woody debris. Limbs from trees infected with saprophytic fungi such as *Phytophthora* should either be chipped or removed.

**PRUNING**

Pruning of trees should be performed only by a certified arborist or plant health care professional. Coppicing of English laurel and English holly blocking blufftop views is a high priority, and should be performed during the dry season to minimize potential erosion of exposed soil. Other pruning should be limited to removal of limbs that pose a hazard to human safety or infrastructure. Dead limbs should not be left on site if they are capable of sliding down slope. Best professional judgement should prevail regarding bluff edge tree removals, an approach sometimes used to preempt local slope failure due to windthrow-induced root heave. Pruning decisions should reflect consideration of safety, erosion control and habitat enhancement.

**PLANTING**

Planting should only be done if at least three-year establishment care can be assured.

Only plant species that are adapted to survive on slopes and that will not contribute to erosion should be planted on the bluff. Species selection should also consider the potential invasiveness of species, microclimate conditions at each planting site and the historic landscape character of Lincoln Park.

#### MULCHING

The ground immediately surrounding newly installed plants should be covered with woody mulch, taking care not to pile mulch on root crowns or against plant stems. Coarse woody mulch can also be spread on relatively flat, bare areas of the bluff.

#### THREE YEAR ESTABLISHMENT CARE

Establishment care will be necessary for any newly installed woody plants that replace invasive trees and shrubs.

### 6.3 Forest Management Area

Area: 49.8 acres. Boundary encompasses substantial portions of Vegetation Zones C, D, H, I, L & M. The Forest Management Area covers the majority of the interior of Lincoln Park. Intervening MA's divide the Forest into discontinuous northern, central and southern parts. The central forest area is essentially continuous, but laced with both official and social trails. Lawn is present between trees in open forest areas near the western edge. Drainage varies from good to poor. Large patches of bare, compacted soil have developed in areas of high human use. A small seasonal stream that runs through portions of the forest has little or no vegetation buffer along its banks.

Canopy: Species vary as a result of exposure and prior human intervention. Evergreen trees such as Douglas fir, Western red cedar, Pacific madrona and Grand fir comprise the majority of the canopy species. Lawson cypress and Japanese cryptomeria intermingle with native conifers in the northern portion of the forest. Small groves of deciduous trees species such as Bigleaf maple and Red alder are present throughout the management area. Some trees have died recently, a probable result of *Phytophthora* root disease.

A distinctive characteristic of Lincoln Park's forested areas is that mature, non-native ornamental trees are present within and along the edges of the forest, most planted small groups. Significant groves of Coast redwoods dominate on the eastern edge, a grove of European beeches on the western edge, and other individual and small groups of trees throughout the forest (Yellowwood, Golden Rain, Oak, Incense cedar, Crabapple, etc.).

Understory: Shrubs and herbs are a combination of both native and invasive species. Common native shrubs include Western hazel, Salal, Red elderberry, Trailing blackberry, Ocean spray, Orange honeysuckle and Snowberry. Ornamental shrubs such as Skimmia, European cranberry bush, Camellia, Rhododendron and Holly cultivars (notably *Ilex aquifolium* 'Aureo-marginata') mix with the native and invasive shrubs in the northern portion of the Forest. Sword fern and moss cover large portions of the forest floor.

Invasive plants: Invasives are present throughout the Forest; density varies. Most commonly-found species are: English ivy (9% - <1%), English holly (8% - <1%), English laurel (3% - <1%), Himalayan blackberry 3% - <1%, Tree lupine (45% - <1%) and Gorse (4.5% - <1%).

#### Objectives:

- Monitor & mitigate potential hazard trees.





- Eliminate or reduce presence of invasive plants.
- Reduce fragmentation by social trails.
- Mitigate compacted soils and eliminate further compaction.
- Maintain ornamental tree groves.
- Protect trees from damage.
- Enhance vegetation along seasonal watercourse.

**Management and Maintenance Annual Calendar  
Lincoln Park – Forest Management Area**

	Month												
	J	F	M	A	M	J	J	A	S	O	N	D	
<i>Management and Maintenance Practices</i>													
Weeding and Invasive Control													
Trees													
Shrubs													
Herbs													
Removing Plants	X	X	X	X					X	X	X	X	X
Pruning	X	X	X	X					X	X	X	X	X
Planting													
Trees													
Shrubs													
Herbs													
3 Yr. Establishment Care								X	X	X	X	X	
Lawn Care													

■ Indicates range of time to perform action as needed  
 X Indicates specific time to perform action

**WEEDING AND INVASIVE CONTROL**

Invasive plant species should be removed to the largest extent possible. Weeding and removal of woody and herbaceous species should take place as needed during the growing season, but at least monthly for the first year in newly planted areas. Woody debris generated by invasive removal that is unlikely to sprout from cuttings may be left on site to improve wildlife habitat. Woody debris placed in brush piles, coarse woody debris, snags and stumps all provide significant wildlife habitat. English holly and English laurel should not be left as snags or stumps because of resprouting potential.

**REMOVING PLANTS**

Other than invasives, removals should be conducted only in the case of hazard trees or to improve growth environment for selected high-value trees like light-stressed historic groves of ornamental species. When possible removals should be done between August and March to avoid disruption of nests. If a failing tree does not pose a threat to human safety, girdling or trimming to provide snag habitat or felling and leaving as coarse woody debris is preferable to complete removal. Limbs from trees infected with saprophytic fungi such as *Phytophthora* should either be chipped or removed. Large woody debris should never be placed directly on the root crown of desirable plants.



## PRUNING

Tree pruning should be performed only by a certified arborist or plant health care professional. Pruning should be limited to removal of limbs that pose a hazard to human safety or infrastructure. Dead limbs should be allowed to fall to the forest floor as coarse woody debris. Best professional judgement should prevail when assessing limb or tree removals. Pruning decisions should reflect consideration of safety and habitat enhancement priorities. Where documented personal safety concerns exist, it may be desirable to undertake selective thinning of tall understory vegetation to improve sight lines. Such thinning should relate to major pedestrian routes, and be performed in consultation with law enforcement and Parks management acquainted with Lincoln Park. Overthinning will result in significant loss of habitat and species diversity.

## PLANTING

Planting should be undertaken only if at least three-year establishment care can be assured, and generally done in concert with restoration of target areas within the MA. Species selection should consider the potential invasiveness of species, microclimate conditions at each planting site, sustainability, habitat enhancement, and the historic landscape character of Lincoln Park. Native species should clearly dominate Forest plantings, except where helping perpetuate the tradition of interspersed non-native groves.

## MULCHING

The ground immediately surrounding newly-installed plants should be covered with coarse woody mulch, taking care not to pile mulch on root crowns or against plant stems. Coarse woody mulch should be spread deeply on compacted areas and decommissioned social trails, to improve soil tilth and microfauna for restoration planting.

## LAWN CARE

Lawn areas within the forest area should be managed at low intensity. Where increased shading makes grass unsuccessful, convert area to native groundcover or woodchip mulch.

## THREE YEAR ESTABLISHMENT CARE

Establishment care will be necessary for any newly-installed woody plants that replace invasive trees and shrubs, as well as trees replenishing the forest canopy.

### 6.4 Passive Use Greensward Management Area

Area: 7.5 acres. Boundary encompasses Vegetation Zone K plus parts of Zones F, I & J. Two passive use greenswards are located in the north central interior of Lincoln Park and one (the “Wedding Grove”) within the southern interior forest. Each greensward is bordered by forest on the north and south. The northern greensward is also bordered by the bluff trail on the west and a ballfield on the east. Both areas provide park visitors with the unique experience of walking freely beneath a mixed tree canopy. Individual trees and small mixed groups of trees and shrubs grow amid open lawn in the northern greensward. The southern greensward is mostly lawn with few trees and some invasive species. Both lawn areas are poorly drained.

Canopy: The majority of the tree canopy is composed of Douglas fir and Lawson cypress. Other non-native tree specimens are present throughout.

Invasive plants: Invasives are limited to those growing near trees and tree/shrub islands. Most do not have a significant presence in this area. English ivy is present and climbing up trunks of some specimen trees.



Objectives:

- Monitor and mitigate potential hazard trees.
- Maintain unique vegetative character of greensward.
- Improve soil drainage.
- Protect trees from damage.
- Prevent spread of invasive plant species.

**Management and Maintenance Annual Calendar  
Lincoln Park – Passive Use Greensward Management Area**

Management and Maintenance Practices	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Weeding and Invasive Control												
Trees												
Shrubs												
Herbs												
Removing Plants	X	X	X	X					X	X	X	X
Pruning	X	X	X	X					X	X	X	X
Planting												
Trees												
Shrubs												
Herbs												
3 Yr. Establishment Care								X	X	X	X	X
Lawn Care												

■ Indicates range of time to perform action as needed  
 X Indicates specific time to perform action

**WEEDING AND INVASIVE CONTROL**

Invasive plant species should be eliminated within the Greensward, a relatively easy task since lawn mowing effectively prevents vegetative spread from area to area. However, seed is constantly distributed by wildlife and human foot traffic, and provide ongoing modes for reinfestation. Frequent monitoring and early control are key. Weeding and removal of woody and herbaceous species should take place as needed during the growing season, but at least monthly for the first year around newly installed plants. Woody debris should not be left on open lawn areas.

**REMOVING PLANTS**

Other than invasives, removals should only be conducted in the case of hazard trees. When possible removals should be done between August and March to avoid disruption of nests. If a failing tree does not pose a threat to human safety, girdling or trimming to provide snag habitat is preferable to complete removal. Felling limbs and leaving on the boarder of tree/shrub clumps and lawn can be used to protect root zones. Limbs from trees infected with saprophytic fungi such as *Phytophthora* should either be chipped or removed. Large limbs should never be placed directly on tree root crowns.

**PRUNING**

Tree pruning is particularly important for the Greensward, because it contains many high-quality specimens and because area trees are fully accessible to Park users. Hazard abatement pruning should be performed as needed, in conjunction with a regular monitoring program. Structural,



disease control and deadwood pruning should occur based on best professional evaluation, with the goal to maintain tree quality and longevity. All pruning should be performed by a certified arborist or qualified plant health care professional. Because the Greensward is a semi-developed landscape, habitat enhancement is secondary to aesthetic and human safety considerations. For the most part, woody debris should be chipped or removed from pruning sites in this MA.

#### PLANTING

Planting should be done only if at least three-year establishment care can be assured. Species selection should address the potential invasiveness of species, individual site microclimate, and historic landscape character of the Greensward. Non-native and native trees are part of the Greensward's historic character and this diversity should be perpetuated. When existing tree decline becomes evident, replacement specimens and groups should be planted. The overall proportion of canopy to open area should be maintained, but patterns will be expected to shift through time. New trees need not - generally cannot - be placed in the exact positions where trees are currently growing. Replacements should be established in anticipation of losses, not simply in reaction.

#### MULCHING

The ground immediately surrounding newly installed plants should be covered with coarse woody mulch, taking care not to pile mulch on root crowns or against plant stems. Coarse woody mulch also should be spread in the root zones of existing trees, and replenished regularly. Any existing grass should be killed or sheet mulched prior to mulch application. Groups of trees should be mulched as a grove, not individual tree circles.

#### THREE YEAR ESTABLISHMENT CARE

Establishment care will be necessary for any newly installed woody plants. Early training pruning is a particularly important element of establishment care for new Greensward trees.

#### LAWN CARE

Best management practices should be used to improve drainage of lawn areas throughout the Greensward. Lawns should never be cut to below a minimum height of three inches. Beyond improving drainage, lawn areas should be managed at low intensity, except where high foot traffic is evident. Lawn maintenance should be conducted in a manner that minimizes tree root zone soil compaction and keeps equipment well clear of tree trunks and root crown, to minimize any inadvertent damage.

### **6.5 Lawn / Ballfields Management Area**

Area: 6.8 acres. Boundary corresponds to Vegetation Zone E. Lincoln Park contains two separate ballfields, both surrounded by lawn. The larger of these areas is found in the north central portion of the Park, the smaller one in the southeast. These fields are designed for baseball and scheduled for team play, also occasionally used for other sports. Bleachers and other structures surround portions of the ballfields.

A mixture of native and ornamental vegetation borders the ballfields and lawn on all sides. Many mature trees lie within this vegetative border, presenting potential hazards if structurally compromised. While active recreation use impedes several vegetation management goals for Lincoln Park, their historic presence and use by the community dictate that the ballfields be retained.



Objectives:

- Monitor potential hazard trees and mitigate as needed.
- Maintain athletic turf appropriately for active use.
- Mitigate compacted soils around tree root zones.
- Minimize disruption to surrounding wildlife habitat.

**Management and Maintenance Annual Calendar  
Lincoln Park – Lawn / Ballfields Management Area**

Management and Maintenance Practices	Month																		
	J	F	M	A	M	J	J	A	S	O	N	D							
Removing Plants	X	X	X	X					X	X	X	X	X	X	X	X	X	X	X
Pruning	X	X	X	X					X	X	X	X	X	X	X	X	X	X	X
Planting																			
Trees																			
Shrubs																			
Herbs																			
3 Yr. Establishment Care									X	X	X	X	X	X					
Lawn Care																			

■ Indicates range of time to perform action as needed

X Indicates specific time to perform action

**REMOVING PLANTS**

Other than invasives, removals should be conducted only in the case of hazard trees. Whenever possible, removals should be done between August and March to avoid disruption of nests, but greatest consideration should be placed on safety. Only trees that pose a direct threat to users or structures should be removed.

