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VEGETATION MANAGEMENT PLAN

1.0 INTRODUCTION

This Vegetation Management Plan has been crafted for Sand Point Magnuson Park, to address a multifaceted need to clarify the intent, methods, and means for managing its diverse landscapes and related uses. Sand Point Magnuson Park represents many things to its many users and neighbors. It is a place for a daily energetic run or a quiet reflective walk; a broad, sweeping expanse of open space along the shorelines of Lake Washington; a place for active sports and recreation; a pastoral viewshed; a setting for picnics, swimming, birding, kite-flying, wind surfing, boat launching, and biking; a venue for myriad cultural, educational, and social gatherings; a sanctuary and a refuge. Sand Point Magnuson is one of Seattle's destination parks, a place as often used by visitors arriving from across the city as by neighbors who simply walk through the front gates. Park use and management are of passionate interest to many who come to the Park, and to those who live nearby. Their interests are as diverse as the landscape of the Park itself.

This plan reflects years of Citywide policies relating to parks and open space within the City of Seattle. It also incorporates the intent of legal documents, which formed the foundation for transfer of Naval Station Puget Sound property from the federal government to local public ownership and care by Seattle Department of Parks and Recreation (DPR) and the University of Washington. In addition, this plan attempts to incorporate some of the disparate perspectives of neighbors and citizens who consider the Park "theirs": those who have lived adjacent to the landscape since it served as an airport, those who worked tirelessly to assure that the site would be protected in some manner and restored to natural conditions, those who seek a balance between 'views' and 'habitat', those who caution about the need to protect endangered species and other wildlife, assorted recreational users whose voices were not heard at public meetings.

The core focus of this plan is vegetation management for the Park. The document starts with an overview of Citywide and Sand Point Magnuson Park-specific guiding plans and policies, plus the issues identified through public meetings on the Plan. Those sources form the backbone of this Vegetation Management Plan. Within the Park, ten discrete Landscape Zones are then identified, according to vegetation types, patterns of use, and prominent geographic distinctions. Within each Landscape Zone, distinct Management Areas are identified. These delineate specific areas where particular, regular maintenance activities are needed to restore, maintain and/or nurture the targeted vegetation communities. The Vegetation Management Plan (VMP) includes a seasonal schedule for each individual Management Area within the ten Park Landscape Zones.

The VMP provides clear direction regarding what should be done, where it should be done, and when it should be done. A section on Management and Maintenance practices details how to perform the work prescribed for each management area, to maintain, restore and control vegetation within the Park. The Implementation Section describes who should do particular types of work in the Park, differentiating activities which are expected - or best performed by - City professional staff from those which present opportunities for citizen stewardship, volunteer and/or corporate involvement, in coordination of Park staff. The final Monitoring Section provides measurable means to determine if the goals and objectives for the VMP are being met.

SECTION 2:
GOALS, OBJECTIVES, AND POLICIES OF SAND POINT MAGNUSON PARK

2.0 GOALS, OBJECTIVES, AND POLICIES

The Goals and Objectives for the Vegetation Management Plan for Sand Point Magnuson Park have been derived by compiling the relevant vegetation related policies and goals from all relevant Citywide plans and policies. Then all the related planning, acquisition, and management documents specifically related to the acquisition, management and goals for Sand Point Magnuson Park were reviewed to compile those goals and objectives related specifically to vegetation management. The Goals and Objectives for managing vegetation within Sand Point Management Park have been drafted to reflect Citywide and Sand Point Magnuson Park-specific goals and objectives, with input from a broad range of interested citizens.

2.1 Goals and Objectives: Sand Point Magnuson Park Vegetation Management Plan

Based on a review of applicable Citywide Plans and policies, specific Sand Point Magnuson Park adopted plans and policies, and a broad range of comment from citizens, park users and stewardship groups, the following five goals have been identified to serve as the framework for this Vegetation Management Plan for Sand Point Magnuson Park:

i. Maintain, preserve and restore the integrity of historic landscape elements within the Park.
ii. Regenerate the natural habitats of the Park.
iii. Promote stewardship and sustainability of the vegetation within the Park.
iv. Provide for active and passive recreation opportunities within the Park.
v. Integrate the diversity of landscapes and uses within the Park.

None of the Goals and Objectives for this Vegetation Management Plan for Sand Point Magnuson Park reflects the oft-spoken concern from some neighbors regarding the views across the Park to the waters of Lake Washington. Vegetation management Goals and Objectives for this Park, like those for any Park in the City, must reflect all previously-adopted Citywide goals, objectives, and policies relating to vegetation.

As discussed in Section 3-3 below, the public opinions and comments on the management of vegetation within Sand Point Magnuson Park covered a broad spectrum: from removing all vegetation to the 'conditions like the days of the runways', to completely restoring the site to native upland forest and wetland habitat. The historic documents summarized in Section 2.3.1 and 2.3.2 of this report outline where historically significant viewsheds from inside the park are required to be maintained. This Plan has been drafted to reflect a broad range of public concerns, but does not propose to manage vegetation within the Park to restore or maintain private views from outside the Park.

2.2 Overview: Applicable Department of Parks and Recreation Plans and Policies

The following summaries present bulleted highlights of each applicable Citywide plan or policy that is relevant to managing vegetation within Sand Point Magnuson Park.

2.2.1 Seattle Department of Parks and Recreation Complan (2000)

Mission Statement: The mission of Seattle Parks is to connect the people of Seattle and our visitors with programs and places to play, grow, and build community.
The following qualities represent values and long term goals that follow from the mission statement.

- Enhancement of both a green and blue Seattle will be strongly advocated for as will habitat for terrestrial and aquatic wildlife.
- The system of open public space will be expanded, as resources become available and maintained to conserve natural areas.
- Selected areas will be restored to a more natural condition, with attention to creeks and other wildlife corridors.
- More recognition will be given to the natural and human history of the city and neighborhoods.
- Manage shoreline resources to protect and where possible enhance habitat for salmon and other native fish.
- Incorporate habitat restoration or enhancement measures in maintenance activities as well as capital projects.

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

The Tree Policy was adopted by DPR 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. A VMP is to include:

- 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 DPR Public Involvement Procedures (PIP).
- Maintenance plan including tasks, and frequencies.

For all Vegetation Management Plans the following directives, applicable to Sand Point Magnuson Park, are included:

- Topping of trees (removal of the upper portion by cutting off the main trunk) is disallowed.
- Vegetation work will be evaluated for its overall public benefit with priority given to public safety, limiting removal, increasing forest canopy, and preserving appropriate vegetation.
- No trees on public lands will be removed solely for private views.
- Work related to private views must achieve public benefit beyond view relief.

2.2.3 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.

2.3 Sand Point Magnuson Park Adopted Plans and Policies

The following goals, objectives and policies have been gleaned from plans that have been adopted specifically to address issues related to the transfer and management of the Sand Point Naval Station to Seattle Parks Department.

2.3.1 Sand Point Physical Development Management Plan (PDMP) (1997)
[Amended by Council Resolution 30063 (1999) Magnuson Park Concept Plan, Council Resolution 30293 (2001) Athletic Fields Configuration] Combined with the City Comprehensive Plan Amendments and the City Zoning code, the Sand Point PDMP constitutes the 1997 Reuse Plan for Sand Point Naval Station. Site management parameters relevant to vegetation are: the Site Design Guidelines, Historic Properties Reuse and Protection Plan Plan (HPRP) and the Long Term Management Plan. These are specific Activity Area recommendations in the (PDMP) that relate to vegetation as follows:

North Shore Recreation Area

- Demonstrate environmental stewardship, restore shoreline, and enhance public use of slope with landscaping improvements.

Education and Community Activities Area

- Sites of demolished buildings to be landscaped as usable open space.

Arts, Culture, and Community Center Area

- Replace Building 222 with terraced lawn amphitheater (completed 2001).
- Consider demolishing Building 223 to enlarge open space (completed 1999).
- Create a large landscaped parking lot southeast of Building 41.

Federal Institutional Uses

- Existing federal neighbors (NOAA & National Biological Service) should integrate with Sand Point peninsula, designing for visual integration & physical coherence of site.

Magnuson Park Open Space/Recreation Expansion Area

- Enhance open space & natural areas.

- Demonstrate environmental sensitivity.
- Improve Park entrance and 65th corridor with tree plantings and landscape improvements (in process 2001).
- Create complex ecosystem similar to that which previously existed, for wildlife habitat, environmental education, and recreational activity values.
- Develop large unstructured open space to blend proposed sports fields with existing Magnuson Park.

2.3.2 Design Guidelines Manual for Sand Point Magnuson Park (1997)

Provides detailed guidance for physical development of the Park. It is written for administrators, maintenance personnel, Park designers, Park-users and neighbors. The Design Guidelines Manual also includes Technical Guideline Sections (relating to vegetation management) addressing the following issues: Site Design, Open Space & Recreation, Shoreline Restoration, Circulation and Access, Planting, Fences, Walls & Screens, Architecture, Public Art, and Demolition of Existing Structures. The Design Guidelines Manual includes the following directions:

- Lays out formal procedures relating to project implementation.
- Functions independently of particular Park master and facility plans.
- Focuses on design issues of converting historic military base to civilian public use.

Overarching Design Goals

- Create single identifiable place at former Naval Air Station.
- Retain historical character of Sand Point.
- Reveal authentic character of buildings and landscape, rather than creating new identity.

Implementation Objectives

- Foster visual and functional integration of open space, recreation, and campus components of Park with neighboring community.
- Ensure continuity for phased and ongoing incremental improvements for park development, site improvements, and building adaptation/rehabilitation.
- Incorporate stewardship and sustainable design into all aspects of guidelines.

Site Design Objectives

- Unify Park through development of a common landscape treatment & palette.
- Respect and enhance historic character of Sand Point.
- Stabilize, enhance, and restore shoreline to establish sustainable balance of human recreation access and shoreline habitat areas.
- Create a viable wetland habitat with direct hydrologic link to Lake Washington.
- Reduce pavement at Sand Point to allow additional landscaping and decrease runoff.
- Preserve and enhance existing landscape of the Naval Station to maintain historic 1930's character, with new projects and restorations adhering to landscape style of era.

Active Recreation Zone Objectives

- To create landscape transition from historic district to more naturalized Magnuson Park and provide orderly, low maintenance, high use plantings.
- Utilize walls, rockeries, and terracing to retain steep grades, provide planting terraces, screen service functions, and separate incompatible land uses.

Architecture Objective

- New building design should respond to surrounding site conditions: existing topography, natural features, vegetation and significant views.

Public Art Objective

- Artwork should be integrated into the overall site, designed to be compatible with the natural and historic landscapes.
- Artwork should demonstrate sensitivity to environmental concerns: water use, conservation, recycling, and restoration of indigenous landscape, diversity of plant species.

Demolition Objective

- Minimize environmental impact and respect integrity of historic site character during both demolition and site restoration, never leaving site unvegetated for any length of time.
- Protect existing trees to be retained on site.

2.3.3 Sand Point Historic Properties Re-use and Protection Plan (1998)

The Historic Properties Re-use and Protection Plan is one of four documents that provides a manual for developers and property managers working with Sand Point Magnuson Park. It outlines appropriate uses, management and maintenance actions to ensure that future projects and long-term maintenance are compatible with the overarching goals and policies established in the Plan. This particular document confirms the Navy's 1994 determination that former Naval Station Puget Sound, Sand Point (now known as the Community Campus area) qualifies for designation as a National Register of Historic Places Historic District, and sets forth the contributing elements and terms of their protection.

Deed Covenant Requirements

Historic preservation covenants included in the Federal government's transfer documents require the City of Seattle and University of Washington (the property recipients) to:

- Prepare a Historic Properties Re-Use and Protection (HPRP) Plan in consultation with the State Historic Preservation Officer (SHPO).
- Review plans and proposals with the SPMP Historic Preservation Coordinator prior to initiation of any construction, alteration, remodeling, demolition, or any other action which would materially affect integrity or appearance of historic resources at Sand Point, including identified vegetation.

- Insure that all planned actions conform to the Secretary of Interior's Standards and Guidelines for Historic Preservation Projects, and follow stipulated historic review procedures.

HPRP Plan Elements

- Identifies and maps "contributing" Historic District Buildings, Landscape Features and View Corridors to be preserved and maintained, including twelve landscape features that are designated as vegetation resources.
- Defines the policies, principles and guidelines by which historic resources at Sand Point will be maintained and managed, naming "rehabilitation" the preferred treatment for eligible (contributing) resources.
- Adopts Secretary of Interior's Standards to guide historic preservation and rehabilitation at Sand Point, outlining appropriate maintenance and management techniques.
- Establishes review process for proposed projects that have the potential to affect historic properties. According to this plan, a designated SPMP Historic Preservation Coordinator is delegated by the SHPO to spearhead most reviews, one relevant exception being "Removal of a significant landscape feature (listed in Table 2-3), " which triggers automatic consultation with the SHPO in what is known as Level C Review.
- Presents methods to interpret site history to enhance public appreciation and enjoyment.
- Sets up Standard Operating Procedures to address staffing responsibilities and training, procedures for tracking and reviewing activities within the historic district, and appropriate record keeping related to historic resources.
- Mandates and describes four categories of cyclic and ongoing monitoring to fulfill City stewardship responsibilities and long-term management goals for historic resources.

2.3.4 Sand Point Blue Ribbon Committee Report to the Mayor and Seattle City Council (1999)

The Committee undertook a comprehensive re-examination of the Sand Point Magnuson Park peninsula, addressing planning, operations, management and financing issues. Their findings included a vision statement plus specific recommerndations relevant to vegetation management, as follows.

Vision

"In our priorities, the land comes first, the historic structures of national significance come second, and the rich mix of uses and user groups comes third. Integrate Sand Point within Magnuson Park and begin restoration of expanded park… bringing back to life the magnificent lake, wetlands, habitat and streams. Restore the contours of the land, grow back the lush vegetation…"

Design Recommendations

- Peninsula should be unified and restored, its structures treated as "buildings in a park."

- Collaborate with NOAA regarding shared peninsula natural systems and habitat.
- Improve park entrance, involving community in the process.
- Give attention to transition areas: between activity and natural areas; between shoreline and the land, on west side, where Park meets Sand Point Way and the neighborhood.
- Minimize fencing; rely on landscaping and topography where separation is essential.
- Identify and address historic preservation issues and requirements.

Management Recommendations

- Seattle Department of Parks and Recreation should manage expanded Park as an integrated site; responsibilities to include: planning and management of natural areas and restoration projects, maintenance of grounds and sports fields, preparation and implementation of Park design, transportation plan, parking plan and design guidelines.

Operations and Use Recommendations

- Use should be considered not as consumption – using up space or land – but as adding to the sum total of Magnuson Park.
- City should seek opportunities to employ residents on reclamation, construction, maintenance and other projects.

Funding Recommendations

- Fund short-term projects which will establish framework for longer-term Park success:
    - Mud Lake restoration as critical first step in the Park's environmental restoration.
    - Responsible building preservation and asset maintenance.
    - Improved Park entrance design and construction.
- Fund Seattle Conservation Corps pilot projects: trail construction, shoreline restoration.
- Consider funding branch library emphasizing habitat, environment and sustainability.
- Provide strong and continuous commitment to funding Park maintenance, insuring stewardship for future generations of environmental improvements made.

SECTION 3:
INVENTORY OF HISTORIC AND EXISTING CONDITIONS

3.0 INVENTORY OF HISTORIC AND EXISTING CONDITIONS

3.1 Historic Conditions

The following is a very abbreviated summary of the tranformations to the Sand Point peninsula landscape, from pre-Euro-American settlement to the present day.

Approximately 700 aboriginal Native Americans were reported living on the shores of Lake Washington and its environs during the mid-nineteenth century (Buerge, 1984). Seven winter villages were located around the lakeshore, usually at the mouth of a salmon stream or along the portage route from the lake to Puget Sound. A group situated near Union Bay used Green Lake and the salmon resources of Ravenna Creek; another one located at Wolf Bay used the small prairie near the current Windermere community and the resources of Mud Lake at what is now Sand Point Magnuson Park (Buerge 1984). A third group lived at the mouth of Thornton Creek at Matthews Beach, just north of Sand Point (Waterman 1922). Use of Lake Washington by Native Americans apparently continued until 1916 when the Lake Washington Ship Canal was built and the water level in the lake was lowered by nine feet, thus affecting fisheries resources which were a key element for Native American use.

Settlement of the Puget Sound area by Euro-Americans commenced in the 1800's. The following is a brief time-line of Euro-American documented use in the vicinity of Sand Point Magnuson Park.

1860's	Euro-Americans begin settling the Puget Sound and Lake Washington areas under the Homestead Act.
1870's	Morgan J. Carkeek acquired property along Pontiac Bay (NW corner of present day SPMP).
1885	Seattle Lake Shore & Eastern Railroad was extended to Pontiac Bay 1885 Sand Point area first surveyed by John R. Neal.
1900	Washington Shipyards moved to Houghton, WA; brickyard developed at Pontiac Bay area.
1916	Water level of Lake Washington lowered 9 feet with the construction of the Ship Canal and Chittenden Locks, significantly reducing the size of Mud Lake and Pontiac Bay.
1918	Carkeek property deeded to the city for a park (NW corner of present day SPMP).
1919	King County acquired 416 acres to establish Naval Station Seattle (Carkeek property included in 1929, Carkeek Park moved to NW Seattle).
1925	Navy formally accepted the property.
1920-30's	Sand Point landscape was leveled; Mud Lake and Pontiac Bay were filled to accommodate runways and buildings. An additional 37-acre plot was acquired for necessary improvements and construction.
1935-45	Most of the buildings constructed on Naval Station Seattle.

1976-78	Warren G. Magnuson Park was created and developed after the City received approximately 195 acres from the decommissioned portion of Naval Seattle. Swimming beach, boat launching, and sports fields areas were built after most of old runway pavements were demolished.
1993	Sand Point Magnuson Plan to expand park adopted by the Seattle City Council.
1996	Management of remainder of former Navy facility transferred to the City of Seattle.
1999	Magnuson Park Concept Plan adopted by City Council Resolution (30063).

3.2 Current Conditions Studies

Over the years several studies have been conducted within the Park to identify existing habitats, bird and mammal use, and vegetation conditions. The following is a brief summary of the applicable studies; copies of these studies can be obtained from Sand Point Magnuson Park staff at their offices.

3.2.1 Magnuson Park Habitats Project Survey of Existing Conditions (Audubon. January 31, 1997.)

This project, conducted by Seattle Audubon Society, consisted of a four-month survey of existing conditions at Magnuson Park, including bird counts, a study of wildlife habitat, a survey of native and invasive plants, and an examination of the history, present, and future of the park. The project also included a series of interpretive walks and the installation of interpretive signage at the park. A total of 125 species of birds were observed at the park, including permanent residents, spring and summer breeders, wintering birds, migrants, and accidentals. Forty-seven species of birds have been observed in the shoreline areas, 26 species in the forested areas, 25 species in meadow habitats, 32 species in scrub/shrub habitats, and 13 species in managed and disturbed areas. The most frequent mammals present at the park were domestic and feral cats and dogs, mice, rabbits, rats, voles, possums, and raccoons, and possibly beaver and coyote.

Field observations led to the definition of five categories of habitats in Magnuson Park that were illustrated on a map: meadow/wet meadow; shoreline; forest; scrub/shrub habitat; and managed and disturbed areas. Invasive non-native weeds have been introduced to the area through human activities, and are spreading rapidly into native plant communities.

3.2.2 Magnuson Park Wildlife Habitat Study (Adolfson Associates, Inc. November 1998.)

This study was also funded by the Seattle Audubon Society. Field observations of habitat types and vertebrate wildlife use at Magnuson Park were conducted in April, May, June, and September 1998. Six primary habitat types, including forest, scrub/shrub, meadow, shallow near-shore, maintained lawn and developed areas were

identified. In addition, 16 seasonal wetlands and drainage features were identified during reconnaissance-level investigation, including palustrine forested, scrub/shrub, and emergent habitat types. These observations did not include any formal wetland delineation, and did not constitute identification of regulated or jurisdictional wetlands. The report notes that several of these wetlands are connected via culverts that act as drainage features, and that at least one wetland has a seasonally ponded area that provides habitat for Pacific chorus frogs.

3.2.3 Seattle Urban Nature Project Map, September 2000

The Seattle Urban Nature mapping project conducted a field inventory of the resource lands present in Magnuson Park from fieldwork conducted in the summer of 2000. Their map presents a graphical representation of the habitats of Magnuson Park. The four major habitats include forest, open canopy, wetlands, and developed landscape, all presented with various subcategories. Identification of wetlands did not include any official delineation, and did not constitute identification of regulated or jurisdictional wetlands. Their field work and map also identified the areas within the Park where invasive non-natives formed a significant component of the vegetative cover. Their map indicates percent cover of invasive species including Himalayan blackberry, holly, English ivy, reed canary grass, and Scot's broom.

3.2.4 Magnuson Park: Existing Conditions (2001)

Field assessment of existing conditions was conducted in the summer of 2001 for this study and other related activities at the Park. That field assessment identified 10 different vegetation community types within the vegetated portions of Sand Point Magnuson Park. All of the habitats and vegetation communities within the Park have been altered historically: most of the quite significantly. The majority of the 'natural' landscapes within the Park are the result of 20+ years of recovery and establishment since the air station uses have stopped. Extensive concrete and pavement runways were removed in the 1970's and in most instances, no attempt to restore or regenerate native plant communities was made.

The result is that the majority of the Park is vegetated by a daunting mix of native and non-native herbs/grasses, shrubs, and trees. Some species, once purposefully planted, now are considered as noxious invasives (Lombardy poplars). Other species were not installed, but have thrived in the severely altered and depleted soils present on the site (Himalayan blackberry and Scot's broom). Even some invasive non-natives, such as blackberry, are cherished by some community members as a source of family activity in late summer berry-picking season. Some non-natives, such as the Lombardy poplars throughout the center of the Park and the non-native weeping willows along the shoreline, present large canopy masses that impact views from within and outside the Park.

Habitat values within the Park are variable. There is great benefit in having such expansive open vegetated open space near the lake margins. However, the lack of native species, the lack of structural elements in the forests, and the paucity of

vegetation community types in the Park severely limits the benefits of the existing habitats for a wide array of potential wildlife species.

There are wetlands within the natural areas of the Park: expanses of wet meadows characterized by native and non-native grasses and rushes. Multiple small seasonal marshes are present, where surface water collects and stays in pools of 4"-18" in depth, long enough to provide some habitat for amphibians and native freshwater snails. Stands of black cottonwood have established around the margins of these small impoundments, causing them to shift from emergent marsh communities to shrub and tree dominated wetlands. Upland grassland meadows are still present, although non-native hawthorn and Himalayan blackberry pose a risk. Most shrub thickets are dominated by non-native blackberry and hawthorn: both of which provide food source and cover for birds and small mammals.

Promontory Point provides the most intact upland forest complex on the site, though smaller stands of upland black cottonwoods and madrone sapling stands also exist. Small blocks of remnant upland forest also flank 65th Avenue NE toward the west end of the Park; the southerly of these blocks contains substantial intact canopy and understory, the northerly, fewer residual natives due to invasion by exotic species. All the vegetation community types are discussed more fully in each specific area of a Management Area, in Section 5 of this report, as well as in appendices.

3.2.5 Sand Point Existing Conditions (2001)

Existing vegetation in the developed landscape areas of the former Naval Station Sand Point was documented in two ways, to assess condition of both its canopy and understory components. An understory characterization was completed by walkthrough mapping in late summer, 2001, noting type and general condition of vegetation. See Appendix for summary of baseline findings. In addition to vestige historic shrub plantings, newly-planted beds were examined, and areas of turf, "meadow", and invasives or neglect identified. The developed landscape's understory spans a very wide range of composition and care, although mowed lawn, minimally-maintained, clearly dominates.

To document the canopy element, a comprehensive tree inventory was completed during the first half of 2001. Trees were mapped and individual characteristics noted, including: species, number & diameter of trunks, height, spread, crown type, canopy vigor, health, defects (dead/broken limbs, lean, trunk wound, decay, structural problems), evidence of past management (topping, cabling, pruning), and presence of potential targets should a tree fail.

Complete data sets were generated for the Historic District Zone and Sand Point East Housing Zone, plus some additional partial areas. Summary and analysis of inventory findings are included in Appendix C, in addition to tree locator maps. Full GIS-integrated tree maps and inventory database will be provided both electronically and as hard copy to SPM Park staff, for their ongoing use and reference.

The tree inventory revealed information key to vegetation management planning for Sand Point. A high proportion of trees within the Historic District is identified in the HPRP Plan as "Historic Landscape Features to be Preserved and Maintained." Of these, the majority have been topped, and almost all have potential targets due to the open, pedestrian-accessible understory and proximity to both buildings and roads. Significant numbers of trees are members of species known to have serious inherent problems, including proven invasiveness, susceptibility to insects or disease, and proclivity for structural failure at maturity.

In addition, many trees originally were planted very close to buildings or to one another (notably along Sand Point Way), resulting in both canopy and rootzone cramping and potential for long-term instability. Given the presence of both resident and workforce populations, hazard trees assume added significance, beyond that already associated with a public-use, open park setting. Developing an abatement strategy must therefore be given highest vegetation management priority. All told, a great many problems plague this large, historically-valuable tree population, most of which cannot prudently be ignored.

Just as recreation of habitat will require enormous, sustained investment in other parts of the Park, so also will care and restoration of vegetation in the developed Sand Point landscape. In the former setting, disturbance and neglect are primary culprits, in the latter, errors in past tree selection, placement and maintenance – as well as neglect in understory areas. Vegetation management and site redevelopment thus will need to proceed hand-in-hand, in coordinated fashion.

3.3 Public Comment on Vegetation Management Plan

The City of Seattle DPR staff conducted four public meetings in the summer and fall of 2001 for the proposed Vegetation Management Plan. Information materials were mailed to households in the surrounding neighborhood and northeast Seattle. In addition e-mail notices were sent to citywide and regional environmental organizations. Comments from the public were taken at each meeting. Written comments (letters and emails) were also invited from individuals, active citizens groups, and other organizations. In Appendix A of this report is a summary of the range of comments received during those meetings. Presented below is an abbreviated summary of the main topic areas and perspectives covered by the public comments:

Views

- Restore views of the beach and lake from private property outside of the Park.
- Maintain expansive views inside the park and across the lake to Mt. Rainier.
- Block views of structures outside the park from areas inside of the Park.
- Don't manage the vegetation within the Park to maintain or restore views from private property to the lake.

Habitat
- Maintain diverse habitat types within the Park.
- Restore habitat types inside the Park.
- Restore fish habitat along the shoreline of Lake Washington.
- Link habitats within the Park to one another and to the Lake.
- Plant native trees and shrubs to create native habitats.
- Don't plant any trees that will grow more than 20 feet tall.

Invasive Plants
- Remove and control aggressive invasive shrubs, trees and herbs.
- Maintain some blackberries for family picking activity.

Historic Area
- Restore and maintain the historic area vegetation per the previously adopted Plans.
- Remove the tall deodora cedars.
- Keep and replace the deodora cedars.
- Restore the gardens, period plantings, azaleas and rhododendrons.
- Maintain the historic view corridors as identified in the Historic Plans.

Recreation
- Provide for continued passive recreation such as walking, biking, swimming.
- Manage Kite Hill to provide for continued use for recreational kite flying

Art
- Maintain the grass area within the Fin Art zone in a manner that benefits the art installation and viewer access.
- Maintain the grass and adjacent native shrub plantings near and in the Fin Art area to restore/create habitat.

Comments on all issues covered a broad range of perspectives, usually including voices from opposite ends of all spectrums on each issue. The most contentious issue was that of the conflict between managing the vegetation within Sand Point Magnuson Park for views from private property located outside of the Park and managing Park vegetation to restore and maintain native habitats within open spaces of the Park. This is not a conflict with a simple resolution: off-site views based on visual access to the beach of Lake Washington within Sand Point Magnuson Park cannot be restored and maintained while restoring native vegetation communities to zones within the main body of the Park and/or pockets along the shoreline.

Restoring views to the conditions of the mid 1970's (the time of Naval Air Station transfer of the lands to City responsibility) would entail removal of many native black cottonwood trees that have reached heights of 40-50+ feet in the 25 years since the landing strip tarmac was removed. Seattle Department of Parks and Recreation's 2001 Tree Policy states that trees on public land will not be removed or topped to provide views from private property. The summary of key vegetation-related relevant goals and

policies from applicable adopted City-wide and Sand Point Magnuson specific Plans (see Section 2 of this Plan) directs DPR towards restoring native habitats, managing trees for health and control of hazards, improving canopy coverage by native trees, managing for environmental health and stewardship, and preserving the historic character of specific zones within Sand Point Magnuson Park. This Vegetation Management Plan attempts to follow the directions established by previously adopted City Plans, Policies, and the legal agreements the City entered into, that relate to vegetation issues embedded at Sand Point Magnuson Park.

Comments from the four public meetings, the Board of Park Commissioners Public Hearing, as well as additional written comments received are incorporated into the final VMP where possible.

SECTION 4: LANDSCAPE ZONES AND MANAGEMENT AREAS

4.0 LANDSCAPE ZONE ANALYSIS

In order to direct and clarify management activities within Sand Point Magnuson Park, the Park has been divided into ten Landscape Zones (LZ) for this Vegetation Management Plan. The LZ's are based on areas defined by vegetation types, patterns of use, or geographic distinctions within the Park. The ten Landscape Zones are mapped and labeled on Figure 4-1, located at the back of this Section 4. Within each Landscape Zone may be one or more Management Areas (MA), which are specific areas where regular maintenance activities are necessary to restore, maintain, or nurture the targeted vegetation or vegetation communities.

Table 4.1 provides a summary of the approximate acreage of each Management Area within each of the Landscape Zones. For the 'built' zones in the Historic District, acreages of the Management Areas were not calculated.

Table 4.1 Size by Landscape Zone and Management Area

	TOTAL ACRES	Non-native Shrub	Tree/Shrub Savannah	Upland Forest	Upland Meadow	Wetland	Wetland Mosaic	Mowed Grass/Turf	Other*
LANDSCAPE ZONES		**19**	**35**	**25**	**41**	**13**	**22**	**40**	**116**
Habitat	97	11	16.8	10.6	18.7	11.4	22.1	6.4	0
Shoreline	42	6	7.5	0	15.1	1.1	0	9.8	7.3
Promontory Point	19	1.5	0	13	4.8	0	0	0	0
Dog Off Leash	9	0.4	0	1	0	0	0	0	7
Sportsfield	27	0	0	0	2.8	0	0	23.5	0
Community Activity	17	0	10.5	0	0	0	0	0	6.2
Subtotals	**211**	**18.9**	**34.8**	**24.6**	**41.4**	**12.5**	**22.1**	**39.7**	**20.5**
Sand Point East Housing	5	NA							5
Historic District	79	NA							79
Forest Remnant	6	Not calculated							6
Building 193	10	NA							10
TOTAL ACRES	**311**								

* Includes the acreage of four Zones at the bottom of the table, the Fin Art MA, Nearshore MA, Dog Run MA, Community Activities Center MA, and Junior League Playground MA

Note: Acreages are approximations therefore they may not total with complete accuracy

4.1 Identification of Management Areas within Landscape Zones

Described below are the ten Landscape Zones identified within the Park for the Vegetation Management Plan. Within each LZ may be one or more Management Areas, specific areas where regular maintenance activities are necessary to restore, maintain, or nurture the targeted vegetation or vegetation communities. For each

Management Area within each of the Landscape Zones, the VMP provides an annual calendar summarizing the seasonal schedule for that Management Area.

For each Management Area there are clear directions as to what should be done, where it should be done, and when it should be done to maintain the health and vigor of the vegetation. Specific management and maintenance practices, for example mulching, turf maintenance, or removing invasives, are based on and in accordance with the standards within DPR standard best management practices. They are described in Section 6 of this report, with specific modifications and clarifications made for management actions anticipated in Sand Point Magnuson Park.

4.1.1 Shoreline Zone

The roughly 45-acre Shoreline Zone encompasses the entire shoreline area within the Park, with the exception of the Dog Off Leash beach at the far north end of the Park. The western boundary of this Zone is the beach access road and the eastern boundary is the shallow nearshore along the beach itself. This Zone receives some of the most intensive and concentrated use with swimmers, boaters, and walkers using and enjoying beaches, the boat ramp and offshore areas, picnic and bathroom facilities, public art installations, and the shoreline promenade throughout the year.

Ecologically this Zone is a key component of the Park, because it includes upwards of 4500-5000' of shallow aquatic habitat and upland habitat interface. Vegetation in the Shoreline Zone is diverse and reflects this area's dual importance as both a high human use area, as well as an important ecological component of the Park and Lake Washington ecosystem. Vegetation types range from mowed grassland to meadow, formal plantings of landscape trees along the promenade to naturally occurring clumps of willow and black cottonwood along the shoreline, and thickets of invasive shrubs to patches of native shrub communities.