**PRUNING**

Tree pruning should be performed only by a certified arborist or plant health care professional, and should be limited to removal of limbs that pose a hazard to human safety or infrastructure. Limbs from trees infected with decay fungi should either be chipped or removed. Pruning decisions should reflect best professional judgement balancing safety, tree protection and habitat enhancement priorities.

**PLANTING**

Planting should be done only if at least three-year establishment care can be assured. Species selection should address the potential invasiveness of species, microclimate conditions at each planting site, and historic landscape character. Every tree removal should be accompanied by new tree and/or large shrub planting, to maintain a buffer between ballfields and surrounding forest and greensward areas. Easily-damaged taxa should be avoided, due to the likelihood that errant balls and players will occasionally enter plant buffers.

**MULCHING**

The root zones of surrounding trees should be covered with coarse woody mulch, when mulching will not interfere with maintenance of actively-used, vigorous lawn. The ground immediately surrounding newly installed plants should be covered with woody mulch, taking care not to pile mulch on root crowns or against plant stems.

### THREE YEAR ESTABLISHMENT CARE

Establishment care will be required for any newly-installed woody plants that replace either invasive shrubs or hazard trees.

### LAWN CARE

Best management practices should be followed for care of athletic turf. Lawns surrounding ballfields should be managed for moderate to high use, and never be cut to below three inches height. Turf maintenance should be conducted in a manner that minimizes compaction of tree root zone soil and prevents equipment-related damage to tree trunks and surface roots.

## 6.6 Active Use Greensward Management Area

Area: 6.6 acres. Boundary encompasses much of Vegetation Zones F & M plus a small part of Zone H. The Active Use Greensward consists of two similar but discontinuous areas in the northern and southern portions of the park. Forest surrounds the greenswards, and a parking lot borders the southeastern edge of the larger, southern area. The south greensward is a combination of playground and picnic area. The north greensward is a picnic and recreational area with several related structures present (shelters, wading pool, etc.). The vegetation in both areas is primarily lawn with widely-spaced plant islands throughout. These islands are composed of mature native and non-native trees and shrubs.

Many of the Greensward trees have limbs overhanging the playground, picnic tables and grills. Generally, lawn grows immediately adjacent to tree trunks, without mulch or understory vegetative buffer. Few invasive species are present in the area except sparse infestations within the tree/shrub clumps. Lawns in both areas are poorly drained and predictably, compacted due to heavy use.

#### Objectives:

- Monitor potential hazard trees and mitigate as needed.
- Improve soil drainage.
- Protect trees from damage.
- Prevent spread of invasive plant species.
- Enhance vegetation along intermittent stream.



**Management and Maintenance Annual Calendar  
Lincoln Park- Active Use Greensward Management Area**

Management and Maintenance Practices	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Weeding and Invasive Control												
Trees												
Shrubs												
Herbs												
Removing Plants	X	X	X	X					X	X	X	X
Pruning	X	X	X	X					X	X	X	X
Planting												
Trees												
Shrubs												
Herbs												
3 Yr. Establishment Care								X	X	X	X	X
Lawn Care												

■ Indicates range of time to perform action as needed  
 X Indicates specific time to perform action

**WEEDING AND INVASIVE CONTROL**

Invasive plant species should be removed to the largest extent possible. Control may take place as needed during the growing season, but at least monthly for the first year surrounding newly-installed plants. Large woody debris generated by invasive removal that is unlikely to sprout from cuttings may be left on site as a border around tree/shrub clumps. Large woody debris should never be placed directly on the root crown of plants, nor left in open lawn areas.

**REMOVING PLANTS**

Other than invasives, removals should be conducted only in the case of hazard trees. When possible removals should be done between August and March to avoid disruption of nests. If a failing tree does not present a hazard to park users or facilities, snag creation is preferable to complete removal; such opportunities within this active use area will be limited. Trees that overhang the playground or other high use areas should not be left as snags. Felled limbs can be placed in such a manner as to create informal protective borders at tree/shrub islands. Limbs from trees infected with decay fungi should either be chipped or removed. Large downed woody debris should never be placed directly on tree root crowns or left in open lawn.

**PRUNING**

Pruning decisions should balance consideration of user safety, tree protection and habitat enhancement priorities. Tree pruning should be performed by a certified arborist or qualified plant care professional. Pruning should be limited to removal of limbs that pose a hazard to human safety or infrastructure. Dead limbs can be left as an informal, protective border between tree/shrub clumps and lawns. Never place large limbs directly on tree root crowns or lawn.

**PLANTING**

Planting should be done only if at least three-year establishment care can be assured. Species selection should consider structural stability and safety, the potential invasiveness of species, microclimate conditions at each planting site and the historic landscape character of the Park. Non-native and native trees are both part of the historic character of the picnic and playground areas; this diversity should be maintained when adding to or replacing existing plants.



Understory planting is strongly recommended, in turf grove areas and to expand or replenish existing vegetation “islands. This strategy aims primarily to reduce soil compaction and resulting tree root zone damage and hazard creation, with ancillary aesthetic and habitat benefits. Target areas should be identified with best opportunity for success and greatest need in mind, as well as to respect this MA’s essentially open understory character. To insure success, such plantings will require extensive, careful soil preparation (loosening, organic amendment), species selection to include resilient, tough, low-to-mid height native taxa, and excellent establishment care and protection. Permanent rustic fencing may be required to prevent destructive trampling.

#### MULCHING

The ground immediately surrounding newly installed plants should be covered with coarse woody mulch, taking care not to pile mulch on root crowns or against plant stems. Coarse woody mulch should be spread on the root zones of existing trees, being careful not to pile mulch against stems. Root crowns should be mulched within all tree root zones; any existing turf growing near stem should be removed or killed before placing wood chip mulch.

#### THREE YEAR ESTABLISHMENT CARE

Establishment care will be necessary for any newly installed woody plants that replace invasive or hazardous trees and shrubs. Early structural pruning for trees is especially important to insure that a strong and stable framework develops through time, reducing longterm hazard potential. Likewise, maintaining coarse woody mulch to minimize root zone compaction is crucial for Active Use Greensward trees.

#### LAWN CARE

Best management practices should be used to improve drainage of lawn areas throughout the picnic and playground areas. Lawns should never be cut to below a minimum height of three inches. Beyond improving drainage, lawn areas should be managed at moderate intensity reflecting the demands of concentrated use; at peripheral areas where foot traffic is dispersed, less intensive maintenance is needed. Lawn care activities should be conducted in a manner that minimizes compaction of tree root zone soil, and averts root scalping and trunk damage.

### 6.7 Native/Ornamental Landscape Management Area

Area: 8.9 acres. Boundary incorporates major portions of Vegetation Zones C, D & L. Native/Ornamental Landscape areas encompass the entire eastern edge of Lincoln Park. Fauntleroy Way SW forms the eastern border, and several other Management Areas border it to the west. A large Parks crew headquarters building and parking lot lies within the northern portion of this MA. A service road runs through this northern portion.

Tree canopy is intermittent, and is composed of mixed native and non-native species. Understory vegetation is a combination of native, non-native and invasive shrubs and herbs. Most of the length of this area is comprised of a wide vegetation swath dominated by English ivy with some interspersed salal. Species of holly, viburnum and shrub cotoneaster line the MA’s western edge; their spread by seed to forested areas of the park is evident. These inadvertently-invasive ornamentals, planted historically in this area, constitute a significant seed source which birds can distribute to other parts of the Park. The northern portion has some ornamental beds containing species of herbaceous perennials.

#### Objectives:

- Monitor potential hazard trees and mitigate as required.
- Prevent spread of invasive species to other Park areas.



- Eliminate over time the presence of invasive ornamentals.
- Enhance and sustain mixed native-ornamental character.
- Mitigate compacted soils and eliminate further soil compaction.
- Protect trees from user-related damage.

**Management and Maintenance Annual Calendar  
Lincoln Park – Native/Ornamental Landscape Management Area**

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
<i>Management and Maintenance Practices</i>												
Weeding and Invasive Control												
Trees												
Shrubs												
Herbs												
Removing Plants	X	X	X	X					X	X	X	X
Pruning	X	X	X	X					X	X	X	X
Planting												
Trees												
Shrubs												
Herbs												
3 Yr. Establishment Care								X	X	X	X	X
Lawn Care												

■ Indicates range of time to perform action as needed

X Indicates specific time to perform action

**WEEDING AND INVASIVE CONTROL**

Invasive plant species should be removed to the largest extent possible, with the longterm goal of replacing all invasive ornamental plants with substantially-similar but noninvasive taxa (example: substitute Holly-leaf Osmanthus cultivars for invasive English holly). Areas most proximate to intact native forest should receive first attention. Weeding and removal of woody and herbaceous species should take place as needed during the growing season, but at least monthly for the first year surrounding newly-installed plants. Large woody debris generated by invasives removal of species unlikely to sprout from cuttings may be left on site in wilder portions of this MA, but not in developed ornamental beds. English holly and English laurel should not be left as snags or stumps. Large woody debris should never be placed directly on the root crown of plants, nor left on open lawn.

**REMOVING PLANTS**

Plant removals should serve one of the following purposes: to control invasives, to alleviate plant overcrowding, to eliminate hazard trees. When possible, removals should be done between August and March to avoid disruption of nests. If a failing tree does not pose a threat to property or human safety, girdling or trimming to provide snag habitat is preferable to complete removal. Limbs from trees infected with decay fungi should either be chipped or removed.

**PRUNING**

Tree pruning should be performed only by a certified arborist or qualified plant health care professional. Pruning should address at least one of the following purposes: removal of limbs that pose a hazard to human safety or infrastructure, breakage, disease or deadwood cleaning, thinning and structural pruning to improve plant health, beauty, and structural integrity. Pruning decisions should reflect consideration of ornamental value, safety, tree protection and habitat



enhancement. While largely informal, the native/ornamental landscape should be maintained with a less wild character in mind than most Park areas.

#### PLANTING

Planting should be done only if at least three-year establishment care can be assured. Species selection should consider structural stability and safety, the potential invasiveness of species, microclimate conditions at each planting site and the historic landscape character of the Park. Mixed exotic and native species are part of the historic character of the native/ornamental landscape area, and this diversity should be maintained. Careful assessment of alternate taxa to replace invasive ornamentals will be required, to insure maximum fidelity to plants originally selected for this landscape.

#### MULCHING

A minimum of six inches of coarse woody mulch should be spread on areas where vehicles are likely to pull off the service road. The ground immediately surrounding newly installed plants should be covered with coarse woody mulch, taking care not to pile mulch on root crowns or against plant stems. Coarse woody mulch should be spread on the root zones of existing trees, being careful not to pile mulch against stems. Root crowns should be mulched only after killing or removing any existing lawn within a tree's root zone.

#### THREE YEAR ESTABLISHMENT CARE

Establishment care will be necessary for any newly installed woody plants that replace invasive or declining trees and shrubs. Pruning to establish tree structure or stimulate vigor may be required, based on periodic evaluation by horticultural professionals.

#### LAWN CARE

Lawns should never be cut to below a minimum height of three inches in these areas. Lawn should be managed at moderate intensity. Lawn care should be conducted in a manner that minimizes compaction of tree root zone soil and avoids damage to trunk and root crown.



## Chapter Seven MANAGEMENT AND MAINTENANCE PRACTICES

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The practices described below are meant to provide the greater level of detail needed to carry out maintenance and project-specific work outlined in this VMP. Chapter 6 and 7 are meant to be used together to describe **what** is to be done, **when**, and **where** (Chapter 6) and specifically **how** to do it (Chapter 7). The following practices for maintaining, restoring, establishing or removing vegetation have been developed with adaptation in some portions from Seattle DPR Landscape, Horticulture and Urban Forestry Best Management Practices Manual (BMPs) (1999) and ‘City Among the Trees’ (1998). These practices have been crafted to address conditions present at Lincoln Park. Specific emphasis has been provided for control of non-native invasive species, and how to care for, establish, and maintain native vegetation in natural area restoration and enhancement projects at the Park.

### 7.1 Mulching

[Adapted from DPR Landscape, Horticulture and Urban Forestry BMPs (1999) & ‘City Among the Trees’ (1998).]

Mulching is one of the easiest and most important maintenance practices for protecting and nurturing all vegetation types. Mulching is an essential component of any natural area planting project for suppressing weeds/ invasives and thereby reducing root competition, to conserve soil moisture and keep soil cool, and to add organics to the nutrient-deficient soils. In developed landscape areas it also serves these functions, as well as adding a cared-for appearance. Mulching material in developed landscape areas may include bark products, wood chips, compost, GroCo, grass clippings, cardboard, leaves or pebbles. In natural areas, the most desirable mulch material is a combination of cardboard sheet mulch overlain by 4-6” of wood chips. Compost, GroCo, or leaf mulch can be added either on top of or underneath the cardboard layer if soil amendments are desired. Where large areas of invasives have been removed, the entire planting area should be sheet mulched and wood chipped to minimize re-invasion. In most cases, wood chips of recycled Parks Department plant material are available at no cost. Plastic, landscape fabric or inorganic mulch should be avoided in most cases, except as specified for highly invaded areas., where it may be the most effective strategy.