Management Areas

Fin Project
Art installation at the northwest of swimming beach, west of the promenade.

Non-native Shrub
Thickets of predominantly Himalayan blackberry and/or Scot's broom are mostly located in the northern third of the Zone, but also adjacent to the riparian corridor north and south of the boat ramp and in south end of the Zone.

Upland Meadow
These are grassy, unmowed, natural areas dominated by bent grass species, velvet grass, sweet vernal-grass, and forbs, with very few trees or shrubs present. A large area is in the northern third of Zone, with the remainder in two main patches north and south of the boat ramp parking lot.

Tree/Shrub Savannah
These are grassy, unmowed, natural areas interspersed with small clusters of trees or shrubs, found along the southern perimeter of the Zone adjacent to the shoreline and Promontory Point, and north of the boat ramp.

Mowed Grassland
Mowed turf-grass areas are managed for active human use, and are found mostly in the central portion of the Zone associated with the swimming beach, and in the picnic shelter area south of the boat ramp.

Nearshore
This MA is a narrow strip along the length of the shoreline from the wetted bank waterward 10-15'.

Wetland
These are areas dominated by wetland vegetation located north of the boat ramp associated with the swale draining east from the shoreline road. No jurisdictional wetland criteria were investigated in making this designation.

4.1.2 Promontory Point Zone

The Promontory Point Zone, located at the far south end of Sand Point Magnuson Park, is made up of roughly 17 acres in a complex of meadow, upland forest and transitional shrub thicket habitats with fairly good access through the Zone via a well-established trail network. The two larger meadow areas that make up approximately one third of the Zone lie in the western half of the site, separated from each other by a narrow east-west ridge of upland forest.

The central portion of the Zone has a prominent ridge of upland forest rising upwards from the south boundary of the Park to the north boundary of the zone near the NE 65th St. entrance road. This ridge falls off very steeply to the east, where sand and gravel were historically quarried. The resulting cliff wall has become a prime nesting area for cliff-dwelling birds, and is referred to as Kingfisher Basin. South of Kingfisher Basin lies another ridge of upland forest, and to the east, nearest the parking lot for the boat ramp area, lies the Education Pavilion and Butterfly Garden.

Promontory Point has been the focus of significant planning and implementation efforts spearheaded by community volunteers since 1996, focusing on habitat restoration and place-based environmental education.

Management Areas

Upland Meadow
These are grassy, unmowed, natural areas dominated by bent-grass species, velvet grass, sweet vernal grass, and forbs, with very few trees or shrubs present. They are located in three main areas within this Zone – two east-west

running meadows west of the ridge that bisects the Zone, and the area below Kingfisher Basin and including the Education Pavilion and Butterfly Garden.

Upland Forest
These are areas with tree canopy covering at least 6000 sq. ft or areas that cover an equivalent area with a mixture of trees and shrubs. Upland forest is the dominant community type in this Zone, found in broad bands covering the ridges and slopes radiating from the center of the Zone.

Non-native Shrub
Thickets of predominantly Himalayan blackberry and/or Scot's broom are found in roughly ¼- acre patches adjacent to meadows, along edges of the Zone, and in forest areas where there are significant canopy gaps.

4.1.3 Forest Remnant Zone
The Forest Remnant Zone includes two woodland areas flanking NE 65th St. from 62nd Ave. NE eastward toward Sportsfield Drive. Although small, these forest remnants represent vestiges of native vegetation that existed prior to Sand Point's military use. Stand composition and condition vary within the zone. An adjacent cleared area along Sportsfield Drive is included. Appendix D provides additional detail concerning existing vegetation composition, both native and exotic species.

Management Areas

South Woodland
This rectangular area south of NE 65th St. is composed of mostly-intact, mixed native forest dominated by mixed-age Western red cedar, big leaf maple and madrona, with a few Douglas firs. Understory dominants include hazel, Indian plum, sword fern, Oregon grape and salal. A rough cat track approximately bisects the area east to west. The site slopes upward moderately toward the west. Ivy and Himalayan blackberry encroach at the northeast periphery. Because development surrounds this site on all sides, trampling and construction damage also threaten the integrity of its native vegetation.

North Woodland
This wooded area extends from NE 65th St. in a band northward to the abandoned tennis courts and clearing surrounding the former bowling alley. The woodland covers a steep slope paralleling the Historic District's Officer's Row just west above, plus flatter terrain below. The canopy includes mixed native and non-native species and age classes, with broadleaf trees far outnumbering conifers. In the south and midsections, a few large Douglas firs and Western red cedars (perhaps 10 total) intermix with alder, cottonwood and big leaf maple. The area's northerly half includes deciduous native trees plus many non-natives, both mature planted specimens and self-sown progeny: European birch, London plane, horse chestnut, cherry, apple, Norway maple, Sawara cypress and English holly all are represented.

Understory is largely dominated by invasives, with considerable unchecked ivy growth high into tree canopies. Himalayan blackberry is abundant at all peripheries. Vestiges of native undergrowth include sword fern, salmonberry and Indian plum, but these are few and struggling.

Open Forest Margin
This area north of 65th St. and west of Sportsfield Drive, bridges from the wooded slope to the sports field access road. It is abandoned, cleared land once used for a playground. Poorly-drained pockets contain sedges. The majority of the area is vegetated in blackberry patches, rough meadow and colonies of Lombardy poplar saplings.

4.1.4 Historic District Zone

This zone is delineated to exactly correspond with the designated Sand Point National Register Historic District boundaries. The zone is unique within the park both for its overall character and for the requirements by which it is altered or maintained. In addition to twenty Naval Base buildings, twenty-three landscape features and five view corridors have been identified as historic resources contributing to the District.

Many of the zone's trees are included among contributing landscape features, either individually or as groups, among them the row along Sand Point Way and the Deodara cedars along 62nd Avenue NE (once called Deodara Drive). Some remnant historic shrub plantings also are included; these are a faint shadow of the extensive ornamental plantings designed for Base buildings for which archived drawings exist. While these designs are historic due to their age, it is not known if the design where significant for their use of plant materials or due to the designer's name.

Although unified by its historic character, the zone possesses management areas that differ significantly from one another due to original use and vegetation composition. Each is described below.

Management Areas

North Shore Recreation Area
This area is dominated by vast paved areas and a hangar historically used for seaplane landing and storage. Enhancements for aquatic and shore recreation in the future will alter existing vegetation, as will any associated, upslope landscape alterations. Currently, the area contains a mix of native and ornamental plantings, rough meadow, and invasives colonies north and upslope behind the armored shoreline and Building 11. Trees are limited to small groves and rows along zone peripheries, the total count very low (52).

Eleven tree species were identified by inventory, of which three, non-native taxa account for 73% of the population. Two of the dominant taxa are invasive

species which in time should be eliminated from the park (Lombardy poplar and Norway maple); in addition, all individuals of the third (Blieriana plum) pose potential hazards due to structural problems and identified targets. Target presence is exceptionally high in this zone (associated with 94% of inventoried trees), as is number of trees with defects (77%); however, currently low usage around most trees makes this finding less daunting than it might otherwise be.

The inventory excluded sapling natives planted nursery-fashion near Sand Point Way N.E., most of these Oregon ash and Cascara, many struggling and too-densely spaced. Six sizable native conifers are found in the zone, divided equally between Douglas fir and Western red cedar. Tree health in the zone is predominantly good (80%), despite noted species and structural problems.

Sizeable Douglas firs and mixed deciduous trees are concentrated near the area's north end. The recent, young native plantings that parallel Sand Point Way N.E. give way to blackberry thickets and rough vegetation toward the landscaped NOAA entry (which is not within DPR jurisdiction). A designated view corridor runs due north in line with the access road underpass; while this historic vista has no bearing on management of current vegetation, it could affect plant locations in future park development.

Aircraft Industrial Area

Landscape elements are a minor feature in this area, limited to narrow vegetated bands adjacent to buildings and roadways: rows of deciduous trees, ornamental shrubbery, lawn, and peripheral meadow, blackberry and young alder thickets. Pavement and structures dominate. Potential exists that plantings may increase in the future to enhance pedestrian park use, while respectful of original industrial character. Recent tree and shrub additions have been made along 63rd Avenue NE and the north side of Building 2; original planting plans and the 1997 Design Guidelines contain direction pertinent to these areas.

Trees in this large zone total only 73, of which more than 42% are young red maples. Another 9.5% are Lombardy poplars, the remainder scattered among 17 additional taxa. The tree inventory excludes hillside stands of regenerating red alders just west of Building 5, many of which now exceed sapling caliper. Overall tree health is rated as 90% good, the best among Historic District Zone management areas. Targets are associated with two-thirds of trees inventoried; a fairly low (but not exemplary) 40% were identified as having structural defects. These findings mirror the relative youth of the area's trees.

Historic District Core

This area constitutes the heart of historic Sand Point, incorporating all major

Naval administrative and residential buildings, streets and surrounding developed landscape. Mature trees and mowed turf dominate the vegetation, while original and very recent shrub bed plantings provide scattered accents. Pruning, mulching and weed control are little in evidence; past tree topping is visible throughout the area. Historically, the balance was probably quite different. Extensive ornamental plantings were designed for these Base buildings, for which original plans survive. Some, if not all, were installed as individual structures were completed. Research might reveal which historic plantings could appropriately be reinstated.

Identified contributing Historic Landscape Elements include many large conifers – notably 45 of the area's 53 Deodar cedars, a memorial Norway spruce, and a pair of Norway maples recently replaced in kind immediately south of Building 29. Historic view corridors in the area include: eastward along NE 74th St., the 62nd Ave. north-south axis, eastward from between Buildings 26N & 26S. Vegetation will need to be managed with these vistas in mind.

This management area contains 30% of all Historic District trees (215), exceeded only slightly by the Sand Point Way Management Area. A total of 26 taxa were identified by inventory, dominant among these Deodar cedar (25%), hawthorn (16%), English holly (12%) and Sawara false cypress (11%). The remaining 36% are distributed among 22 species, native taxa representing only 7% of the population, in four species.

More than 22% (almost 50 trees) are included as HPRP Plan-identified Historic Landscape Features to be Preserved and Maintained. Such status requires that special attention and protection be accorded these trees, a mandate which may prove challenging to meet in face of hazard and problem-species trees among them – potentially almost half. Appendix C lists identified historic trees and their additional management needs.

Although 80% of the overall tree population is rated as having good health, 72% have structural defects, 25% have been topped, and 65% or more possess associated targets. Compounded with the maturity and size of many area trees, and its high user population, these findings suggest that hazard poses a significant management concern.

A final concern identified through inventory is that 36% of area trees belong to known problem species: these ultimately should be eliminated and sensitively replaced. Preliminary screening indicates that almost one quarter of area trees need to be more fully evaluated for hazard status and mitigation options. In composite, inventory analysis portrays both large magnitude and high priority for active tree management in this area. Appendix C provides further detail.

Officer's Row

This portion of the Historic District consists of the remnant residential landscaping that surrounds three officer's homes now used for teen transitional housing. Overgrown ornamental foundation shrubs remain, with large gaps and variable ivy and weed infestation evident. Adjacent degraded woodland exerts constant invasive plant pressure to the rear of the houses. A resident-planted vegetable garden occupies one small side lawn, little visible from the designated Landscape Feature front yard landscape. Lawn and mostly-deciduous mature trees unify the area's vegetation. A few native conifers and understory plants are present.

Trees inventoried total 61. Because Officer's Row is very small compared to other management areas within the Historic District, its canopy cover is relatively high despite these modest numbers. Species distribution is quite broad (22 taxa), with only two approaching a 10% population share (Blieriana plum and Chinese arborvitae). Natives total about 10% of trees and include Western red cedar and a Pacific madrone.

Half of area trees were found to be in fair condition, another 20% poor. Almost three-quarters have associated targets; equal numbers have defects, and 18% have been topped. Given the round-the-clock residential use of the former officers' quarters, hazard must be accorded elevated attention.

A final noteworthy observation is that the area possesses 23 trees from eight problem species which will need removal over time, both to improve stand health and to reduce invasive plant pressure adjacent to a stand of remnant native forest. Since the entire management area is an identified Historic Landscape Feature, sensitive tree replacement will be required, matching species character as closely as possible to original plant selections.

Golf Greensward

The landscape in this area consists of rolling lawn with scattered large trees and little additional understory. Once used as an informal officer's golf course, its character echoes traditional, naturalistic English greensward. Toward the south end the vegetation approximates a native grove, including several Pacific madrone with a low undergrowth of seedlings, salal, bracken and sword fern competing with invasive ivy and blackberry.

Near the 65th St. entry lie overgrown ornamental shrubs and specimens associated with the former hobby shop, once site of vegetable gardens. This area is already undergoing redesign relative to park entry enhancements; several Lombardy poplars near the southwest corner recently were removed. At the opposite, northeast end is a large Atlas cedar, Sand Point's former official "holiday tree" which continues to provide the visual terminus for designated 62nd Avenue vista. Both this individual cedar and the entire greensward have been formally identified as contributing historic landscape features.

Douglas fir and native cedar dominate the canopy with 26.5% of the area's 102 trees, probably all residual from before Naval development. Among native conifers, nearly two-thirds have defects that could compromise their longevity or safety. Over three-quarters of area trees have identified defects, 38% have been topped, and 70% possess potential targets. Since the Golf Greensward's open landscape character invites park users into close contact with its trees, hazard abatement must be accorded high management priority.

A broken row of twelve topped Norway maple trees parallels Avenue A along much of the area's west edge. At over 20% of area trees, Norway maple is the Golf Greensward's most common species, and together with European birch provides much of the mature deciduous canopy cover. Unfortunately, Norway maple and birch possess significant capacity for invasiveness, already evident in adjacent wild areas. Altogether, nearly half of area trees belong to problematic taxa with strong proclivities for disease, pests, structural deterioration or invasiveness. Through time, therefore, a large turnover in individual trees and taxa must be anticipated, within the context of conserving overall landscape character.

Sand Point Way

This area consists of the narrow, end-to-end band running between Sand Point Way N.E. and internal Avenue A, and a similar breadth continuing northward along the street to the Park's north boundary. The management area is broken at the N.E. 74th St. entry and N.E. NOAA Drive, thus divided by these features into three distinct segments. Sand Point Way's primary vegetation is its long rows of trees identified in the HPRP Plan as an element contributing to historic character. A row of 21 Seattle Transportation-planted red maples is included for purposes of vegetation management planning, since overall landscape character depends on continuity between these and Park trees.

Sand Point Way includes more trees than all other Historic District management areas - a total of 223, nearly one third of the zone's total. Given the large number of trees, a modest 18 taxa are represented, and among these over 80% fall into just six species. The three top taxa alone account for 55% of trees, including in descending order Deodar cedar, Lombardy poplar, and Douglas fir. Deodar cedar makes up 24% of all area trees, their distribution concentrated in tight rows along the south and central segments. Lombardy poplars are located in all three sections, both as groups and interspersed with other trees. Douglas fir is clustered toward the two ends of the south section only.

Red maple, Norway maple and flowering crabapple also are found in significant numbers, primarily as single-species blocks to the north of N.E 74th St. The area's otherwise eclectic palette suggests somewhat random past plant selection and placement. While future replantings must adhere to historic character, it is the effect of long lines of mixed-species trees which needs to be respected, more than the exact, horticulturally-dubious existing configuration.

Extensive topping and excessively close spacing present problems for ongoing management. 69% of trees have structural defects and 44% have been topped, which for conifers usually represents irreparable damage. Virtually all Sand Point Way trees possess significant potential targets; hazard therefore must be considered a key management concern. Sixty percent of trees are in good health, varying considerably among species.

Understory is generally open, varying from weeds and meadow north of the NOAA drive, to rough lawn, with shrub interplanting in limited sections south of Building 9 (Barracks). Historic drawings, perhaps unrealized, indicate rhododendron plantings along the entire frontage of Sand Point Way N.E. in all three sections; no rhododendrons currently exist in the area.

4.1.5 Sand Point East Housing Zone

This zone is visually and physically contiguous with the Sand Point Historic District on the west, north and part of its south side. Two designated historic view corridors relate strongly to this zone, one north-south along 62nd Ave. NE, and one eastward over existing Building 6 toward the lake. Of two remaining military structures in the zone, Building 224 currently is utilized for single-adult housing, while Building 6 is vacant and slated for demolition to develop additional housing.

This Landscape Zone is treated as a single unit, not divided into Management Areas. Vegetation is predominantly lawn, some maintained, some rough, unmown and weedy. Also remaining is considerable pavement associated with parking lots, drives and abandoned tennis courts, some disused and deteriorating with poplar sprouts and blackberry taking hold.

Little canopy exists in this zone. Groups of ornamental trees formally arrayed within the zone include rows of Sawara false cypress and English hawthorn, as well as fruiting apples bordering Sportsfield Drive. Of 37 trees total within the zone, 83% fall into just three taxa, while over half are members of species known for invasiveness, pest or disease problems. Inventory reveals that high percentages possess both defects and potential targets. Appendix C provides further detail on findings and management implications thereof.

Remnant shrub beds bordering parking and buildings contain mixed ornamental species, few native. A row of Chinese elms along the west zone edge has resprouted from basal cuts, to shrublike form. A small vegetable garden, recently developed by housing residents, parallels the south side of Building 224.

4.1.6 Community Activity Center Zone

The Community Activity Center Zone is located directly east of the Historic District and between the ball-fields along the northern boundary of the Park alongside NOAA property. It includes the landscaped Community Activity Center (formerly the Brig) grounds with mowed lawn grass, foundation beds, and

associated streetscape; the Junior League Play Area in the western portion of the Zone; as well as upland meadow in the eastern portion of the Zone. A row of evenly spaced Lombardy poplars follows a 1500'-long stretch of restricted use paved road cutting north-south through the Zone.

Current conceptual planning for this Zone is focused on the development of a 4-acre Community Garden directly east of the Community Activity Center, and expansion of the Dog Off Leash Area into the meadow area to the east of the restricted use road.

Management Areas

Community Activities
This MA is a 5-acre area surrounding and including the Community Activity Center (Building 406, formerly the Brig). The vegetated grounds consist of mowed lawn and landscape plantings in beds around the building and along the parking area and NE 74th St.

Junior League Playground
The Junior League Playground lies in the south of the Zone and includes an area of roughly just under an acre that encompasses the playground and picnic shelters, mowed lawn areas, groups of specimen trees, and planting beds along the western edge of the playground.

Tree/Shrub Savannah
This approximately 10-acre MA makes up the eastern half of this Zone, and consists of upland meadow with 80-100 non-native poplars mostly located along the gated road that bisects the MA.

4.1.7 Sportsfield Zone

Two playfield areas are present in the Park. The Sand Point fields are located due east of Sportsfield Drive. The Magnuson fields are located further north, and are bordered to the north and west by the Dog Off-Leash Zone. Both sets of fields are grass, managed as turf for baseball, soccer, rugby and ultimate Frisbee team sports.

Management Areas

Turf
The sportsfields are dominated by managed rough turf that is regularly mowed during the growing season. No fertilizers are used on the ball field surfaces, however they are regularly over-seeded to restore and increase the turf vigor.

Upland Meadow
To the east of the Magnuson fields is a small area of grassland adjacent to the fields, which is not managed as turf. This upland meadow is dominated by a mixture of native and non-native pasture grasses.

4.1.8 Habitat Zone

This is the largest Zone and is the portion of the Park located east of Sportsfield Drive and the Sand Point fields, south of the Dog Off-leash Zone, and west of the Shoreline. Within the roughly 80-acre Habitat Zone there are seven Management Areas identified. This Zone has some of the greatest variety and acreage of different habitat types, and is characterized by early successional plant communities that have established in the years since the late 70's when Naval Station Sand Point was decommissioned. None of the existing vegetation in this Zone is remnant from plant communities existing prior to development of the site as a naval station as the entire Zone was dramatically altered. The Zone consists mainly of large expanses of upland meadow and wetland mosaic, with fragments of early seral upland forest areas (mainly black cottonwood and madrone), and large areas of non-native shrub thickets.

Management Areas

Non-native Shrub
These are areas generally dominated by monotypic swaths or thickets of Himalayan blackberry. These impenetrable thickets provide refuge habitat for some passerine birds and small mammals from domestic dogs and native predators, as well as a food source. They are wide-spread throughout the Habitat LZ in both upland and marginal wetland settings, occurring extensively in the northern half of the LZ.

Upland Forest
These are areas dominated by native black cottonwood trees, with some madrone, scattered big leaf maple and red alder present (though not common). There is very little native understory or diverse herb layer. Many of these upland forests contain invasive non-native woody species such as Himalayan blackberry, Scot's broom, hawthorne, non-native grasses and scattered reed canary grass as an 'understory'. The main upland forest patches are found immediately east of the parking lot of the swim beach, south of and between the two bunkers (at the southern limits of Kite Hill), and in scattered clusters near the south and eastern limits of the Habitat Zone. None of these upland forest patches is larger than roughly 2 acres in size.

Upland Meadow
These are unmowed grasslands interspersed with the wetter meadows within the wetland mosaic in this Zone. Visually it is difficult to discern between these two MAs. The upland grasslands include some of the same species as found within the wet meadows including bent-grass, fescue, and Kentucky blue grass. Along with the wetland mosaic MA, upland meadows represent the dominant habitat type in this Zone.

Tree/Shrub Savannah
These are areas within the Habitat Zone where scattered trees are widely spaced within a forb/grass dominated landscape. The trees are too wide-spread to create a forest, yet they are dominant enough to preclude this MA from being identified as simply grassland. The trees within this MA may be native black cottonwood, native Oregon ash, non-native hawthorns, non-native Lombardy and/or white poplars. The grasses are similar to those identified within the Upland Meadow MA, and there may also be thickets of non-native Himalayan blackberry within this MA. This MA is prevalent along the eastern third, as well as in the south-central portions of the Zone.

Mowed Grassland
Some grassy portions of the Habitat Zone are currently mowed on a regular basis and do not function as meadow. The largest of these areas occurs on Kite Hill, where a roughly 4.5-acre area along the top and eastern flank of the hill is kept mowed. Other mowed grassland areas are primarily along the margins of the Zone in narrow strips along roads and pathways, and near the existing tennis courts.

Wetland
The areas inside of the park have been identified and labeled as wetland based on their biological characteristics. No delineations have been conducted and no jurisdictional determination of the extent of wetland in the Park has been conducted.

FORESTED

The forested wetlands are predominantly scattered stands of black cottonwood encircling closed depressions on the eastern portions of the Habitat Zone. These areas lack much herbaceous understory, however some of them have sparse coverage of spike rush. Understory shrubs may include native willows and some hardhack (spirea). In the southwestern end of the Habitat Zone is a small stand of Oregon ash (older trees with many younger saplings) as well as black cottonwoods. A small stand of quaking aspen is present to the southwest, just north of the auxiliary parking lot (west of Building 193). It is unknown if this is a native stand, but more likely it is the off-spring of planted landscape specimens from the Naval Air Station days.

SEASONAL MARSH

These are the small closed depressions that hold 6" to 18"of water long enough into the growing season to strongly influence the type of vegetation growing within the depression. Some, like "Frog Pond" (located due SW of the parking lot located in the interior of the Habitat Zone) have quite a large species diversity including bulrush, numerous sedges and spike rushes, rushes, as well as traces of cattail. Less diverse seasonal marshes are dominated by various spike rush species, with few sedge species scattered along the margins. Some of the seasonal marshes include a 'ring' of native woody shrubs and saplings just establishing. These include willow species, hardhack, black cottonwood, some red alder, and an occasional Oregon ash. Several of the larger, shallower marshes have some limiting soil conditions, that no vegetation has established within the inundated zone. This may remain constant until sufficient organic debris accumulates in the bottom of these areas to provide adequate growth substrate for plants.

Wetland Mosaic

The wetland mosaic is located mainly in the northwestern to west-central portion of the Habitat Zone. It is characterized by a broad sweep of Baltic rush, with traces of sweet vernal grass, velvet grass, smooth rush and reed canary grass interwoven with upland grasses dominated by bent grass and fescues. These areas are labeled mosaics because they are a complex mixture of wet and upland habitats scattered across a very flat landscape. These areas are differentiated from the Seasonal Marsh wetlands by the lack of species diversity and the lack of long-term inundation. The wet portions of the mosaics are wet because slight depressions in the compacted soils prevent water from infiltrating and the relatively flat topography prevents water from flowing off-site. This management type comprises a majority of the Habitat Zone.

4.1.9 Dog Off-leash Zone

This Zone is located to the south and east of the Junior League Playfield, north of the Magnuson Fields and Kite Hill, and stretches east to the lakeshore. The Dog Off-leash Zone has a long, narrow footprint, and forms the northern boundary between the Park and NOAA. This Zone is characterized by wood chip and gravel pathways for dog-walking, and includes a small ½-acre patch of upland forest at the west end, and a portion of lakeshore at its eastern end with approximately 120 lineal feet of shoreline. The majority of the landscape within the existing dog run is woodchip with very little vegetation present; therefore there is no "vegetation management" for that portion of the off-leash. It is explained in more detail in Section 5, that the Off-leash area is currently under proposed revisions. It is proposed to enlarge the off-leash area, incorporating a larger portion of adjacent upland grasses, as well as small elements of spirea wetland to the south. The proposal is to seasonal fence portions of the off-leash to keep dogs and humans out, while it is also proposed to enhance some existing adjacent wetlands, create new wetlands, and enhance upland buffer that is dominated by non-native blackberry.

Management Areas

Upland Forest
On the far west end of the Zone is a small woodland stand characterized by a dense grove of madrona saplings on the west margin. In addition, this woodland includes non-native birch saplings, black cottonwood, and some scattered red alder and big leaf maple. All the trees are sapling stage, probably no more than 10-15 years old.

Non-native Shrub
At the eastern end of the Zone there are extensive swaths of Himalayan blackberry immediately landward of the lakeshore. Within this area is also one very large non-native weeping willow specimen on the shore.

4.1.10 Building 193 Zone

The area immediately adjacent to the 65th Street entrance road into the Park, lying west and north of the old Commissary is characterized by a large parking lot, storage area, debris piles. It is largely unvegetated, but is included here as a Landscape Zone because of the landscape plantings that are present within the parking lot strips. Existing vegetation in these parking strips is remnant and neglected, consisting mainly of pin oak (*Quercus palustris*), barberry (*Berberis sp*.), and strawberry tree (*Arbutus unedo*) interspersed with weedy species such as Himalayan blackberry. No MAs are identified within this Zone.

4.2 Management Goals and Objectives by Landscape Zone

This Vegetation Management Plan for Sand Point Magnuson Park has been structured on significant public effort that has come before it (see Section 2, an overview of adopted applicable City-wide and SPMP-specific plans). To assure that the long-term management of the vegetation within Sand Point Magnuson Park is conducted within the intent and purpose of this Vegetation Management Plan, the goals and objectives for each of the identified Landscape Zones and Management Areas within the Park are outlined below. These goals and objectives are derived from work that has been publicly adopted for the City and for SPMP, as well as from input through the public process for this Plan, and the best professional judgment of the contributing authors and City staff.

4.2.1 Shoreline Zone

Goal: Restore and enhance shoreline fringe for improved public access

Objectives

- Remove rubble and debris from shoreline and nearshore area.
- Reshape portions of shoreline by regrading and restoring sloping beach areas.
- Plant trees and shrubs to provide shoreline interest and pockets of shade while maintaining selected view corridors along the shoreline.
- Manage shoreline vegetation to discourage use by Canada geese and other urbanized waterfowl.

Goal: Restore and enhance shoreline fringe for native fish habitat

Objectives

- Remove rubble and debris from shoreline and nearshore area.
- Restore shallow littoral zone by regrading to create more natural slope at water's edge and beyond.
- Plant trees and shrubs to provide overhanging vegetation (shade, cover, and nutrients) in the nearshore environment.
- Manage shoreline vegetation to discourage waterfowl use (minimize nutrient loading).
- Retrofit existing docks with fish-friendly decking to discourage non-native predator fish.

Goal: Improve quality and diversity of vegetation for habitat connectivity.

Objectives

- Remove and/or control non-native invasive species in uplands and along shoreline and replace with natives.
- Increase plant species diversity with the addition of native species.
- Evaluate existing specimen trees and replace as appropriate depending on health and habitat value.
- Establish diverse vegetated connection between lakeshore and Promontory Point habitats.

Goal: Maintain special management areas as specified in Maintenance Agreements.

Objective

- Maintain Fin Project area as grassy meadow with adjacent wildlife habitat areas of native woody species by mowing and weeding as specified in Maintenance Agreement.

4.2.2 Promontory Point Zone

Goal: Preserve and enhance Promontory Point as native habitat for wildlife, especially birds.

Objectives

- Remove and/or control non-native invasive species and replace with natives.
- Preserve existing known valuable habitat areas and enhance them.

4.2.3 Forest Remnant Zone

Goal: Reclaim, restore and expand residual native forest.

Objectives

- Actively control and ultimately eliminate invasive exotic plants, including trees.
- Mitigate tree hazards through snag creation or removal where required.
- Supplement existing native understory and canopy tree populations.
- Expand forested area to encompass and restore adjacent degraded land.
- Integrate woodlands with adjacent existing or anticipated native plant communities.

Goal: To the maximum extent possible, create a rich and self-sustaining native plant community.

Objectives

- Protect native vegetation from encroachment by surrounding park development.
- Coordinate restoration efforts to create an authentic natural character, which can serve as both an anchor and model for reclamation of the Park's disturbed larger landscape.
- Establish a substantially self-sustaining woodland plant community.
- Discourage human access to forest interior except for stewardship activity.

Goal: Integrate N.E. 65th Street corridor with Zone's native forest character.

Objectives

- Extend unifying native plantings along right of way, especially canopy trees.
- As much as possible use native vegetation to mitigate off-site conditions that reduce park integrity.
- As much as possible use native species to buffer vehicular lanes from bicycle and pedestrian traffic.

- Utilize non-native species only if necessary to satisfy other right of way requirements.

4.2.4 Historic District Zone

Goal: Protect and enhance Sand Point's historic landscape qualities, safeguarding continuity while accommodating appropriate change.

Objectives

- Preserve and enhance existing landscape plantings of the Naval Station to maintain its historic, predominantly 1930's character.
- Encourage new projects and restorations to adhere to stylistic landscape character of the historic era, reflecting actual archival design whenever available.
- Recognize and respond to new needs which result from altered site uses, without compromising the integrity of historic vegetation.
- Safeguard historic district vegetation from cumulative damage and incremental destruction resulting from inappropriate maintenance, planting or neglect.
- Foster public appreciation and enjoyment of Sand Point's historic vegetation through diverse modes of interpretation.

Goal: Educate maintenance staff and others who care for the Historic District vegetation regarding the common vision and management ethic.

Objectives

- Provide education seminars and interpretative events to all property owners, staff, tenants, citizens and design professionals engaged in the care or alteration of Sand Point vegetation.
- Develop specific vegetation management, maintenance and monitoring guidelines that are consistent with specific HPRP Plan requirements and cultivate their use by all parties.

Goal: Maximize sustainability of Historic District vegetation, while respecting its historic landscape character.

Objectives

- Develop a plant palette for new plantings appropriate to contemporary horticultural and environmental needs, minimizing use of chemicals, water and labor.
- Integrate native plant species and vegetative structure in locations and ways which do not detract from overriding 1930's era landscape character.
- Exploit transitional District edges for native planting opportunities.
- Improve habitat value by restoring richer understory plantings to Historic District.
- Implements appropriate landscape Best Management Practices.

Sand Point Way Management Area

Goal: Maintain and enhance the quality of the tree row edging Sand Point Way, in a manner consistent with its historic character.

Objectives

- Remedy existing tree health and hazard problems.
- Foster species diversity while retaining consistent overall character.
- Integrate tree row with park gateway landscape treatment at NE 65th St.

Goal: Soften Sand Point Way edge vegetation to achieve a more welcoming, attractive character, consistent with historic intent and contemporary park identity.

Objectives

- Reinstate appropriate understory plantings that balance current and historic design and selection criteria.
- When possible, eliminate landscape elements that detract from current park edge character.

Golf Greensward Management Area

Goal: Preserve area's traditional informal, semi-native open space character.

Objectives

- Retain existing canopy mix, configuration and density through appropriate tree care and regeneration planting.
- Enhance quantity and extent of native understory, especially along south periphery.
- Eliminate undesirable weedy non-native plants, including trees, and replace where needed with aesthetically and culturally appropriate species.

Goal: Establish with plantings a strong sense of park entry, identity and destination.

Objectives

- Through a collaborative process between DPR, Seattle Transportation and community, create unified tree palette and landscape treatment for Sand Point Way intersection.
- Implement future NE 65th Street improvements in a manner respectful of area's historic golf course/greensward heritage.
- Reinforce native tree presence along Park entry corridor.

Officer's Row Management Area

Goal: Perpetuate original 1930's residential landscape character within context of modified contemporary use and management.