#### *Trees*

- Clear weeds and grass from under the tree, in a circle out to the drip line at the tips of the branches.
- Where weeds are very aggressive, use a “sheet mulch” of thick layers of newspaper or cardboard.
- Spread layer of organic mulch, 2-4” deep in developed landscape areas, 4-6” deep in natural areas, in a circle out to the tree’s drip line or in a 3’ diameter circle (whichever is greater).
- Keep mulch away from the tree trunk to prevent crown rot or insect damage.
- Maintain 3”-4” of mulch annually in developed landscape areas, 4-6” in natural areas (during 3 year establishment period or beyond as needed).

#### *Shrubs*

- Follow similar procedures as for trees, above.
- Spread layer of organic mulch 2-3” deep in developed landscape areas, 4-6” deep in natural areas and 2-3’ in diameter around shrub.



- Cover entire planting bed with mulch where applicable.
- Keep mulch away from contact with crown of plant.

### *Herbs*

- Flowerbeds and smaller plant material should be mulched with finer material.
- Spread layer of mulch 1-2" deep depending on size and spacing of plants.
- Avoid drift of mulch onto turf or pavement by recessing edge of beds.
- Do not smother plant crowns with mulch.

## **7.2 Planting**

The basic procedure of plant installation is essentially the same whether in a developed landscape or in a natural area. Site preparation, species selection, and planting layout are site-specific and depend on the goals of the project as well as the micro-site conditions. Instructions for planting trees, shrubs, and herbaceous material are given below. Because the broad goals of any natural area planting include restoration of a functional native plant community, information about species choices and plant palettes for planting in natural areas is given in Tables immediately following. Plant selection for use in developed landscapes can have a wider range of options, in particular including non-native species, and should also be informed by historic information when relevant.

### *Trees*

The two basic steps in planting are preparing the site, and setting the tree or shrub. Proper preparation will encourage root growth rather than adding to the difficulties already challenging the newly planted trees or shrubs.

- Ideal planting hole is 2-3x the diameter of the root spread or the root ball (depending on existing soil conditions)
- Minimum planting hole is 12" wider than root spread or root ball
- Hole shall be no deeper than the ball and the ball shall sit firmly on the undisturbed subsoil
- Native soil shall be used to backfill the planting hole except in situations where the existing soil is contaminated or filled with rubble or pure clay
- Trees shall not be fertilized at the time of planting
- Balled-and-burlapped trees shall be placed in the hole and plumbed vertically. All rope shall be removed from around the trunk of the tree and the top 1/3 of the burlap shall be folded back down into the hole. Whenever possible complete removal of the top third of burlap by cutting it away with a sharp knife is preferred. Do not remove any B&B packaging material until the tree is placed in the hole and securely plumbed into its final position.
- Trees in wire baskets shall have all of the basket removed, using bolt cutters
- Backfill soil in lifts of 4-6" at a time with compaction of each layer. Do not compact muddy backfill. Water thoroughly after backfilling to settle the soil, eliminate air pockets and re-wet the root system.
- If project scope allows, watering soil rather than compacting is preferred. Backfill ½ the soil in the tree pit and thoroughly drench with water to settle. Complete backfilling and then thoroughly drench with water again. This method is preferred for removing air pockets and settling soil, but can be impractical on big jobs or jobs using volunteers.
- Trees planted in sandy or loamy soils should have a 3" high berm erected just past the perimeter of the planting hole to funnel water to the root ball and wet the hole/sidewall interface.



- Berms should not be constructed in clay soils or on heavily compacted sites.
- Stake only in situations where normal planting procedures does not provide a stable plant, otherwise, staking is not generally required.
- Staking is sometimes recommended as a vandal deterrent device or to prevent mechanical injury from mowers or trimmers. Ties for stakes should be some biodegradable or flexible fastener that precludes collaring of the trunk if the ties are not removed in a timely fashion.
- Stakes shall be removed at the end of the first year.
- Plant trees at the depth they were growing in the nursery.
- Do not wrap tree trunks.
- Remove tree trunk wrapping materials, tags, and all ties at the time of planting.

***Shrubs*** (refer to general guidelines for trees, above)

- If needed, incorporate fertilizer into soil before adding plants.
- Wait until plants are established before adding chemical fertilizer.
- Plant at proper depth taking into consideration room for mulch.
- Plant shrubs with proper spacing to allow for spread at mature size.
- Plant bareroot stock at the same grade as grown in the nursery.

***Herbs***

- Plant ground cover and floral plantings to provide adequate coverage to compete with weeds.
- In landscaped beds, plant to provide effective display.
- Do not crowd.
- Remove containers prior to placement in the planting pit.
- Tease pot-bound roots with hands or tools prior to final placement in planting pit.
- Protect bare root plants from root drying prior to and immediately after planting.
- Cleanly prune exceptionally long roots to create a uniform root mass.

***Live Stakes***

Live stakes are cuttings harvested from live native plants. Stakes are cut from the parent plant, and then installed directly into the soil where they establish roots and grow to maturity. The best species to use for live stakes are willow species, black cottonwood, and red osier dogwood. Stakes should be planted in areas that will be consistently moist through out the growing season, such as along the waterline at the lakeshore and in wetland areas. Although live staking can be done throughout the year, to maximize survival the best time for taking cuttings and installing them is during the dormant season, between early November and late February.

Stakes can be harvested from an appropriate site or purchased. They should be installed as soon as possible after harvesting – ideally within 24-72 hours – and kept wet in a bucket and in the shade until installation. Stakes should be at least 2-3' in length and  $>\frac{3}{4}$ " diameter for willows and cottonwood, and  $>\frac{1}{2}$ " diameter for red osier dogwood. If harvesting your own stakes, no more than 5% of the parent plant should be removed at any one time. Stakes should be installed with a rubber mallet if the ground is soft enough, or by using a planting bar to create the hole in more compacted soils. The stake should be installed with  $\frac{1}{4}$  of stake above ground and  $\frac{3}{4}$  of stake below ground. There should be good soil contact below ground for the length of the stake. [Adapted from DPR's Landscape, Horticulture and Urban Forestry BMPs (1999) and King County Water and Land Resources Bulletin "Live Stake Cutting and Planting Tips."]

**Table 7.1. Native Plant Species and Microclimate Requirements**

Table format and information is derived from field observations and the following documents: King County DDES Sensitive Area Mitigation Guidelines Habitat Worksheet (1999); Ecology Publication #93-17 "Restoring Wetlands in Washington" by Stevens and Vanbianchi (1993); Flora of the PNW (Hitchcock & Cronquist); Plants of the PNW Coast (Pojar & MacKinnon); Wetland Plants of Western WA (Cooke); Guidelines for Bank Stabilization Projects and Surface Water Design Manual (King County); Proceedings of the Puget Sound Wetlands and Stormwater Management Research Study (9/26/96); Natural Vegetation of Oregon and Washington (Franklin and Dyness).

**Table Abbreviations****Light Needs:**

SI=Shade Intolerant

ST=Shade Tolerant

SD=Shade Dependent

HA=Highly Adaptable

**Site Placement:**

X =Drier (Xeric)Upland

M =Moister (Mesic)Upland

WE=Wetter

SS=Saturated

SW=Shallow

Water  
Soils

Scientific Name	Common Name	Max Ht.	Light Needs	Site Placement	Spacing	Comments
<b>TREES</b>						
<i>Abies grandis</i>	grand fir	125'	SI-ST	X	12-15'	Best conifer for soil binding roots
<i>Acer macrophyllum</i>	big leaf maple	100'	SI-ST	M,X	12-15'	Seral/sprouter - shallow rooter
<i>Alnus rubra</i>	red alder	80'	SI-ST	M,X	5-10'	Seral, sprouter & spreader
<i>Arbutus menziesii</i>	Pacific madrone	80'	SI	X	12-15'	Likes drier, coastal: slow-grower
<i>Cornus nuttalli</i>	Pacific dogwood	70'	ST	M	10-15'	Understory or forest edge tree
<i>Fraxinus latifolia</i>	Oregon ash	80'	SI-ST	WE,SS	12-15'	Requires flat, damp soils
<i>Picea sitchensis</i>	Sitka spruce	230'	SI	WE,SS	12-15'	Wettest conifer
<i>Pinus contorta</i>	shore pine	60'	HA	WE,M,X	10-15'	Tolerates poor soil
<i>Populus balsamifera</i>	black cottonwood	200'	HA	WE,SS,M	10-15'	Seral; sprouter
<i>Populus tremuloides</i>	quaking aspen	75'	SI	X	5-10'	Seral in montane
<i>Prunus emarginata</i>	bitter cherry	50'	SI	M	5-10'	Seral in mesic conditions
<i>Pseudotsuga menziesii</i>	Douglas fir	300'	SI	M,X	12-15'	Driest conifer-seral, fast grower
<i>Quercus garryana</i>	Garry oak	80'	SI	X	12-15'	In groves, slow-growing
<i>Taxus brevifolia</i>	Pacific yew	80'	ST-SD	M	12-15'	Very slow growing
<i>Thuja plicata</i>	western red cedar	230'	SD	SS,WE,M	12-15'	Basic to PNW & wetlands
<i>Tsuga heterophylla</i>	western hemlock	200'	SD	X, M	12-15'	Dry conifer, needs lots of organic in soil
<b>SHRUBS</b>						
<i>Acer circinatum</i>	vine maple	25'	SD	M,X	6-10'	Needs canopy shade or lots of moisture.
<i>Amelanchier alnifolia</i>	serviceberry	20'	SI	X	6-10'	Edge-loving





Scientific Name	Common Name	Max Ht.	Light Needs	Site Placement	Spacing	Comments
<b>SHRUBS, cont.</b>						
<i>Ceanothus sanguineus</i>	redtsem ceanothus	6'	SI	X	5-8'	Commonly seral after fire, deciduous, nitrogen-fixer
<i>Ceanothus velutinus</i>	snowbrush	10'	SI	X	5-8'	Commonly seral after fire, evergreen, nitrogen-fixer
<i>Cornus sericea</i>	red-osier dogwood	20'	ST	WE,SS,M	5-8'	Takes sun if it has lots of moisture
<i>Corylus cornuta</i>	hazelnut	15'	ST	X	4-6'	Good wildlife habitat
<i>Crataegus douglasii</i>	black hawthorn	20'	SI	M,X	5-8'	Typically on meadow hummocks
<i>Gaultheria shallon</i>	salal	7'	ST-SD	X	2-3'	Basic forest groundcover
<i>Holodiscus discolor</i>	ocean spray	10'	SI-ST	X	6-10'	Drought-tolerant, edge-loving
<i>Lonicera involucrata</i>	black twinberry	10'	SI-ST	WE,SS,M	6-10'	Takes sun if has lots of moisture
<i>Mahonia aquifolium</i>	tall Oregon grape	4'	SD	X	3-4'	Dry sites
<i>Mahonia nervosa</i>	short Oregon grape	2'	ST-SD	X	2-3'	Dry sites
<i>Malus fusca</i>	western crabapple	35'	SI-ST	WE,M	5-8'	Edges
<i>Oemleria cerasiformis</i>	Indian plum	15'	SD	M,X	4-6'	Sub-canopy
<i>Oplopanax horridus</i>	Devil's club	7'	ST	WE,M	4-6'	Needs good drainage, forms thickets
<i>Philadelphus lewisii</i>	mock orange	10'	SI-ST	M,X	4-6'	Needs good drainage
<i>Physocarpus capitatus</i>	Pacific ninebark	20'	SI-ST	M,X	5-8'	Needs good drainage
<i>Prunus virginiana</i>	choke cherry	20'		X	5-8'	Native to the whole US
<i>Rhamnus purshiana</i>	cascara	30'	ST-SD	M	6-10'	Found in most wetlands
<i>Ribes bracteosum</i>	stink currant	10'	ST	M	5-8'	Transition
<i>Ribes lacustre</i>	prickly currant	7'	ST	M	4-6'	Can take drought
<i>Ribes sanguineum</i>	red-flowering currant	7'	SI	M,X	4-6'	Doesn't form thickets!
<i>Rosa gymnocarpa</i>	wood rose	7'	ST	X	3-4'	Tough, hardy
<i>Rosa nutkana</i>	Nootka rose	10'	ST	SS,M	3-4'	Rapid volunteer on damp soil
<i>Rosa pisocarpa</i>	clustered rose	7'	ST	WE,SS,M	3-4'	Will hybridize with nootka rose
<i>Rubus leucodermis</i>	black raspberry	10'	ST	X	6-10'	Good buffer planting
<i>Rubus parviflorus</i>	thimbleberry	10'	SI	M,X	4-6'	Seral groundcover in clear-cuts, drought tolerant
<i>Rubus spectabilis</i>	salmonberry	15'	HA	WE,M	4-6'	Takes sun if has lots of moisture
<i>Salix geyeriana</i>	Geyer willow	15'	SI	SW,WE	6-10'	Likes inundation, sluggish water, wet meadows
<i>Salix lasiandra</i>	Pacific willow	50'	HA	WE,SS,M	6-10'	Common, tolerant, riparian
<i>Salix scouleriana</i>	Scouler willow	35'	ST	SS,M		Upland & wetland