Objectives

- Retain vestige ornamental plants, replacing in kind and location where retention is not feasible.
- Remove invasive and weedy plants encroaching on historic plantings.
- Where feasible, replace plantings consistent with archived original landscape plans.

- Reinstate appropriate plantings that balance current and historic design and selection criteria.

Goal: Foster resident participation in landscape preservation and care.

Objectives

- Develop opportunities and clear guidelines for resident involvement in historic landscape restoration and stewardship.
- Educate managers and residents about the responsibilities accompanying an identified Historic District "landscape feature."
- Define areas where residents may engage in personal gardening initiatives without detriment to overall traditional landscape character.

Sand Point Historic Core Management Area

Goal: Retain and enhance character-defining historic landscape features, including trees, vistas and understory plantings.

Objectives

- Refer to Design Guidelines Manual for Sand Point/Magnuson Park as it pertains to vegetation.
- Develop grounds maintenance practices that will prevent resource degradation.
- Remedy inherited tree health and hazard problems, fully replenishing canopy stock with identical or closely related taxa.
- Evaluate fidelity of current understory plantings to historic landscape character, correcting deficiencies as needed.
- Identify and exploit opportunities to reinforce historic landscape character through individual planting and site development project.

Goal: Achieve integrated resource management reflecting a shared understanding and respect for historic site vegetation and landscape design.

Objectives

- Refer to Sand Point Historic Properties Reuse and Protection (HPRP) Plan Standard Operating Procedures.
- Cultivate pride and understanding reflected in appropriate decision making and landscape care, across agencies and interest groups, at all levels.

Goal: Foster resident and community engagement with the landscape through stewardship and education.

Objectives

- Create opportunities and clear guidelines for volunteer and resident involvement with landscape rehabilitation and ongoing care.
- Develop interpretive programs and publications to heighten public awareness of historic vegetation's contribution to Sand Point's character.

Aircraft Industrial Management Area

Goal: Enhance historic character with plantings that reinforce both the designated 63rd Avenue view corridor and the industrial nature and scale of the area's structures.

Objectives:

- Line 63rd Avenue with small, narrow-profile trees to frame the designated view corridor without obscuring hangar facades.
- Supplement existing vegetation to impart human scale, while retaining area's bold utilitarian simplicity.
- Reference, restore, and where feasible, reinstate area's historic plantings.

Goal: Improve vegetation quality and appearance between hangars and Sand Point Way, consistent with industrial character and period landscape vestiges.

Objectives:

- Where feasible eliminate or consolidate pavement and expand vegetative areas.
- Reinstate historic Naval Station fruit orchard in vicinity of vestige trees.
- Eliminate weedy invasive plants and renovate existing ornamentals.
- Supplement plantings consistent with available historical documentation.

North Shore Recreation Management Area

Goal: Expand and enhance lake edge plantings for habitat, unifying with upland native vegetation.

Objectives:

- West of existing pier, install wildlife-friendly lake-edge plantings, consistent with shoreline restoration throughout the Park.
- Reinforce native vegetation linkage upslope from shoreline habitat, accommodating current and future upland passive-recreational use.

Goal: Maintain open, treed, informal character of existing upland vegetation, accommodating anticipated bicycle trail and picnic area development.

Objectives:

- Control and remove non-native invasive and weedy species.
- Enhance canopy by adding scattered appropriate native trees, and relocating existing, closely-spaced young trees.
- Emphasize native plants with ornamental qualities where new usage patterns or replenishment needs dictate.

4.2.5 Sand Point East Housing Zone

Goal: Improve quantity, quality and condition of vegetation.

Objectives:

- Maintain all healthy, non-weedy existing vegetation until development occurs, supplementing plantings if interim becomes protracted.
- Eliminate weedy and invasive plants. Replace deteriorating, unused pavement with habitat-enhancing vegetation.

Goal: Fulfill evolving vegetation-related needs without compromising Sand Point's historic landscape character.

Objectives

- When siting new plantings or structures, respect designated historic view corridors eastward toward Lake Washington and along 62nd Avenue NE.
- Design landscape alterations to reflect historic Sand Point planting plans, patterns and palette.
- Foster opportunities and establish guidelines for residents to help develop and care for site plantings.

Goal: Integrate disparate adjacent uses and landscape characters through use of vegetation.

Objectives

- Provide appropriate transitional vegetation at east and south margins of zone, emphasizing native species.
- Maintain strongly historic character along west edge of zone, honoring adjacent landscape features of key importance.

4.2.6 Community Activity Center Zone

Goal: Improve quality and habitat value of natural area portions of Zone.

Objectives

- Remove and/or control non-native invasive species and replace with natives.
- Locate replacement plantings to maximize value to wildlife.

Goal: Maintain safe and enjoyable formal play spaces for children.

Objective

- Maintain play structures, turf, and trees for play, shade, and picnicking in playground area.

Goal: Create and maintain landscape for community involvement, stewardship, and education.

Objective

- Further develop concept plan for Community Garden.

4.2.7 Sportsfield Zone

Goal: Maintain fields for active organized sports events as well as non-organized recreational sports activities.

Objective

- Maintain routine mowing and turf care activities within the sportsfield complex.

4.2.8 Habitat Zone

Goal: Preserve and enhance native plant communities to benefit habitat for wildlife.

Objectives

- Remove and/or control non-native invasive species and replace with natives.
- Enhance existing habitat areas, increasing species diversity and structural complexity by planting additional native species in all vegetation community layers.
- Prevent alterations to the contributing basins of the seasonal marshes that will affect the hydrology of these wetlands.
- Manage the meadow areas such as to prevent the establishment of woody invasives (e.g., blackberry, Scot's broom), while protecting spring ground-nesting birds and providing late-summer seed sources for feeding resident and migratory birds.

Goal: Increase habitat niches for a variety of wildlife species, including amphibians, birds, and small to medium size mammals while increasing on-site nutrient cycling.

Objectives

- Create brush piles throughout the habitat zone from woody debris removed through other on-site maintenance activities.
- Create large woody debris on the ground from using or importing logs and stumps from native trees from on-site or off-site sources.
- Allow native shrubs and tree saplings to establish (or augment with native plant installations) around the perimeter of seasonal marshes to provide critical upland habitat to meet all life stages of amphibians.

Goal: Reduce habitat fragmentation.

Objectives

- Increase patch size of native shrub and forested habitat with supplemental and replacement planting along edges.
- Encourage patch enlargement of targeted habitat types to increase amount of interior habitat over time rather than increasing amount of exterior edge.

Goal: Increase habitat connectivity across site by linking various habitat types.

Objectives

- Create canopy connectivity between Promontory Point and existing wetland areas on the southeastern limits of the habitat zone.
- Link existing forest patches with supplemental and replacement planting along edges.

4.2.9 Dog Off-leash Zone

Goal: Provide space for active dog use without posing risk to native vegetation communities or critical habitat areas.

Objectives

- Fence sensitive habitats and vegetation community types securely within and adjacent to the Off-Leash Zone.
- Control erosion at the lakeshore to protect fish resources while allowing dog access to the water.
- Provide biofiltration for water running off the main portions of the OLA prior to its discharge into Lake Washington.

Goal: Enhance habitat for critical species where possible.

Objectives

- Restore gravel substrates within the beach zone and immediate underwater nearshore habitats, subject to WDFW permit and approval.
- Replace non-native invasive woody plants (e.g., Himalayan blackberry) within the nearshore habitat areas with appropriate native woody species that will provide bank stabilization and overhanging vegetation.

4.2.10 Building 193 Zone

Goal: Manage landscaped areas to ensure the health and vigor of the installed plants.

Objective

- Prune, replace, and mulch the existing vegetation to promote health of the trees and shrubs.

SECTION 5:
VEGETATION TREATMENT TYPES BY ZONE AND MANAGEMENT AREA

5.0 VEGETATION TREATMENT TYPES WITHIN EACH ZONE

This Section of the VMP describes the vegetation "treatments" and seasonal timing for carrying them out, for each of the Management Areas in the Park by Landscape Zone. Treatments include such activities as pruning, mulching, planting, watering, mowing and weeding, plus others. In effect, this section describes *what* is to be done, *when* to do it, and *where* to do it, and is meant in all cases to be used together with Section 6, which specifically describes *how* to do it.

In this Section the following tools are provided for each Management Area:

- A description of the MA (Management Area);
- A year-long calendar for all maintenance and management actions for that MA in that Landscape Zone;
- A summary of the maintenance and management actions that are to be performed;
- Site-specific direction about performing any actions;
- A Maintenance Monitoring Checklist.

The Maintenance Monitoring Checklists were created as a tool to determine the effectiveness of implementing the directives of this Vegetation Management Plan. Maintenance Monitoring Checklists (MMC's) have been created for each MA where regular maintenance activities are needed and expected. For the Sand Point East Housing Zone and Historic District Zone MA's, the checklist format used elsewhere is replaced with a Sand Point Maintenance Monitoring Form to be tailored to individual landscape areas, based on the template provided in Appendix D. Vegetation differs in these two zones from the rest of the park landscape because of its developed, historic character.

Checklists are not intended for specific project actions within the Park, such as a major removal of blackberry thickets or replanting native species within one of the habitat areas, or a recreation of historic bed plantings. Section 6.11 of this Plan provides thresholds to determine whether weeding and invasive control actions fall under maintenance, or constitute instead specific projects which require individual monitoring plans and checklists (see Section 8). The MMC's are provided as tools to ascertain if normal and routine maintenance is being implemented effectively.

Ten orthophoto maps are located at the end of Section 5, one for each Landscape Zone, also delineating its component Management Areas,. A final, key tool in Section 5 is a Master Calendar that summarizes all of Section 5 on one page. This calendar includes all Landscape Zones and Management Areas, and summarizes by numeric code every recommended maintenance and management action by month. SPMP Maintenance staff requested that this Master Calendar be assembled, to assist them in efficiently planning their work.

5.1 Shoreline Zone

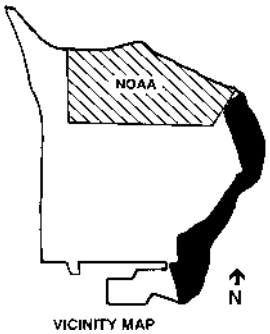
5.1.1 Fin Project Management Area

The Fin Project MA is northwest of the swimming beach and is bounded by paved walkways to the east, west, and south, and extends to the north 50' beyond the northernmost fin. Management of this MA should focus on the site's function primarily as an art installation. Management is specified in the 1998 Maintenance Agreement for the art installation, and consists mainly of meadow mowing in the greater part of the area, and weeding and invasive control in the planted habitat islands as well as in the meadow. Any planting done in this MA should be limited to replacing failed plantings in the habitat islands according to existing 1998 planting plan.

Management and Maintenance Annual Calendar
Shoreline Zone – Fin Project Management Area

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

▢ Indicates range of time to perform action as needed
• Indicates specific time to perform action



3 YR. ESTABLISHMENT CARE

This care will be necessary for any new plantings that are added to the habitat islands to replace woody plants that have not survived since initial planting.

MEADOW MAINTENANCE

Mowing should be done three times annually in the late winter/early spring to maintain the site's main function as an art installation, to suppress invasive weed growth, and to provide summer forage and cover for wildlife. The proposed mowing schedule has a different seasonal timing than all other meadow areas in the Park (spring instead of fall), and a change in the timing from what is specified in the maintenance agreement. This is being done to prevent bird nesting in an area where nests are very likely to be disrupted, but to provide later season summer forage and cover.

Mowing must be done early enough in the spring to prevent bird nesting in this area where the intensive human use of the site will disturb nests. Mowing should be started in mid-March, and should be done twice more at 3-4 week intervals to keep the grass low enough so that birds nest elsewhere. After the last mowing in May, grass can be allowed to grow until the following March. If invasive weed growth is not adequately suppressed over time with this regimen, an additional mowing can be added in September. An amendment to the 1998 Maintenance Agreement should be made that incorporates these changes.

MULCHING

Mulch woody species installed within the habitat areas annually as necessary or desirable. Re-surface the bark pathway through the MA annually as specified in the Maintenance Agreement.

PLANTING

Plant selected woody species in the habitat islands to replace those individuals that did not survive from the initial planting. Choose species from the original planting plan and make substitutions as necessary on the basis of plant survival from the initial planting.

PRUNING

Prune trees and shrubs throughout as needed for plant health or hazardous limbs, and on the west side of the Management Area to maintain reasonable views of the Fin Project and Lake Washington from the concrete walkway at the base of Kite Hill as specified in the Maintenance Agreement.

PLANT REMOVAL

Other than invasives, removals should be performed only in the case of hazard trees, or of diseased plant material that needs to be replaced. When possible, removals should be done between August and March to avoid potential disruption of nests. Woody debris resulting from removals that will not sucker or sprout from cuttings or branches can be used anywhere in the Habitat Zone, except in the small seasonally

ponded wetlands, for wildlife habitat features such as brush piles, LWD, snags, or stumps. Wood from suckering species such as Lombardy and white poplar, that cannot be used for habitat features until completely dead, should be stored off the ground until such time that it is no longer viable (2 years).

WEEDING AND INVASIVE CONTROL

Control of invasives will be needed in the habitat islands as well as in the meadow if mowing alone does not adequately suppress woody invasives. Scot's broom and Himalayan blackberry are particularly problematic throughout this MA in habitat islands as well as meadow area. All woody species (native or non-native) are undesirable in meadow areas if upland meadows are to be maintained at that successional stage, and weedy herbaceous species should also be controlled.

5.1.2 Non-native Shrub Management Area

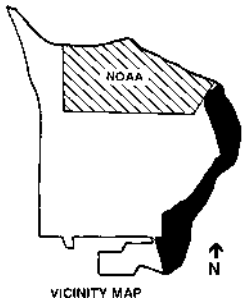
The largest concentrations of non-native shrub thickets in the Shoreline Zone occur between the swimming beach and the north boundary of the Zone. These thickets are made up almost exclusively of Himalayan blackberry and Scot's broom, and range in size from approximately 0.2 acres to 1.5 acres. There are two sizeable thickets in the southern part of the Zone, just northwest of the boat ramp and directly south of the south parking lot.

Thickets should be cleared of invasives by mechanical mowing and replanted for conversion to native shrub, forest, or limited areas of meadow communities. Clearing of thickets should occur only when follow-up replanting with native species and 3 yr. establishment care is intended, and should be done incrementally in patches as specified in Section 6.11 to provide displaced wildlife with adjacent or nearby replacement habitat.

Management and Maintenance Annual Calendar
Shoreline Zone – Non-native Shrub Management Area

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Management and Maintenance Practices												
3 Yr. Establishment Care	▒	▒	▒	▒	▒	▒	•	•	•	•	▒	▒
Establishing Meadow			▒	▒	▒	▒	▒	▒	▒	▒		
Maintaining Meadow									•			
Planting												
Trees		▒	▒							▒	▒	▒
Shrubs		▒	▒							▒	▒	▒
Herbs			▒	▒	▒	▒				▒		
Amending Soils							▒	▒	▒			
Weeding and Invasive Control												
Trees						▒	▒	▒	▒			
Shrubs				▒	▒	▒	▒	▒	▒			
Herbs				▒	▒	▒	▒	▒				

▒ Indicates range of time to perform action as needed
• Indicates specific time to perform action



3 YR. ESTABLISHMENT CARE

This care will be needed for any new woody plantings that replace non-native shrubs.

ESTABLISHING MEADOW

Some limited meadow areas can be established in cleared thicket areas that are adjacent to existing upland meadows. This will be the most labor-intensive and difficult plant community to establish in these areas due to the level of invasive control that will be needed. For these reasons, and because of the prevalence of this habitat type at the Park currently, establishing more meadow may not be the most desirable choice for both ecological and economic reasons. Establishment would include seeding, weeding, mowing, and possibly soil amending.

MAINTAINING MEADOW

Any newly established meadows created as conversion from non-native shrub thicket must be actively managed to prevent colonization by woody plants and invasion by weedy herbaceous species. Annual mowing will be necessary to adequately control re-sprouting shrubs until meadow is established. After that point mowing frequency can be decreased to one mowing every other year or every third year depending on the presence and rate of re-growth/reinvasion by woody species. Some regular hand-weeding to control invasives may also be needed.

PLANTING

Planting of non-native shrub areas should proceed after clearing, and any soil amending or sheet mulching has been completed. Thickets adjacent to existing forest should be converted to native woody plant communities (trees and/or shrubs). Thickets adjacent to existing upland meadow should be converted to native shrubs, oak or madrone savannah, or limited areas of meadow. Thickets adjacent to wet meadows should be replaced with native shrubs.

AMENDING SOILS

Soil amending throughout the planting area may be necessary or desirable after non-natives have been cleared and prior to planting.

WEEDING AND INVASIVE CONTROL

Non-native shrub thickets consist largely of Himalayan blackberry and Scot's broom. Control and removal strategies for these two species are very similar.

5.1.3 Upland Meadow Management Area

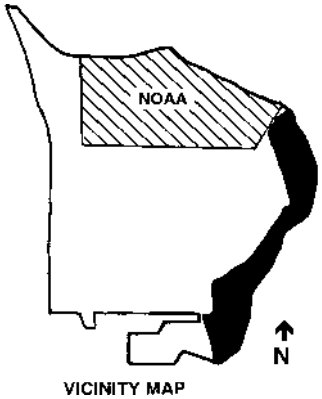
The upland meadows in this Zone, like the non-native shrub thickets, are concentrated at the north and south ends of the Zone. Large meadow areas are interspersed with these thickets north of the swimming beach and beyond to the north boundary of the Zone. The meadows in the south are located straddling the boat ramp access road, and to the north and south of the south parking lot.

These areas are to be managed as meadow habitat to prevent colonization by both non-native and native woody species. This management will consist of a mowing regimen, and might possibly also include regular hand weeding as necessary. Mowing is to be done late enough in the growing season (September) to accommodate bird nesting season as well as seed head production for wildlife forage.

Management and Maintenance Annual Calendar
Shoreline Zone – Upland Meadow Management Area

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Management and Maintenance Practices												
Establishing Meadow												
Maintaining Meadow									•			
Weeding and Invasive Control												
Trees						▒	▒	▒	▒			
Shrubs					▒	▒	▒	▒	▒			
Herbs				▒	▒	▒	▒	▒				

▒ Indicates range of time to perform action as needed
• Indicates specific time to perform action



VICINITY MAP

ESTABLISHING MEADOW

Remove remnant pavement from upland meadow areas north of the swimming beach and east of the promenade and restore to meadow. Establishment would include seeding, weeding, mowing, and possibly soil amending.

MAINTAINING MEADOW

Upland meadows are to be actively managed to prevent colonization by woody plants and invasion by weedy herbaceous species. This will consist of a September mowing every other year or every third year depending on the presence and rate of re-growth/reinvasion by woody species. Some regular hand-weeding to control invasives may also be needed.

WEEDING AND INVASIVE CONTROL

Non-native poplars are the most common invasive tree species encountered in meadows. The most common invasive shrubs are Himalayan blackberry, Scot's broom, and non-native hawthorn. Problematic herbaceous species often encountered include Canada thistle in meadow areas, and bindweed in newly planted areas.

5.1.4 Tree/Shrub Savannah Management Area

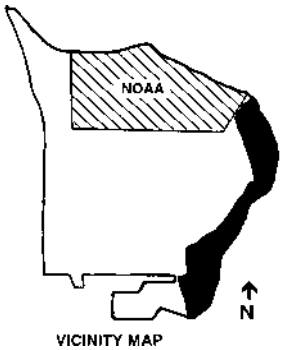
Tree/Shrub Savannah areas in the Shoreline Zone are limited to a 50-100 ft.-wide band wrapping around the south end directly across the road from Promontory Point and along the shoreline itself; and a 2.5-3 acre patch between the boat ramp and the bathroom facility. These areas should be managed as upland meadows interspersed with small clusters of native trees or shrubs. To achieve this, management actions must include a mowing regimen to maintain the meadow habitat, removal of non-native trees and shrubs, and replacement with appropriate native tree and shrub species to approximate the existing pattern of meadow interspersed with clumps of woody vegetation.

Tree/Shrub Savannah at the southernmost shoreline in this Zone should be managed to maintain existing spectacular views of Mt. Rainier from the high shoreline north of the USGS intake pumps, and to establish and encourage a wildlife corridor between Promontory Point and the lakeshore at the southernmost end of this MA (south of the USGS intake pumps). No meadow maintenance mowing should be done in this MA south of the USGS intake pumps at the south shoreline.

Management and Maintenance Annual Calendar
Shoreline Zone – Tree/Shrub Savannah Management Area

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Management and Maintenance Practices												
3 Yr. Establishment Care	▒	▒	▒	▒	▒	▒	•	•	•	•	▒	▒
Maintaining Meadow									•			
Planting												
Trees			▒	▒	▒	▒					▒	▒
Shrubs			▒	▒	▒	▒					▒	▒
Removing Plants	•	•	•	•	▒	▒	▒	•	•	•	•	•
Weeding and Invasive Control												
Trees						▒	▒	▒	▒			
Shrubs					▒	▒	▒	▒	▒			
Herbs					▒	▒	▒	▒				

▒ Indicates range of time to perform action as needed
• Indicates specific time to perform action



VICINITY MAP

3 YR. ESTABLISHMENT CARE

This care will be needed for any new woody plantings that replace non-native trees and shrubs or are installed in meadow areas.

MAINTAINING MEADOW

Upland meadows portions of the savannah are to be actively managed to prevent further colonization by native woody plants and invasion by non-native species. Maintenance actions should consist of a September mowing every other year or every third year depending on the presence and rate of re-growth/reinvasion by woody species. Some regular hand-weeding to control invasives may also be needed. No mowing should be done south of the USGS intake pumps on the southernmost shoreline as this area is being converted to a tree/shrub plant community, improving the link between Promontory Point and the lakeshore.

PLANTING

Native trees should replace non-native trees that are removed from these savannah areas. Native replacements can be planted in the same location or in adjacent or nearby forest areas. Native shrubs should replace non-native shrubs that are removed, but should be planted in the same location as those plants that are removed. Planting at the southernmost shoreline Tree/Shrub Savannah should not diminish the spectacular existing views of Mt. Rainier. Islands in the parking lot south of the boat ramp should be planted with clusters of xeric native trees and shrubs (madrone, Douglas fir, Garry oak, oceanspray, mock orange, woods rose) to improve the aesthetics of the parking lot, provide shade, and provide a more unifying theme between the built and natural portions of the park.

REMOVING PLANTS

Removals other than invasives are intended to be performed only in the case of hazard trees or diseased plant material that needs to be replaced. When possible, removals should be done between August and March to avoid potential disruption of nests. Woody debris resulting from plant removals that does not sucker or sprout from cuttings or branches can be left or placed as wildlife habitat such as brush piles, LWD, snags, or stumps. Wood from suckering species such as Lombardy and white poplar, that can not be used for habitat features until completely dead, should be stored off the ground until such time (2 years) that it is no longer viable.

WEEDING AND INVASIVE CONTROL

Non-native poplars are the most common invasive tree species encountered in these savannah areas. The most common invasive shrubs are Himalayan blackberry, Scot's broom, and non-native hawthorn. Problematic herbaceous species often encountered include Canada thistle. Woody debris resulting from removal of invasive trees or shrubs that do not sucker or sprout from cuttings or branches can be left or placed as wildlife habitat features such as brush piles, LWD, snags, or stumps. Wood that can not be used for habitat features until completely dead, should be stored off the ground until such time (2 years) as it is no longer viable.

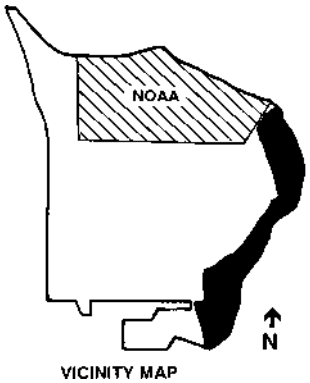
5.1.5 Mowed Grassland Management Area

Mowed grassland is found in and around high human activity areas in this Zone – from the swimming beach south to the boat ramp, and south of the boat ramp associated with the parking lots and picnic shelter. Grassy areas are interspersed with trees and shrubs directly along the shoreline, and with planted specimen trees inland of the sand near the bathrooms. These grassy expanses should continue to be managed as mowed grassland to welcome human uses such as picnicking, sunbathing, and other informal recreational activities. Along the shoreline itself where pockets of woody vegetation are currently found, invasive species should be controlled and vegetation should be managed to feature native species that will enhance and stabilize the shoreline for wildlife. Inland areas should feature individual or groupings of non-invasive specimen trees and/or shrubs for aesthetics and to provide shade and focal points for people.

Management and Maintenance Annual Calendar
Shoreline Zone – Mowed Grassland Management Area

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

▒ Indicates range of time to perform action as needed
• Indicates specific time to perform action



3 YR. ESTABLISHMENT CARE

This care will be needed for any new woody plantings that replace non-native trees and shrubs.

PLANTING

Immediately along the shoreline itself, where pockets of woody vegetation are currently found, invasive species should be controlled and replaced with typical native riparian trees and shrubs. Further inland, the plant palette can include appropriate non-invasive non-native species as specimen plantings, but all non-native invasive species or species prone to disease should be incrementally replaced.

PRUNING

Prune trees and shrubs throughout as needed for plant health and public safety.

REMOVING PLANTS

Removals are intended to be performed only in the case of hazard trees or diseased plant material that needs to be replaced. When possible, removals should be done between August and March to avoid potential disruption of nests. Woody debris resulting from removal of invasive trees or shrubs that do not sucker or sprout from cuttings or branches can be left or placed as wildlife habitat features such as brush piles, LWD, snags, or stumps. Wood that can not be used for habitat features until completely dead, should be stored off the ground until such time (2 years) that it is no longer viable. Norway maples, and crabapples, in particular, are stressed, diseased, and misshapen in this MA. Pines near the picnic shelter south of the boat ramp are stressed and should be evaluated for health.

TAKING CARE OF TURF

Turf care activities occur throughout the year. Mowing in particular should be done with attention to protect existing desirable shoreline vegetation and large tree roots.

WEEDING AND INVASIVE CONTROL

Regular and frequent mowing in this MA greatly reduces the occurrence of invasives, and limits them to the outer edges, in particular along the shoreline edge where they root in the bank among desirable natives. Typically, Himalayan blackberry, Scot's broom, reed canary grass, and yellow iris are the common invasives present here, all of which should be removed and replaced with natives. Patches of Japanese knotweed are also present, and should be prioritized for removal to prevent further spread. Non-native poplar is also found along the shoreline edge and inland. The swimming beach area has a number of Norway maples. Incremental removal and replacement of these tree species is recommended.

Woody debris resulting from removal of invasive trees or shrubs that do not sucker or sprout from cuttings or branches can be left or placed as wildlife habitat features such as brush piles, LWD, snags, or stumps. Wood that can not be used for habitat features until completely dead, should be stored off the ground until such time (2 years) that it is no longer viable.

5.1.6 Nearshore Management Area

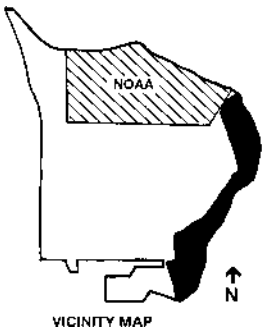
The Nearshore MA is a narrow strip waterward of the shoreline and includes the shallow beach and water-land interface along the entire length of the Shoreline Zone. It is included as a Management Area because it is a critical link to improving this edge habitat for wildlife, particularly native fish, as well as improving access to the shoreline for people, and reducing shoreline erosion. In addition, shallow shoreline areas with fringing emergent and aquatic bed vegetation are the most biologically productive habitats in the lake environment. Actions in this MA to restore this type of natural vegetated shoreline start with removal of rubble and debris to restore a substrate and slope that can be planted. Removing concrete rubble and debris along this riparian edge to restore a more natural shoreline substrate, reshaping portions of the shoreline to create more gently sloping pocket beaches, and planting the edges of these pocket beaches with riparian vegetation are the main management actions for this MA.

Management and Maintenance Annual Calendar
Shoreline Zone – Nearshore Management Area

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Management and Maintenance Practices												
3 Yr. Establishment Care	▢	▢	▢	▢	▢	▢	•	•	•	▢	▢	▢
Planting												
Trees		▢	▢	▢						▢	▢	
Shrubs		▢	▢	▢						▢	▢	
Herbs		▢	▢	▢					▢	▢	▢	
Live Stakes	▢	▢									▢	▢
Removing Nearshore Rubble[1]												
Restoring Pocket Beaches[2]												

▢ Indicates range of time to perform action as needed
• Indicates specific time to perform action

[1] Removal and timing of concrete bulkheads will be dependent upon permit conditions from WDFW and Corps of Engineers.
[2] Restoring pocket beaches and placing gravel in the nearshore environments will be dependent upon permit conditions from WDFW, the Corps of Engineers, and City of Seattle Shoreline permit conditions.



3 YR. ESTABLISHMENT CARE

This care will not include mulching or watering, and will likely require a far less intensive effort with regard to weeding than in typical upland areas since planting in this MA will only be done at water's edge and slightly above.

REMOVING NEARSHORE RUBBLE AND RESTORING POCKET BEACHES

Concrete rubble and debris occurs along a large portion of the shoreline from the bank outwards anywhere from approximately 5-20' offshore. This material creates an abrupt edge, with an unnatural substrate, and prevents establishment of desirable emergent and aquatic bed vegetation. Removal will require numerous permits including WDFW HPA (Hydraulic Project Approval), U.S. Army Corps Section 401 and/or 404 (which will trigger a Biological Assessment), City of Seattle Shoreline Permit, and SEPA. This work should only be done with consultation and detailed planning from a shoreline processes specialist and/or hydrogeomorphologist. Importing round gravels in a range of smaller sizes to restore optimal substrate may be necessary. Creation of pocket beaches and shoreline reshaping should be done to dissipate wave energy, and to create more desirable nearshore conditions for native fish species. Pocket beach creation should include a stepped grade at the beach-to-grass transition to discourage goose access. Installation of LWD in selected areas of the MA may be advised, but should be done judiciously so as not compromise water access or safety for people. Planting of portions of the newly created shallows will also likely be a component of work to be performed in the Nearshore MA to help dissipate wave energy as well as limit goose access to the grassy, high human use areas upslope.

Specific areas and actions are described as follows:

In south nearshore high bank areas, leave bank as is but remove concrete rubble in the water and at the toe of the bank. Where there are existing trees and shrubs, plant the toe of the bank with native willows. Remove and replace non-native trees and shrubs with appropriate native species incrementally, and control the invasives. Where there are no existing trees and shrubs, remove any invasives, and experiment with drill-planting tubelings of low-growing upland native shrubs such as snowberry and rose into the upper portions of the bank.

In nearshore area directly south of the boat ramp, remove armoring and stabilize the bank with bioengineering techniques such as heavy planting of willows and other riparian shrubs along the toe of the bank. Planting should extend upslope and blend with management for the mowed grassland here. This would also help screen the boat ramp activities from the picnic shelter area. In low bank areas further south, continue the pattern of pocket beach creation already present, sloping the shoreline and adding fine, round gravels to the substrate as necessary. Plant along the edges of pockets mimicking the existing pattern.

In the nearshore area directly north of the boat ramp, maintain the existing riparian corridor, remove and replace invasive species (yellow iris, purple loosestrife), and remove concrete rubble and armoring to replace with dense planting of willows and

other riparian shrubs at the toe of the bank. Maintain the viewpoint to the south towards Mt. Rainier by limiting the northward extent of new vegetation in this area. Create series of pocket beaches with gently sloping shoreline, appropriate-sized gravels, and edge planting extending northwards from the boat ramp to the bathroom structure to tie in with restored pocket beaches north of the bathroom structure. As part of the improvements to habitat, retrofit the existing boat docks with more fish-friendly open metal decking to allow light beneath the structures and reduce habitat for salmonid predators.

In the nearshore area north of the swimming beach, continue the pattern of enhanced pocket beaches with larger patches of native riparian vegetation to replace existing non-natives and to create pockets of vegetation in large open areas. Remove rubble. Combine nearshore restoration and bank planting with upland, non-native shrub thicket conversion, between the water's edge and the promenade. Management of these areas should focus more on improving habitat quality than on care of more intensive human use swimming areas and mowed grasslands to the south. Revegetation should include more trees in larger groves, building on and enhancing the existing pattern. Pocket beaches here are still meant to offer secluded access and water views for people as they currently do.