Scientific Name	Common Name	Max Ht.	Light Needs	Site Placement	Spacing	Comments
<b>SHRUBS, cont.</b>						
<i>Salix sitchensis</i>	Sitka willow	25'	HA	WE,SS,M	6-10'	Common, tolerant
<i>Sambucus racemosa</i>	red elderberry	20'	HA	M	5-8'	tolerates sun, seral on clear-cuts
<i>Sorbus sitchensis</i>	Cascade mountain ash	15'	SI-ST	M	6-10'	Not to be mistaken for <i>S. aucuparia</i>
<i>Symphoricarpos albus</i>	snowberry	7'	SI	M,X	3-4'	Common, tolerant
<i>Vaccinium ovatum</i>	evergreen huckleberry	5'	SD	M,X	4-6'	Prefers mature shade
<i>Vaccinium parvifolium</i>	red huckleberry	13'	SD	M,X	5-8'	Requires lots of organic matter

<b>FERNS</b>						
<i>Athyrium filix-femina</i>	lady fern	6'	ST	SS,M	4-6'	Very common, tolerant
<i>Blechnum spicant</i>	deer fern	2'	SD	M	2-4'	Needs shade, moisture, evergreen
<i>Dryopteris expansa</i>	wood fern	2'	SD	WE,SS,M	2-4'	Likes muddy soil
<i>Gymnocarpium dryopteris</i>	oak fern	16"	S	M	1.5-2'	Forms carpets
<i>Polystichum munitum</i>	western sword fern	4'	ST	M,X	4-6'	PNW basic; needs shade or moisture, evergreen
<i>Pteridium aquilinum</i>	bracken fern	5'	SI	X	2-4'	Seral on disturbed areas
<b>RUSHES &amp; SEDGES</b>						
<i>Carex obnupta</i>	slough sedge	4.5'	ST	SW,WE,SS	1.5'	Extremely common
<i>Carex rostrata (utriculata)</i>	beaked sedge	3'	SI-ST	SW,WE,SS	1.5'	Common
<i>Carex stipata</i>	sawbeak sedge	3'	SI-ST	SW,WE,SS	1.5'	Lowland to mid-montane
<i>Juncus ensifolius</i>	dagger leaf rush	2'	SI	SW,WE,SS	1.5'	Lowland to mid-montane
<i>Juncus oxymersis</i>	pointed rush	3'	SI	SW,WE,SS	1.5'	Lowland
<i>Scirpus microcarpus</i>	small-fruited bulrush	4.5'	SI-ST	SW,WE,SS	1.5'	Lowland to mid-montane, very common
<b>GRASSES</b>						
<i>Alopecurus aequalis</i>	short-awn foxtail	1.5'	SI-ST	SW,WE,SS	1.5'	Often submerged
<i>Alopecurus geniculatus</i>	water foxtail	1.5'	SI-ST	SW,WE,SS	1.5'	Often submerged, tolerant
<i>Beckmannia syzigachne</i>	American sloughgrass	2'	SI	WE,SS	1.5'	Good wildlife forage, lowland to mid-montane
<i>Calamagrostis canadensis</i>	bluejoint reedgrass	3'	ST	WE,SS,M	1.5'	Rhizomatous, coastal to mid-montane
<i>Cinna latifolia</i>	wood reed	6'	ST	WE,SS,M	1.5'	Coastal to sub-alpine
<i>Deschampsia caespitosa</i>	tufted hairgrass	2'	SI	WE,SS,M	1.5'	Common, keystone species in wet meadows



Scientific Name	Common Name	Max Ht.	Light Needs	Site Placement	Spacing	Comments
<b>GRASSES, cont.</b>						
<i>Elymus glaucus</i>	blue wildrye	2'	SI	X	1.5'	Very drought-tolerant, good wildlife forage
<i>Festuca idahoensis</i>	Idaho fescue	2.5'	SI	X	1.5'	Drought-tolerant
<i>Festuca occidentalis</i>	Western fescue	2.5'	SI	X	1.5'	Open areas, forest edges
<i>Festuca rubra</i> var. <i>rubra</i>	red fescue	2.5'	SI	SS,M	1.5'	Common, tolerant
<i>Glyceria borealis</i> ( <i>occidentalis</i> )	northern mannagrass	4'	ST	WE,SS	1.5'	Tolerates up to 3' of water
<i>Glyceria elata</i>	tall mannagrass	4.5'	SD	WE,SS,M	1.5'	Prefers streamside
<i>Panicum occidentale</i>	western panic-grass		SI	WE,SS,M	1.5'	Coastal to sub-alpine



Scientific Name	Common Name	Max Ht.	Light Needs	Site Placement	Spacing	Comments
<b>HERBS, VINES &amp; GROWDCOVERS</b>						
<i>Achillea millefolium</i>	yarrow	1'	SI	X	1-1.5'	Self-seeds, robust, tolerant
<i>Anaphalis margaritacea</i>	pearly everlasting	1'	SI	X	1-1.5'	Robust, tolerant
<i>Arctostaphylos uva-ursi</i>	kinnikinnick	1'	SI	X	1-1.5'	Slow grower - likes dry stony soil
<i>Aruncus dioicus</i>	goat's beard	2'	ST	M,X	1-1.5'	Streamside, edges
<i>Caltha palustris</i>	marsh marigold	9"	ST	SW,WE	1-1.5'	Coastal
<i>Chimaphila umbellata</i> or <i>menziesii</i>	pipsissewa	10"	ST	M	1-1.5'	Needs organic soil
<i>Dicentra formosa</i>	bleeding heart	1.5'	ST-SD	M,X	1-1.5'	Very common, tolerant
<i>Epilobium angustifolium</i>	fireweed	4'	SI	X	1-1.5'	Seral on clear-cuts, common, tolerant
<i>Fragaria vesca</i>	woodland strawberry	6"	SI	X	1-1.5'	Rapid spreader, evergreen
<i>Geum macrophyllum</i>	big-leaf avens	3'	ST	WE,SS,M	1-1.5'	Common
<i>Heracleum lanatum</i>	cow parsnip	6'	ST	WE,SS,M	1-1.5'	Likes riparian, self-seeds
<i>Hieracium albiflorum</i>	hawkweed	2'	HA	M,X	1-1.5'	common
<i>Hydrophyllum tenuipes</i>	Pacific waterleaf	12"	ST-SD	M	1-1.5'	Wet forest groundcover
<i>Linnaea borealis</i>	twinline	6"	ST	M,X	1-1.5'	Usually in forests, but seral on clear-cuts
<i>Lonicera ciliosa</i>	orange honeysuckle	15'	ST	M,X	1-1.5'	Trailing/climbing vine
<i>Lupinus polyphyllus</i>	big-leaf lupine	3'	SI	X	1-1.5'	Seral, common, tolerant
<i>Lysichiton americanum</i>	skunk cabbage	10"	SD	SW,WE	1-1.5'	Common, typical PNW
<i>Maianthemum dilatatum</i>	wild lily of the valley	14"	ST	M,X	1-1.5'	Rapid spreader
<i>Mimulus guttatus</i>	yellow monkey flower	3'	SI	WE,SS,M	1-1.5'	Forms sheets near seeps
<i>Oenanthe sarmentosa</i>	water parsley	3'	ST	SW,WE,SS	1-1.5'	Common, hardy, good amphibian habitat
<i>Osmorhiza chilensis</i>	sweet cicely	6"	ST-SD	X	1-1.5'	Very common in PNW forest
<i>Oxalis oregana</i>	wood-sorrel	9"	ST	M,X	1-1.5'	Very rapid spreader, robust, highly tolerant
<i>Petasites frigidus</i>	coltsfoot	20"	ST	WE,SS,M	1-1.5'	Rhizomatous, good spreader
<i>Smilacina stellata</i>	Solomon's Star	1.5'	ST	M	1-1.5'	Forms drifts near streams
<i>Stachys cooleyae</i>	Cooley hedge nettle	4'	SI-ST	M	1-1.5'	Common
<i>Tellima grandiflora</i>	fringecup	2'	ST	M	1-1.5'	Common, tolerant
<i>Tiarella trifoliata</i>	foamflower	2'	ST	M	1-1.5'	Common, tolerant
<i>Tolmiea menziesii</i>	piggy-back plant	30"	SD	M	1-1.5'	Forms drifts near streams
<i>Trientalis latifolia</i>	western starflower	6"	ST	M	1-1.5'	Often found in clumps around trees
<i>Viola glabella</i>	stream violet	7"	SI-ST	M	1-1.5'	Common, rapid spreader



### 7.3 Pruning

Pruning is a maintenance action used primarily in developed landscape areas. Pruning in natural areas should be limited to addressing hazard trees that pose a threat to public safety, and maintaining visibility through understory where specific security concerns dictate. Pruning can produce strong, healthy, attractive plants, but only if done well. Poorly pruned plants often develop problems far worse than when left alone. The need for pruning is minimized when plants are appropriately sited at the outset; plants outgrowing their available space should be evaluated for radical renovation or removal and replacement with more appropriate species. The first step in pruning is thus to evaluate whether it is the appropriate action for the situation, and to clarify pruning objectives.

Pruning can stimulate fruit production, invigorate a plant, promote growth, repair injury, and increase value of trees and shrubs. It also can reduce hazard and enhance wildlife habitat if dead wood remains on site. As a general rule, it is best to begin pruning by removing the “three D’s”: Dead, Diseased and Damaged wood. Always use clean, sharp pruning tools including handsaws, loppers, pruners, and where appropriate, chainsaws. Use of power tool by volunteers in Seattle parks is prohibited. All tree pruning must conform to current ANSI and ISA (International Society of Arboriculture) standards.

#### *Trees*

##### *Prune for Safety*

- Remove branches that grow too low and could cause injury or property damage.
- Trim branches that interfere with site lines on streets or driveways.
- Remove branches that grow into utility lines.
- Remove or trim branches in natural areas that are a hazard to public safety.

##### *Prune for Health*

- Create a strong structure when tree is young.
- Remove dead, diseased or damaged branches to increase strength and longevity of trees.
- Thin crown to increase airflow and reduce pest problems.
- Remove crossing and rubbing branches.
- Do not apply dressing to pruning wounds, as this may invite disease problems.

##### *Prune for Aesthetics*

- Enhance the natural form and character of the tree.
- Never ‘top’ trees. It is against adopted Parks Tree Policy (2001) to do so on public lands for views from private lands.

#### *Shrubs*

##### *Prune for Health*

- Follow principles of natural target pruning.
- Make cuts as close to the bud as possible.
- Do not make flush cuts.
- Do not leave stubs.
- Reinvigorate or regenerate overgrown plant.

##### *Prune for Aesthetics*

- Enhance balanced, natural shape of shrub species.
- Remove crowded and crossing branches.
- Remove terminal bud to stimulate lower branching.



- Remove reverted shoots on grafted cultivars.
- Enhance flowering and fruiting.

#### 7.4 Removing Plants

Besides control of invasive non-native plants, removals are done for the following reasons: poor tree architecture, summer branch drop, increased exposure, root loss, unstable rooting, girdling roots, severe lean, cracks, cankers, conks, seams, decay, cavities, and root and butt diseases. Unfavorable soil conditions, chronic insect or disease problems, crowding and decline are additional reasons relating to shrubs and herbaceous plants as well. Trees in particular may present a risk because of old age, storm damage, poor structure, past construction activities or death of the tree. Derelict trees in natural areas that do not pose a hazard should be left standing to enrich wildlife habitat.

If a tree is defective AND has a target, it is considered a hazard.

- Remove derelict trees that cannot be made safe or functional by corrective pruning.
- Remove trees that constitute a high hazard if no other prescription will eliminate the risk.
- Alert the community before tree removal begins, to provide opportunity for comment.

At times, trees and shrubs may be removed for new park construction, access or other issues not related to the plant's viability. Cost and availability of funds for tree-spade work should be weighed against the cost of replacing the tree with a new, smaller caliper tree. Establishment of larger trees is often less successful than planting younger replacements.

- Determine value of specimen to be transplanted, by appraisal, when considering replacement vs. transplanting.
- Transplant trees smaller than 10-12" in diameter with a large tree-spade.
- Transplant shrubs by carefully digging rootball and placing in pots or balling and burlapping.
- Do not let roots dry out.
- Remove plant material that is too large for the allotted space.
- Remove plant material that is diseased or dead and dispose off site.

Large woody debris and brush piles are critical elements that are often lacking in habitat areas of Lincoln Park. When large trees have been removed, recycle as much of the woody debris on site as possible. Trunks and large branches that will not sprout can be placed directly on the ground within any of the habitat areas. Brush (i.e. non-sprouting limbs and branches) can be used for wildlife brush piles dispersed throughout park natural areas. Debris not used for brush piles can be chipped onsite and used as mulch.

**CAUTION:** Do NOT place trunks or large branches from non-native *Populus* species (Lombardy, white poplar, or their hybrids) directly on the ground. These species will live sprout from large woody debris kept in contact with moist soil. To use the remains of those species appropriately, prop them off the ground (on both ends) by placing the log on 6-8" thick pieces of wood from non-invasive species (red alder, big leaf maple). In that manner, the native softwood will rapidly decompose from direct contact with the soil while the potential live-sprouting log will dry out and become non-viable. Eventually poplar wood will rest on the ground while smaller pieces of wood decompose, resulting in large pieces of woody debris that pose no risk for sprouting and spreading unwanted invasive species.