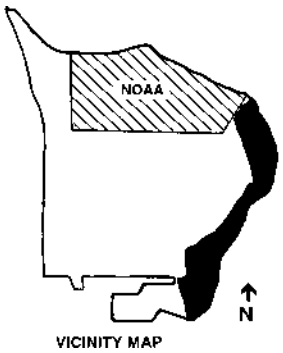
5.1.7 Wetland Management Area

The Wetland MA in this Zone is associated with a swale on the north side of the boat ramp. The designation of the area as wetland was made on the basis of vegetation – regulatory determination of wetland presence was not conducted and no wetland delineation was done. This MA is less than 100' in width for its entire length stretching east-west across the Zone from the shoreline road to the boat ramp. No work should be done in this MA without consultation with a wetland ecologist or biologist to develop a specific invasive control, replanting, and monitoring plan. Management should focus on removal of invasives and replacement with appropriate wetland and riparian species, and increasing native species diversity and structural complexity of the plant community. Both purple loosestrife and yellow iris are present here in limited areas, and should be a priority for control and removal. The practices outlined below assume professional assistance, therefore they are not as specific as for other MAs.

Management and Maintenance Annual Calendar
Shoreline Zone – Wetland Management Area

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

▢ Indicates range of time to perform action as needed
• Indicates specific time to perform action



3 YR. ESTABLISHMENT CARE

This care will be needed for any newly installed plantings in the buffer and possibly within the wetland as well.

PLANTING

Planting should only be done with a commitment for 3 year establishment care. Species selection should reflect microclimate and hydrologic conditions at each planting site, but should be Puget lowland native species typical of wetlands subject to severe periodicity and prolonged drought.

PRUNING

Pruning should be limited to removal of limbs that pose a hazard to human infrastructure or public safety, otherwise dead limbs should be allowed (or encouraged) to fall as woody debris. Misshapen or hazardous limbs may not be critical issues in wetland areas where no maintained trails traverse. Best professional judgment should prevail for limb or tree removal, keeping in mind habitat enhancement priorities as well as public health and safety.

REMOVING PLANTS

Other than invasives, removals should be performed only in the case of hazard trees, or diseased plant material that needs to be replaced. When possible, removals should be done between August and March to avoid potential disruption of nests. Woody debris resulting from plant removals that does not sucker or sprout from cuttings or branches can be left or placed as wildlife habitat such as brush piles, LWD, snags, or stumps. Wood from suckering species such as Lombardy and white poplar, that can not be used for habitat features until completely dead, should be stored off the ground until such time (2 years) that it is no longer viable.

WEEDING AND INVASIVE CONTROL

Weedy and invasive species most likely to be problematic in this MA include: Himalayan blackberry, non-native poplar, yellow iris, purple loosestrife, and reed canarygrass. Woody debris resulting from invasive control that does not sucker or sprout from cuttings or branches can be left or placed as wildlife habitat such as brush piles, LWD, snags, or stumps. Wood from suckering species such as Lombardy and white poplar, that can not be used for habitat features until completely dead, should be stored off the ground until such time (2 years) that it is no longer viable. Weeding and removal of shrub and herbaceous species should take place during the growing season with as-needed frequency but at least monthly in the first year after installation.

5.2 Promontory Point Zone

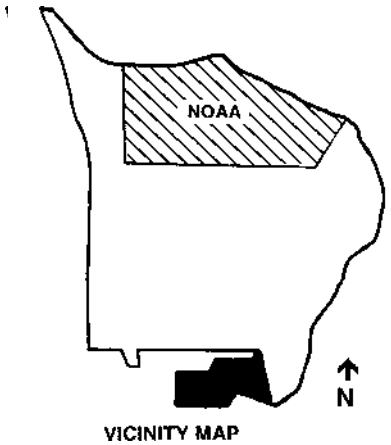
5.2.1 Upland Meadow Management Area

The Upland Meadow MA consists of a northwest, southwest, and northeast meadow. The northwest meadow currently has the most intact meadow habitat and should be a high priority to maintain. The southwest meadow is currently in the process of being established and should be used to evaluate methods to inform future meadow establishment both in the Promontory Point Zone as well as throughout the Park. The northwest meadow in Kingfisher Basin is in a particularly impacted part of the Zone. The eastern portion of this meadow includes the Education Pavilion and Butterfly Garden, and the main public entrance to this Zone.

Management and Maintenance Annual Calendar
Promontory Point Zone – Upland Meadow Management Area

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Management and Maintenance Practices												
Establishing Meadow			▒	▒	▒	▒	▒	▒	▒	▒		
Maintaining Meadow									•			
Planting												
Trees		▒	▒							▒	▒	▒
Shrubs		▒	▒							▒	▒	▒
Removing Plants	•	•						•	•	•	•	•
Amending Soils							▒	▒	▒			
Weeding and Invasive Control												
Trees						▒	▒	▒	▒			
Shrubs					▒	▒	▒	▒	▒			
Herbs				▒	▒	▒	▒	▒				

▒ Indicates range of time to perform action as needed
• Indicates specific time to perform action



VICINITY MAP

Establishing Meadow

Continue meadow establishment in the southwest meadow and evaluate feasibility for the northeast meadow in Kingfisher Basin. The non-native shrub thicket in the northwest meadow can be replaced with native shrubs and/or trees, or converted to meadow. Some limited meadow areas can be established in cleared thicket areas that are adjacent to existing upland meadows. This will be the most labor-intensive and difficult plant community to establish in these areas due to the level of invasive control that will be needed. For these reasons, and because of the prevalence of this habitat type at the Park currently, establishing more meadow may not be the most desirable choice for both ecological and economic reasons. Establishment would include seeding, weeding, mowing, and possibly soil amending.

Maintaining Meadow

Upland meadows are to be actively managed to prevent further colonization by native woody plants and invasion by non-native species. Maintenance actions will consist of a September mowing every other year or every third year depending on the presence and rate of re-growth/reinvasion by woody species which would be mostly Himalayan blackberry and Scot's broom, as well as non-native poplar species. Some regular hand-weeding to control invasives may also be needed.

Planting

Removal of non-native shrub thickets may result in planned conversion to a forest or shrub community in meadow interiors or along forest-meadow interface.

Plant Removal

Removals other than invasives are intended to be performed only in the case of hazard trees, or diseased plant material that needs to be replaced. When possible, removals should be done between August and March to avoid potential disruption of nests. Woody debris resulting from plant removals that does not sucker or sprout from cuttings or branches can be left or placed as wildlife habitat such as brush piles, LWD, snags, or stumps. Wood from suckering species such as Lombardy and white poplar, that can not be used for habitat features until completely dead, should be stored off the ground until such time (2 years) that it is no longer viable.

Amending Soils

Soil amendments may be necessary in future meadow planting areas such as the northeast meadow in Kingfisher Basin depending on soil quality and lessons learned from southwest meadow establishment project currently underway. Amending should only be done in conjunction with intended planting.

Weeding and Invasive Control

Hand-weeding to supplement weed suppression by mowing may be needed to control invasives and other woody species. All woody species (native or non-native) are undesirable if upland meadows are to be maintained at that successional stage, and weedy herbaceous species should also be controlled. Weeding should be timed so that weeds are removed before they attain size and before flowering occurs. Woody

debris resulting from plant removals that does not sucker or sprout from cuttings or branches can be left or placed as wildlife habitat such as brush piles, LWD, snags, or stumps. Wood from suckering species such as Lombardy and white poplar, that can not be used for habitat features until completely dead, should be stored off the ground until such time (2 years) that it is no longer viable.

Weeding and removal of shrub and herbaceous species should take place during the growing season with as-needed frequency but at least monthly in the first year for newly planted areas. Weedy and invasive species most likely to be problematic in this MA include Himalayan blackberry, Scot's broom, hawthorn, non-native poplar species, bindweed, and Canada thistle.

5.2.2 Upland Forest Management Area

The Upland Forest MA covers a large portion of the Zone and consists of upland forested ridges and slopes radiating off a main spine running north-south down the middle of the Zone. This MA contains more than half of the total upland forest area in the Park east of Sportsfield Drive. The occurrence of and coverage by invasive species in the forested areas is highly variable ranging from heavy infestations to much more sparse or patchy coverage. Management of the forest should focus on preserving and enhancing the following:

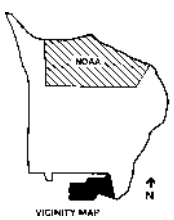
- interior areas of mild infestation where invasive control and eradication is more easily accomplished and intact plant communities can remain so by establishing and maintaining an 'invasive front';
- areas which are known to be prime habitat areas or are in an important landscape setting from a habitat perspective; and
- areas that have already been the focus of invasive removal and replanting efforts.

Evaluating relative importance in a landscape setting might include considerations for connectivity between habitats, location and continuity of wildlife corridors, ecotones (interface of two different types of habitat), and buffers. Lower priority management efforts should go towards habitat improvement (invasive control and replacement with natives) in severely infested areas that will require the greatest level of initial effort and follow-up care.

Management and Maintenance Annual Calendar
Promontory Point Zone – Upland Forest Management Area

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

▒ Indicates range of time to perform action as needed
• Indicates specific time to perform action



3 YR. ESTABLISHMENT CARE

This care will be needed for any newly installed woody plantings that replace non-native trees and shrubs.

PLANTING

Planting should only be done with a commitment for 3 yr. establishment care. Species selection should reflect microclimate conditions at each planting site, but should be Puget lowland native species typical of an upland forest.

PRUNING

Pruning should be limited to removal of limbs that pose a hazard to human infrastructure or public safety, otherwise dead limbs should be allowed (or encouraged) to fall to the forest floor as woody debris. Misshapen or hazardous limbs may not be critical issues in the interior of woodlands or forests where no maintained trails traverse. Best professional judgment should prevail for limb or tree removal, keeping in mind habitat enhancement priorities as well as public health and safety.

REMOVING PLANTS

Other than invasives, removals should be performed only in the case of hazard trees, or of diseased plant material that needs to be replaced. When possible, removals should be done between August and March to avoid potential disruption of nests. If tree does not pose a threat to public safety, girdling or trimming as needed to leave standing dead wood for snag habitat is preferable to complete removal. Woody debris resulting from plant removals that does not sucker or sprout from cuttings or branches can be left or placed as wildlife habitat such as brush piles, LWD, snags, or stumps. Wood from suckering species such as Lombardy and white poplar, that can not be used for habitat features until completely dead, should be stored off the ground until such time (2 years) that it is no longer viable.

WEEDING AND INVASIVE CONTROL

Weedy and invasive species most likely to be problematic in this MA include: Himalayan blackberry, English ivy, laurel, clematis, bindweed, hawthorn, non-native poplar, and Scot's broom. Woody debris resulting from invasive control that does not sucker or sprout from cuttings or branches can be left or placed as wildlife habitat such as brush piles, LWD, snags, or stumps. Wood from suckering species such as Lombardy and white poplar, that can not be used for habitat features until completely dead, should be stored off the ground until such time (2 years) that it is no longer viable. Weeding and removal of shrub and herbaceous species should take place during the growing season with as-needed frequency but at least monthly for the first year in newly planted areas.

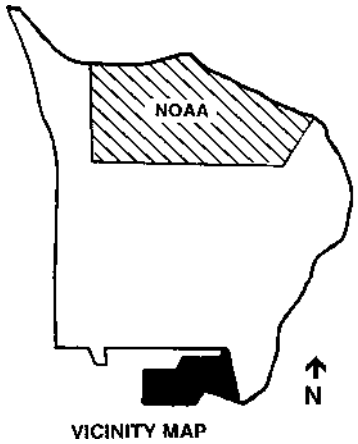
5.2.3 Non-native Shrub Management Area

The Non-native Shrub MA is patchy throughout the Zone, but is found mainly in the northwest meadow, on the west-facing slope east of the USGS laboratory, and along the north side of the perimeter trail along the south boundary of the Zone. These thickets can be removed and converted to native communities as follows: convert thicket in NW meadow to native shrub or limited areas of meadow, convert thicket near USGS to native shrubs and trees, convert thicket along perimeter trail to native shrubs.

Management and Maintenance Annual Calendar
Promontory Point Zone – Non-native Shrub Management Area

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Management And Maintenance Practices												
3 Yr. Establishment Care	▢	▢	▢	▢	▢	▢	▢	▢	•	•	•	•	•	•	▢	▢	▢	▢	▢	▢
Establishing Meadow				▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢				
Maintaining Meadow														•						
Planting																				
Trees			▢	▢	▢	▢										▢	▢	▢	▢	
Shrubs			▢	▢	▢	▢										▢	▢	▢	▢	
Herbs					▢	▢	▢	▢	▢	▢					▢	▢				
Amending Soils											▢	▢	▢	▢	▢	▢				
Weeding and Invasive Control																				
Trees										▢	▢	▢	▢	▢	▢					
Shrubs								▢	▢	▢	▢	▢	▢	▢	▢					
Herbs							▢	▢	▢	▢	▢	▢	▢	▢						

▢ Indicates range of time to perform action as needed
• Indicates specific time to perform action



3 YR. ESTABLISHMENT CARE

This care will be needed for any newly installed woody plantings that replace non-native trees and shrubs.

ESTABLISHING MEADOW

Some limited meadow areas can be established in cleared thicket areas that are adjacent to existing upland meadows. This will be the most labor-intensive and difficult plant community to establish in these areas due to the level of invasive control that will be needed. For these reasons, and because of the prevalence of this habitat type at the Park currently, establishing more meadow may not be the most desirable choice for both ecological and economic reasons. Establishment would include seeding, weeding, mowing, and possibly soil amending.

MAINTAINING MEADOW

Any newly established meadows created as conversion from non-native shrub thicket must be actively managed to prevent colonization by woody plants and invasion by weedy herbaceous species. Annual mowing will be necessary to adequately control re-sprouting shrubs until meadow is established. After that point mowing frequency can be decreased to one mowing every other year or every third year depending on the presence and rate of re-growth/reinvasion by woody species. Some regular hand-weeding to control invasives may also be needed.

PLANTING

Planting should proceed after clearing of invasives and any soil amending and/or sheet mulching is completed

AMENDING SOILS

Soil amending throughout planting area may be necessary or desirable after non-natives have been cleared and prior to planting.

WEEDING AND INVASIVE CONTROL

Non-native shrub thickets consist of Himalayan blackberry and Scot's broom. Control and removal strategies for these two species are very similar. Thickets should be replanted, converting them to native plant communities incrementally as specified in Section 6.11.

5.3 Forest Remnant Zone

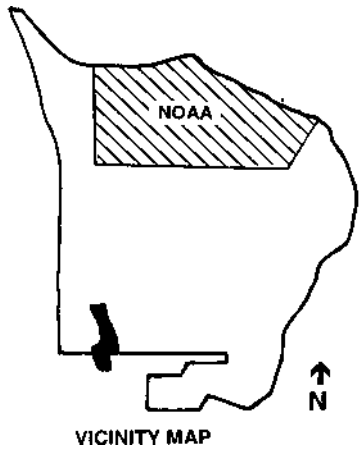
5.3.1 South Woodland Management Area

Treatment types for this area are directed toward preserving existing, high caliber vegetation, healing construction-related damage, eliminating invasives, and enhancing quality of habitat and plant community long term.

Management and Maintenance Annual Calendar
Forest Remnant Zone – South Woodland Management Area

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

▢ Indicates range of time to perform action as needed
• Indicates specific time to perform action



3 YR. ESTABLISHMENT CARE

All new plantings require follow-up care for three years to insure their healthy survival.

MULCHING

Areas cleared of invasives and/or replanted must be well-mulched to suppress re-growth of unwanted plants and to conserve soil moisture.

PLANTING

Trees

Although canopy is mostly closed and in good condition, additions are needed to correct damage related to surrounding construction, and secondarily to replenish and diversify the stand. Several perimeter trees, particularly Western red cedars along the west edge, have visible as well as potential root zone damage. Replant in kind, in a ratio of at least 3:1, for any declining or removed tree. In addition, the rough cat track bisecting the MA should be replanted after completing construction debris cleanup and soil decompaction. Species should echo surrounding mix, and include madrona and Douglas fir to take advantage of the created light gap. Canopy and understory tree additions elsewhere in the grove should follow a detailed walk-through evaluation, marking specific need and opportunity sites. Species selection should reinforce existing native taxa, with a balance of evergreen and deciduous trees.

Shrubs

Relative to many urban forest fragments, this area possesses much intact native undergrowth. Understory plantings are needed mostly to reclaim areas where natives have been lost to invasive incursion or physical destruction. A full complement of appropriate species exists on-site, to extend and match wherever replanting is slated: sword fern, salal, Oregon grape, thimbleberry, trailing blackberry, bracken, fireweed, ocean spray, Indian plum, hazel. Ongoing trampling and wildlife disturbance pressure on this woodland will be high, given adjacent, intensive residential use. Sturdy protective fencing – at a minimum – needs to be installed concurrent with planting, to safeguard understory establishment. Permanent full perimeter fencing, while desirable from a resource protection standpoint, may not be feasible from a political or budgetary standpoint. Alternate strategies for controlling access and preventing habitat fragmentation need to be developed on a proactive basis: formal trail construction, brushy, thorny perimeter plantings, signage, public education, etc.

Herbs

As a complement to woody understory plantings, herbaceous natives may be added where and when opportunities present themselves. Such additions constitute enrichment more than necessity in the continuum of forest restoration need, trees and shrubs being more urgently required.

Pruning

Pruning should be limited to removal of limbs that pose a hazard to human infrastructure or public safety, otherwise dead limbs should be allowed (or encouraged) to fall to the forest floor as woody debris. Misshapen or hazardous limbs may not be critical issues in the interior of woodlands or forests where no maintained trails traverse. Best professional judgment should prevail for limb or tree removal, keeping in mind habitat enhancement priorities as well as public health and safety.

Removing Plants

Plant removals other than invasives are limited to trees determined to be hazardous, with high target potential. Perimeter trees adjacent to current or recent construction sites should be evaluated at least annually for hazard condition and appropriate removals promptly undertaken. When possible, removals should be done between August and March to avoid potential disruption of nests. Downed wood may prove useful to help discourage physical access to interior of MA.

Amending Soils

Soil amendment may be needed where heavy equipment has scarred the ground. Where subsoils poor in nutrients and organic matter are exposed, deep tilling to replenish both should precede revegetation planting. Extremely compacted disturbed soils should be mechanically ripped to open them up before amending. Deep mulching after planting will be especially important as an adjunct to advance soil preparation in such areas as the cat track.

Weeding and Invasive Control

Shrubs

Although much of this MA is an intact native plant community, perimeter invasive encroachments need to be eliminated to protect against loss of high quality interior vegetation. Priority should be given to removing blackberry and ivy infestations, principally along the northeast edge of the woodland area. A secondary need is to remove, or girdle, herbicide treat and leave standing, upright shrubby invasives (laurel, holly, hawthorn, cotoneaster, viburnum) to provide woody habitat debris. Thereafter, annual monitoring and spot removals should keep the area nearly invasive-free, especially if coupled with proactive native planting of all disturbed ground.

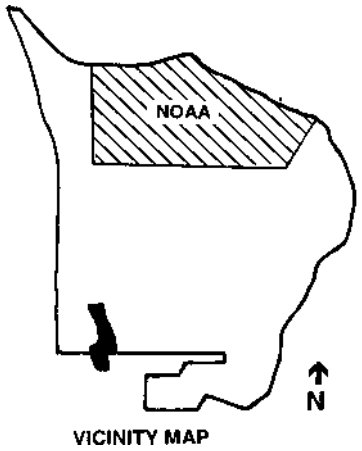
5.3.2 North Woodland Management Area

Treatment types for this area focus on remedying major, diverse invasives problems, including exotic tree removal, creating a sustainable native canopy, re-establishing a native understory plant community, and protecting the stand from fragmentation.

Management and Maintenance Annual Calendar
Forest Remnant Zone – North Woodland Management Area

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

▢ Indicates range of time to perform action as needed
• Indicates specific time to perform action



3 YR. ESTABLISHMENT CARE

All new plantings require followup care for three years to insure their healthy survival.

MULCHING

Areas cleared of invasives and/or replanted must be well-mulched to suppress regrowth of unwanted plants and to conserve soil moisture.

PLANTING

Trees

In contrast to the South Woodland, this MA needs significant canopy replenishment:

1. Offset loss of numerous mature alders which soon will enter natural decline (in addition to few, very large bigleaf maples), by underplanting with hazel, vine maple and western red cedar, which already exists in the stand but only as two mature specimens. Conifers were likely once plentiful in this woodland, before disturbance.
2. Recreate canopy once invasive trees are removed, notably at the northeast end of the stand. Here the opportunity exists to plant madrona, grand and Douglas fir as well as well as cedar, because large canopy gaps will be created. Complementary deciduous species plantings are also recommended, especially low-growing taxa for understory and peripheral locations. The palette should reflect natives already present at Sand Point Magnuson Park, but not limited to those found in this MA itself.
3. Insure canopy continuity long-term, by supplementing existing tree population wherever opportunities to plant exist - or develop. Spot openings that present themselves should be exploited for tree replenishment, as scattered short-lived or invasive individuals come out, or blowdowns occur. Long-lived native conifers should be the main taxa planted.
4. Remediate severe loss of native vegetation due to invasive smothering, systematic planting of additional, shade-tolerant understory tree species should be undertaken.

Shrubs

Because invasive shrubs and vines have degraded such large areas of this woodland, understory replenishment constitutes a major aspect of forest restoration. After invasive control is underway, both low and mid-height shrub layers should be re-established. Islands of intensive planting using suckering species may work well, but a variety of approaches may be attempted. Where slope is very steep, plant through erosion control fabric and mulch bare ground heavily. Intact understory in the adjacent South Woodland MA provides direction for an appropriate indigenous palette, although additional species may also thrive. Competitive success is important in this MA.

Herbs

As a complement to woody understory plantings, herbaceous natives may be added where and when opportunities present themselves. Such additions constitute enrichment more than necessity in the continuum of forest restoration need, trees and shrubs being much more urgently required.

PRUNING

Pruning should be limited to removal of limbs that pose a hazard to human infrastructure or public safety, otherwise dead limbs should be allowed (or encouraged) to fall to the forest floor as woody debris. Misshapen or hazardous limbs may not be critical issues in the interior of woodlands or forests where no maintained trails traverse. Best professional judgment should prevail for limb or tree removal, keeping in mind habitat enhancement priorities as well as public health and safety.

REMOVING PLANTS

Plant removals other than invasives are limited to trees determined to be hazardous, with high target potential. When possible, removals should be done between August and March to avoid potential disruption of nests. Unless formal trails are constructed through this woodland in the future, only perimeter trees adjacent to 65th and the Officer's Row houses will require annual inspection for hazard. Any downed wood resulting from hazard tree abatement should be retained on site to discourage foot traffic and enhance wildlife habitat.

WEEDING AND INVASIVE CONTROL

Trees

An unusually large number of reproducing non-native trees is present in the North Woodland area, the core grove apparently intentionally-planted decades ago near the MA's north end. These include London plane, Norway maple, horse chestnut, Lombardy poplar and European white birch, ranging in size from 9 - 24" diameter. Among offspring growing in their close proximity, some by now are sizable trees in their own right. In addition, scattered self-sown apple, cherry, hawthorn and European mountain ash trees occupy the canopy, many mature. These latter species, all randomly reseeded by animal transport into wild areas, are less troublesome than the first group which successfully reproduce in their own shade to the eventual exclusion of all other vegetation.

Non-native trees should be eliminated from this MA, with varying degrees of urgency. Although the absolute numbers are small, the percent of total canopy is significant. Removals therefore should be phased, and coordinated with major tree replanting. Taking care of the worst first, Norway maple and horse chestnut are the top priority, followed closely by London plane and Lombardy poplar, which reproduces aggressively vegetatively, as well as by seed. The second group of non-indigenous trees ultimately should be excluded from this native vestige forest as well, by a combination of active removal and attrition. Young

progeny of all the above species should be sought out annually and quickly uprooted. The four Sawara cypress trees can be eliminated by attrition over time.

Shrubs

Both perimeter and interior invasive plant encroachments need to be eliminated, to protect both trees and remaining, intact native understory vegetation. Priority should be given to removing vine infestations, notably ivy engulfing trees in the south half of the area. Large-scale blackberry eradication is also needed, again principally in the south half of the MA, and along the north edge. A secondary need is to remove, or girdle, herbicide treat and leave standing, upright shrubby invasives (laurel, holly, hawthorn) to provide woody debris for wildlife.

Herbs

Morning glory is abundant in the upper portion of this MA and should be actively controlled, with the goal of elimination.

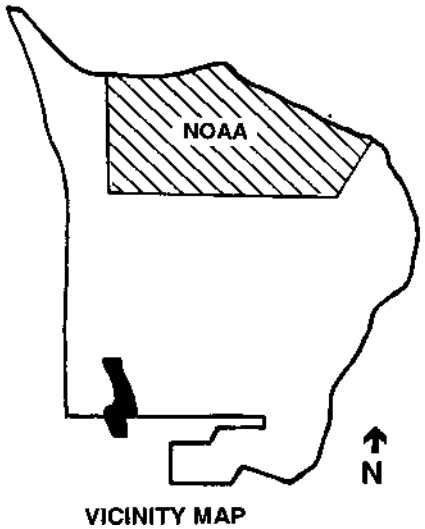
5.3.3 Open Forest Margin Management Area

Vegetation treatments in this area are directed toward expanding the adjacent, remnant woodland, and preventing invasive woody plants from further establishing.

Management and Maintenance Annual Calendar
Forest Remnant Zone – Open Forest Margin Management Area

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

▒ Indicates range of time to perform action as needed
• Indicates specific time to perform action



VICINITY MAP

3 YR. ESTABLISHMENT CARE

All new plantings require follow-up care for three years to insure their healthy survival.

MULCHING

Areas cleared of invasives and / or replanted must be well mulched to suppress re-growth of unwanted plants and to conserve soil moisture.

PLANTING

Develop a restoration planting plan for trees, shrubs and herbaceous natives before commencing planting, whether phased or by means of a single project. This area would lend itself particularly well to a large volunteer planting effort.

Trees

Plant trees throughout the area to expand adjacent forest, intermixing coniferous and deciduous species: Douglas fir, hazel and bigleaf maple on driest land, blending into alder, Sitka spruce, vine maple and cedar in lower sites and wetland pockets.

Shrubs

Plant understory and edge species throughout the area, with emphasis on aesthetics and wildlife value. In wet areas, add redtwig dogwood, ninebark, red elderberry and other moisture-loving native shrubs with ornamental character. Include at least half evergreen species.

Herbs

Some robust herbaceous species should be included in restoration plantings: additional sedges, plus, for example, lady fern, low bleeding heart.

WEEDING AND INVASIVE CONTROL

Trees

Non-native Lombardy poplars, while few, should be eliminated along with their suckers. Herbicide application to freshly-cut stems probably will be needed to achieve complete root kill and prevent re-sprouts.

Shrubs

A sparse Scot's broom population should be eliminated as a top priority, to prevent substantial colonies from taking hold.

Herbs

Existing grasses and forbs presumably are mostly exotic in this heavily-disturbed environment. To re-establish forest vegetation, meadow plants should be smothered or tilled under with heavy mulching prior to reforestation planting. Maintain mulch cover should interval between clearing and planting be protracted.

5.4 Historic District Zone

Treatment for all Historic District management areas shares two common elements which have direct bearing on vegetation management: first, a comprehensive tree inventory and its analysis, and second, 1998 Historic Properties Reuse and Preservation (HPRP) Plan jurisdiction. All landscape maintenance, design and alteration work undertaken in this Zone needs to make active use of both. Treatment recommendations given for individual MA's reflect these inventory findings and HPRP requirements.

Vegetation management plan users also should acquaint themselves with both Appendix B – Sand Point Historic District Documents and Appendix C - Sand Point 2001 Tree Inventory. Among other things, Appendix B lists, maps and illustrates vegetation-related HPRP "Historic Landscape Features and View Corridors to be Preserved and Maintained," and provides lists of historic planting plans and plant material for future use. Appendix C identifies Priority Management Trees, with recommended action(s) linked to individual trees, sorted according to MA. This list adds implementation specifics to more generalized treatment text provided below. The complete, baseline tree inventory is available electronically; and its use as an ongoing vegetation management tool is strongly encouraged.

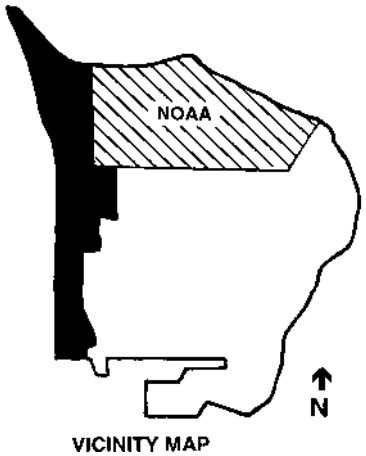
5.4.1 North Shore Recreation Management Area

Treatment in this area focuses on containing invasives until redevelopment occurs, preserving native plantings, and laying out appropriate future actions to enhance shore and upland habitats.

Management and Maintenance Annual Calendar
Historic District Zone – North Shore Recreation Management Area

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Management and Maintenance Practices												
3 Yr. Establishment Care	▒	▒	▒	▒	▒	▒	•	•	•	•	▒	▒
Maintaining Meadow									•			
Mulching	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Planting												
Trees		▒	▒	▒						▒	▒	▒
Shrubs		▒	▒	▒						▒	▒	▒
Herbs			▒	▒					▒	▒		
Live Stakes	▒	▒	▒								▒	▒
Pruning	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Removing Plants	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Amending Soils							▒	▒	▒			
Weeding and Invasive Control												
Trees						▒	▒	▒	▒			
Shrubs					▒	▒	▒	▒	▒			
Herbs					▒	▒	▒	▒				

▒ Indicates range of time to perform action as needed
• Indicates specific time to perform action



VICINITY MAP

3 YR. ESTABLISHMENT CARE

All new plantings require follow-up care for three years to insure their healthy survival.

MAINTAINING MEADOW

Existing meadow-like areas should be maintained to prevent being overtaken by woody vegetation.

MULCHING

Areas cleared of invasives and/or replanted must be well mulched to suppress re-growth of unwanted plants and to conserve soil moisture.

PLANTING

Develop restoration planting plans for trees, shrubs and herbaceous natives before commencing any more than spot planting, whether to be implemented incrementally or as a single project. Shoreline restoration plantings are to be consistent with treatments and palette outlined under Nearshore Management Area within Shoreline Zone, elsewhere in this document. Upland plantings are to remain largely unaltered until major development occurs.

Trees

Near-term tree planting will be limited to transplanting young natives, if culturally appropriate sites well clear of anticipated site alterations can be identified and prepared. Species include Oregon ash and cascara, the latter in far better condition than the former. Given the effort involved, it may be more sensible to radically thin this overplanted upland stand, culling poor stems and removing many trees to other zones or parks. Long-term, native tree planting in scattered or grove configurations should occur. This site could provide excellent Garry oak or madrona habitat, in addition to limited native species already present (Douglas fir, cedar, alder).

Trees removed from formal settings adjacent to Building 11 and NE NOAA Drive for reasons of decline, hazard or invasiveness should be replaced with uniform rows of trees from similar but less problematic taxa. When replacing blireiana flowering plums along Building 11, respect original character as documented in archived 1942 planting plan. Appropriate replacement species include: *Prunus ceracifera 'Mt. St. Helens', Amelanchier 'Autumn Brilliance', Prunus yedoensis 'Akebono'*.

Potential Lombardy poplar substitutes include columnar flowering and coniferous trees as well as deciduous shade trees*: Quercus robur 'Fastigiata', Fagus sylvatica 'Dawyck', Ginkgo biloba 'Princeton Sentry', Pyrus calleryana 'Capital', Prunus serrulata 'Amanogawa'* (smaller stature tree), *Calocedrus descurrens, Picea omorika.* Final selection should be made with consideration of overall effect parkwide of Lombardy row replacements, balancing visual continuity with species diversity.

Shrubs

New understory plantings are to be deferred until such time as site development occurs. Palette should be predominantly native, entirely so along the water's edge, and selected to match particularities of aspect, moisture and soil conditions. Understory placement and character should balance human use and aesthetics with habitat requirements.

Herbs

Interim seeding with native meadow mix may accompany clearing of invasives and reclamation of bare ground or unused pavement areas.

REMOVING PLANTS

Flowering blireiana plum trees, the majority identified as topped and in mediocre condition, should be monitored and removed as further decline or hazard dictates. For the sake of aesthetic quality and historic character, this row should be cut down and replanted simultaneously, not piecemeal as individual trees fail.

Inventory results indicate that 77% of trees possess defects and 21% have been topped. Detailed hazard evaluation should be undertaken, and may well result in additional removals. Since general tree health is quite high (80% = good), removals anticipated due to decline should be few.

WEEDING AND INVASIVE CONTROL

Trees

Remove any Lombardy poplar trees and suckers, also Norway maple trees after confirming their correct species identity (vs. native bigleaf maple).

Shrubs

Spread of blackberry thickets should be controlled near-term by periodic mowing, if not completely eradicated. Since development will result in new grading disturbance, full blackberry removal is perhaps best integrated with implementation of site improvements. Few other woody invasives are present.

Herbs

Rough weedy areas ultimately should be converted to native meadow or shrubbery, but eradication of herbaceous weeds at present is impractical. Mow as flower heads appear, to limit viable seed production, monitoring annually for presence of noxious weeds. If found, these will require immediate and complete removal.

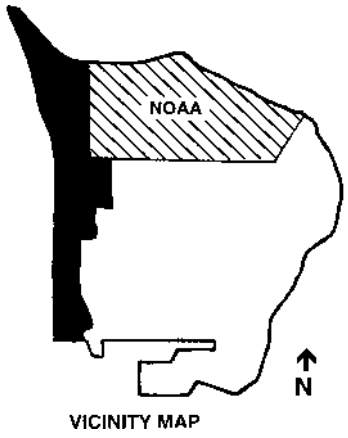
5.4.2 Aircraft Industrial Management Area

Treatment types in this area focus on reclaiming neglected plant beds and slopes, maintaining existing turf and shrubs, adding trees to complement but not obscure buildings and the view axis, and adding plants to humanize scale and reinstate historic planting plans.

Management and Maintenance Annual Calendar
Historic District Zone – Aircraft Industrial Management Area

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Management And Maintenance Practices												
3 Yr. Establishment Care	▒	▒	▒	▒	▒	▒	•	•	•	▒	▒	▒
Mulching	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Planting												
Trees		▒	▒							▒	▒	▒
Shrubs		▒	▒							▒	▒	▒
Herbs			▒	▒					▒	▒		
Pruning	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Removing Plants	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Amending Soils			▒	▒	▒	▒	▒	▒	▒			
Taking Care of Turf	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Watering							▒	•	•	•	▒	
Weeding and Invasive Control												
Trees						▒	▒	▒	▒			
Shrubs					▒	▒	▒	▒	▒			
Herbs					▒	▒	▒	▒				

▒ Indicates range of time to perform action as needed
• Indicates specific time to perform action



3 YR. ESTABLISHMENT CARE

All new plantings require follow-up care for three years to insure their healthy survival.

MULCHING

Beds, trees and areas cleared of invasives must be well mulched to suppress unwanted plants, improve tilth and conserve soil moisture.

PLANTING

This MA is as opposite a "natural area" as exists at Sand Point, and while natives can be incorporated into new plantings, a naturalistic style is largely inappropriate. Likewise, contemporary ornamental embellishment is to be avoided, relying instead on documented historic planting precedent.

Trees

Identify possible gaps in young red maples planted along 63rd Avenue NE and infill with trees of matching cultivar. Inventory results indicate that these trees are quite small (one inch trunk diameter), and probably not well-established. Although as a group given a "good" health rating, their low average "live crown ratio" (around 60%) suggests serious transplant shock. Red maples are native to moist woodland habitats in the Eastern and Central U.S. Street planting of this species without attentive establishment watering and mulching is thus inherently stressful, particularly when few roots have yet developed.

Should significant numbers of the red maples along 63rd NE exhibit further dieback – or death – appropriate recourse would be to replace them with a uniform planting of smaller, narrower, tougher trees, as recommended in the 1997 Design Guidelines. Although narrow forms of red maple exist, the species already is heavily used in this half of the Park, making other species preferable for purposes of diversity as well. Possible choices might include Sentry ginkgo, Tschonoskii crabapple or fastigiate Amanogawa cherry. The designated vista north toward the Lake should be framed, not obscured, by the corridor's street trees.

Additional fruiting apple trees should be planted in the general vicinity of existing heritage trees west of Building 5. Selections should meet modern standards for quality and disease resistance, with heirloom status a secondary consideration. Other opportunities for tree planting include the currently open slope between Buildings 5 and 67, where orchard, or groves of shore pine, Garry oak or Madrona might prosper in meadow.

Small areas between or within parking lots and along drives present other possibilities for softening plantings that do not obscure the building facades. Simple palettes, moderate stature, and generally formal spacing are recommended. Water-demanding species should be excluded.

Shrubs

Shrub additions include two potential types: historic landscape restoration plantings where original plans are to be reinstated, and reclamation plantings for areas cleared of weeds or blackberry. The former should be undertaken on a project basis in association with individual buildings, and carefully reviewed for authenticity of style and palette. The latter should immediately follow invasive plant eradication, favoring historic vestige shrub species and tough evergreen natives like mahonia, or sword fern and salal where sufficiently shady. For steep outlying slopes, thicket-forming natives like rose, redtwig and snowberry may prove useful.

Herbs

Few herbaceous plantings are envisioned for this area, with the possible exception of seasonal color immediately adjacent to major building entries to humanize their appearance without indulging in excessive "beautification" inconsistent with the area's industrial character.

PRUNING

Radically prune extremely overgrown ornamental shrubs in beds atop railroad siding retaining wall, to restore their normal landscape size. Also renovate shrubs remaining in historic foundation beds along 63rd Avenue NE, unless species characteristics prevent (juniper, false cypress). Initiate maintenance pruning on an ongoing, three year cycle.

Tree pruning should be based on further evaluation of the 47% of MA trees inventoried which exhibit structural defects, past topping, or both. Given that 67% of trees possess potential targets, hazard abatement pruning is an important priority. Fortunately, since many of these trees are still relatively young, corrective and training pruning may still be feasible, with long-term benefits far outweighing this near-term investment.

REMOVING PLANTS

Thin the juvenile alder stand on slope behind Building 5 to a variable spacing of 6-15 ft. apart. Re-thin as needed. Remove overgrown foundation trees and shrubs that cannot be either renovated or appropriately converted to tree form (arborized). Examine recent plantings for historically-inappropriate plant selections, transplanting these elsewhere outside the Historic District while still young.

AMENDING SOILS

If paving is removed and areas planted, advance soil conditioning will be crucial for plant establishment, even survival. Elsewhere, site conditions may reveal areas of fill, subsoil or industrial debris. Obviously, such areas will require thorough amendment before attempting planting. Mulch will provide supplementary conditioning over the longer term.

TAKING CARE OF TURF

No top quality turf exists in this MA, but some moderate, and considerable rough turf exist and must be maintained to DPR standards. Conversion of some lawn to either meadow or low shrubbery is recommended, precluding the front of historic structures where lawn was the traditional landscape treatment.

WATERING

Water turf and ornamentals according to need, conserving water wherever possible without compromising plant health. Few remaining MA shrubs require more than minimal irrigation.

WEEDING AND INVASIVE CONTROL

Trees

Remove Lombardy poplars, holly and English hawthorn from zone. These species can either spread or reseed into nearby natural areas.

Shrubs

Blackberry eradication should be undertaken at the railroad siding retaining wall, as a high priority. Other large patches further north also need to be eliminated.

Herbs

Rough weedy areas ultimately should be converted to native meadow or shrubbery. In the interim, mow as flower heads appear, to limit viable seed production, and monitor annually for noxious weeds. If found, these require immediate and complete removal.

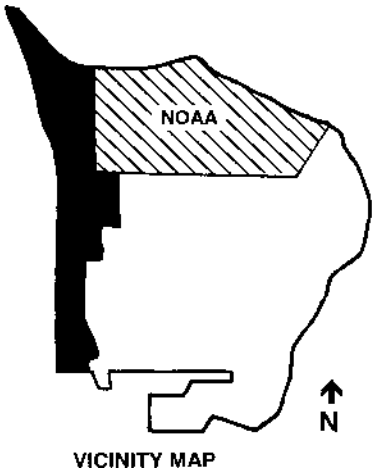
5.4.3 Historic District Core Management Area

Treatments for this area include tree hazard abatement, tree and shrub pruning, turf care, special maintenance and restoration of historic landscape features, and invasive plant removal.

Management and Maintenance Annual Calendar
Historic District Zone – Historic District Core Management Area

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Management and Maintenance Practices												
3 Yr. Establishment Care	▢	▢	▢	▢	▢	▢	▢	•	•	•	•	▢
Mulching	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢
Planting												
Trees			▢	▢	▢					▢	▢	▢
Shrubs			▢	▢	▢	▢				▢	▢	▢
Herbs				▢	▢	▢			▢	▢		
Pruning	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢
Removing Plants	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢
Amending Soils				▢	▢	▢	▢	▢	▢			
Taking Care of Turf	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢
Watering							▢	•	•	•	•	▢
Weeding and Invasive Control												
Trees							▢	▢	▢			
Shrubs						▢	▢	▢	▢			
Herbs						▢	▢	▢				

▢ Indicates range of time to perform action as needed
• Indicates specific time to perform action



3 YR. ESTABLISHMENT CARE

All new plantings require follow-up care for three years to insure their healthy survival.

MULCHING

Planting beds, trees and areas cleared of invasives must be well mulched to help suppress weeds, improve tilth and conserve soil moisture. Annual replenishment is especially important in this area, where the highest caliber of landscape care is both expected and appropriate. Wood chip mulch is appropriate for tree rings, a finer organic mulch for primary planting beds.

PLANTING

New plantings in this area need to conform to both the Design Guidelines Manual and the Sand Point HPRP Plan, whether a proposed installation is major or incidental. SHPO Level C Review (consultation) will be required for replanting involving contributing historic landscape features, which are identified by list, map and photos in Appendix. Sand Point Historic Preservation Coordinator review may not be required in all other cases, but individuals selecting and arranging plants should be thoroughly familiar with – and respectful of - available historic documentation and plant lists (see Appendix). Because this area constitutes the heart of the historic district, plant additions can strengthen traditional character, or if inappropriately matched to this context, undermine it. Significant planting need exists, for both canopy and understory.

Trees

The Historic District tree inventory revealed a significant proportion of trees with structural, siting or disease problems: 72% with defects, 25% topped, 65% with targets, 22% in fair/poor health. Undesirable species - those prone to disease, pest, structural weakness or invasiveness - make up one quarter of the total MA trees, and nearly half that many more pose potential hazards. The net effect of mitigating these problems will be extensive planting site creation over time.

A well-planned replacement program should begin immediately, in coordination with carefully-sequenced removals. Specific priorities should be established jointly by professionals knowledgeable in tree hazard, tree selection, landscape design, and historic preservation, using inventory findings as a springboard. Piecemeal tree planting should be completely curtailed until such comprehensive groundwork is laid.

Obvious candidates for replacement are damaged Deodar cedars and diseased hawthorns, as well as invasive species like hollies and the many conifers growing tight against building walls. Hazardous trees and high-value landscape elements should be accorded top priority. In the latter case, of identified “contributing landscape features,” replacement in kind of removed trees is mandated - or if cultural or life safety prohibitions exist, with as similar a tree as possible.

Although emphasis clearly needs to lie on reinstating character-defining historic tree plantings, additional sites should be identified and filled over time to increase net canopy. Such discretionary plantings must be reviewed for appropriateness of both species and location in relation to overall historic landscape character. Tree selections should reflect taxa historically utilized at Sand Point, per Appendix list; related or improved varieties may be incorporated also. Tree planting should proceed in an orderly manner, according to specific strategies building on these vegetation management guidelines.

In the interest of long-term success, a discretionary tree replacement plan should be developed through collaborative effort amongst a professional arborist, a landscape designer and Park management, with Historic Preservation Coordinator, DPR landscape architect and urban forester and community review. Once in place, this plan will provide context and guidance for special planting opportunities as they inevitably arise, safeguarding quality and longevity of the canopy so key to this MA's character.

Shrubs

The existing understory badly needs renovation and expansion, to bring back its lost historic character. Some let-go plantings can be rejuvenated through pruning and infill with suitable period plant material, referencing archival plans wherever possible. Selected native species may be used ornamentally; while certain traditional taxa may fail to meet modern standards for sustainability and be eliminated. Priority should be given to restoration planting in most highly-visible areas.

The former rose garden south of Building 26S was identified as a "contributing landscape feature" and should be recreated using original plant varieties tempered with considerations for ease of upkeep. This project might appeal to local rosarians as a volunteer undertaking. All recently planted beds need to be evaluated for fidelity to historic design principles and plant palette; inconsistent material should be transplanted elsewhere and plantings modified to achieve more appropriate character.

Herbs

Major building entries may be planted with seasonal color as resources allow, remembering that mixed shrub plantings, not annual bedding-out, was the primary understory landscape treatment of Sand Point's military period.

PRUNING

Significant deferred pruning needs to be taken care of, for size control and invigoration of shrubs, and to improve both safety and appearance of trees. Past plant neglect and maltreatment have created a daunting burden of pruning and other corrective actions. Shrub pruning can be undertaken by qualified gardeners as part of routine grounds maintenance, or in conjunction with restoration projects. Ultimately,

replacement trees and shrubs will require minimal routine pruning if they are carefully selected and attentively established.

Tree work will mostly require services of certified arborists, with scope of work and priorities clearly defined. The 2001 inventory serves as an initial screen for hazard potential and other problems which pruning can help address. Because the area's trees grow where multiple targets inherently exist, hazard mitigation pruning represents a crucial under-addressed need.

Removing Plants

Trees

Hazard and secondarily, disease- and location-related removals need to be carefully planned and phased. Tree removals should be initiated quickly, for reasons of public safety and historic resource stewardship. The tree inventory represents a preliminary screen and starting point for detailed removal and replacement planning. Grouped removals are recommended, but their exact size and sequence remains to be determined in concert with replantings.

Shrubs

Some vestige shrubs have become overgrown, or declined without hope of restoration. These should be identified by a skilled gardener with species-specific knowledge, removed, and in most cases replaced with equivalent material.

Amending Soils

Soils in this MA have become compacted under years of foot traffic. Organic matter has received little or no replenishment over the years since planting occurred. As part of routine maintenance, mulching, aeration and fertilization all will help improve soil quality and thereby, plant vigor. Soil amending should be included as a key component in all landscape renovation projects.

Taking Care of Turf

This area is defined in large part by generous lawns with trees. Prime location and heavy use dictate premium turf care for at least the northerly portion of the area. Utility work has damaged grade, lawn and irrigation system; all conspire against high quality turf and need to be addressed. Long-term, most lawn areas not reclaimed to shrub plantings will need renovation.

Watering

Historic plantings were not designed with regard to minimizing or eliminating irrigation; most plants which remain have self-selected for low water need. Tailor irrigation to demand, whether manually or automatically by computer analysis. Emphasize xeric replacement planting, within the parameters of traditional palette. Irrigate turf according to location and quality to be maintained.

WEEDING AND INVASIVE CONTROL

Trees

Isolated Norway maple, horse chestnut, Lombardy poplar and London plane, and rows of potentially self-seeding hawthorn and holly are present in this area. All of these should be removed from the Park, to reduce natural area degradation by their progeny.

Shrubs

Few invasive shrubs exist in this MA, but scattered blackberry and reproducing cotoneaster should be eliminated.

Herbs

Significant amounts of morning glory (bindweed) encroach in ornamental beds, particularly those recently planted near Buildings 26N and 26S. Although challenging to eradicate, intensive effort can greatly reduce maintenance and improve appearance longer term. Additional weeds also infest area plantings; thorough weeding combined with religiously-maintained mulches should help provide control.

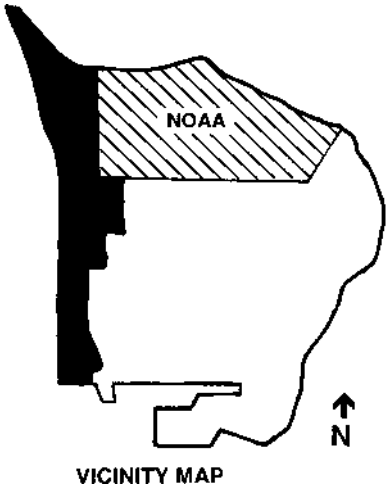
5.4.4 Officer's Row Management Area

Treatments focus on invasives elimination, turf and tree care, and historic landscape preservation and renovation through planning, removal, pruning and replanting activities.

Management and Maintenance Annual Calendar
Historic District Zone – Officer's Row Management Area

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Management and Maintenance Practices												
3 Yr. Establishment Care	▢	▢	▢	▢	▢	▢	•	•	•	▢	▢	▢
Mulching	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢
Planting												
Trees		▢	▢	▢						▢	▢	▢
Shrubs		▢	▢	▢	▢					▢	▢	▢
Herbs			▢	▢					▢	▢		
Pruning	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢
Removing Plants	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢
Amending Soils			▢	▢	▢	▢	▢	▢	▢			
Taking Care of Turf	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢
Watering							▢	•	•	•	▢	
Weeding and Invasive Control												
Trees						▢	▢	▢	▢			
Shrubs					▢	▢	▢	▢	▢			
Herbs					▢	▢	▢	▢				

▢ Indicates range of time to perform action as needed
• Indicates specific time to perform action



VICINITY MAP

3 YR. ESTABLISHMENT CARE

All new plantings require follow-up care for three years to insure their healthy survival.

MULCHING

Beds, trees and areas cleared of invasives must be well-mulched to suppress unwanted plants, improve tilth and conserve soil moisture.

PLANTING

Trees

After confirming species identity, replace Norway maples with non-aggressive alternatives, like hedge or sugar maple. Because of high target potential, bigleaf maple is best avoided. Additional trees throughout the area should be replaced through time, consistent with historic planting plans and precedent. Invasive and problem species removals will yield numerous planting sites over time. New trees should match or exceed numbers removed, with their exact siting to balance historic fidelity with current vegetation composition.

Fewer natives are found in this area than in the adjacent woodland zone; more could be introduced if similar in character to non-native species being removed. For example, a Douglas fir might replace an Atlas cedar, a Western red cedar a Lawson cypress, or a mountain hemlock a Sawara cypress. In peripheral areas adjacent to woodlands, native flowering species could replace declining ornamental plum, cherry, dogwood and hawthorn; Western serviceberry, Douglas hawthorn, and Eddie's White Wonder hybrid dogwood are possible useful taxa. Because Pacific dogwood is plagued by introduced disease, it should be avoided.

Shrubs

Shrub planting is much needed to reinstate the historic foundation landscaping character, an important feature mandated for preservation. Plant selection and placement should follow careful study of original planting plans, with the utmost attempt at fidelity. Palette adjustments to eliminate invasive or disease-prone taxa may be necessary. As a "contributing feature" front bed alterations must receive appropriate level Historic Preservation Coordinator review.

Herbs

Temporary seasonal color plantings may be integrated near building entries, encouraging resident participation. Likewise, the small vegetable garden in rear side yard of Building 332 may be retained and replanted annually; while not historically-appropriate its location is well-screened from streetside view, it fulfills an important programmatic function, and by its nature it is a temporary installation which could be returned readily to lawn.

PRUNING

Many existing shrubs badly need renovation pruning by skilled gardeners, to restore their intended appearance and scale without destroying their natural form.

Over-large plants should be radically renovated, a process to be coupled with extra fertilization, mulching and watering. Because most of these are original plantings, pruning is the treatment much preferred over replacement.

Tree pruning should be performed by a certified arborist according to ranked priority; the 2001 inventory noted at least half a dozen trees that merit hazard assessment, and potentially will require corrective pruning. Trees identified for elimination because they belong to problem species should receive pruning only to keep them safe during the interim, which may be either a brief or a protracted period depending on a tree's contribution to the landscape and the severity of its deficiencies.

REMOVING PLANTS

Trees

Given that three-quarters of trees inventoried in this MA were identified as having structural defects and target potential, and close to 20% are topped, evaluation by a certified arborist for priority removals should be completed promptly. Hazard identification must be paired with timely action, whereas other problems may allow more flexible timing for removal. For example, an atlas cedar - while not a desirable species for replanting – might safely remain in place for thirty years with monitoring.

Shrubs

For the most part, overgrown ornamentals can be reduced to appropriate scale through renovation pruning. An experienced professional gardener should evaluate remnant historic shrubs and direct the selective removal of those that cannot be reclaimed. Hybrid roses also should be evaluated for current condition and disease resistance, and retained only if vigorous and problem-free. Alternate varieties and locations may be indicated, short of total elimination.

AMENDING SOILS

Any foundation bed renovation work should be accompanied by soil reconditioning. In many beds soil appears bare, compacted and congested with roots. Hand methods must be used where historically-planted plants are to remain in place.

TAKING CARE OF TURF

Lawn needs to be maintained in good condition, particularly along 62nd Avenue NE where it contributes to the traditional character of this identified "contributing landscape feature." Lower lawns require a lower standard of care, and where little used and too shaded to thrive, might be evaluated for replacement with noninvasive, evergreen groundcovers.

WATERING

Front lawns are important to Officer's Row both aesthetically and from a residents' use standpoint**;** furnish adequate summer irrigation. Likewise, historic foundation plantings and seasonal color additions will require watering for optimal health and

appearance. Lower visibility landscape beds to rear should emphasize low water-demand species, to the extent historic plans can accommodate such palette adjustments.

WEEDING AND INVASIVE CONTROL

Trees

About twenty trees of invasive species need to be removed from this MA. Fig trees behind Buildings 330 and 331 have self-sown into an impassible thicket: remove them all. Any existing Norway maples (confirming species first), plus holly, Portugal laurel, hawthorn, European white birch and a golden chain tree should be taken out as well. Seedlings should be sought out and destroyed annually. Because these species reseed and colonize readily into the wild, their removal helps reduce degradation of nearby native woodlands. For most, non-invasive substitute taxa are available for purposes of replanting.

Shrubs

Self-sown cotoneaster and viburnum plants are evident in beds surrounding the area's buildings and naturalized elsewhere in the Park. Although not yet a major invasives problem, these species should be removed from the landscape despite their historic usage. Infertile alternate selections can replace them. The usual complement of invasive blackberry, English ivy and clematis encroaches significantly along the rear (east) fenceline bordering the North Woodland, as well as infesting certain of the ornamental beds. Along the woodland edge, trim these vines away from ornamental landscape areas regularly, and target actual eradication at the roots in the woods. Where present within the MA, control spread and ultimately eradicate in concert with landscape restoration projects. Eradication without replanting could lead to erosion or re-infestation with other opportunistic species.

Herbs

Morning glory in beds should be eliminated through persistent effort, perhaps by volunteer adoption of bed areas. Other incidental herbaceous weeds can be removed largely through improved cultural practices like mulching.

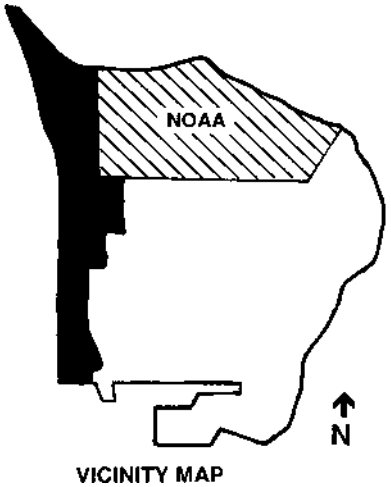
5.4.5 Golf Greensward Management Area

Treatment efforts in this area are directed toward maintaining lawn and tree canopy, dealing with tree hazard reduction and stand replenishment, reinforcing native plant periphery adjacent to N.E. 65th, and eliminating invasive trees and woody plants**.**

Management and Maintenance Annual Calendar
Historic District Zone – Golf Greensward Management Area

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Management and Maintenance Practices												
3 Yr. Establishment Care	▒	▒	▒	▒	▒	▒	•	•	•	•	▒	▒
Mulching	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Planting												
Trees			▒	▒	▒					▒	▒	▒
Shrubs			▒	▒	▒	▒				▒	▒	▒
Pruning	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Removing Plants	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Taking Care of Turf	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Watering							▒	•	•	•		
Weeding and Invasive Control												
Trees						▒	▒	▒	▒			
Shrubs					▒	▒	▒	▒	▒			

▒ Indicates range of time to perform action as needed
• Indicates specific time to perform action



VICINITY MAP

3 YR. ESTABLISHMENT CARE

All new plantings require follow-up care for three years to insure their healthy survival.

MULCHING

Trees and replanted areas cleared of invasives must be well-mulched to suppress unwanted plants, improve tilth and conserve soil moisture.

PLANTING

This whole management area constitutes an identified "contributing historic landscape feature." Certain changes proposed by interested citizens (converting turf to meadow, eliminating tall native conifers) are inconsistent with the historic character. Proposed plantings and alterations must receive appropriate level Historic Preservation review before implementation, the exception being in place, in kind replacements.

Trees

To avoid creating even-age stands, tree planting in this MA should be undertaken over time, more or less continuously. Planting is best accomplished incrementally but not randomly: it should adhere to clear, preordained principles consistent with both sound urban forestry and landscape preservation practice. To perpetuate the area's character, new generations of trees should be planted in anticipation of losses and in coordination with necessary removals. The pattern of open area and canopy may shift over time, but its essential configuration and balance should remain intact.

Of 27 sizable Douglas firs and cedars present in this MA, two thirds were found to have structural defects or evidence of past topping: either could lead to the premature demise of these normally long-lived trees, and accelerate the need to provide in-kind replacements. Native trees should be added along the ridge and slope abutting NE 65th Street; madrones are currently self-seeding in this area and should be both encouraged and supplemented.

Norway maples, including a topped row of twelve along the west edge of the MA, should be replaced with other, noninvasive maple varieties having similar form and ultimate stature. Sugar maple or *Acer freemanii* hybrids may prove a good alternative, with the bonus of excellent fall color for this highly-visible location.

Shrubs

Native understory enhancements should be added in the grove-like margin at the MA's southeast edge. Ocean spray, hazel, snowberry and salal are particularly appropriate for madrona / Douglas fir under-planting. No replacement ornamental shrubs should be added in the vicinity of Building 15 at the Sand Point Way corner. This immediate area will likely undergo major change as a new Park entry is developed.

Pruning

Tree pruning needs to be evaluated in detail by a certified arborist and undertaken according to relative urgency, particularly hazard potential. Because of their size and particular defects, for some trees removal may be the only prudent option. Whenever possible, pruning is the preferred alternative to avoid wholesale canopy destruction – even if only to defer the inevitable. The Historic District tree inventory identified both problems and targets for almost all perimeter trees in this MA, indicating that pruning (and removal) requirements may prove quite extensive.

Shrub pruning for residual ornamentals in the southwest portion of the area should be limited to dead, damaged and diseased wood removal until the ultimate disposition of these plantings is ascertained. If retained long-term, major renovation pruning should be undertaken.

Removing Plants

Numerous MA trees need further evaluation for hazard potential, following a preliminary inventory screening. To protect public health and safety, some tree removals are likely to result. Otherwise, no non-invasive plants need to be removed, except eventually as part of Park entry modifications. Ornamental spirea and groundcover roses near NE 65th Street ultimately should be removed, for replacement with ornamental native species of the same genera.

Taking Care of Turf

Mown turf constitutes an essential element of this landscape's character, and also provides park users a convenient and attractive place to sit, picnic and play. Golf Greensward turf must therefore be maintained to a standard consistent with its frequent use and visibility.

Weeding and Invasive Control

Trees

Norway maples possess major invasive potential, and should be eliminated from this MA - particularly so because of proximity to residual native woodlands. Many of these 21 trees are poor topped specimens in any case, so high quality trees will not be lost. Several hollies, European white birches, Lombardy poplars, a golden chain and a hawthorn also need to be removed, for an ultimate total of about 45 invasive trees.

Shrubs

Isolated shrub-size holly, cotoneaster and Portuguese laurel should be removed, as should privet if evidence of reseeding is observed in the vicinity. Ivy and blackberry are present in limited patches, and need to be eradicated before they present a major threat to area trees or understory. Recent invasive control efforts should be continued to consolidate gains already made.

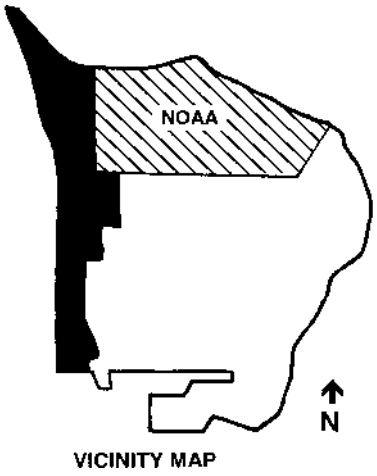
5.4.6 Sand Point Way Management Area

Treatments in this area focus on restoring and possibly extending the historic tree row, developing more appropriate underplantings, mowing, tree pruning and hazard abatement and invasive plant removal.

Management and Maintenance Annual Calendar
Historic District Zone –Sand Point Way Management Area

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Management and Maintenance Practices												
3 Yr. Establishment Care	▢	▢	▢	▢	▢	▢	•	•	•	▢	▢	▢
Mulching	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢
Planting												
Trees		▢	▢							▢	▢	▢
Shrubs		▢	▢	▢						▢	▢	▢
Herbs			▢	▢					▢	▢		
Pruning	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢
Removing Plants	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢
Amending Soils			▢	▢	▢	▢	▢	▢	▢			
Taking Care of Turf	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢
Watering							▢	•	•	•	▢	
Weeding and Invasive Control												
Trees						▢	▢	▢	▢			
Shrubs					▢	▢	▢	▢	▢			
Herbs					▢	▢	▢	▢				

▢ Indicates range of time to perform action as needed
• Indicates specific time to perform action



VICINITY MAP

3 YR. ESTABLISHMENT CARE

All new plantings require follow-up care for three years to insure their healthy survival.

MULCHING

Trees and new understory plantings must be well-mulched to discourage grass and weed growth, improve root environment, and conserve soil moisture.

PLANTING

Trees

Sand Point Way requires a major replanting initiative, due to factors of structural defect (153 trees, 69% of MA population), topping (44%), problem species (42%), and potential targets for virtually all existing trees. While individual trees will be removed or die as time goes by, replacements must take their place to perpetuate the overall planting. Because the entire row is an identified "historic landscape feature," trees must reflect the original character as closely as possible; however, errors of past species selection, spacing and management must be corrected.

New trees should be chosen to balance species diversity with visual continuity, and to accurately reflect the existing ratio among conifer, shade and ornamental varieties and among diverse form and stature. Whether undertaken incrementally or as a single project, replanting must proceed by approved plan, subject to appropriate level historic preservation review (in this case, directly by consultation with the SHPO – State Historic Preservation Officer).

Planning should be undertaken as a top priority, since replanting must accompany all removals within a contributing landscape feature, and certain removals appear urgently needed. As for other Historic District MA's, planning must include parties qualified to address forestry, landscape design, historic preservation, Park management and community concerns.

The existing Sand Point Way row includes over 200 trees, representing 18 taxa, but dominated by very few (6 species = 85% of trees). Several of the current species should be excluded from future use: suckering, invasive Lombardy poplar, invasive Norway maple, disease-prone crabapple and English hawthorn, insect prone, self-seeding European white birch, much overplanted red maple. Existing species appropriate to replicate in a new tree row include Deodar cedar, Douglas fir, Scot's pine, Chinese elm, and possibly bigleaf maple. In addition, the new palette should include at least one disease-resistant flowering tree, an alternate maple, and a tall, narrow deciduous tree like fastigiate English oak, beech or ginkgo.

New plantings through time should repair gaps and correct awkward offsets in the lengthy, discontinuous row, and introduce culturally-appropriate spacings of 15 – 40 ft., depending on species. These changes represent a necessary departure from

historic precedent in favor of tree health and longevity. The segment north of the NOAA access road particularly needs design attention; currently the row peters out except for occasional native trees. Whether a formal tree row should continue along Sand Point Way to the Park's northernmost boundary is a question not answered by history so much as by aesthetics and landscape function. In sum, the evolving Sand Point tree row should both honor and improve upon its history.

Shrubs

Existing pyracantha underplantings toward the south end of the park should not be replanted. Tree replacement creates an opportunity for portions, if not all, of an historic rhododendron planting plan to be implemented at the same time, allowing trees and shrubs to establish together. In many places grades are too steep and /or planting areas too narrow to maintain turf. Such areas would both look better and function better if underplanted with moderate height, ornamental shrubbery and groundcovers. Such plantings should be extremely simple, using rugged but attractive species. Northwest natives could be incorporated to advantage.

PRUNING

As a high priority, existing trees should be evaluated individually for pruning needs, to improve condition and reduce hazard potential wherever possible. For many trees, removal and replacement – not pruning – will be the only viable option. Very few shrubs exist along Sand Point Way, and fewer still are slated to remain. No shrub pruning should be required, until such time as recommended understory additions have established and matured.

REMOVING PLANTS

Trees with significant structural problems should be removed proactively at the recommendation of a certified arborist, either en masse or in defined groups. Inventory suggests that about 90 trees need further evaluation for hazard, among which several may require expedited removal. Scattered removals on an emergency basis should be avoided, both because of inefficiencies and because cumulative attrition without prompt replacement could easily follow.

Diseased crabapples (18 trees), while not especially hazardous, are recommended for eventual removal. Individual "oddball" trees and shrubs likewise eventually should be removed, as part of overall renovation. Where (if) high quality trees remain, removal of crowded, intervening trees should be undertaken to improve spacing. Until specific hazard and problem tree removals are identified, exact locations for such thinning cannot be provided.