## 7.5 Taking Care of Turf

Turf is the term applied to any lawn or grasses grown in the developed landscapes within the Park and is the traditional “green carpet” many visitors associate with parks. The wide variety of type of use indicates varied maintenance and management practices.

### Maintenance

#### ***Mowing***

##### *Frequency*

- Mow weekly from MARCH through OCTOBER; bi-weekly in FEBRUARY and NOVEMBER; and at least monthly in DECEMBER and JANUARY.

##### *Cutting Height*

- Mow to a height of 2 to 2.5 inches (avoid removing more than 1/3 leaf blade height at any one time). Care should be taken in areas where tree roots protrude above the ground surface, and mower height should be raised whenever possible to avoid excessive root damage.

##### *Mulch Mowing*

- Do not remove grass clippings from mowed turf areas.
- Alternate mowing patterns to avoid ruts and compaction from the wheels.
- Avoid driving on frozen turf.
- Avoid driving on wet ground where ruts will remain.

#### ***Trimming***

- Use walk- behind mowers and line trimmers where site cannot be accessed by riding mowers, and around trees to avoid trunk damage from riding mowers.

#### ***Edging***

- Edge 2 to 4 times per year, depending on the maintenance standard for the site.

### Cultural Care

#### ***Fertilization***

- Soil test routinely fertilized turf on a 4-year cycle.
- Provide turf fertilizer 5-1-4 NPK unless otherwise indicated by soil tests.
- Apply approximately 1 lb. of N per 1000 square feet.
- Fertilizers N should be approx. 50% water insoluble N preferable with some organic sources.
- Avoid applications during heavy rainfall to avoid runoff.
- Avoid applications in very hot weather.
- Irrigation systems should be operational before growing season applications.
- Mark sprinkler heads to avoid damaging them during truck applications.
- Add micronutrients and lime as soil tests indicate.

Use site-specific fertilizers, and only organic formulations near streams, wetlands, and shorelines.

#### ***Irrigation***

- Apply approximately one inch of water per week.
- Monitor auto irrigation effectiveness on a weekly basis.

#### ***Aeration***

- 2 to 3 times per year using .75 inch hollow tines.
- Best periods: March/April, late June, late August.
- Make two passes at 90 degree angles.





### ***Top Dressing***

- Use 80% coarse sand and 20% composted organic material.
- Most effective when done lightly and frequently.
- Apply ¼ inch, each application.
- Monthly applications in heavy wear areas during peak seasons.

### ***Overseeding***

- Overseed entire area at least once per year.
- Overseed in fall and slicer seed in spring.
- Overseed 5 lb. / 1000 square feet.
- Site characteristics, usage, and maintenance practices guide seed selection. Ideal sites (full sun, good drainage, reasonable fertility) are suited for perennial ryegrass blends. Lawns that are in partial shade or on poorly drained sites should be seeded with mixes of perennial rye and fescues. Avoid Kentucky Bluegrass.

## Site Standards

### ***Prominent Irrigated Lawn Areas:***

These are high visibility or high use landscapes. Examples include: community center lawns; popular picnic/sunbathing areas; lawns adjacent to busy arterials.

*Fertilization:* 5-1-4 NPK ratio at 2 to 6 lb. N per year applied in 3 to 4 applications. Only organic fertilizers should be used near riparian areas.

*Aeration:* 2 to 3 times per year with conventional 0.75" hollow tines.

*Overseeding:* Once per year at 5 lb. per 1000 sq. Monthly applications in heavy wear areas.

### ***General Irrigated Lawn Areas:***

*Fertilization:* apply 5-1-4 NPK ratio at 1 to 2 lb. N per year applied in 1 to 2 applications. Only organic fertilizers should be used near riparian areas.

*Aeration:* 1 to 2 times per year with conventional 0.75" hollow tines.

*Overseeding:* as needed, in April/May and October.

### ***Non-Irrigated Lawn Areas:***

*Fertilization:* apply 5-1-4 NPK ratio once October/November, only organic fertilizers should be used near riparian areas.

*Overseeding:* as needed, in October.

### ***Steep Slopes:***

Leave unmowed or mow only once or twice per year. Replace existing slope vegetation with "low grow" turf cultivars or woody groundcovers.

### ***Soil Based Athletic Fields:***

Maintain as general irrigated lawn unless there is exceptionally high usage.

*Fertilization:* apply 5-1-4 NPK ratio at 2 to 6 lb. N per year applied in 3 to 4 applications.

*Aeration:* 2 to 3 times per year with conventional 0.75" hollow tines.

*Overseeding:* Once per year at 5 lb. per 1000 sq. ft or about 375 lb. per soccer field.

Monthly in heavy wear areas such as goal mouths through the playing season.

### ***Bathing Beaches:***

*Fertilization:* apply 5-1-4 NPK ratio at 2 to 6 lb. N per year applied in 3 to 4 applications, only organic fertilizers should be used near riparian areas.

*Aeration:* 2 to 3 times per year with conventional 0.75" hollow tines.

*Overseeding:* Annually at 5 lb. per 1000 sq. ft. Monthly applications in heavy wear areas.



**Design and Construction Issues:**

Construct turf areas with a minimum slope of 2% to promote surface drainage and a maximum of 25% to allow riding mowers to safely access the areas.

**7.6 Three Year Establishment Care**

All new plantings require follow-up care for a period of three years that is more intensive and frequent than plants that are already established. Main components of this three year care program are: mulching, watering, and weeding. One time maintenance actions that are project dependent are things like removing tree stakes and inorganic sheet or fabric mulch. A three year calendar for these actions is shown below. Detailed instructions on how to perform these maintenance actions can be found in this section under the title of the specific practice, i.e. “Mulching” (Section 7.1). Once the three year period is over and the plantings have established, care of these planted areas should be incorporated into the regular ongoing maintenance within the management area that they are located.

**Three Year Establishment Care Calendar**

Action	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
At Time of Installation												
Mulching												
Watering												
<b>Year 1</b>												
Mulching												
Weeding					•							
Watering						•	•	•	•	•	•	
Removing Tree Stakes												
<b>Year 2</b>												
Mulching												
Weeding					•							
Watering						•	•	•	•	•	•	
Removing Tree Stakes												
<b>Year 3</b>												
Mulching												
Weeding					•							
Watering						•	•	•	•	•	•	
Removing Inorganic Mulch												



Indicates range of time to perform action as needed

- Indicates specific time to perform action

**Mulching:** See M&M Practice “Mulching”.

**Weeding:** See M&M Practice “Weeding and Invasive Control”.



**Watering:** All new plantings should be watered in at the time of planting. Regular three year watering should consist of at least 1” weekly for first two growing seasons, then taper to ½” weekly for plantings in natural areas. See M&M Practice “Watering”.

**Removing Tree Stakes:** Do not use tree stakes in natural area plantings. Tree stakes used elsewhere should be removed after 1 year.

**Removing Inorganic Mulch:** Inorganic sheet mulch used in areas of severe invasive species problems should be removed during the dormant season after 3 years and entire area should be mulched with 4-5” layer of wood chips. Depending on site conditions and concern about re-invasion by weeds, entire planting area can be sheet mulched with a double layer of cardboard underneath the wood chips. Application of these techniques is usually limited to planting in natural areas and would not typically be necessary in a more developed landscape area.

## 7.7 Watering

Watering is the key to plant survival. Seattle receives an average of 39 inches of rain each year, but only 13 of those inches fall during the growing season. This is why summer watering is so important, particularly for plant installations in the first three years of establishment. Water management is a term used to describe the efficient use of supplemental irrigation, which is needed to sustain many planted landscapes in the Puget Sound region. By controlling the application of water for irrigation, water management conserves this resource, reduces urban runoff and saves money. For most efficient watering, establishment of an irrigation infrastructure for areas that require regular watering is recommended. Water sources for temporary irrigation during 3 year establishment care of newly planted areas may include watering trucks, fire hydrants (permit required), hoses from existing bibbs and permanent irrigation lines.

Irrigate the following Park areas:

- Newly installed landscapes.
- Athletic fields.
- Bathing beaches.
- High-use or high-visibility turf planting.
- High-use or high-visibility shrub and annual plant beds.

Do NOT irrigate:

- Low-use or low-visibility park turf areas.
- Turf meadow areas.
- Natural areas - except during period of establishment.

In general:

- Water new trees and shrubs thoroughly at planting.
- Provide water to new trees and shrubs during first two summers, totaling at least 1” per week of precipitation and/or irrigation; taper watering (to ½” weekly) in the third year.
- Established trees and shrubs do not require supplemental watering except during periods of extreme drought (dependent, however, on species characteristics).
- Water valuable, specimen trees and high-use or high-visibility planting beds during periods of extreme drought even if established.
- Prepare irrigation systems for season as weather warms in spring; early irrigation may be required during early dry periods, especially following or during ongoing drought conditions.



- Field check soil moisture for drying regularly from May through late September: water content will vary significantly with soil type, temperature, drainage and year-to-year.
- Modify turf irrigation around established trees to accommodate the water requirements of the trees.
- Do not direct water spray on tree trunks.

See Seattle DPR Landscape, Horticulture and Urban Forestry Best Management Practices Manual (BMPs) (1999) for additional information on irrigation systems. See Planting (Section 7.2), and 3 Year Establishment Care (Section 7.6) for instructions on watering newly installed trees and shrubs.

### 7.8 Weeding and Invasive Plant Control

Weeding and controlling invasives are necessary as an ongoing maintenance action throughout the Park in developed landscaped areas as well as natural areas. In addition, most natural area planting projects will include initial removal and ongoing control of invasives as a major component of the project. Invasive control is also an important part of 3-year establishment care for all newly planted areas throughout the Park. The most commonly occurring and problematic non-native invasive species in the Park are listed below with a brief description of their characteristics, some information about where each species is typically found in the Park, and some recommended eradication and control methods for that particular species. Recommendations and protocols (including herbicide use) are in accordance with DPR's 1999 Landscape, Horticulture, and Urban Forestry BMPs), and focus on using an integrated pest management approach characterized by a combination of control and removal methods.

Generally, the most effective long-term control of invasive species is achieved by using a combination of control methods, reducing site disturbance, and establishing healthy native plant communities. All control efforts should be directed over time towards establishing and maintaining more sustainable plant communities. To this end, weedy species and infestations that pose the greatest threat to healthy desirable plant communities are those that should be targeted. In addition, to keep the weed control workload at the most reasonable level possible, new infestations should be targeted for control before they become widespread or well-established, and the extent of current invasion should be controlled at or below existing levels for those species that threaten to spread.

Thus, invasive control should focus on those species and specific infestations that are:

- 1) the fastest-growing,
- 2) the least established but potentially threatening,
- 3) the most disruptive to functional habitat, and
- 4) listed noxious weeds with mandated control.

Large woody debris and brush piles are critical elements in the natural areas of the Park. When large trees have been removed, recycle as much of the parts of the woody debris on site as possible. Trunks and large branches that will not live sprout can be placed directly on the ground within any of the habitat areas, except for within the existing small wetlands on site. Brush (non-sprouting limbs and branches from the tree tops) can be used for wildlife brush piles. . Other plant debris not appropriate for wildlife features should be disposed of following current DPR protocol. In accessible areas (developed landscapes accessed by roads), debris can be removed from the site. In more remote natural areas debris can be piled or stacked off the ground and left on-site to decompose.



The following text describes in detail how to remove non-native invasive plants identified as a significant presence at Lincoln Park. At the end of the text are found tables describing specifics such as removal quantities, seasonal timing, replacement ratios, and removal intervals for major targeted species. Non-native invasive species that are not specified in these tables can be removed without limitation, as appropriate.

### **Invasive Removal – Noxious Weeds**

All listed noxious weed species found in Lincoln Park will be controlled as required by County regulations and in accordance with Seattle Parks BMP's.

### **Invasive Removal – Tree Species** (canopy species >20' tall at maturity)

#### ***Non-native Poplar (Populus alba, Populus nigra, and cultivars and hybrids)***

This genus is known for its stump sprouting and suckering, so removals must include treatment of the cut stump with an herbicide to be effective. Trees should be cut, and the stumps immediately painted with an appropriate herbicide mixed with a water-soluble dye. On large stumps, paint only the outer 2-3"; on stumps 3" or less in diameter, paint the entire stump. A 25% solution of Garlon 4 is recommended in upland areas away from aquatic resources e.g. shoreline, wetlands. Within 100' of aquatic resources, a 50% solution of Rodeo in a water base (no surfactant) is recommended. Treated cut stumps should be checked for resprouts every 2 to 6 months for the first year after cutting and re-treated if necessary. Logs and limbs can be used in natural areas for habitat features. To avoid resprouting, they should be stored off the ground for 2 years or until non-viable, before placing in natural areas.

#### ***English Holly (Ilex aquifolium)***

#### ***English Laurel (Prunus laurocerasus)***

#### ***Portugal Laurel (Prunus lusitanica)***

Laurel and holly are broad-leaved evergreen trees (initially, shrubs) that are spread readily by birds due to their prolific and tasty fruit and abundance in the general landscape. These species also sucker and re-sprout vigorously. Laurel and holly prefer – but do not require - partial shade and are generally found in upland forest in the understory, or along forest edges.