AMENDING SOILS

As part of tree replacement, soil in planting areas must be thoroughly loosened and amended wherever unfavorable ground conditions are encountered. The opportunity to create an optimal growth environment should be exploited fully, since Sand Point Way's planting beds are modest at best. Any existing turf should be stripped, not incorporated, and reestablished later where design dictates.

TAKING CARE OF TURF

At present, turf underplanting trees is a major vegetation component. In the future, its use should be greatly curtailed, in tandem with tree replacement. Grass negatively affects tree growth. It requires continual maintenance, even when provided minimal levels of care. Mowers frequently damage tree trunks, especially in tight areas and eventually, tree canopies and roots push turf into unattractive, weedy decline. In the interim period, provide minimal level turf care. Areas ultimately returned to lawn should be accorded moderate to high quality care, consistent with visibility of location. Regrading to reduce steep slopes should precede lawn replacement wherever feasible.

WATERING

Before selecting trees and underplantings to use for renovation, determine whether or not irrigation will be provided. If rhododendrons are to be incorporated for historical reasons, watering will be a necessity, and water-requiring tree varieties could also be included. Alternatively, the entire row can be designed for xeric conditions, and plants selected accordingly. Current vegetation survives adequately without necessity of irrigation.

WEEDING AND INVASIVE CONTROL

Trees

Non-native poplars constitute a serious invasive plant problem at Sand Point, and should be eliminated, whether individual trees are in good or poor condition. Norway maple, European white birch, and English hawthorn trees also should be taken out through time, because they self-seed in Park natural areas. A total of 70 trees are involved, over 30% of the total population; many gaps in the tree row will result.

Shrubs

Pyracantha occasionally self-seeds into the wild, and therefore should be removed. Its current aesthetic contribution is minimal. Particularly along the northerly street edge, blackberry and Scot's broom should be controlled and eventually eliminated altogether.

Herbs

The north portion of this MA contains extensive areas of weedy grassland, which should be mown prior to seed maturation, to minimize dispersal, until complete landscape redevelopment occurs. Where young native shrubs are establishing in this rough area, extra effort should be accorded to suppress competing weeds.

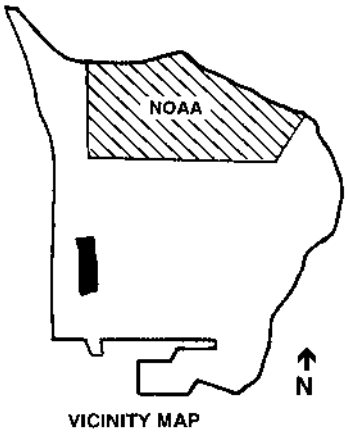
5.5 Sand Point East Housing Zone

Treatments in this zone are directed toward maintaining turf, controlling invasives, interim pruning, removing overgrown and poor condition plants, reclaiming asphalt and encouraging native edge, and establishing planting criteria for future site redevelopment.

Management and Maintenance Annual Calendar
Sand Point East Housing Zone

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Management and Maintenance Practices												
3 Yr. Establishment Care	▒	▒	▒	▒	▒	▒	•	•	•	▒	▒	▒
Mulching	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Maintaining Meadow								•				
Planting												
Trees		▒	▒							▒	▒	▒
Shrubs		▒	▒	▒	▒	▒				▒	▒	▒
Herbs			▒	▒	▒	▒				▒	▒	
Pruning	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Removing Plants	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Amending Soils			▒	▒	▒	▒	▒	▒	▒	▒		
Taking Care of Turf	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Watering							▒	•	•			
Weeding and Invasive Control												
Trees						▒	▒	▒	▒			
Shrubs					▒	▒	▒	▒	▒			
Herbs				▒	▒	▒	▒	▒				

▒ Indicates range of time to perform action as needed
• Indicates specific time to perform action



3 YR. ESTABLISHMENT CARE

All new plantings require follow-up care for three years to insure their healthy survival.

MULCHING

All beds and trees should be mulched after weeding per DPR standards, and replenished annually.

MAINTAINING MEADOW

Current turf areas on very steep slopes, and turf below Building 9 near Sports Field Drive should be converted to meadow, and regularly maintained as such.

PLANTING

Future site redevelopment will offer excellent opportunities for plant additions. Most existing plant material is functional but ultimately expendable. Short-term, seasonal color plantings may be integrated near building entries, encouraging resident participation. Major shrub gaps in existing beds may likewise be filled, selecting plant material for close match to Historic District palette and style. Avoid obviously-contemporary design and taxa. Add natives as feasible within primary parameters above. Particularly along south edge to integrate with Forest Remnant Zone margin. Tree planting is otherwise a low priority until a site redevelopment timeline is known; thereafter, additional ornamental and low-maintenance fruit trees are highly recommended where clear of construction.

PRUNING

Prune existing, healthy shrubs and trees to remove dead, damaged and diseased wood. Undertake renovation pruning in high-visibility locations on amenable species, elsewhere optional as time allows. Fertilize heavily-pruned plants. Apple trees growing along Sports Field Drive should receive annual dormant-season pruning to maintain their productivity. Residents and recreational users of the Park may welcome the fruit produced.

REMOVING PLANTS

Identify alternate location for resident vegetable garden, siting to minimize visibility from prime Historic District frontage. Replant area in lawn. Remove remnant shrubs that are either self-sown, in poor condition, or permanently-overgrown. Regarding trees, many hawthorns are extremely diseased and unattractive, and good candidates for removal; however only one third of these have been identified as potentially hazardous, making removal priority relatively low.

The Sawara false cypress row is planted very close to Building 221; all these trees are candidates for removal, should further hazard evaluation or opportunity for landscape renovation dictate. The Lombardy poplar and developing saplings should be removed, the birch and flowering crabapples eventually as well, due to species unsuitability. Refer to Appendix matrix Sand Point East Housing Zone – Individual Tree Management for tree by tree removal and hazard evaluation direction.

TAKING CARE OF TURF

Provide turf maintenance to match level of use and visibility, which varies within Zone from high to very low. Entrance side of Building 224 along 62nd Avenue NE requires highest quality care.

WEEDING AND INVASIVE CONTROL

Portions of the zone contain encroaching blackberries, Lombardy poplar and sprouts in peripheral areas, plus assorted weeds in neglected planting beds. To reclaim landscape from abandoned appearance, undertake weed and particularly invasive species removal as a top priority. Eliminate English laurel, holly, and self-seeding viburnum and cotoneaster plants.

PAVEMENT REMOVAL

Where paved areas are unused and deteriorating, break up and haul away, regrade and plant to meadow and/or habitat shrubbery. This treatment is inappropriate immediately adjacent to 62nd Avenue NE.

5.6 Community Activity Center Zone

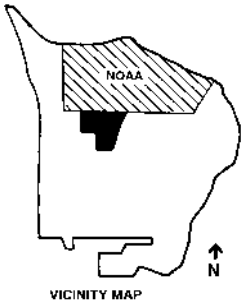
5.6.1 Community Activities Management Area

This MA is a 4-5 acre area surrounding and including the Community Activity Center (Building 406, formerly the Brig). The vegetated grounds consist of mowed lawn and landscape plantings in beds, around the building and along the parking area and NE 74th St. Planning is currently underway to create a Community Garden on four acres directly east of the Community Activity Center building, bordered on the east by an old paved access road that bisects the Zone. The Garden as planned would include a P-Patch, tranquil garden, and children's garden, among numerous features (Magnuson Community Gardens Plan, Aug. 2001). Management of this area in the interim focuses on maintaining existing plantings for health and aesthetics until a cohesive plan for the Community Garden is completed and implemented.

Management and Maintenance Annual Calendar
Community Activity Center Zone – Community Activities Management Area

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Management and Maintenance Practices												
3 Yr. Establishment Care	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢
Mulching	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢
Planting												
Trees			▢	▢	▢					▢	▢	▢
Shrubs			▢	▢	▢					▢	▢	▢
Herbs					▢	▢			▢	▢	▢	
Pruning	•	•	•	•				•	•	•	•	•
Removing Plants	•	•	•	•				•	•	•	•	•
Amending Soils					▢	▢	▢	▢	▢	▢		
Taking Care of Turf	•	•	•	•	•	•	•	•	•	•	•	•
Watering							▢	•	•			
Weeding and Invasive Control												
Trees							▢	▢	▢			
Shrubs						▢	▢	▢	▢			
Herbs				▢	▢	▢	▢	▢				

▢ Indicates range of time to perform action as needed
• Indicates specific time to perform action



3 YR. ESTABLISHMENT CARE
This will be required for any woody plants installed.

MULCHING
Mulch tree rings as needed to maintain 2-4" depth. Mulch landscape beds as needed to maintain 1-3" depth depending on plant types.

PLANTING
Plant landscape beds as needed and desired with consideration for changes due to proposed Community Garden development.

PRUNING
Prune landscape plants as needed for health or to remove dead, misshapen, or hazardous limbs.

REMOVING PLANTS
Removals other than invasives are to be performed only in the case of hazard trees, or diseased plant material that needs to be replaced. When possible, removals should be done between August and March to avoid potential disruption of nests. Woody debris resulting from plant removals that does not sucker or sprout from cuttings or branches can be left or placed in appropriate Zones (Habitat, Promontory Point) as wildlife habitat such as brush piles, LWD, snags, or stumps. Wood from suckering species such as Lombardy and white poplar, that can not be used for habitat features until completely dead, should be stored off the ground until such time (2 years) that it is no longer viable.

AMENDING SOILS
Soil in planting areas must be thoroughly loosened and amended wherever unfavorable ground conditions are encountered. The opportunity to create an optimal growth environment should be exploited fully, since Sand Point Way's planting beds are modest at best. Any existing turf should be stripped, not incorporated, and reestablished later where design dictates.

TAKING CARE OF TURF
Mown turf provides an important function as an informal gathering place around the Community Activity Center, and must therefore be maintained to a standard consistent with this use.

WATERING
Regular watering during the driest part of the growing season is necessary for landscape beds.

WEEDING AND INVASIVE CONTROL
Keep tree ring areas clear of herbaceous weeds during the growing season (frequency as needed). Weed landscape beds as needed.

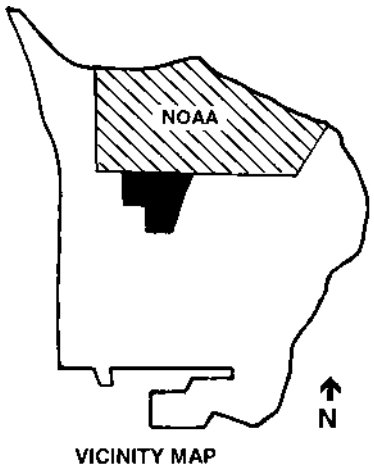
5.6.2 Junior League Playground Management Area

The Junior League Playground lies in the south of the Zone and includes an area of roughly just under an acre that encompasses the playground and picnic shelters, mowed lawn areas, and groups of specimen trees. Management of this MA should focus on maintaining an area that is for young children and parents actively playing and picnicking. Main actions include turf care, mulching of trees and landscape beds, and pruning and hazard tree removal.

Management and Maintenance Annual Calendar
Community Activity Center Zone – Junior League Playground Management Area

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Management and Maintenance Practices												
3 Yr. Establishment Care	▒	▒	▒	▒	▒	▒	▒	•	•	•	•	•	•	▒	▒	▒	▒	▒	▒
Mulching	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Planting																			
Trees			▒	▒	▒	▒										▒	▒	▒	▒
Pruning	•	•	•	•	▒	▒	▒	▒	▒	▒	▒	▒	•	•	•	•	•	•	•	•	•	•	•	•
Removing Plants	•	•	•	•	▒	▒	▒	▒	▒	▒	▒	▒	•	•	•	•	•	•	•	•	•	•	•	•
Taking Care of Turf	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Watering											▒	•	•	•	•	▒								
Weeding and Invasive Control																			
Herbs							▒	▒	▒	▒	▒	▒	▒	▒					

▒ Indicates range of time to perform action as needed
• Indicates specific time to perform action



3 YR. ESTABLISHMENT CARE
This will be required for any woody plants installed.

MULCHING
Mulch tree rings as needed to maintain 2-4" depth.

PLANTING
Plant trees to replace diseased or dying as needed.

PRUNING
Prune landscape plants for health as needed.

REMOVING PLANTS
Removals other than invasives are to be performed only in the case of hazard trees, or diseased plant material that needs to be replaced. When possible, removals should be done between August and March to avoid potential disruption of nests. Woody debris resulting from plant removals that does not sucker or sprout from cuttings or branches can be left or placed in appropriate Zones as wildlife habitat such as brush piles, LWD, snags, or stumps. Wood from suckering species such as Lombardy and white poplar, that can not be used for habitat features until completely dead, should be stored off the ground until such time (2 years) that it is no longer viable.

TAKING CARE OF TURF
Mown turf provides an important function as a place for families with children to sit, picnic, and play and must therefore be maintained to a standard consistent with this use in accordance with DPR BMPs for General Lawn Areas.

WATERING
Water turf and ornamentals in planting beds according to need.

WEEDING AND INVASIVE CONTROL
Keep tree ring clear of herbaceous weeds during the growing season (frequency as needed).

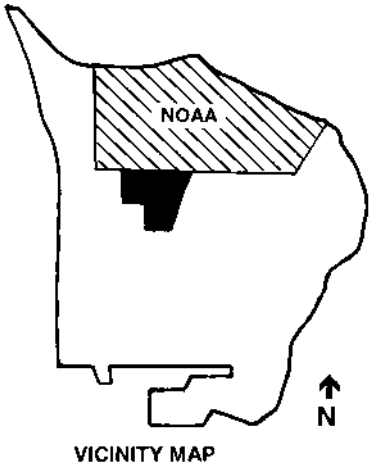
5.6.3 Tree/Shrub Savannah Management Area

This approximately 10-acre MA makes up the eastern half of this Zone, and consists of upland meadow with numerous non-native poplars primarily located along the gated road that bisects the MA. This area should be managed for conversion to upland meadow with a cluster of mixed forest/shrub community at the far south end of the Zone. This will connect to and expand an existing patch of upland forest located to the south in the Dog Off Leash Zone. Management actions will include a mowing regimen to maintain the meadow habitat, removal of non-native poplar trees and shrubs, and replacement in adjacent upland forest areas with appropriate native species.

Management and Maintenance Annual Calendar
Community Activity Center Zone – Tree/Shrub Savannah Management Area

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Management and Maintenance Practices												
3 Yr. Establishment Care	▒	▒	▒	▒	▒	▒	•	•	•	▒	▒	▒
Maintaining Meadow									•			
Planting												
Trees		▒	▒	▒						▒	▒	▒
Shrubs		▒	▒	▒						▒	▒	▒
Removing Plants	•	•	•	▒	▒	▒	▒	•	•	•	•	•
Weeding and Invasive Control												
Trees						▒	▒	▒	▒			
Shrubs					▒	▒	▒	▒	▒			
Herbs				▒	▒	▒	▒	▒				

▒ Indicates range of time to perform action as needed
• Indicates specific time to perform action



3 YR. ESTABLISHMENT CARE

This care will be needed for any new woody plantings that replace non-native trees and shrubs.

MAINTAINING MEADOW

Upland meadows are to be actively managed to prevent further colonization by native woody plants and invasion by non-native species. Maintenance actions will consist of a September mowing every other year or every third year depending on the presence and rate of re-growth/reinvasion by woody species. Some regular hand-weeding to control invasives may also be needed. The abandoned road and parking lot in this MA are unused and could be removed and restored to upland meadow.

PLANTING

Replacement for removed non-native poplars will be required. Planting of trees and shrubs should be done as directed in Sections 6.11 and 6.5. Replacement planting should be done at a location along an edge of adjacent or nearby upland forest to the south or at the north end of the Habitat Zone. Species composition of replacement plant community will depend on specific location of planting area, but should be comprised of a combination of mixed evergreen and deciduous trees and shrubs.

REMOVING PLANTS

Removals other than invasive species are to be performed only in the case of hazard trees or diseased plant material that needs to be replaced. When possible, removals should be done between August and March to avoid potential disruption of nests. Woody debris resulting from plant removals that does not sucker or sprout from cuttings or branches can be left or placed as wildlife habitat such as brush piles, LWD, snags, or stumps. Wood from suckering species such as Lombardy and white poplar, that can not be used for habitat features until completely dead, should be stored off the ground until such time (2 years) that it is no longer viable.

WEEDING AND INVASIVE CONTROL

Non-native poplars are the main invasive tree species encountered in this area. The most common invasive shrubs are Himalayan blackberry, Scot's broom, and non-native hawthorn. Problematic herbaceous species that may occur include Canada thistle. Woody debris resulting from removal of invasive trees or shrubs that do not sucker or sprout from cuttings or branches can be left or placed as wildlife habitat features such as brush piles, LWD, snags, or stumps. Wood from suckering species such as Lombardy and white poplar, that can not be used for habitat features until completely dead, should be stored off the ground until such time (2 years) that it is no longer viable.

5.7 Sportsfield Zone

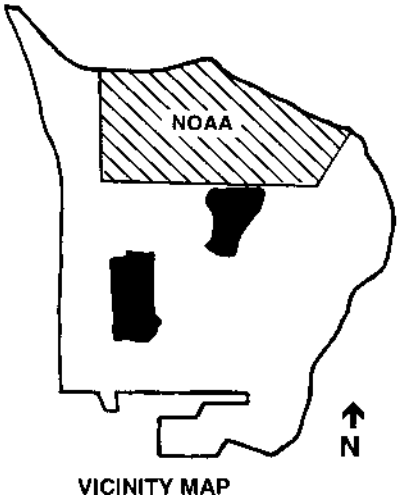
5.7.1 Turf Management Area

The 24 acres of athletic field turf comprise the majority of this Zone. Both Magnuson Sportsfields and Sand Point Sportsfields are included in this MA. Maintenance and management actions consist entirely of turf care, as described in the Maintenance and Management Section 6.8.

Management and Maintenance Annual Calendar
Sportsfield Zone – Turf Management Area

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Management and Maintenance Practices												
Taking Care of Turf	• •	• •	• •	• •	• •	• •	• •	• •	• •	• •	• •	• •
Watering							▢ •	• •	• ▢			

▢ Indicates range of time to perform action as needed
• Indicates specific time to perform action



VICINITY MAP

TAKING CARE OF TURF

Sportsfield turf should be taken care of in accordance with DPR BMPs for Soil Based Athletic Fields (Section 6.8).

WATERING

Irrigate fields in accordance with DPR BMPs for Soil Based Athletic Fields (Section 6.8).

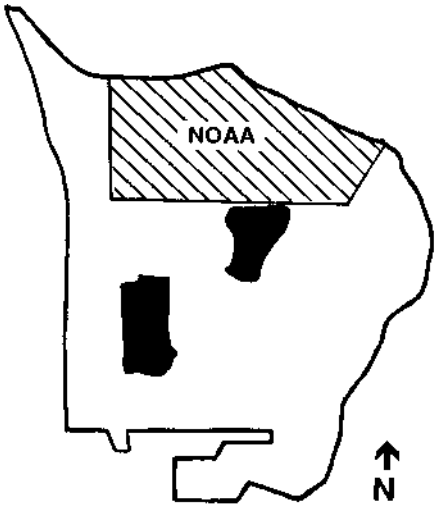
5.7.2 Upland Meadow Management Area

The small patch of upland meadow in this Zone is located in the northeast corner of the Sand Point sportsfields, south of the Dog Off Leash Zone. This area is to be managed as meadow habitat to prevent colonization by both non-native and native woody species. This management will consist of a fall mowing regimen, and might possibly also include regular hand weeding as necessary. Mowing is to be done late enough in the growing season (September) to accommodate bird nesting season as well as seed head production for wildlife forage.

Management and Maintenance Annual Calendar
Sportsfield Zone – Upland Meadow Management Area

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Management and Maintenance Practices												
Maintaining Meadow									•			
Weeding and Invasive Control												
Trees							▒	▒	▒			
Shrubs					▒	▒	▒	▒	▒			
Herbs				▒	▒	▒	▒	▒				

▒ Indicates range of time to perform action as needed
• Indicates specific time to perform action



VICINITY MAP

MAINTAINING MEADOW

Upland meadows are to be actively managed to prevent colonization by woody plants and invasion by weedy herbaceous species. This will consist of a September mowing every other year or every third year depending on the presence and rate of re-growth/reinvasion by woody species. Some regular hand-weeding to control invasives may also be needed.

WEEDING AND INVASIVE CONTROL

Non-native poplars are the main invasive tree species encountered in meadows. The most common invasive shrubs are Himalayan blackberry and Scot's broom. Non-native hawthorn is another commonly occurring non-native invasive species in meadow areas. Problematic herbaceous species that may occur include Canada thistle. All woody species (native or non-native) are undesirable to maintain upland meadows an early successional stage, and weedy herbaceous species should also be controlled.

5.8 Habitat Zone

5.8.1 Non-native Shrub Management Area

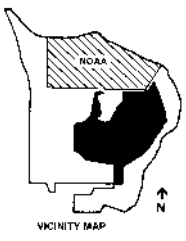
This MA is found scattered throughout the Habitat Zone and consists primarily of either Himalayan blackberry or Scot's broom in dense monotypic stands. The largest patches occur in the northern portion of the Zone, both north and south of Kite Hill, the largest being upwards of 6 acres in size. Smaller patches between 1/10 acre and ½ acre in size are more typical. Thickets of non-natives should be cleared by mechanical mowing and then replanted to convert them to native shrub, forest, or limited areas of meadow communities. In addition, the eastern flanks of Kite Hill which are now dominated by Scott's broom and blackberry thicket may provide an excellent opportunity to establish a native oak/meadow savannah in the Park. Gradual removal of Scott's broom and blackberry thicket, and replacement with native Garry oak interspersed with unmowed meadow will provide a new habitat type. A slow-growing, open native canopy will develop, vegetation in the long run requiring far less annual maintenance than the highly invasive blackberry and broom.

Removal of non-natives should occur only when follow-up replanting with native species and 3 yr. establishment care is planned and implemented. Removal of large thickets should be done incrementally (see Section 6.11) to assure that all the habitat niches provided by the thicket are not removed all at once and some remain as habitat for wildlife during habitat transition.

Management and Maintenance Annual Calendar
Habitat Zone – Non-native Shrub Management Area

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Management and Maintenance Practices												
3 Yr. Establishment Care	▒	▒	▒	▒	▒	▒	•	•	•	•	•	•	▒	▒	▒	▒	▒	▒
Establishing Meadow				▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒		
Maintaining Meadow									•									
Planting																		
Trees			▒	▒	▒	▒										▒	▒	▒
Shrubs			▒	▒	▒	▒										▒	▒	▒
Herbs					▒	▒	▒	▒	▒	▒	▒	▒			▒	▒		
Amending Soils							▒	▒	▒	▒	▒	▒						
Weeding and Invasive Control																		
Trees							▒	▒	▒	▒	▒	▒						
Shrubs					▒	▒	▒	▒	▒	▒	▒	▒						
Herbs				▒	▒	▒	▒	▒										

▒ Indicates range of time to perform action as needed
• Indicates specific time to perform action



3 YR. ESTABLISHMENT CARE

This care will be needed for any new woody plantings that replace non-native shrubs.

ESTABLISHING MEADOW

Some limited meadow areas can be established in cleared thicket areas that are adjacent to existing upland meadows. This will be the most labor-intensive and difficult plant community to establish in these areas due to the level of invasive control that will be needed. For these reasons, and because of the prevalence of meadow habitat in the Park currently, establishing more meadow may not be the most desirable choice for both ecological and economic reasons. Establishment would include removal of the invasives, seeding, weeding, mowing, and possibly soil amending.

MAINTAINING MEADOW

Any newly established meadows created as conversion from non-native shrub thicket must be actively managed to prevent colonization by woody plants and invasion by weedy herbaceous species. Annual fall mowing will be necessary to adequately control re-sprouting shrubs until meadow is established. After invasive shrub recruitment is controlled, mowing frequency can be decreased to one mowing every other year or every third year depending on the presence and rate of re-growth/reinvasion by woody species. Some regular hand-weeding to control invasives may also be needed.

PLANTING

Planting in non-native shrub areas should proceed after clearing, and any soil amending or sheet mulching has been completed. Thickets of non-natives that are adjacent to existing forest should be converted to a native woody plant community (trees and/or shrubs) rather then meadow, in order to expand the native shrub/forest communities on site. Thickets adjacent to existing upland meadow should be converted to meadow, oak or madrona savannah, or native shrubs. Thickets adjacent to wet meadows should be replaced with native shrubs tolerant of variable moisture regimes. See the Tables in Section 6.11 for information on plant moisture tolerances.

AMENDING SOILS

Soil amending throughout planting area may be necessary or desirable after non-natives have been cleared and prior to planting.

WEEDING AND INVASIVE CONTROL

Non-native shrub thickets consist largely of Himalayan blackberry and Scot's broom. Control and removal strategies for these two species are very similar, as described in Section 6.11.

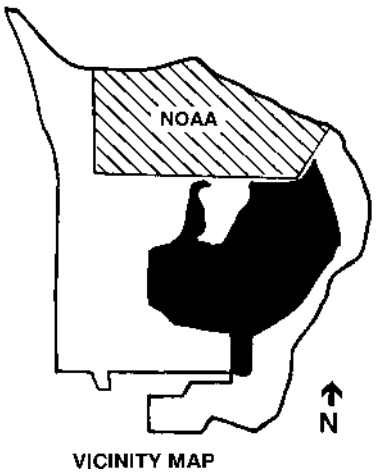
5.8.2 Upland Forest Management Area

The Upland Forest MA covers the portions of the Habitat Zone west of the swim beach parking lot, south of the bunkers south of Kite Hill, and north of the existing tennis courts. A small lobe is present northeast of Building 193, and also due east of Building 193. The Upland Forest MA totals approximately 11 acres in this Zone. Together with the 12 acres of upland forest in the Promontory Point Zone, this represents all of the upland forest present in the Park east of Sportsfield Drive. It is quite fragmented across the landscape in existing conditions. There is significant presence of invasive species in the forested areas and along edges, mostly Himalayan blackberry and some Scott's broom.

Management and Maintenance Annual Calendar
Habitat Zone – Upland Forest Management Area

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

▒ Indicates range of time to perform action as needed
• Indicates specific time to perform action



VICINITY MAP

Priorities for management of the Upland Forest MA's should focus on preserving and enhancing those interior areas of woodland where invasives are present as mild infestations, and where complete control and eradication is most easily accomplished. Native forest communities that are mostly intact can withstand overwhelming invasion by non-natives by launching and maintaining an aggressive campaign to limit their spread. Additional high priority sites for invasives control are those that provide prime habitat, or are part of a landscape setting important from a habitat perspective. Finally, high priority should be given areas that already have been the focus of invasive removal and replanting.

Evaluating relative importance in the landscape setting of the Park should include considering connectivity between similar habitats (linking isolated forest fragments across the Park), continuity for wildlife corridors (linking dissimilar habitat types such as the shoreline to the upland forests of Promontory Point), creating or enhancing ecotones (the interface of two different types of habitat), and providing buffers to existing wetlands. Lower priority management efforts (invasives control and replacement with natives) should go toward habitat improvement in severely-infested areas that will require the greatest level of initial effort and follow-up care.

Additional effort can be focused on increasing species diversity within forest stands, creating multiple age class mixed (deciduous and coniferous) forests with diverse canopy structure (canopy, sub-canopy, shrub and herbaceous components), and reducing invasive coverage both within forest patches and around their edges. Where appropriate, native conifers tolerant of shade conditions (red cedar, hemlock rooted on rotted woody debris) should be started in the understory.

3 YR. ESTABLISHMENT CARE

This care will be needed for any newly installed plantings.

PLANTING

Planting should only be done with a commitment for 3 year establishment care. Species selection should reflect microclimate conditions at each planting site, but should be Puget lowland native species typical of an upland forest. As noted above, targeting species diversity within each canopy layer is critical for long-term forest succession. See Section 6.11 Tables for recommendations of plant associations.

PRUNING

Pruning should be limited to removal of limbs that pose a hazard to human infrastructure or public safety, otherwise dead limbs should be allowed (or encouraged) to fall to the forest floor as woody debris. Misshapen or hazardous limbs may not be critical for removal in the interior of woodlands or forests where no maintained trails traverse. Best professional judgment should prevail for limb or tree removal, keeping in mind habitat enhancement priorities as well as public health and safety. Where tops of trees have fallen or major branches broken off, the trunk should be left standing intact (where human safety is not an issue) to promote the establishment of snags for habitat niches.

Removing Plants

Removals, other than invasives, are intended to be performed only in the case of hazard trees, or installed plant materials that are diseased and need to be replaced. When possible, removals should be done between August and February to avoid potential disruption to breeding wildlife. Woody debris from plant removals should be left or placed to create complexity for wildlife habitat. Branches, logs, and trunks from woody plants that do not sucker or sprout from cuttings can be gathered into brush piles, placed on the ground as Large Woody Debris (LWD), left upright as snags, or left intact as stumps. Large Woody Debris from suckering/sprouting species like Lombardy and white poplar can be used if the logs are propped off the ground surface until wood is no longer viable (2 years). Poplar logs can be elevated on scrap lumber or other easily-decomposable, non-sprouting wood.

Weeding and Invasive Control

Weedy and invasive species most likely to be problematic in this MA are numerous and include: Himalayan blackberry, English ivy, laurel, clematis, bindweed, hawthorn, non-native poplar, and Scot's broom. Weeding and removal of shrub and herbaceous species should take place during the growing season with as needed frequency but at least monthly in the first year for newly installed plantings.

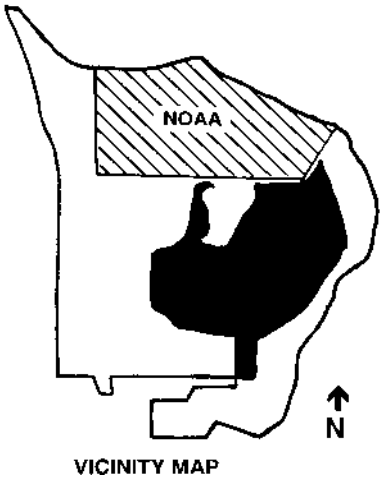
5.8.3 Upland Meadow Management Area

Upland meadows occur scattered in this Zone, freely mixed with wet meadows in the Wetland Mosaic. Perhaps the largest patch of upland meadow area (7 acres) is located just northwest of Building 193, south of Sand Point sportsfields along Sportsfield Drive. North and south of the interior parking lot is another area of Upland Meadow. All of these meadow areas are to be managed as meadow habitat to prevent colonization by both non-native and native woody species. This management will consist of a fall mowing regimen, and might also include regular hand weeding as necessary. Mowing is to be done late enough in the growing season (September) to accommodate bird nesting season as well as seed head production for wildlife forage. These areas are important habitat for passerine birds and as prey production areas for short-eared and barn owls, present on the NOAA site to the north. Habitat complexity can be improved by placing wood debris/brush piles within the interior of the meadow zones, or near areas of shrub/woodland edges. Wildlife will use brush piles as refuge, perches, and escape habitat.

Management and Maintenance Annual Calendar
Habitat Zone – Upland Meadow Management Area

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Management and Maintenance Practices												
Maintaining Meadow									•			
Weeding and Invasive Control												
Trees							▒	▒	▒			
Shrubs					▒	▒	▒	▒	▒			
Herbs				▒	▒	▒	▒	▒				

▒ Indicates range of time to perform action as needed
• Indicates specific time to perform action



VICINITY MAP

MAINTAINING MEADOW

Upland meadows are to be actively managed to prevent colonization by woody plants and invasion by weedy herbaceous species. This will consist of a September mowing every other year or every third year depending on the presence and rate of re-growth/reinvasion by woody species. Some regular hand-weeding to control invasives may also be needed.

WEEDING AND INVASIVE CONTROL

Non-native poplars are the main invasive tree species encountered in meadows. The most common invasive shrubs are Himalayan blackberry, Scot's broom, and non-native hawthorn. Problematic herbaceous species that may occur include Canada thistle. All woody species (native or non-native) are undesirable in upland meadows, and weedy herbaceous species should also be controlled in order to keep the meadows maintained in an early successional stage.

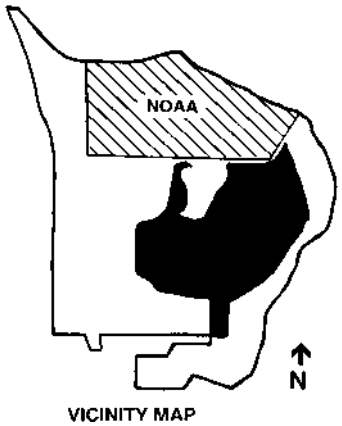
5.8.4 Tree/Shrub Savannah Management Area

Tree/Shrub Savannah areas in the Habitat Zone are present in the eastern/central portion of the Habitat Zone, primarily south of Kite Hill (east of the interior parking lot and northwest of the swim beach access road) and at the far south end adjacent to the Building 193 Zone. These areas should be managed as upland meadows interspersed with small clusters of native trees or shrubs. To achieve this, management actions must include a fall mowing regimen to maintain the meadow habitat, removal of non-native trees and shrubs with replacement with appropriate native tree and shrub species to approximate the existing pattern of meadow interspersed with clumps of woody vegetation. The pattern of long-grass meadow interspersed with clumps of woody vegetation is the result of the site re-colonizing after removal of the airfields. In order to maintain such a complex ecotone, active management will be required.