Removal of these species should be a high priority. Young plants can be pulled by hand, removed with a weed wrench, or grubbed using pick or shovel. Plants too large to remove with roots intact are most effectively eliminated by a combination of mechanical means and herbicide. A 25% solution of Garlon 4 is recommended in upland areas away from aquatic resources (e.g. shoreline, wetlands). Within 100' of aquatic resources, a 50% solution of Rodeo in a water base (no surfactant) is recommended. Herbicide should be mixed with a water-soluble dye. Several cut-and-paint methods can be used:

- 1) Cut shrub to a stump at or near ground level and paint entire cut surface immediately with herbicide.
- 2) Cut shrub to a stump at or near chest level and with a portable drill, make 1/8" diameter holes 1" deep into the stump from the outer sides all the way around the circumference of the stump every 2". Then inject herbicide with syringe



directly into each hole. If standing dead brush is desired, this method can be used without cutting the plant to a stump.

- 3) Girdle the standing plant by making a series of downward overlapping cuts all the way around the trunk (also called frilling), leaving the chips attached to the trunk at the base of the cut. Then paint herbicide onto fresh cuts. This technique should be used before fruit production so that standing dead plant does not have fruit on it.

Treated cut stumps should be checked for resprouts every 2 to 6 months for the first year after cutting and re-treated if necessary. If no herbicide is used, repeated cutting will be required to weaken and eventually kill the plant over time. This is a more labor-intensive method and will require diligent follow-up visits over a period of at least several years to remove suckering growth resulting from initial cutting.

### **Invasive Removal – Shrub Species** (< 20' tall at maturity)

#### ***Cotoneaster lacteus* (formerly *C. Parnyi*)**

Cotoneaster is a large shrub that spreads by prolific fruit production that is excellent bird forage. It is found throughout the landscaped edge along Fauntleroy Way, and is spreading throughout the forested natural areas of Lincoln Park.

The most effective technique is to removal the entire plant with the roots intact. If it is too large, the next option will be to cut individual shrubs and apply herbicide directly to the cut surface to prevent resprouting. A 25% solution of Garlon 4 is recommended in upland areas away from aquatic resources e.g. shoreline, wetlands. Within 100' of aquatic resources, a 50% solution of Rodeo in a water base (no surfactant) is recommended. Herbicide should be mixed with a water-soluble dye. Several cut and paint methods can be used:

- 1) Cut shrub to a stump at or near ground level and paint entire cut surface immediately with herbicide.
- 2) Cut shrub to a stump at or near chest level and with a portable drill, make 1/8" diameter holes 1" deep into the stump from the outer sides all the way around the circumference of the stump every 2" or one hole for every 1" dbh. Holes should be drilled at a slight downward angle. Then inject herbicide with syringe directly into each hole. If standing dead brush is desired, this method can be used without cutting the plant to a stump.
- 3) Girdle the standing plant by making a series of downward overlapping cuts all the way around the trunk (also called frilling), leaving the chips attached to the trunk at the base of the cut. Then paint herbicide onto fresh cuts. This technique should be used before fruit production so that standing dead plant does not have fruit on it.

Treated cut stumps should be checked for resprouts every 2 to 6 months for the first year after cutting and re-treated if necessary. If no herbicide is used, repeated cutting will be required to weaken and eventually kill the plant over time. This is a more labor-intensive method and will require diligent follow-up visits over a period of at least several years to remove suckering growth resulting from initial cutting.

Ongoing control of shoots newly emerging from past fruit dispersal should occur with implementation of prescribed mowing regimen in meadow areas.





***Himalayan Blackberry (Rubus procerus)***

***Evergreen blackberry (Rubus laciniatus)***

Both non-native blackberry species are found in Lincoln Park, although Himalayan blackberry is far most prevalent. Eradication and control methods for these two species are the same. Blackberry is found in upland areas throughout the Park, as an understory species along forest edges, and in dense monotypic stands in open areas. Blackberry is shade-intolerant, so long-term control is linked to successful establishment of healthy native plant communities that will create undesirable conditions for this species.

Removal methods include hand grubbing with root removal, repeated cutting or mowing, cutting and dabbing stubs with herbicide (cut and dab), or combinations of two or more of these techniques. Hand-grubbing is generally only a reasonable method for small areas, or for maintenance around trees or shrubs. If herbicide is used, a glyphosate herbicide is recommended – Roundup for upland areas and Rodeo for areas within 100' of an aquatic resource. The method(s) chosen depends mainly on how bad the infestation is, and the available labor resources.

Removal, other than in areas with sparse occurrences and a relatively intact healthy existing plant community, should not be done unless subsequent replacement planting is planned. For sparse occurrences, hand-grubbing is recommended. Removal of thickets will result in displacement of wildlife that may use these areas for cover and forage. Therefore, whenever possible removal work should accommodate wildlife by occurring after July 31<sup>st</sup>. Depending on the removal method chosen, this may not always be possible, and maximum removal effectiveness may take precedence over wildlife impacts.

In general if herbicide is used, timing of its application should coincide with the time of year that the target plant is most actively growing and translocating resources to its roots to maximize herbicide effectiveness. For Himalayan blackberry, this is generally considered to be mid-summer during flowering. For removal of denser stands or thickets the following methods are recommended:

- 1) Mow or cut to the ground numerous times during the growing season (May-Oct) to reduce plant vigor. If combining with an herbicide treatment, do a late summer (July) cut and dab (herbicide) treatment on resprouts. Herbicide should be applied to fresh cuts immediately (within 30 min.) for most effective treatment. In fall, after final mowing, plant and apply double layer of cardboard sheet mulch covered with 4-6" of mulch. Note: This method, while effective, does not accommodate wildlife as much as other methods, and for this reason may not be preferred.

OR

- 2) Mow or cut to the ground late in the growing season (after July 31<sup>st</sup>), and immediately cover entire area with heavy weed fabric firmly stapled to the ground. In fall, cut slits in the fabric to install plants. After 2-3 years, remove fabric, hand pull any resprouts, and apply double layer of cardboard sheet mulch covered with 4-6" of wood chips.

OR





- 3) Mow or cut to the ground late in the growing season (after July 1<sup>st</sup>) and either dab cut ends at that time, or cut and dab resprouts late in the summer when they appear.

Removal of large stands should be done incrementally, as thickets provide forage, refuge and cover for wildlife. Native wildlife should have nearby comparable habitat to take the place of what is removed. In edge habitat where invasion is low and coverage sparse, replant gaps created by removals with native species to prevent re-colonization, based on site-specific evaluation.

***Scot's broom (Cytisus scoparius)***

***Gorse (Ulex europaeus)***

Scot's broom and Gorse - which it resembles - are found in open dry areas in Lincoln Park, established and colonizing in open areas and along forest edges and bluff. Where well-established, like blackberry these species form monotypic stands or thickets. Gorse is a listed noxious weed and its active control therefore required. Ongoing efforts to eradicate should continue wherever this species remains or reappears.

Scot's broom is shade-intolerant, so long-term control is linked to successful establishment of healthy native plant communities that will create undesirable conditions for this plant species. Scot's broom provides some cover and refuge for wildlife, but its habitat function is not high. It produces large quantities of self-dispersed, long-lived seed. Removal of plants of seed-producing age is the most labor intensive, but crucial to reduce spread and seed accumulation. Removal of younger plants is easier because they can be hand-pulled or mowed, and also important to keep seed-producing population from expanding and becoming more widespread.

Thicket removal can be done incrementally as resources are available, and should not be done unless subsequent replacement planting is planned. Plants can be removed by mowing, hand-cutting individual plants, or manual removal and grubbing with shovels, weed wrenches or machinery, which may be the least desirable due to soil disturbance and increased broom seed germination and seedling emergence it causes. It may be desirable to strip the duff layer of seeds from the ground as part of the removal strategy. If this is the case, the plant removal method with the least disturbance to the soil should be used. Cutting should be done early in the summer when flowering has just started. Cutting should be followed by annual (or more frequent) cutting, or by herbicide treatment (Roundup with water soluble dye) of cut stems/stumps.

Broom thickets could be used as early establishment areas for later successional trees and shrubs. The basic concept is to underplant the thicket with desirable natives that will then form the foundation of the native community that will replace the broom. Once the installed plantings have established, broom can be removed by hand-cutting and removal of the roots or a cut and dab herbicide treatment.

Hand-pulling of smaller infestations of young plants (3' tall and smaller) should be done when soil is moist and loose (fall-spring). In edge habitat where invasion is low and coverage is sparse it may be advisable to replant with native species to prevent re-colonization. This determination should be made on a site specific basis.



### ***English Ivy (Hedera helix)***

English ivy is a broadleaved evergreen found in the forest ground layer and climbing up tree trunks in much of the park. Ivy is shade-tolerant, and forms dense mats on the ground. Hand-pulling appears to be the most effective removal method for this plant. Any efforts to control ivy should initially target vines climbing into trees. Vines should be cut at shoulder height and again at the base of the tree all the way around its circumference. For safety reasons, cut vines should not be pulled out of trees. A radius of at least 5' all around the base of the tree also should be cleared of ivy.

Patches of ivy on the ground are best removed by hand-pulling and rolling into a mat. Removal of dense mats in the ground layer should only be undertaken if coupled with deep mulching and/or replanting. New planting areas should have an additional 10'-wide strip cleared around the edges. Removal of sparse occurrences of ivy can be done without replacement planting, where existing native species exist and can rebound and refill the area. Control in areas of low infestation should receive high priority, to prevent further ivy spread.

### **Removal Schedule Laurel and Holly**

<b>Removal Size</b>	All sizes
<b>Removal Strategy</b>	Remove individuals and return once yearly to check for and remove re-sprouts in conjunction with 3 year establishment care.
<b>Removal Quantity</b>	Limited only by resources for replanting and 3 yr. establishment care
<b>Landscape Setting</b>	Any Zone, any M.A.
<b>Timing</b>	Depends on strategy chosen but July 1 - April 1 is preferred
<b>Maximum Annual Removal Quantity</b>	Limited only by resources for replanting and 3 yr. establishment care
<b>Removal Interval</b>	3 years
<b>Replanting Strategy</b>	Replacement planting is necessary only where removed plants are in the mature shrub stage or at sapling ht. of >4'. Replace lost aerial coverage with equal area of tree and shrub plant community at removal location, <b>OR</b> around edges of nearest adjacent forest patches. 3-yr. establishment care is required.
<b>Replanting Densities</b>	Trees: 500/acre = 0.012/sq. ft. (min. 25-50% evergreen) and Shrubs: 1200-2500/acre = 0.028-0.058/sq. ft. (shrub density depends on optimal spacing for species used)
<b>Species Composition of Replanting</b>	Xeric or Mesic plant community depending on microclimate conditions and existing vegetation at replanting location

### **Removal Schedule for Blackberry Thickets (Himalayan, Evergreen)**

<b>Size of thicket</b>	<50 sq. ft.	<50 sq. ft.	>50 sq. ft. to 1/10 acre	>1/10 acre
<b>Landscape Setting</b>	<i>Not</i> contiguous with shrub or forest habitat, <b>and not</b> in Shoreline MA	Contiguous with shrub or forest habitat, <b>or</b> in Shoreline MA	Any Zone, any M.A.	Any Zone, any M.A.