Management and Maintenance Annual Calendar
Habitat Zone – Tree/Shrub Savannah Management Area

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Management and Maintenance Practices												
3 Yr. Establishment Care	▢	▢	▢	▢	▢	▢	•	•	•	▢	▢	▢
Maintaining Meadow									•			
Planting												
Trees		▢	▢	▢						▢	▢	▢
Shrubs		▢	▢	▢						▢	▢	▢
Removing Plants	•	•	▢				▢	•	•	•	•	•
Weeding and Invasive Control												
Trees							▢	▢	▢			
Shrubs					▢	▢	▢	▢	▢			
Herbs				▢	▢	▢	▢	▢				

▢ Indicates range of time to perform action as needed
• Indicates specific time to perform action



VICINITY MAP

3 YR. ESTABLISHMENT CARE

This care will be needed for any new woody plantings that are installed in meadow areas.

MAINTAINING MEADOW

Upland meadows are to be actively managed to prevent further colonization by native woody plants and invasion by non-native species. Maintenance actions will consist of a September mowing every other year or every third year depending on the presence and rate of re-growth/reinvasion by invasive woody species. Some regular hand-weeding to control invasives may also be needed. Timing of mowing is to avoid breeding birds and allow seed production for fall migrants and resident birds.

PLANTING

Native trees should replace non-native trees that are removed from these savannah areas. Native replacements should be planted in adjacent or nearby forest areas. Native shrubs should replace non-native shrubs that are removed, but should be planted in the same general location as those plants that are removed. Planting should be clustered near existing forested/wooded areas to create multi-layered habitat complexes.

REMOVING PLANTS

Removals of non-invasive plants are appropriate to perform only in the case of hazard trees or of diseased plant material that needs to be replaced. When possible, removals should be done between August and February to avoid potential disruption of wildlife breeding. Woody debris from plant removals should be left or placed to create complexity for wildlife habitat. Branches, logs, and trunks from woody plants that do not sucker or sprout from cuttings can be gathered into brush piles, placed on the ground as Large Woody Debris (LWD), left upright as snags, or left intact as stumps. Large Woody Debris from suckering/sprouting species like Lombardy and white poplar can be used if the logs are propped off the ground surface until wood is no longer viable (2 years). Poplar logs can be elevated on scrap lumber or other easily-decomposable, non-sprouting wood.

WEEDING AND INVASIVE CONTROL

Non-native poplars are the main invasive tree species encountered in these savannah areas. The most common invasive shrubs are Himalayan blackberry, Scot's broom, and non-native hawthorn. Problematic herbaceous species that might occur include Canada thistle.

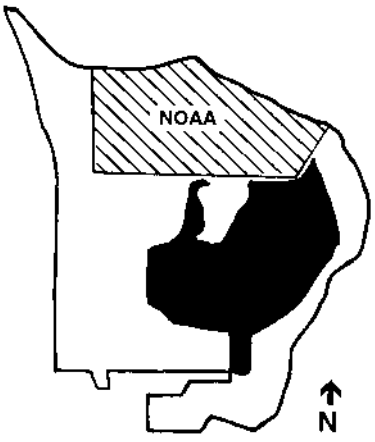
5.8.5 Wetland Management Area

The wetland areas within the Habitat Zone form a mosaic with upland communities across a broad landscape. The designation of the area as wetland was made on the basis of vegetation – regulatory determination of wetland presence was not conducted and no wetland delineation was done. Approximately 11 acres of the Wetland MA are within the Habitat Zone. The three main areas of wetland in this Zone are associated with a shrubby swale that curves through the center of the Habitat Zone flowing in a southeasterly direction, and in two large areas in the western side of the Zone

Management and Maintenance Annual Calendar
Habitat Zone – Wetland Management Area

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

▢ Indicates range of time to perform action as needed
• Indicates specific time to perform action



VICINITY MAP

The management approach for the wetlands within the Habitat Zone reflects the basic concept for the entire zone: remove and control invasives; add replacement plantings where appropriate; manage natural succession to maintain existing habitat types; or, encourage and accelerate successional change in others. Invasives to target for removal and control in this MA include Lombardy poplar, and species that are not currently prevalent or widespread, such as purple loosestrife and yellow iris. In addition to controlling invasives, the other key element that would improve habitat value within and surrounding the wetland communities on site, would be to create swaths of upland woody vegetation linking isolated wetlands, and further linking these systems to the lakeshore and/or the forests of Promontory Point and the Forest Remnant Zone. Habitat functions also could be improved by placing brush piles and woody debris near existing wetland margins, to provide perches and refuge niches.

Detailed design and implementation work within the wetland habitats of the site should not be undertaken without input from professional wetland ecologists. A thorough understanding of the limits and opportunities present will assure greater success when this work is undertaken. In addition, there may be substantial regulatory permitting concerns and issues on site. The practices outlined below assume professional assistance, therefore they are not as specific as for other MAs.

3 YR. ESTABLISHMENT CARE

This care will be needed for any newly installed plantings in buffers and possibly within wetlands as well.

PLANTING

Planting should only be done with a commitment for 3 year establishment care. Species selection should reflect microclimate and hydrologic conditions at each planting site, but should be Puget lowland native species typical of wetlands subject to severe ranges in moisture periodicity from inundation to prolonged drought. Section 6.11 Tables give some reference lists of appropriate species.

PRUNING

Pruning should be limited to removal of limbs that pose a hazard to human infrastructure or public safety, otherwise dead limbs should be allowed (or encouraged) to fall as woody debris. Misshapen or hazardous limbs may not be critical issues in wetland areas where no maintained trails traverse. Best professional judgment should prevail for limb or tree removal, keeping in mind habitat enhancement priorities as well as public health and safety.

REMOVING PLANTS

Other than invasives, removals should be performed only in the case of hazard trees, or of diseased, installed plant material that needs to be replaced. When possible, removals should be done between August and February to avoid potential disruption of breeding wildlife. Woody debris from plant removals should be left or placed to create complexity for wildlife habitat. Branches, logs, and trunks from woody plants that do not sucker or sprout from cuttings can be gathered into brush piles, placed on

the ground as Large Woody Debris (LWD), left upright as snags, or left intact as stumps. Large Woody Debris from suckering/sprouting species like Lombardy and white poplar can be used if the logs are propped off the ground surface until wood is no longer viable (2 years). Poplar logs can be elevated on scrap lumber or other easily-decomposable, non-sprouting wood.

WEEDING AND INVASIVE CONTROL

Weedy and invasive species most likely to be problematic in this MA include: Himalayan blackberry, non-native poplar, yellow iris, purple loosestrife, and reed canarygrass. Woody debris resulting from invasive control that does not sucker or sprout from cuttings or branches can be left or placed as wildlife habitat such as brush piles, LWD, snags, or stumps (see description, above). Weeding and removal of non-native or invasive shrub and herbaceous species should take place during the growing season with as-needed frequency but at least monthly in the first year after installation.

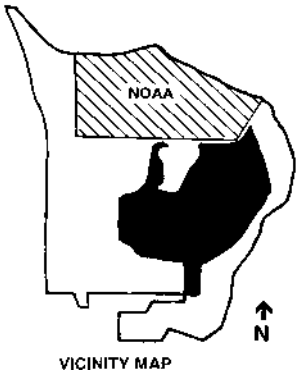
5.8.6 Wetland Mosaic Management Area

This MA represents the largest area within the Habitat Zone at 23 acres. The area has been designated a 'mosaic' because it has both wetland and upland habitats intermixed in such complexity as to make it unreasonable to map the distinctions for this VMP. The MA is located in the western and central areas of the Habitat Zone, north of Building 193, east of the Sand Point fields, and west and south west of the interior parking lot. It is characterized by herbaceous vegetation (mostly grasses and grass-like wetland plants), as well as scattered native and non-native trees and shrubs. Non-native poplars are a significant invasive presence within this MA and contribute to the overall existing canopy coverage. They are highly invasive, but do provide some wildlife habitat functions (perch habitat for songbirds, raptors, and owls; food source for insectivorous birds), so should be removed and replaced with native species incrementally.

Management and Maintenance Annual Calendar
Habitat Zone – Wetland Mosaic Management Area

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

▢ Indicates range of time to perform action as needed
• Indicates specific time to perform action



VICINITY MAP

For management purposes, the area will be treated similarly to the Wetland MA, with a focus on the control and removal of invasives; add replacement plantings where appropriate; manage natural succession to maintain existing habitat types; or encourage and accelerate successional change in others. Invasives to target for removal and control MA include Lombardy poplar and hawthorn. In addition to controlling invasives, the other key element that would improve habitat value is placing brush piles and woody debris throughout the MA for perches and refuge niches.

3 YR. ESTABLISHMENT CARE

This care will be needed for any newly installed plantings throughout the MA.

PLANTING

Planting should only be done with a commitment for 3 year establishment care. Species selection should reflect microclimate and hydrologic conditions at each planting site, but should be Puget lowland native species adapted to severe ranges in moisture periodicity from inundation to prolonged drought. Section 6.11 Tables give some reference lists of appropriate species.

PRUNING

Pruning should be limited to removal of limbs that pose a hazard to human infrastructure or public safety, otherwise dead limbs should be allowed (or encouraged) to fall as woody debris. Misshapen or hazardous limbs may not be critical issues in habitat areas where no maintained trails traverse. Best professional judgment should prevail for limb or tree removal, keeping in mind habitat enhancement priorities as well as public health and safety.

REMOVING PLANTS

Other than invasives, removals should be performed only in the case of hazard trees, or of diseased, installed plant material that needs to be replaced. When possible, removals should be done between August and February to avoid potential disruption of breeding wildlife. Woody debris from plant removals should be left or placed to create complexity for wildlife habitat. Branches, logs, and trunks from woody plants that do not sucker or sprout from cuttings can be gathered into brush piles, placed on the ground as Large Woody Debris (LWD), left upright as snags, or left intact as stumps. Large Woody Debris from suckering/sprouting species like Lombardy and white poplar can be used if the logs are propped off the ground surface until wood is no longer viable (2 years). Poplar logs can be elevated on scrap lumber or other easily-decomposable, non-sprouting wood.

WEEDING AND INVASIVE CONTROL

Weedy and invasive species most likely to be problematic in this MA include: Himalayan blackberry, non-native poplar, yellow iris, purple loosestrife, and reed canarygrass. Woody debris resulting from invasive control that does not sucker or sprout from cuttings or branches can be left or placed as wildlife habitat such as brush piles, LWD, snags, or stumps (see description, above). Weeding and removal of non-

native or invasive shrub and herbaceous species should take place during the growing season with as-needed frequency but at least monthly in the first year after installation.

5.8.7 Mowed Grassland Management Area

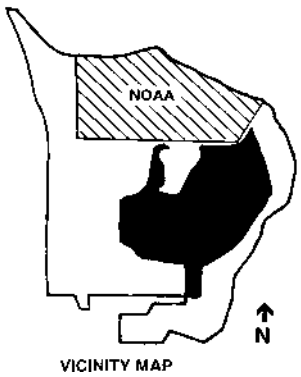
This MA is present immediately surrounding the existing tennis courts and on the top and eastern flanks of Kite Hill. It represents 6.4 acres of the Habitat Zone. This MA represents areas that are used for recreational purposes within the Habitat Zone: tennis, sitting, kite flying and other 'grassy field' sports or activities. Although these uses may not be considered 'habitat', this MA is included within this Landscape Zone for ease of mapping considerations. It is assumed that management will continue as regular repeated mowing based on turf management standards, not meadow standards.

The MA abuts areas of meadow, non-native thickets, and upland forests, so management activities may 'borrow' from each of those on the margins of the mowed grassland in order to keep the grassland intact. Near the tennis courts is a row of Lombardy poplar that are spreading by suckers and wind-blown seed. A long-term goal would be to remove these trees incrementally and replace them with more appropriate native trees and shrubs in order to maintain while replacing the shade and wind-blocking function that they currently provide.

Management and Maintenance Annual Calendar
Habitat Zone – Mowed Grassland Management Area

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Management and Maintenance Practices												
3 Yr. Establishment Care	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢
Pruning	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢
Removing Plants	•	•	•	•	▢	▢	▢	▢	▢	•	•	•
Taking Care of Turf	•	•	•	•	•	•	•	•	•	•	•	•
Weeding and Invasive Control												
Trees							▢	▢	▢			
Shrubs					▢	▢	▢	▢	▢			
Herbs				▢	▢	▢	▢	▢				

▢ Indicates range of time to perform action as needed
• Indicates specific time to perform action



VICINITY MAP

3 YR. ESTABLISHMENT CARE

This care will be needed for any new woody plantings that replace non-native trees and shrubs.

PRUNING

Prune trees and shrubs along the margins as needed for plant health and public safety.

REMOVING PLANTS

Removals of any natives should be performed only in the case of hazard trees, or of diseased plant material that needs to be replaced. When possible, removals should be done between August and March to avoid potential disruption of nests. Woody debris resulting from removal of invasive trees or shrubs that do not sucker or sprout from cuttings or branches can be left or placed as wildlife habitat features (such as brush piles, LWD, snags, or stumps) on the margins of the mowed grasslands. Wood that can not be used for habitat features until completely dead, should be stored off the ground until such time (2 years) that it is no longer viable.

TAKING CARE OF TURF

Turf care activities occur throughout the year.

WEEDING AND INVASIVE CONTROL

Regular and frequent mowing in this MA greatly reduces the occurrence of invasives, and limits them to the outer edges. Care to control the expansion of stands of Himalayan blackberry and Scot's broom should be taken, especially on Kite Hill. Non-native poplar is present and incremental removal and replacement of these tree species is recommended.

5.9 Dog Off-Leash Zone

This Zone is currently undergoing redesign while this Vegetation Management Plan is being crafted. Future conditions may include management of wetland areas to preclude seasonal access by dogs and humans during winter months, the creation of several acres of wetland and upland buffer compensation for proposed trail expansions from existing conditions. In addition, there is a conceptual plan for removal of the non-native thicket near the beach and replacing it with a variety of native shrubs and trees. Future conditions within the OLA are not described in this vegetation management plan as the conditions are subject to at least two permit applications, review and conditioning by Federal regulatory agencies. The Off-Leash Zone is therefore described in existing conditions. Future monitoring and maintenance activities, as outlined in the Off-Leash Area Wetland Compensatory Plan, now under review by the Corps of Engineers, or other future permit applications should be incorporated into this VMP once the permits have been accepted and conditioned by the Corps.

It is proposed to realign the Off-leash boundary to the north and west, to incorporate more upland meadow currently located northeast of the Junior League Playground. The seasonally wet swale that runs through this area will be fenced off from fall through spring, to preclude human or canine access into the standing water. Further east in the Off-leash area, the narrow E/W trail may be slightly widened to the south in some locations. Such widening has been proposed in areas avoiding existing wetland as much as feasible. To compensate for woodchip fill which has been placed in wetland - and for proposed additional impacts - wetland habitats outside the off-leash area will be created and enhanced at the north base of Kite Hill. In addition, an expansive area of dense blackberry thicket will be removed and replaced with native upland trees and shrubs to form a structurally more diverse upland shrub/forest buffer.

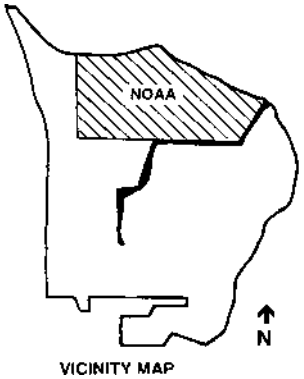
5.9.1 Upland Forest Management Area

The Upland Forest MA is a small patch of the Zone. It includes the small stand of mixed deciduous saplings located just south of the Junior League Playground, on the west side of the Dog Off Leash Zone. The madrone saplings are a key component of this woodland, however, protecting them from fungal blight may not be possible. The density and vigor of the young saplings is sufficient to warrant an attempt to preserve them. Deciduous species, located further to the east in the stand, are a mixture of non-native birches and native alder, big leaf maple and willow. This stand could benefit from additional species installation, of both canopy and shrub species. Given its location, care for tree height choices may be in order. The soils in the patch are severely compromised due to historic activities. If additional woody species are installed, some 'over-excavation' by breaking apart the compacted soils mechanically in an exaggerated circle around the installed plants may be extremely beneficial to long-term establishment and survival.

Management and Maintenance Annual Calendar
Dog Off-leash Zone – Upland Forest Management Area

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

▒ Indicates range of time to perform action as needed
• Indicates specific time to perform action



VICINITY MAP

3 YR. ESTABLISHMENT CARE

This care will be needed for any newly installed woody plantings.

PLANTING

Planting should only be done with a commitment for 3 year establishment care. Species selection should reflect the setting and should be Puget lowland native species typical of an upland forest, suggestions are in Section 6.11. It may be beneficial to break apart the extraordinarily compacted soils mechanically prior to installing larger woody material (this is not advised within the rooting zones of the madrone sapling grove, to avoid accidental damage or ingress for fungal diseases).

PRUNING

Pruning should be limited to removal of limbs that pose a hazard to human infrastructure or public safety, otherwise dead limbs should be allowed (or encouraged) to fall to the forest floor as woody debris. Misshapen or hazardous limbs may not be critical issues in the interior of woodlands or forests where no maintained trails traverse. Best professional judgment should prevail for limb or tree removal, keeping in mind habitat enhancement priorities as well as public health and safety.

REMOVING PLANTS

Other than invasives, removals should be performed only in the case of hazard trees, or of diseased plant material that needs to be replaced. When possible, removals should be done between August and March to avoid potential disruption of nests. Woody debris resulting from plant removals that does not sucker or sprout from cuttings or branches can be left or placed as wildlife habitat in the Habitat Zone, but not in the dog run. Habitat features can be brush piles, LWD, snags, or stumps. Wood that cannot be used for habitat features until completely dead, should be stored off the ground for the interim period (2 years).

WEEDING AND INVASIVE CONTROL

Weedy and invasive species most likely to be problematic in this MA include: Himalayan blackberry, hawthorne, non-native poplar, and Scot's broom. Weeding and removal of shrub and herbaceous species should take place during the growing season with as-needed frequency but at least monthly.

5.9.2 Non-native Shrub Management Area

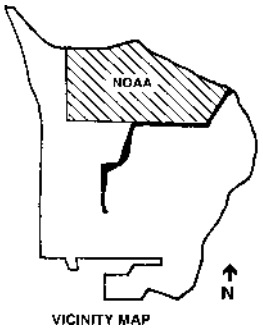
One substantial non-native shrub thicket (0.4 acres) exists in the Dog Off Leash Zone at the far east, end near the shoreline. In current conditions this is a high use area, which prevents any rapid undesirable expansion of the blackberry thicket. Because of the intensive human and dog use of this area, it is not considered high in habitat value. There is currently a very draft plan under development to remove the invasive thicket and replace it with a variety of native shrubs and trees. That plan is subject to review and conditioning by the Corps of Engineers, therefore, it is recommended that the maintenance and monitoring plan associated with that plan be incorporated as part of this VMP when the permits are approved.

If the site remains as an extensive non-native shrub thicket, then it should be managed under the same provisions as other Non-Native Shrub MA's in the Park. Those standards are provided below.

Management and Maintenance Annual Calendar
Dog Off-Leash Zone – Non-native Shrub Management Area

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Management and Maintenance Practices												
3 Yr. Establishment Care	▒	▒	▒	▒	▒	▒	•	•	•	•	•	•
Establishing Meadow				▒	▒	▒	▒	▒	▒	▒		
Maintaining Meadow									•			
Planting												
Trees		▒	▒							▒	▒	▒
Shrubs		▒	▒							▒	▒	▒
Herbs			▒	▒	▒	▒				▒	▒	
Amending Soils							▒	▒	▒			
Weeding and Invasive Control												
Trees						▒	▒	▒	▒			
Shrubs				▒	▒	▒	▒	▒	▒			
Herbs				▒	▒	▒	▒	▒				

▒ Indicates range of time to perform action as needed
• Indicates specific time to perform action



VICINITY MAP

3 YR. ESTABLISHMENT CARE

This care will be needed for any new woody plantings that replace non-native shrubs.

ESTABLISHING MEADOW

Some limited meadow areas can be established in cleared thicket areas that are adjacent to existing upland meadows. This will be the most labor-intensive and difficult plant community to establish in these areas due to the level of invasive control that will be needed. For these reasons, and because of the prevalence of meadow habitat in the Park currently, establishing more meadow may not be the most desirable choice for both ecological and economic reasons. Establishment would include removal of the invasives, seeding, weeding, mowing, and possibly soil amending.

MAINTAINING MEADOW

Any newly established meadows created as conversion from non-native shrub thicket must be actively managed to prevent colonization by woody plants and invasion by weedy herbaceous species. Annual fall mowing will be necessary to adequately control re-sprouting shrubs until meadow is established. After invasive shrub recruitment is controlled, mowing frequency can be decreased to one mowing every other year or every third year depending on the presence and rate of re-growth/reinvasion by woody species. Some regular hand-weeding to control invasives may also be needed.

PLANTING

Planting in non-native shrub areas should proceed after clearing, and any soil amending or sheet mulching has been completed. Thickets of non-natives that are adjacent to existing forest should be converted to a native woody plant community (trees and/or shrubs) rather then meadow, in order to expand the native shrub/forest communities on site. Thickets adjacent to existing upland meadow should be converted to meadow, oak savannah, or native shrubs. See the Tables in Section 6.11 for information on plant moisture tolerances.

AMENDING SOILS

Soil amending throughout planting area may be necessary or desirable after non-natives have been cleared and prior to planting.

WEEDING AND INVASIVE CONTROL

Non-native shrub thickets consist largely of Himalayan blackberry. Control and removal strategies for this species are described in Section 6.11.

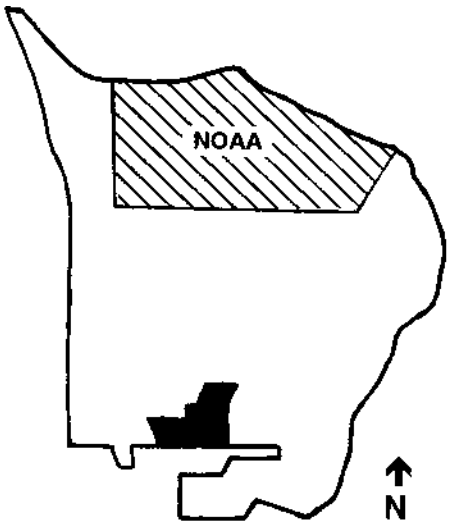
5.10 Building 193 Zone

This Zone is located immediately west of Building 193, and incorporates the parking lot landscaping for the building. The plants are typical non-native landscaping species of trees and shrubs. Maintenance priorities have to focus on maintaining public health and safety within the actively used parking lot for humans and vehicles.

Management and Maintenance Annual Calendar
Building 193 Zone

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Management and Maintenance Practices												
Pruning	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢
Removing Plants	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢	▢
Weeding and Invasive Control												
Trees						▢	▢	▢	▢			
Shrubs					▢	▢	▢	▢	▢			
Herbs					▢	▢	▢	▢				

▢ Indicates range of time to perform action as needed
• Indicates specific time to perform action



VICINITY MAP

PRUNING

Existing trees should be evaluated for pruning needs, to improve condition and reduce hazard potential wherever possible.

REMOVING PLANTS

Trees with significant structural problems should be removed.

WEEDING AND INVASIVE CONTROL

Removal of invasive non-natives such as Himalayan blackberry should be done on a regular basis to assure that no thickets become established. Weedy herbs should be removed on a regular basis to preclude setting seed to be dispersed into the nearby Habitat Zone.

SECTION 6: MANAGEMENT AND MAINTENANCE PRACTICES

6.0 MANAGEMENT AND MAINTENANCE PRACTICES

The practices described below are those referenced in Section 5 of this document, and are meant to provide the greater level of detail needed to carry out maintenance and project-specific work outlined in this VMP. Sections 5 and 6 are meant to be used together to describe what is to be done, when, and where (Section 5) and specifically how to do it (Section 6). The following practices for maintaining, restoring, establishing or removing vegetation have been developed for this VMP 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 the conditions and policies present at Sand Point Magnuson Park. Specific emphasis has been provided for control of non-native invasive species; how to care for, establish, and maintain native vegetation in natural area restoration and enhancement projects at the Park; and how to restore the historic developed landscapes at SPMP.

6.1 Amending Soils

The soil at SPMP is for the most part highly disturbed hard sandy silt to silty sand fill soil that is poorly drained because it has been highly compacted. The topsoil layer is no more than 2-3" deep, when present at all. Organic content is very low in these disturbed mineral soils. These soil characteristics favor opportunistic non-native invasive species, as well as early successional native pioneer species. Planting projects in the natural areas should reflect this in the choice of species, but in many cases it may be desirable to amend the soil throughout the area to be planted to improve site conditions for optimal success. Amendment of soil may need to be accompanied by mechanical ripping or scarification of the soil and/or tilling in of amendments to add organic material throughout the top 12" root zone. In developed landscape areas, soil amending can be done in specific planting beds, and where specimen trees are to be installed. Plant species choices in these areas should also reflect the site-specific conditions.

If soil amendments are part of a natural area project, amending should be done throughout a planting area, not by adding nutrient-rich soil to each individual plant pit. Doing a soil test to determine specific nutrient deficiencies may be desirable. Generally, the best way to add soil amendments to an area is to clear the site of invasives, aerate or scarify the soil if necessary, and then spread amendment (e.g. Cedargrove compost or equivalent) on the surface throughout the planting area. Amendment should then be tilled into the site with a tractor tiller or equivalent to incorporate it into the top 12" of the soil. Seasonal timing of this should be such that bare soils are not exposed to winter rains. Therefore, if done in the fall after summer weed removal, soil should be seeded or covered with wood chips whether or not site is planted that season. For logistical reasons such as cost, access, or lack of machinery, amending in this way may not be feasible. In this case, limiting the plant palette and planting into existing soil, or choosing a different technique are recommended.

Experimental soil amending can also be done at SPMP to explore other ways of improving soil health and thereby increasing planting success. The use of biosolids, used in gravel pit reclamation and road decommissioning work, for example, may be applicable at SPMP. Simple application of wood chips and leaf mulch onto the soil surface may also be a way to effectively get organic content back into the soil.
For soil amending in developed landscape areas, aerate and/or till the soil as needed, and apply amendments such as compost, GroCo/SteerCo, sand, or perlite to annual beds at planting time.

6.2 Establishing Meadow

Meadow establishment is not something that will likely be done much at Sand Point Magnuson due to the existing prevalence of this habitat type in the Park. Currently, tree/shrub savanna and upland meadow habitats combine for over 75 acres in the undeveloped landscape of the Park (Table 4.1, pg. 4-1). However, in some instances it may be desirable to convert some non-native shrub thicket or disturbed area to upland meadow, or to convert some meadow area to a more native species dominated grassland. The biggest challenge will likely be twofold: poor soil quality, and colonization or re-sprouting by invasive species (both woody and herbaceous) particularly while native forbs and grasses are establishing.

Soil quality can be improved by amending and tilling of the top 12" of soil matrix, or by scarifying the existing soil surface and simply top-dressing. Soil testing to determine the specific amendment that would best suit the site may be desirable. Possible amendments or combinations of materials to consider might include organic compost, wood chips, GroCo, or biosolids.

Planting is generally done with a combination of seeding and plug-planting. Seeding is usually done in late fall or very early spring (March). Plug-planting is usually done in early spring (March). Species composition should be a combination of forbs and grasses, predominantly bunchgrasses. A partial list of some of the typical Puget lowland/western Washington meadow/prairie species that might comprise the matrix of a meadow planting is given below. Examples of other local meadow restoration efforts that might help inform similar efforts at Sand Point Magnuson include: Promontory Point (at SPMP), Red Town Meadow at Cougar Mountain Regional Park (King County Park System), and Union Bay Natural Area in Seattle. Other examples of active prairie restoration work that may yield useful information even though the site conditions are very unique and quite different than conditions at SPMP, include glacial outwash prairie restoration at Smith Prairie on Whidbey Island, and at Mima Mounds near Olympia.

Partial List of Dominant Meadow Species

Scientific Name	Common Name
Achillea millefolium	yarrow
Anaphalis margaritacea	pearly everlasting
Aster curtus	white top aster
Camassia quamash	camas
Carex inops	long-stoloned sedge
Danthonia californica	California oatgrass
Elymus glaucus	blue wildrye
Eriophyllum lanatum	Oregon sunshine
Festuca idahoensis var. roemeri	Roemer's fescue
Festuca rubra var. rubra	red fescue
Koeleria macrantha	prairie junegrass
Lomatium sp.	lomatium, spring gold
Lupinus lepidus	prairie lupine
Potentilla gracilis	Northwest cinquefoil

6.3 Maintaining Meadow

Upland meadows must be actively managed to keep them from being colonized by woody species and converted into a later successional stage plant community. Infrequent but regular mowing is recommended as the best way to achieve this. The timing of mowing should minimize adverse impacts to nesting and feeding wildlife (particularly birds). Spring and summer mowing should be avoided to protect ground-nesting birds, and to allow birds time to forage for seed in summer. Mowing should occur in September, and for established meadow areas can be done at a frequency of once every second or third year. Mowing height should be approximately 5-6", unless management of target weed species requires lower cutting.

For meadows that currently have a high degree of invasion, or for newly establishing meadows that have been converted from non-native shrub thickets, mowing may need to be done annually for adequate suppression of woody species until woody species occurrence is sufficiently reduced. In some cases, additional brush control by hand-weeding may be necessary.

If meadow areas exhibit presence of invasive or noxious herbaceous species that is persistent, problematic, or increasing in coverage, mowing timing may need to be adjusted to occur earlier (July or August) so that the area is mowed before seed production and drop. Timing will depend on flowering and seed production of target species. Mowing height may need to be adjusted as well. Earlier seasonal mowing should only be done if needed, and if this timing adjustment is limited to a small (<0.5 acre) area at any one time. Maximum and minimum thresholds for target species occurrence should be determined as part of project monitoring recommended for any maintenance practice alteration. Alteration of mowing timing should be monitored, evaluated for effectiveness, and shifted back to later season (September) when weed suppression is adequate based on established thresholds.

The use of controlled burning as a means of meadow management may be a desirable option at some time in the future. This would have to be done in concert with the local fire department and applicable City and County regulations, and begin with some limited test burns to evaluate the effectiveness of this method. Current County regulations prohibit controlled burning as a maintenance option at this time. Therefore, no detailed burn plan is being proposed in this VMP.

6.4 Mulching

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.

Adapted from DPR's Landscape, Horticulture and Urban Forestry BMPs (1999) and 'City Among the Trees' (1998)

6.5 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 6.1-6.5 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. Section 5 provides some guidance with regard to species choices in these types of settings, by Landscape Zone and Management Area.