<b>Removal Strategy</b>	Remove entire thicket and return for follow-up removal of re-sprouts at least twice during the next 2 growing seasons.	Remove entire thicket and return for follow-up removal of re-sprouts at least twice during the next 2-3 growing seasons in conjunction with 3 year establishment care of new plantings.	Remove entire thicket and return for follow-up removal of re-sprouts at least twice during the next 2-3 growing seasons in conjunction with 3 year establishment care of new plantings.	Remove 1/3 total thicket area up to 1/10 acre and return for follow-up removal of re-sprouts at least twice during the next 2-3 growing seasons in conjunction with 3 year establishment care of new plantings.
<b>Timing</b>	Depends on strategy used: July 1 - April 1 is preferred	Depends on strategy chosen but July 1 - April 1 is preferred	Depends on strategy chosen but July 1 - April 1 is preferred	Depends on strategy chosen but July 1 - April 1 is preferred
<b>Max. Annual Removal Area</b>	unlimited	Limited only by resources for replanting and 3 year establishment care	Limited only by resources for replanting & 3 year establishment care	Not to exceed 1/3 total acreage of blackberry thickets of this size class in Park
<b>Thicket Size</b>	<50 sq. ft.	<50 sq. ft.	>50 s.f. - 1/10 acre	>1/10 acre
<b>Removal Interval</b>	none	none	none	Every 3 years at the successful completion of 3 yr. establishment care period for previously removed area
<b>Replanting Strategy</b>	No replanting required	Replant removal area with trees and shrubs if contiguous to forest, shrubs if contiguous to shrub habitat. 3-yr. establishment care is required.	Replant removal area with trees and shrubs if contiguous to forest, shrubs if contiguous to shrub habitat. 3-yr. establishment care is required.	Replant removal area with trees and shrubs if contiguous to forest, shrubs if contiguous to shrub habitat. 3-yr. establishment care is required.
<b>Replanting Densities</b>	NA	Trees: 500/acre = 0.012/sq. ft. (min. 25-50% evergreen) Shrubs: 1200-2500/acre = 0.028-0.058/sq. ft. (shrub density depends on optimal spacing for species used)	Trees: 500/acre = 0.012/sq. ft. (min. 25-50% evergreen) Shrubs: 1200-2500/acre = 0.028-0.058/sq. ft. (shrub density depends on optimal spacing for species used)	Trees: 500/acre = 0.012/sq. ft. (min. 25-50% evergreen) Shrubs: 1200-2500/acre = 0.028-0.058/sq. ft. (shrub density depends on optimal spacing for species used)
<b>Species Composition of Replacement Planting</b>	NA	Xeric or Mesic plant community depending on microclimate conditions and existing vegetation at replanting location	Xeric or Mesic plants depending on microclimate conditions and existing vegetation at replanting location	Xeric or Mesic plant community depending on microclimate conditions and existing vegetation at replanting location

**Removal Schedule for Scot's Broom Thickets**

<b>Size of thicket</b>	<50 sq. ft.	>50 sq. ft.
<b>Landscape Setting</b>	Any Zone, any M.A.	Any Zone, any M.A.
<b>Removal Strategy</b>	Remove entire thicket and return for follow-up removal of re-sprouts at least twice during the next 2 growing seasons.	Remove entire thicket and return for follow-up removal of re-sprouts at least twice during the next 2-3 growing seasons in conjunction with 3 year establishment care of new plantings.
<b>Timing</b>	Depends on strategy chosen but July 1 - April 1 is preferred	Depends on strategy chosen but July 1 - April 1 is preferred
<b>Max. Annual Removal Area</b>	unlimited	Limited only by resources for replanting and 3 yr. establishment care
<b>Removal Interval</b>	none	none
<b>Replanting Strategy</b>	No replanting required	Replant removal area with trees and shrubs. 3-yr. establishment care is required.
<b>Replanting Densities</b>	NA	Trees: 500/acre = 0.012/sq. ft. (min. 25-50% evergreen) and Shrubs: 1200-2500/acre = 0.028-0.058/sq. ft. (density depends on optimal spacing for species used)
<b>Species Composition of Replacement Planting</b>	NA	Xeric plant community

**Removal Schedule for English Ivy**

<b>Size of Patch</b>	Any size
<b>Landscape Setting</b>	Any Zone, any M.A.
<b>Removal Strategy</b>	Remove any size patch and return twice yearly during the next 2-3 growing seasons to check for and remove re-sprouts in conjunction with 3 year establishment care.
<b>Timing</b>	Depends on strategy chosen
<b>Max. Annual Removal Area</b>	Limited only by resources for replanting and 3 year establishment care
<b>Removal Interval</b>	none
<b>Replanting Strategy</b>	Replant cleared area with shrubs or trees and shrubs for any ivy removed from the ground. 3 year establishment care is required. Ivy can be cut from trees per described removal protocol without any replacement planting.
<b>Replanting Densities</b>	Trees: 500/acre = 0.012/sq. ft. Shrubs: 1200-2500/acre = 0.028-0.058/sq. ft.
<b>Species Composition of Replacement Planting</b>	Xeric or Mesic shade-tolerant community depending on microclimate conditions

## Chapter Eight IMPLEMENTATION

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### 8.1 Overall Approach to Implementation

Implementation of this plan must be done strategically and incrementally to maximize potential benefits from efforts expended. This chapter is meant to provide guidance on setting priorities among the numerous maintenance actions and individual projects described in previous sections of this document. Most Management Areas will require a combination of **maintenance actions** and **specific projects** – the former ongoing, the latter concentrated effort and resources directed toward a particular landscape element or area. Over time, the bulk of the Lincoln Park landscape will shift progressively toward ongoing maintenance and away from a restoration project basis. Deferred maintenance, evident in both Lincoln and many other parks, escalates the ultimate need for intensive remedial actions. While the projected cost of implementation is considerable, the fiscal and environmental cost of delay is much higher still.

It is the hope of the Urban Forestry Program that implementation of recommendations included in the Vegetation Management Plan will occur continuously over time, using this document as a guide. Assuming that much of the work can and must be accomplished by volunteer labor under the direction of the District staff responsible for Lincoln Park, additional resources also may be tapped to help fulfill plan goals. Capital project funds are unlikely to match the entire anticipated implementation need, and will require substantial supplementation.

Key to VMP implementation will be identifying and incorporating expertise already available among existing grounds personnel, and increasingly integrating plan recommendations into ongoing maintenance practices and special crew projects. This strategy is best summed up as working ever “smarter”, with VMP guidance helping simplify the ordering of grounds management priorities and protocols.

Ongoing maintenance consists of the regular maintenance activities that are necessary simply to keep the Park in its current condition. The work encompassed by these activities is performed by Seattle Parks staff: mowing grass, taking care of landscape beds, removing hazard trees after windstorms, pruning, mulching beds, etc. There exist ample opportunities for volunteer involvement and stewardship within the framework of ongoing maintenance activities, such as invasive plant removal guided by Park staff.

As implementation of specific projects proceeds, expanding the volunteer base to help with stewardship of newly-planted areas will be critical to the success of these projects. Ensuring adequate stewardship prior to project implementation is strongly recommended.

Possible sources of implementation help include:

- Forming partnerships with local schools to encourage “service learning” activities.
- Building ties with specific user groups, such as cross-country runners and bird-watchers, to become advocates and undertake service projects relating to their interests.
- Utilizing Pro Parks Natural Area Crew for both maintenance and special projects.
- Establishing a vital, active “Friends of Lincoln Park” community group.
- Grant-writing efforts for special implementation projects.
- Integrating VMP implementation with other Park maintenance and capital projects, such as upcoming Colman Pool landscape renovation.

**8.2 Implementation Priorities**

The following actions should receive HIGH priority:

- Establish ongoing program of tree hazard monitoring and mitigation.
- Eradicate identified noxious weeds from park (i.e. Gorse & Hogweed).
- Maintain existing restoration sites (water new plantings, control weeds).
- Replace invasive ornamental plants (ivy, holly, cotoneaster, horse chestnut) in landscape beds with non-invasive species.
- Focus restoration resources on least compromised, highest value vegetation (forest interior, greensward groves).
- Restore habitat with highest potential value, regardless of existing condition (bluff bottom, forest edge).

The following actions should receive INTERMEDIATE priority:

- Remove Laurel at top of bluff and replace with Salal at established view corridors.
- Begin a Madrona replacement project.
- Create mulch beds to protect trees in areas of heavy use.
- Remove English Ivy from east park edge in Lawn/Ballfields Management Area.

The following should be assigned LOW priority, due to higher implementation and maintenance costs, as well as protracted labor required. Given likely poor cost:benefit ratios, these projects are least likely to attract either internal or outside funding:

- Restore severely infested or compromised areas that lack high potential value as landscape or habitat, even if returned to an intact condition.

**8.3 Estimated Implementation Cost**

The cost of landscape and forest restoration is high and can run in the neighborhood of \$50,000 an acre for severely impacted areas. Unit costs vary substantially with extent of degradation and hazard mitigation to be remedied, physical site characteristics (degree of slope, slide history, accessibility, etc.), and availability/suitability for volunteer participation in specific restoration work. The table below lays out the estimated VMP implementation budget for the Lincoln Park VMP by Management Area, reflecting particulars of vegetation type and physical condition.

<b>Management Area</b>	<b>Acreage</b>	<b>Cost per Acre</b>	<b>Total Cost / M.A.</b>
Shoreline	16.2	\$3,704	\$60,000
Bluff	18.7	\$4,278	\$80,000
Forest	49.8	\$12,048 – 15,060	\$600,000 – 750,000
Passive Use Greensward	7.5	\$6,667 – 10,000	\$50,000 – 75,000
Lawn / Ballfields	6.8	\$1,176 – 1,765	\$8,000 – 12,000
Active Use Greensward	6.6	\$9,091 – 12,879	\$60,000 – 85,000
Native Ornamental Landscape	8.9	\$8,427 – 10,112	\$75,000 – 90,000
<b>TOTAL</b>	<b>114.5 acres</b>		<b>\$933,000 – 1,152,000</b>

It must be noted that at this time no Seattle Parks and Recreation funding is budgeted for implementation of the Vegetation Management Plan, although funded pilot projects served as a precursor to plan creation. This document provides the foundation for securing appropriate implementation resources over time. Estimates that follow reflect the management



recommendations of this plan, not necessarily full area restoration if that has been deemed unrealistic to pursue. Cost ranges represent likely investment required, above and beyond existing operations and maintenance funding.

#### **8.4 Implementation Strategies and Funding Sources**

Identified by Management Area below are implementation strategies and funding mechanisms appropriate to or available for each. Best fit depends on individual restoration needs, as well as potential suitability of particular approaches to address such needs. In some locations, for example, large groups of volunteers may work effectively, whereas for certain tasks and locations, only professionals, staff or contractors will be a good match. Sources and strategies given reflect these distinctions.

##### Shoreline Management Area

###### Sources:

2003 Lincoln Park South Beach Landscape Restoration Project – \$35,000

###### Strategies:

Build on upcoming capital project by soliciting additional grant funding.

##### Bluff Management Area

NOTE: This budget covers only limited management/restoration of targeted bluff areas.

###### Sources:

No current funding identified. ProParks Natural Area & Tree Crews could assist District

###### Strategies:

Much of required work can be accomplished using Parks Staff for special projects (gorse removal, periodic laurel & holly coppicing at viewpoints, tree hazard monitoring).

Volunteers can supplement staff for directed weeding, invasives removal, mulching & planting projects, where slope and access do not present undue hazard (along trail corridors, in flatter areas near top or bottom of bluff). Contract arborist or Parks Tree Crew must perform any hazard mitigation pruning/removal work.

##### Forest Management Area

###### Sources:

No funding is currently available for forest restoration beyond pilot projects already undertaken in 2001. Department of Neighborhoods Tree Fund potentially can provide replacement trees and shrubs for community planting projects in this MA. King County DNR grants are another good source for habitat-enhancement funding.

###### Strategies:

Volunteers can accomplish much of invasive plant control, mulching, planting, brush pile construction and trail blocking needed, via individual area “adoption,” regular small group initiatives, or large event work parties. Knowledgeable staff will need to identify priority areas, tasks and techniques for volunteers to insure optimal benefit to vegetation resource, consulting this document for guidance. Establishment watering will need to be provided by staff or contractor.

Tree hazard monitoring and any related abatement pruning/removal work will require professional arborist involvement, either staff or contractor. Special, non-native tree groves require additional attention relating to pruning or replacement needs, beyond that typical for native forest.



### Passive Use Greensward Management Area

#### Sources:

No funding beyond existing Operations and Maintenance budget exists at this time; however, ProParks Tree and Natural Area crews can supplement District resources. Department of Neighborhoods Tree Fund could provide replacement trees for community planting projects in this MA.

#### Strategies:

Volunteers can help control minor invasive plant infestations and place and replenish wood chips under trees, activities with highly-visible results well-suited to large groups because they are labor-intensive but require no specialty skills. Parks staff will need to correct turf drainage problems, either as a Crew project or if corrective underdrainage is required, as an identified landscape restoration project.

Tree management should continue to be addressed as it currently is, by Parks District Gardener with Tree Crew support, including periodic hazard monitoring, structural and hazard pruning and removals. If because of work load staff is unable to monitor and abate tree hazard at least annually, outside contractors should be hired to perform this work. Likewise, contract arborists may need to supplement Parks crews to maintain specimen trees in optimum condition.

Both Passive and Active Use Greenswards merit further attention by a Consulting Arborist/Landscape Architect team regarding the selection, location and cycles of tree replacement. A palette and longterm plan should be developed to supplement this VMP.

### Lawn / Ballfields Management Area

#### Sources:

Existing Maintenance and Operations funding should cover most implementation needs. Hazard tree monitoring and abatement, and replacement tree planting and mulching may somewhat expand existing maintenance requirements, but existing Parks Staff activity should accomplish most VMP objectives for this MA. Department of Neighborhoods Tree Fund could provide replacement trees for community planting projects.

#### Strategies:

Volunteers can play a limited role, doing mulching for perimeter plantings and bases of existing trees: target recruitment among scheduled ballfield users. The bulk of vegetation care (trees and turf) needs to be supplied by skilled Parks staff or contractors.

### Active Use Greensward Management Area

#### Sources:

No funding exists at this time for specific support of VMP implementation in this MA. The current hazard tree abatement program could cover removal and replacement of specific highly-dangerous trees, although recent inventory and abatement have been completed and few additional candidates are likely to be identified during the life of this program. ProParks Tree Crew could assist with some of the area's special tree care needs. Understory enhancements would make an appropriate Department of Neighborhoods or private grant project, particularly if success is monitored through time and findings disseminated. This MA merits high priority for capital project funding.

#### Strategies

Volunteers can help Parks staff place and replenish wood chips under trees, and potentially spearhead understory enhancement planning and implementation.

Recruitment may be fruitful among groups reserving shelters and those routinely using area recreational facilities (playground, picnic sites, wading pool).

Parks staff will need to correct turf drainage problems, either as a Crew project or if corrective underdrainage is required, as an identified landscape restoration project.

Tree management should continue to be addressed by Parks District Gardener with Tree Crew support, including periodic hazard monitoring, structural and hazard pruning and removals. If staff work load precludes hazard and disease monitoring and abatement on at least an annual basis, outside contractors should be hired to help perform this work. Although responsible hazard management in high use areas is the paramount concern, contract arborists may need to help Parks crews to maintain specimen trees in optimum condition, as well.

#### Native / Ornamental Landscape Management Area

##### Sources:

No current source exists to fund implementation in this MA. Parks staff and volunteers can accomplish significant work without additional funding. Replacement plants may be available for community-based projects through Department of Neighborhoods Tree Fund or other grant source. Community college horticulture students potentially could provide invasive ornamentals identification and alternative taxa list as a class project.

##### Strategies:

ProParks and District staff together can provide much of needed implementation over time, supplemented by short-term and longterm volunteer projects. Special crew or funded landscape restoration projects could be directed toward VMP implementation. “Search and destroy” missions to eliminate invasive ornamentals may appeal to skilled, independent volunteers, while mulching and mass ivy removal would best suit one-time, large group work parties. A horticultural consultant or professional intern should be engaged to confirm all invasive ornamental taxa found in MA and develop a list of plants appropriate to replace each, assigning implementation priorities among beds or species. Tree disease and hazard monitoring should be performed regularly by skilled staff, or a consulting arborist if staff time precludes. Parks Tree Crew can mitigate identified hazards.

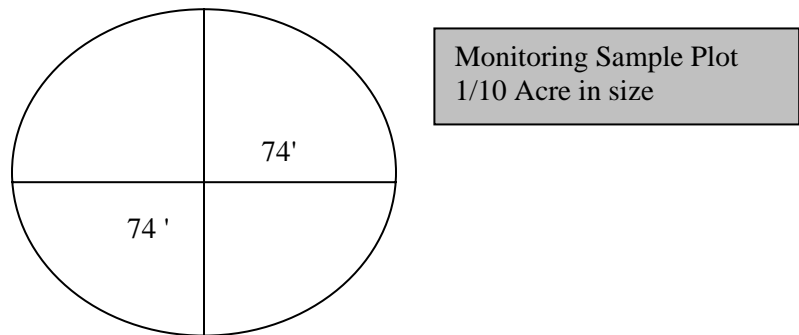
Chapter Nine  
MONITORING PLAN

9.1 How and Why to Monitor

An important part of both restoration and maintenance of Lincoln Park vegetation is active monitoring of vegetation condition and composition over time. Systematic monitoring and record keeping adds to organizational memory for citizen groups and Seattle Parks staff. Accurate records can highlight relative effectiveness of different management practices. Records also can be used to refine management practices, to determine who is best suited to perform particular tasks, and to learn how to make best use of limited citizen and Seattle Parks staff resources. Monitoring of work performed consistent with this plan thus completes a feedback loop, and assesses whether or not the management is meeting stated Goals and Objectives for the VMP.

Monitoring itself is an interesting and valuable activity that can be performed by citizen groups or individuals using standardized forms and methods to insure a consistent approach. For longterm monitoring to succeed, each monitor must collect information about an area identically. Monitoring of management areas may be done either in conjunction with active maintenance, or as a separate task. When choosing to monitor particular areas, volunteers or staff should refer to the management area map (Appendix F, Map F4.) to confirm appropriate MA names.

Monitoring is best conducted by walking to a randomly selected location in a given management area or specific project site. Individuals undertaking monitoring should establish a 1/10 acre circular plot for each identified location, most easily laid out as a 74 foot diameter circle. It is not necessary to be entirely precise in plot measurement. A 100 foot tape should be used to determine two diameters of 74 feet in length, from which the remainder of a circle can be estimated. Alternatively, a 37 foot radius can be struck from plot centerpoint to perimeter at several intervals, marking with flagging tape or stakes. For narrow areas like shoreline or ornamental borders, a similar-sized plot can be laid out with proportions practical for the location.



9.2 What, When and Where to Monitor

Monitors should resist the temptation to simply step off a Park trail and begin monitoring, or to choose areas of particular personal interest. For monitoring information to be useful, it is important to sample randomly throughout a management area, not just at the edges or in a preferred spot. In the case of designated restoration projects, monitoring plots must lie entirely within the project area.

Restoration monitoring will follow particular protocols established individually for projects.

Maintenance monitoring ideally should be completed in each Management Area, every year. The number of plots sampled does not need to be large, but should be dispersed over the entire geographical area. If this standard proves unrealistic to meet within resources available, greatest attention should be paid to high value and/or high hazard Park areas where resources and users are most vulnerable to changing conditions. This emphasis corresponds to recommended VMP implementation priorities. While not an entirely scientific approach, targeted monitoring can provide early warning about significant trends or situations needing prompt attention.

### 9.3 Restoration Project Monitoring

Planned implementation projects will require individual, customized monitoring plans to be developed concurrently with the project itself. Many of the same parameters as for maintenance monitoring likely will be included, but need to be tailored to fit the specific goals, site, and nature of restoration work proposed. **Project Monitoring** plans should include:

- Clearly-stated Goal(s) for project: a general statement of what result you are trying to achieve.  
Example: Develop 1 acre of healthy mixed forest and shrub plant community.
- Clearly stated Objectives: more specific description of accomplishments to fulfill goals.  
Example: Create forest canopy with at least three species, and shrub layer with at least six species.
- Performance Standards: measurable, quantifiable indicators of performance relative to baseline, pre-project conditions.  
Example: Ground coverage by invasive species – maximum thresholds per species.
- Monitoring Methods: when, how often, how, and what data to collect; report format, who gets report, and when.  
Specific requirements: Monitoring should be done once a year during growing season (June-July optimal) for 3-5 years, twice a year for likely problematic, high care sites. Reports should include: brief summary of project goals, objectives and performance standards, summary of monitoring results and status assessment relative to performance standards, and description of any recommended actions.
- Contingency Plan: contingency actions described to remedy predicted potential problems.  
Example: Problem = Reinvasion by weeds beyond acceptable threshold.  
Action needed = Increase weeding frequency from once to 3x/month until control is achieved.

### 9.4 Maintenance Monitoring

A set of checklists follows, tailored to monitor vegetation composition and condition in each of Lincoln Park's seven Management Areas. Individual checklists provide specific direction concerning what needs to be measured, observed and recorded to build a meaningful data set, then guide followup actions. **Maintenance Monitoring** checklist forms are designed to be copied and used for standardized monitoring of park vegetation maintenance and management by trained volunteers, Seattle Parks staff, or possibly, consultants. Their order matches the Management Area sequence used in Chapter 6 – Vegetation Management Recommendations.



**Lincoln Park  
Maintenance Monitoring Checklist**

DATE: \_\_\_\_\_ Observer's Name \_\_\_\_\_

Management Area: **Bluff**

**Boundaries of Management Area Monitored on this Date** (describe or draw the limits):

Is there a plant installation in this Management Area?  yes When? \_\_\_\_\_  no  
If yes, has the project-specific monitoring plan for the installation been implemented?  
 yes  no

**OBSERVATIONS:**

Are there hazard trees that pose a risk to public health or safety? Describe in detail their location and condition.

Are any of the following present?

- Holly >4' tall  yes  no
- Laurel >4' tall  yes  no
- Gorse >1' tall?  yes  no
- English ivy up tree trunks or in tree crowns?  yes  no
- Sparse English ivy on the ground?  yes  no
- Hogweed present?  yes  no
- Evidence of a recent land slide?  yes  no
- Other? (specify)

**ACTIONS:**

Control and removal of non-native species at or below threshold sizes indicated above can be done without replacement planting. Removal of larger sizes or greater coverages may require replacement planting (project) per direction in Management and Maintenance section.

**Pruning:**

**Removing Plants:**

**SCHEDULE:**

Work to be done by:  Park Staff  volunteers  others

**Targeted Completion Date:**

\_\_\_\_\_

\_\_\_\_\_ Responsible DPR Staff

\_\_\_\_\_ Date Work Completed

**Lincoln Park  
Maintenance Monitoring Checklist**

DATE: \_\_\_\_\_ Observer's Name \_\_\_\_\_

Management Area: **Forest**

**Boundaries of Management Area Monitored on this Date** (describe or draw the limits):

Is there a plant installation in this Management Area?  yes When? \_\_\_\_\_  no  
If yes, has the project-specific monitoring plan for the installation been implemented?  
 yes  no

**OBSERVATIONS:**

Are there hazard trees that pose a risk to public health or safety? Describe in detail their location and condition.

Are any of the following present?:

- Holly >4' tall?  yes  no
- Laurel >4' tall?  yes  no
- Cotoneaster >3' tall?  yes  no
- English ivy up tree trunks or in tree crowns?  yes  no
- Sparse English ivy on the ground?  yes  no
- Himalayan blackberry overarchng natives?  yes  no
- Gorse > 1' tall?  yes  no
- Other? (specify)

**ACTIONS:**

Control and removal of non-native species at or below threshold sizes indicated above can be done without replacement planting. Removal of larger sizes or greater coverages may require replacement planting (project) per direction in Management and Maintenance Practices Section.

**Pruning:**

**Removing Plants:**

**SCHEDULE:**

Work to be done by:  Park Staff  volunteers  others

**Targeted Completion Date:**

---

Responsible DPR Staff Date Work Completed



**Lincoln Park  
Maintenance Monitoring Checklist**

DATE: \_\_\_\_\_ Observer's Name \_\_\_\_\_

Management Area: **Passive Use Greensward**

**Boundaries of Management Area Monitored on this Date** (describe or draw the limits):

Is there a plant installation in this Management Area?  yes When? \_\_\_\_\_  no  
If yes, has the project-specific monitoring plan for the installation been implemented?  
 yes  no

**OBSERVATIONS:**

Are there hazard trees that pose a risk to public health or safety? Describe in detail their location and condition.

Are any of the following present?

- English ivy up tree trunks or in tree crowns?  yes  no
- Sparse English ivy on the ground?  yes  no
- Himalayan blackberry overarching natives?  yes  no
- Noxious weeds (gorse, garlic mustard, hogweed)?  yes  no
- Area(s) of standing water?  yes  no
- Bare soil area(s) without vegetative or mulch cover?  yes  no
- Other? (specify)

**ACTIONS:** (describe what, when, who, and where)

**Mulching:**

**Pruning:**

**Removing Plants:**

**Taking Care of Turf:**

**Weeding and Invasive Control:**

**SCHEDULE:**

Work to be done by:  Park Staff  volunteers  others

**Targeted Completion Date:**

---

\_\_\_\_\_

Responsible DPR Staff Date Work Completed



**Lincoln Park  
Maintenance Monitoring Checklist**

DATE: \_\_\_\_\_ Observer's Name \_\_\_\_\_

Management Area: **Active Use Greensward**

**Boundaries of Management Area Monitored on this Date** (describe or draw the limits):

Is there a plant installation in this Management Area?  yes When? \_\_\_\_\_  no  
If yes, has the project-specific monitoring plan for the installation been implemented?  
 yes  no

**OBSERVATIONS:**

Are there hazard trees that pose a risk to public health or safety? Describe in detail their location and condition.

Are any of the following present?

- English ivy up tree trunks or in tree crowns?  yes  no
- Sparse English ivy on the ground?  yes  no
- Himalayan blackberry overarching natives?  yes  no
- Noxious weeds (gorse, garlic mustard, hogweed)?  yes  no
- Area(s) of standing water?  yes  no
- Bare soil area(s) without vegetative or mulch cover?  yes  no
- Other? (specify)

**ACTIONS:** (describe what, when, who, and where)

**Mulching:**

**Pruning:**

**Removing Plants:**

**Taking Care of Turf:**

**Weeding and Invasive Control:**

**SCHEDULE:**

Work to be done by:  Park Staff  volunteers  others

**Targeted Completion Date:**

\_\_\_\_\_

\_\_\_\_\_ Responsible DPR Staff

\_\_\_\_\_ Date Work Completed

**Lincoln Park  
Maintenance Monitoring Checklist**

DATE: \_\_\_\_\_ Observer's Name \_\_\_\_\_

Management Area: **Native/Ornamental Landscape**

**Boundaries of Management Area Monitored on this Date** (describe or draw the limits):

Is there a plant installation in this Management Area?  yes When? \_\_\_\_\_  no  
If yes, has the project-specific monitoring plan for the installation been implemented?  
 yes  no

**OBSERVATIONS:**

Are there hazard trees that pose a risk to public health or safety?  
Describe in detail their location and condition.

Are there trees with >25% crown dieback or visible decline?  
For each tree, note species, location and approximate % of crown affected:

Are any of the following present?  
Himalayan blackberry overarching natives/ornamentals?  yes  no  
English ivy up tree trunks or in tree crowns?  yes  no  
Sparse English ivy on the ground?  yes  no  
Invasive woody plants >4' tall?  yes  no  
If yes, note species (include both self-sown & planted ornamentals):

**ACTIONS:** (describe what, when, who, and where)

**Mulching:**

**Pruning:**

**Removing Plants:**

**Weeding and Invasive Control:**

**SCHEDULE:**

Work to be done by:  Park staff  volunteers  others

**Targeted Completion Date:**

\_\_\_\_\_  
Responsible DPR Staff

\_\_\_\_\_  
Date Work Completed