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 <u>all</u> 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.
- Protected 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 >¾" diameter for willows and cottonwood, and >½" 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 no more than 3-6" remaining above the ground, and 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 titled "Live Stake Cutting and Planting Tips"

Table 6.1. Recommended Species List for Planting Forest Areas - Xeric/Shady Palette

	Species	Common Name
OVERSTORY		
Early seral	*Abies grandis*	grand fir
	Acer macrophyllum	bigleaf maple
	Alnus rubra	red alder
	Pseudotsuga menziesii	Douglas fir
	Rhamnus purshiana	cascara
Later seral	*Cornus nuttallii*	Pacific dogwood
	Taxus brevifolia	western yew
	Tsuga heterophylla	western hemlock
UNDERSTORY		
Early seral	*Acer circinatum*	vine maple
	Corylus cornuta	beaked hazelnut
	Holodiscus discolor	oceanspray
	Lonicera ciliosa	orange honeysuckle
	Mahonia aquifolium	tall Oregon grape
	Mahonia nervosa	low Oregon grape
	Philadelphus lewisii	mock orange
	Polystichum munitum	sword fern
	Ribes sanguineum	red flowering currant
	Rosa gymnocarpa	baldhip rose
	Rubus parviflorus	thimbleberry
	Symphoricarpos albus	snowberry
Later seral	*Gaultheria shallon*	salal
	Oemleria cerasiformis	Indian plum
	Rhododendron macrophyllum	Pacific rhododendron
	Vaccinium ovatum	evergreen huckleberry
	Vaccinium parvifolium	red huckleberry
GROUND COVER	*Achlys triphylla*	vanilla leaf
	Aruncus dioicus	goat's beard
	Dicentra formosa	bleeding heart
	Linnaea borealis	twinflower
	Pteridium aquilinum	bracken fern
	Trillium ovatum	western trillium

Table 6.2. Recommended Species List for Planting Forest Areas - Mesic/Shady Palette

	Species	Common Name
OVERSTORY		
Early seral	*Abies grandis*	grand fir
	Cornus nuttallii	Pacific dogwood
	Fraxinus latifolia	Oregon ash
	Prunus emarginata	bitter cherry
	Rhamnus purshiana	cascara
	Thuja plicata	western red cedar
Later seral	*Tsuga heterophylla*	western hemlock
	Taxus brevifolia	western yew
UNDERSTORY		
Early seral	*Acer circinatum*	vine maple
	Cornus sericea	red-osier dogwood
	Gaultheria shallon	salal
	Lonicera ciliosa	orange honeysuckle
	Lonicera involucrata	black twinberry
	Mahonia nervosa	low Oregon grape
	Polystichum munitum	sword fern
	Rosa nutkana	Nootka rose
	Rubus parviflorus	thimbleberry
	Rubus spectabilis	salmonberry
	Sambucus racemosa	red elderberry
Later seral	*Vaccinium ovatum*	evergreen huckleberry
	Vaccinium parvifolium	red huckleberry
GROUND COVER		
	Aruncus dioicus	goat's beard
	Asarum caudatum	wild ginger
	Athyrium filix-femina	lady fern
	Blechnum spicant	deer fern
	Claytonia perfoliata	miner's lettuce
	Clintonia uniflora	queen's cup
	Cornus unalaschkensis	bunchberry
	Corydalis scouleri	Scouler's corydalis
	Dicentra formosa	Pacific bleeding heart
	Hydrophyllum tenuipes	Pacific waterleaf
	Linnaea borealis	twinflower
	Maianthemum dilatatum	false lily-of-the-valley
	Smilacina racemosa	false Solomon's seal
	Streptopus amplexifolius	clasping twisted stalk
	Tellima grandiflora	fringecup
	Tiarella trifoliata	foam flower
	Tolmiea menziesii	youth-on-age
	Trillium ovatum	western trillium
	Viola sempervirens	trailing yellow violet

Table 6.3. Recommended Species List for Planting Open Areas - Xeric/Sunny Palette

	Species	Common Name
OVERSTORY		
Early seral	*Abies grandis*	grand fir
	Arbutus menziesii	Pacific madrone
	Pinus contorta var. contorta	shore pine
	Pseudotsuga menziesii	Douglas fir
	Quercus garryana	Garry oak
Later seral	*Cornus nuttallii*	Pacific dogwood
UNDERSTORY		
Early seral	*Acer douglasii*	Douglas maple
	Amelanchier alnifolia	western serviceberry
	Arctostaphylos columbiana	hairy manzanita
	Ceanothus velutinus	snowbrush
	Corylus cornuta	beaked hazelnut
	Holodiscus discolor	oeanspray
	Lonicera ciliosa	orange honeysuckle
	Philadelphus lewisii	mock orange
	Prunus virginiana	chokecherry
	Rosa gymnocarpa	baldhip rose
	Sambucus cerulea	blue elderberry
	Symphoricarpos albus	common snowberry
Later seral	*Gaultheria shallon*	salal
	Oemleria cerasiformis	Indian plum
	Polystichum munitum	sword fern
	Ribes sanguineum	red flowering currant
	Vaccinium ovatum	evergreen huckleberry
GROUND COVER	*Achillea millefolium*	yarrow
	Anaphalis margaritacea	pearly everlasting
	Arctostaphylos uva-ursi	kinnikinnick
	Epilobium angustifolium	fireweed
	Linnaea borealis	twinflower
	Pteridium aquilinum	bracken fern

Table 6.4. Recommended Species List for Planting Open Areas - Mesic/Sunny Palette

	Species	Common Name
OVERSTORY		
Early seral	*Abies grandis*	grand fir
	Acer macrophyllum	bigleaf maple
	Alnus rubra	red alder
	Crataegus douglasii	black hawthorn
	Fraxinus latifolia	Oregon ash
	Malus fusca	Pacific crabapple
	Pinus contorta var. contorta	shore pine
	Populus balsamifera	black cottonwood
	Populus tremuloides	quaking aspen
	Prunus emarginata	bitter cherry
	Prunus virginiana	chokecherry
	Pseudotsuga menziesiii	Douglas fir
	Rhamnus purshiana	cascara
Later seral	*Cornus nuttallii*	Pacific dogwood
	Thuja plicata	western red cedar
UNDERSTORY		
Early seral	*Amelanchier alnifolia*	serviceberry
	Corylus cornuta	beaked hazelnut
	Holodiscus discolor	oceanspray
	Lonicera involucrata	black twinberry
	Physocarpus capitatus	Pacific ninebark
	Ribes sanguineum	red-flowering currant
	Rosa nutkana	Nootka rose
	Rosa pisocarpa	clustered wild rose
	Rubus parviflorus	thimbleberry
	Rubus spectabilis	salmonberry
	Salix lucida ssp. lasiandra	Pacific willow
	Salix sitchensis	Sitka willow
	Sambucus racemosa	red elderberry
	Symphoricarpos albus	snowberry
Later seral	*Acer circinatum*	vine maple
	Gaultheria shallon	salal
	Polystichum munitum	sword fern
GROUND COVER	*Athyrium filix-femina*	lady fern
	Dicentra formosa	Pacific bleeding-heart
	Maianthemum dilatatum	false lily-of-the-valley
	Pteridium aquilinum	bracken fern
	Viola spp.	violet

Table 6.5. Native Plant Species and Microclimate Requirements

Table format and information is adapted from and informed by 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 Dyrness); and field observations.

Table Abbreviations

Ind. Status (indicator status):

OBL Obligate wetland plants that almost always occur in wetlands (estimated probability 99%) under natural conditions.

FACW Facultative wetland plants usually occur in wetlands (estimated probability 67-99%) but occasionally are found in non –wetlands.

FAC Facultative plants are equally likely to occur in wetlands (estimated probability 34-66%) or non-wetlands

FACU Facultative upland plants usually occur in non-wetlands but occasionally occur in wetlands (estimated probability 1-33%)

NI No indicator status assigned

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 Soils SW=Shallow Water

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

Shrubs							
Scientific Name	Common Name	Ind. Status	Max Ht.	Light Needs	Site Placement	Spacing	Comments
Acer circinatum	vine maple	FAC-	25’	SD	M,X	6-10’	Needs canopy shade or lots of moisture.
Amelanchier alnifolia	serviceberry	FACU	20’	SI	X	6-10’	Edge-loving
Ceanothus sanguineus	redtsem ceanothus	UPL	6’	SI	X	5-8’	Commonly seral after fire, deciduous, nitrogen-fixer
Ceanothus velutinus	snowbrush	UPL	10’	SI	X	5-8’	Commonly seral after fire, evergreen, nitrogen-fixer
Cornus sericea	red-osier dogwood	FACW+	20’	ST	WE,SS,M	5-8’	Takes sun if it has lots of moisture
Corylus cornuta	hazelnut	FACU	15’	ST	X	4-6’	Good wildlife habitat
Crataegus douglasii	black hawthorn	FAC	20’	SI	M,X	5-8’	Typically on meadow hummocks
Gaultheria shallon	salal	FACU	7’	ST-SD	X	2-3’	Basic forest groundcover
Holodiscus discolor	ocean spray	UPL	10’	SI-ST	X	6-10’	Drought-tolerant, edge-loving
Lonicera involucrata	black twinberry	FAC+	10’	SI-ST	WE,SS,M	6-10’	Takes sun if has lots of moisture
Mahonia aquifolium	tall Oregon grape	UPL	4’	SD	X	3-4’	Dry sites
Mahonia nervosa	short Oregon grape	UPL	2’	ST-SD	X	2-3’	Dry sites
Malus fusca	western crabapple	FACW	35’	SI-ST	WE,M	5-8’	Edges
Oemleria cerasiformis	Indian plum	FACU	15’	SD	M,X	4-6’	Sub-canopy
Oplopanax horridus	Devil's club	FAC+	7’	ST	WE,M	4-6’	Needs good drainage, forms thickets
Philadelphus lewisii	mock orange	UPL	10’	SI-ST	M,X	4-6’	Needs good drainage
Physocarpus capitatus	Pacific ninebark	FACW-	20’	SI-ST	M,X	5-8’	Needs good drainage
Prunus virginiana	choke cherry	FACU	20’		X	5-8’	Native to the whole US
Rhamnus purshiana	cascara	FAC-	30’	ST-SD	M	6-10’	Found in most wetlands
Ribes bracteosum	stink currant	FAC	10’	ST	M	5-8’	Transition
Ribes lacustre	prickly currant	FAC+	7’	ST	M	4-6’	Can take drought
Ribes sanguineum	red-flowering currant	UPL	7’	SI	M,X	4-6’	Doesn't form thickets!
Rosa gymnocarpa	wood rose	FACU	7’	ST	X	3-4’	Tough, hardy
Rosa nutkana	Nootka rose	FAC	10’	ST	SS,M	3-4’	Rapid volunteer on damp soil
Rosa pisocarpa	clustered rose	FAC	7’	ST	WE,SS,M	3-4’	Will hybridize with nootka rose
Rubus leucodermis	black raspberry	UPL	10’	ST	X	6-10’	Good buffer planting
Rubus parviflorus	thimbleberry	FAC-	10’	SI	M,X	4-6’	Seral groundcover in clear-cuts, drought tolerant
Rubus spectabilis	salmonberry	FAC+	15’	HA	WE,M	4-6’	Takes sun if has lots of moisture
Salix geyeriana	Geyer willow	FACW+	15’	SI	SW,WE	6-10’	Likes inundation, sluggish water, wet meadows

Salix lasiandra	Pacific willow	FACW+	50’	HA	WE,SS,M	6-10’	Common, tolerant, prefers riparian
Salix scouleriana	Scouler willow	FAC	35’	ST	SS,M	6-10’	Upland & wetland
Salix sitchensis	Sitka willow	FACW	25’	HA	WE,SS,M	6-10’	Common, tolerant
Sambucus racemosa	red elderberry	FACU	20’	HA	M	5-8’	tolerates sun, seral on clear-cuts
Sorbus sitchensis	Cascade mountain ash	FACU	15’	SI-ST	M	6-10'	Not to be mistaken for *S. aucuparia*
Symphoricarpos albus	snowberry	FACU	7’	SI	M,X	3-4’	Common, tolerant
Vaccinium ovatum	evergreen huckleberry	UPL	5’	SD	M,X	4-6’	Prefers mature shade
Vaccinium parvifolium	red huckleberry	UPL	13’	SD	M,X	5-8’	Requires lots of organic matter

Sedges and Rushes

Scientific Name	Common Name	Ind. Status	Max Ht.	Light Needs	Site Placement	Spacing	Comments
Carex lenticularis	shore sedge	FACW+	3'	SI	WE,SS	1.5’	From shore to high mountains
Carex obnupta	slough sedge	OBL	4.5'	ST	SW,WE,SS	1.5’	Extremely common
Carex rostrata (utriculata)	beaked sedge	OBL	3’	SI-ST	SW,WE,SS	1.5’	Common
Carex stipata	sawbeak sedge	OBL	3'	SI-ST	SW,WE,SS	1.5’	Lowland to mid-montane
Eleocharis acicularis	spikerush	OBL	0.5'	SI	SW,WE	1.5’	Rhizomatous, lowland to mid-montane
Eleocharis palustris	common spikerush	OBL	0.5'	SI	SW,WE	1.5’	Rhizomatous, coastal to mid-montane
Juncus acuminatus	tapered rush	OBL	2'	SI	SW,WE	1.5’	Tolerant
Juncus articulatus	jointed rush	OBL	2'	SI	SW,WE	1.5’	Tolerant
Juncus ensifolius	dagger leaf rush	FACW	2'	SI	SW,WE,SS	1.5’	Lowland to mid-montane
Juncus oxymeris	pointed rush	FACW+	3'	SI	SW,WE,SS	1.5’	Lowland
Scirpus acutus	hardstem bulrush	OBL	6'	SI	SW,WE	1.5’	Tolerates up to 3' of water; common, hardy
Scirpus microcarpus	small-fruited bulrush	OBL	4.5'	SI-ST	SW,WE,SS	1.5’	Lowland to mid-montane, very common

Grasses

Scientific Name	Common Name	Ind. Status	Max Ht.	Light Needs	Site Placement	Spacing	Comments
Alopecurus aequalis	short-awn foxtail	OBL	1.5’	SI-ST	SW,WE,SS	1.5’	Often submerged
Alopecurus geniculatus	water foxtail	OBL	1.5'	SI-ST	SW,WE,SS	1.5’	Often submerged, tolerant
Beckmannia syzigachne	American sloughgrass	OBL	2'	SI	WE,SS	1.5’	Good wildlife forage, lowland to mid-montane

Calamagrostis canadensis	bluejoint reedgrass	FACW+	3'	ST	WE,SS,M	1.5’	Rhizomatous, coastal to mid-montane
Cinna latifolia	wood reed	FACW	6'	ST	WE,SS,M	1.5’	Coastal to sub-alpine
Deschampsia caespitosa	tufted hairgrass	FACW	2'	SI	WE,SS,M	1.5’	Common, keystone species in wet meadows
Elymus glaucus	blue wildrye	FACU	2'	SI	X	1.5’	Very drought-tolerant, good wildlife forage
Festuca idahoensis	Idaho fescue	UPL	2.5'	SI	X	1.5’	Drought-tolerant
Festuca occidentalis	Western fescue	UPL	2.5'	SI	X	1.5’	Open areas, forest edges
Festuca rubra var. rubra	red fescue	FAC+	2.5'	SI	SS,M	1.5’	Common, tolerant
Glyceria borealis (occidentalis)	northern mannagrass	OBL	4'	ST	WE,SS	1.5’	Tolerates up to 3' of water
Glyceria elata	tall mannagrass	FACW+	4.5'	SD	WE,SS,M	1.5’	Prefers streamside
Panicum occidentale	western panic-grass	FACW		SI	WE,SS,M	1.5’	Coastal to sub-alpine

Ferns

Scientific Name	Common Name	Ind. Status	Max Ht.	Light Needs	Site Placement	Spacing	Comments
Athyrium filix-femina	lady fern	FAC	6’	ST	SS,M	4-6’	Very common, tolerant
Blechnum spicant	deer fern	FAC+	2’	SD	M	2-4’	Needs shade, moisture, evergreen
Dryopteris expansa	wood fern	FACU	2’	SD	WE,SS,M	2-4’	Likes muddy soil
Gymnocarpium dryopteris	oak fern	FAC	16”	S	M	1.5-2’	Forms carpets
Polystichum munitum	western sword fern	FACU	4’	ST	M,X	4-6’	PNW basic; needs shade or moisture, evergreen
Pteridium aquilinium	bracken fern	FACU	5’	SI	X	2-4’	Seral on disturbed areas

Herbs and Groundcovers

Scientific Name	Common Name	Ind. Status	Max Ht.	Light Needs	Site Placement	Spacing	Comments
Achillea millefolium	yarrow	UPL	1'	SI	X	1-1.5’	Self-seeds, robust, tolerant
Anaphalis margaritacea	pearly everlasting	UPL	1'	SI	X	1-1.5’	Robust, tolerant
Arctostaphylos uva-ursi	kinnikinnick	FACU-	1'	SI	X	1-1.5’	Slow grower - likes dry stony soil
Aruncus dioicus	goat's beard	FACU+	2'	ST	M,X	1-1.5’	Streamside, edges
Caltha palustris	marsh marigold	OBL	9"	ST	SW,WE	1-1.5’	Coastal
Chimaphila umbellata or *menziesii*	pipsissewa	UPL	10"	ST	M	1-1.5’	Needs organic soil
Dicentra formosa	bleeding heart	FACU	1.5’	ST-SD	M,X	1-1.5’	Very common, tolerant
Epilobium angustifolium	fireweed	UPL	4'	SI	X	1-1.5’	Seral on clear-cuts, common, tolerant
Fragaria vesca	woodland strawberry	UPL	6"	SI	X	1-1.5’	Rapid spreader, evergreen
Geum macrophyllum	big-leaf avens	FACW-	3'	ST	WE,SS,M	1-1.5’	Common

Heracleum lanatum	cow parsnip	FAC+	6'	ST	WE,SS,M	1-1.5’	Likes riparian, self-seeds
Hieracium albiflorum	hawkweed	UPL	2’	HA	M,X	1-1.5’	common
Hydrophyllum tenuipes	Pacific waterleaf	NI	12"	ST-SD	M	1-1.5’	Wet forest groundcover
Linnaea borealis	twinflower	FACU-	6"	ST	M,X	1-1.5’	Usually in forests, but seral on clear-cuts
Lonicera ciliosa	orange honeysuckle	UPL	15’	ST	M,X	1-1.5’	Trailing/climbingvine
Lupinus polyphyllus	big-leaf lupine	FAC+	3'	SI	X	1-1.5’	Seral, common, tolerant
Lysichiton americanum	skunk cabbage	OBL	10"	SD	SW,WE	1-1.5’	Common, typical PNW
Maianthemum dilatatum	wild lily of the valley	FAC	14"	ST	M,X	1-1.5’	Rapid spreader
Mimulus guttatus	yellow monkey flower	OBL	3'	SI	WE,SS,M	1-1.5’	Forms sheets near seeps
Myosotis laxa	small forget-me-not	OBL	15"	ST	WE,SS	1-1.5’	Uncommon, pretty
Oenanthe sarmentosa	water parsley	OBL	3'	ST	SW,WE,SS	1-1.5’	Common, hardy, good amphibian habitat
Osmorhiza chiloensis	sweet cicely	NI	6"	ST-SD	X	1-1.5’	Very common in PNW forest
Oxalis oregana	wood-sorrel	NI	9"	ST	M,X	1-1.5’	Very rapid spreader, robust, highly tolerant
Petasites frigidus	coltsfoot	FACW-	20"	ST	WE,SS,M	1-1.5’	Rhizomatous, good spreader
Polygonum persicaria	lady's thumb	FACW	3'	SI-ST	SW	1-1.5’	Many species in this genus, good amphibian habitat
Smilacina stellata	Solomon's Star	FAC-	1.5’	ST	M	1-1.5’	Forms drifts near streams
Stachys cooleyae	Cooley hedge nettle	FACW	4'	SI-ST	M	1-1.5’	Common
Tellima grandiflora	fringecup	NI	2'	ST	M	1-1.5’	Common, tolerant
Tiarella trifoliata	foamflower	FAC-	2'	ST	M	1-1.5’	Common, tolerant
Tolmiea menziesii	piggy-back plant	FAC	30"	SD	M	1-1.5’	Forms drifts near streams
Trientalis latifolia	western starflower	UPL	6”	ST	M	1-1.5’	Often found in clumps around trees
Viola glabella	stream violet	FACW+	7"	SI-ST	M	1-1.5’	Common, rapid spreader

6.6 Pruning

At SPMP pruning is a maintenance action that will primarily only be necessary in developed landscape areas. Pruning in natural areas is to be done mainly in the case of hazard trees that pose a threat to public safety. Pruning can produce strong, healthy, attractive plants, but only if done well. Prune for your level of expertise, for poorly pruned plants often become bigger problems than when left alone. Pruning can stimulate fruit production, invigorate the plant, promote growth, repair injury, and increase value of trees and shrubs. If plants are planted in the right plant then pruning is less of an issue, and many future pruning problems can be eliminated. Begin with removing the three D's: Dead, Diseased or Damaged wood. Use clean, sharp pruning tools including handsaws, loppers, pruners, and chainsaws.

Trees

Prune for Safety

- Remove branches that grow to 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 my invite disease problems.

Prune for Aesthetics

- Enhance the natural form and character of the tree.
- Never 'top' trees. It is against DPR adopted 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.

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.
- Enhance flowering and fruiting.

6.7 Removing Plants

Plant removal outside of non-native control efforts is done primarily for the following reasons: poor tree architecture, summer branch drop, increased exposure, root loss, unstable rooting, girdling roots, leaning trees, unfavorable soil conditions, cracks, cankers, conks, seams, decay, cavities, and root and butt diseases. 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.

If the 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 a new one.

- 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.
- 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 the habitat 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 scattered throughout the habitat zone of the park. Placing brush piles and large woody debris is appropriate within any upland or wetland habitat in the Park, except for directly into the small seasonally ponded wetlands.

CAUTION: Do NOT place trunks or large branches from any of the non-native *Populus* species found on site (Lombardy, white poplar, or their hybrids) directly on the ground. These species will live sprout from large woody debris kept in moist contact with 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. It will eventually rest on the ground while the smaller pieces of wood decompose, resulting in large pieces of woody debris on the ground that pose no risk for sprouting and spreading unwanted invasive species. Smaller material, not used for brush piles, can be chipped and used as mulch.

6.8 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, such as organic fertilizer near streams, wetlands, and shorelines (all riparian areas).

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 landscaped. Examples are: 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: Once per year 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.

6.9 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 6.4). 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

	Month											
Action	J	F	M	A	M	J	J	A	S	O	N	D
At Time of Installation												
Mulching												
Watering												
Year 1												
Mulching								■	■	■		
Weeding					•	■	■	■	■			
Watering						•	•	•	•	•	•	•
Removing Tree Stakes											■	■
Year 2												
Mulching								■	■	■		
Weeding					•	■	■	■	■			
Watering						•	•	•	•	•	•	•
Removing Tree Stakes	■	■	■	■	■							
Year 3												
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.

6.10 Watering

Watering is the key to plant survival. Seattle gets 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 the term for efficient use of supplemental irrigation water required for many landscapes in Puget Sound. 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. Planning for temporary or permanent irrigation should be part of all future development or planting plans within SPMP for both developed and natural area landscapes to ensure adequate and efficient watering. Water sources for temporary irrigation during 3 year establishment care of newly planted areas could be watering trucks, fire hydrants (permit required), or existing permanent irrigation lines.

Irrigate the following Park areas:

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

Do NOT irrigate:

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

In general:

- Established trees and shrubs do not require supplemental watering except during periods of extreme drought.
- Water valuable, specimen trees and high-use or high-visibility planting beds during periods of extreme drought.
- Water new trees and shrubs thoroughly at planting.
- Water new trees and shrubs (weekly at least 1") during first two summers, tapering watering (to ½" weekly) in the third 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 6.5), and 3 Year Establishment Care (Section 6.9) for instructions on watering newly installed trees and shrubs.

6.11 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, as will reclamation and renovation projects in the historic landscape areas of the Park. 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 that are often lacking in the habitat 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 scattered throughout the habitat zone of the park. Placing brush piles and large woody debris is appropriate within any upland or wetland habitat in the Park, except directly into the small seasonally ponded wetlands. 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 each of the identified non-native invasive plants or noxious weeds identified as a significant presence at SPMP. At the

end of the text section are a series of tables describing specifics such as removal quantities, seasonal timing, replacement ratios, and removal intervals for each targeted species. Non-native invasive species that are not specified in these tables can be removed without limitations as appropriate.

Tree Species (canopy species >20' tall at maturity)

Non-native poplar (Populus alba, Populus nigra, and cultivars and hybrids)
Lombardy poplar, white poplar, and non-native poplar hybrids are the most prevalent invasive tree species in the Park. They are found throughout the Park as components of existing forest patches, and in upland meadow and tree/shrub savannah areas. 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. Removal can proceed incrementally as resources for removal and re-planting are available. Although these trees are invasive non-natives, and there are a significant number of native canopy trees that will remain to provide lost functions, these trees do provide limited habitat function (mainly perching areas and insect production), and should therefore be removed incrementally as detailed in Table 6.8.

Removal of these trees to halt their spread is a high priority. 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 3A 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. They should be stored off the ground for 2 years or until non-viable, before they are placed in natural areas to avoid any resprouting.

Norway maple (Acer platanoides)
Norway maples are planted as landscape specimen trees in various areas of the Park, namely in the Historic District and the shoreline areas in the vicinity of the swimming beach and bathrooms. They are also found on the low ridge on the south side of the tennis courts. This is a less problematic and less prevalent species at SPMP than non-native poplar, but does produce prolific seed, and is known to be a very opportunistic plant in other settings where it has had more of a chance to gain a foothold in native forests.

Removal and replacement of this species is recommended (see Table 6.8), but at a lower priority level than the poplars. 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 3A 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. They should be stored off the ground for 2 years or until non-viable, before they are placed in natural areas to avoid any resprouting, and no seeds should remain on branches placed as habitat features.

Shrub Species (<20' tall at maturity)

Laurel (Prunus laurocerasus, Prunus lusitanica), English holly (Ilex aquifolium)
Laurel and holly are broad-leaved evergreen shrubs that are spread readily by birds due to their prolific and tasty fruit. They also sucker and re-sprout vigorously. They prefer at least partial shade and are generally found in upland forest in the understory, or along forest edges. At SPMP these species are most prevalent in the wooded portions of Promontory Point, and are also found in the Forest Remnant Zone along NE 65th St.

Removal of these species should be a high priority because they are not yet widespread, and occur mostly as individual plants rather than as large thickets. Young plants that are small enough can be hand-pulled, but most removals of larger plants that cannot be removed with the roots intact will probably be done most effectively by a combination of mechanical means and herbicide. A 25% solution of Garlon 3A 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. Removal details can be found in Table 6.10.

Non-native Hawthorn (Crataegus sp.) and Firethorn (Pyracantha)
Non-native hawthorn is a large tree-like shrub that spreads by suckering and by prolific fruit production that is excellent bird forage. It is found throughout the upland meadow and tree/shrub savannah areas at SPMP. Firethorn is present in the Park to a much more limited degree, in the Shoreline Zone north of the swim beach and to some degree along forest/meadow edges at Promontory Point. Both of these species provide important bird forage as well as cover and refuge for wildlife. For this reason, incremental removal and replacement of hawthorn is recommended (Table 6.9) so that over time this invasive species is replaced with natives that provide the same functions for wildlife without radical displacement occurring during this process. Removal of all firethorn that can be located is a high priority because it is still scarce in the Park.

Because hawthorn is a suckering species, the most effective removal technique for individual plants too large to allow removal of the entire plant with the roots intact will be to cut individual shrubs and apply herbicide directly to the cut surface to prevent resprouting. A 25% solution of Garlon 3A 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 and Evergreen blackberry (Rubus procerus, R. laciniatus)
Both of these non-native blackberries are found in the Park, though Himalayan blackberry is by 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 meadow 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. Ongoing control of sparser occurrences in meadow and savannah areas and preservation of existing non-invaded areas should be achieved with implementation of prescribed mowing regimen in meadow areas. 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 31st. Depending on the removal method chosen, this may not always be possible, and maximum removal effectiveness may take precedent 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 31st), 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 1st) 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 (see Table 6.6), as these thickets provide both forage and good refuge and cover for wildlife. Native wildlife should have adjacent or nearby comparable habitat to take the place of what is removed. Blackberry that is not dense enough to be a monotypic thicket can be removed as part of meadow maintenance activities (mowing or hand pulling) or as invasive control along edge habitat. 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.

Scot's broom (Cytisus scoparius)

Scot's broom is found in open dry upland areas in the Park, established and colonizing in meadows and along forest edges. In areas where it is well-established, like blackberry it has formed monotypic stands or thickets. 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, and long-lived seed. Removal of seed-producing age plants is the most labor intensive, but is important to reduce spread and seed accumulation. Removal and control of younger plants is easier because they can be hand-pulled or mowed, and is also important to keep the 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 (see Table 6.7). Plants can be removed by mowing, hand-cutting individual plants, or manual removal and grubbing with shovels, weed wrenches or machinery, which may the least desirable due to the soil disturbance and opportunity for improved 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 and should either be followed up by continued subsequent annual (or more often) cutting or by herbicide treatment (Roundup with water soluble dye) of cut stumps. Hand-pulling of smaller infestations of young plants (3' tall and smaller) should be done when soil is moist and loose (spring).

Broom thickets could also 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.

Scots broom that is not dense enough to be a monotypic thicket can be removed as part of meadow maintenance activities (mowing or hand pulling) or as invasive control along edge habitat. 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 at SPMP in the forest ground layer and climbing up tree trunks in upland forest areas, mainly Promontory Point, in the Forest Remnant Zone, and in selected portions of upland forest within the Habitat Zone (mostly at the south end 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 (see Table 6.12). Vines should be cut at shoulder height and again at the base of the tree all the way around its circumference. Cut vines should not be pulled down out of trees. A radius of at least 5' from the base of the tree all the way around the tree should also 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 done if subsequent replanting is to be done. New planting areas should have an additional 10'-wide cleared strip around the edge. Removal of sparse occurrences of ivy, as can be found in portions of upland forest at the south end of the Habitat Zone, can be done without replacement planting. Control in these areas of low infestation should be prioritized to prevent further spread of this species.

Butterfly bush (Buddleia davidii)

Although this species is very desirable for attracting butterflies, it is also highly invasive. This plant is not prevalent in SPMP, so removal of individuals immediately when they appear is strongly recommended so that control is achieved before this species becomes widespread in the Park.

Clematis (Clematis vitalba)

Clematis is a woody invasive vine that is found in upland forest habitats. At SPMP, it occurs at Promontory Point and in the Forest Remnant Zone. It is usually seen up in the tree canopy and hanging below. Control of this species involves cutting the vine at the base near the ground in early summer before seed production occurs, and either grubbing out the root, or applying herbicide (Roundup with water soluble dye) directly onto the surface of the cut stump. Dead top growth can be removed in fall or winter when vines have become brittle.

Herbaceous Species

Japanese knotweed (Polyganum cuspidatum)
Knotweed, or false bamboo, is an herbaceous perennial that forms large monotypic clumps upwards of 6-8' in height. It reproduces by seed and by rhizomes, which are very large and impossible to remove effectively by grubbing. It prefers moist soil conditions, and is typically found around wetlands, along streambanks, and in ditches. At SPMP, it currently has a limited presence mainly in a few isolated locations along the shoreline, and in a large stand on the northwest slope of Promontory Point just east of the USGS lab.

Immediate removal of these patches is strongly recommended to prevent further spread of this species because it is so persistent and dominant once established, and can be very difficult to eradicate. The most effective removal method is to exhaust its root reserves by repeated cutting during the growing season (at least 3 times between April and August), and then burying the entire area after the last cutting under well stapled heavy duty weed fabric or double layer industrial strength cardboard, overlain by a deep (8-12") layer of wood chips. If desired, selective application of Rodeo can be used on re-growth in late summer, and fabric/mulch installation can be delayed until late winter. Planting should not be done until after 2-3 years so that the fabric/mulch is not compromised while roots are still viable. See Table 6.11 for removal strategy details.

Purple loosestrife (Lythrum salicaria)
Purple loosestrife is a perennial herb with a well-developed taproot. It is found in wetlands, ditches, wet meadows, and along shorelines. It readily establishes and spreads in disturbed wet soils. At SPMP it is not common or widespread, so control efforts for this should be a high priority. Isolate and reduce/remove existing populations to prevent further spread, and monitor known wet areas in the Park. Bright magenta flowers on 2-5' tall stalks are easy to spot in late summer when the plant is in bloom. Existing known populations at SPMP are in the wetland north of the boat ramp along the promenade, in the wet area surrounding the abandoned building in the far north end of the Shoreline Zone, and in the wet area just south of the Dog Off Leash Zone on the north side of Kite Hill.

Control is achieved by eradicating these existing small populations. Hand-pull to remove the plant and its taproot in the summer before seed has set and when soils are still moist. Minimize disturbance to soil to avoid creating desirable conditions for more seedling establishment. Hand-pulling should continue regularly over 2-3 years until removal is thorough. If pulling is not effective, and populations remain small, cutting flower heads prior to seed production can be done to limit seed production. If herbicide is used (Rodeo), it should only be wick-applied to individual plants.

Field bindweed (Convolvulus arvensis)
Bindweed is a pervasive and very invasive perennial vine that winds around and overtops woody vegetation, and forms strangling mats over the top of low shrubs and

understory. It thrives in disturbed sites, especially in sunny locations with moderately dry soils. It can be a particular problem in areas that have been newly cleared of other invasives (e.g. Himalayan blackberry) and replanted. It is most prevalent in the Promontory Point and Forest Remnant Zones. Control of this species will mostly be required in the course of carrying out 3 year maintenance care for newly planted sites. Regular hand-pulling and heavy mulching with wood chips during that 3 year establishment period should suppress this weed adequately. Less frequent follow-up weeding may also be needed after the three year period.

Canada thistle (Cirsium arvense)

Canada thistle is typically found in open disturbed sites and indeed at SPMP occurs mainly in meadow and savannah areas primarily in the Habitat Zone. It is shade intolerant and will not succeed in forested areas. It spreads mostly by windborne seed, but also reproduces by rhizomes or root segments. Control and removal of this species is done by hand-pulling in the case of small infestations, and mowing in the case of large stands. Hand-pulling should be done throughout summer, optimally in June, August and September, and if only done once should be timed before seed sets. Mowing as close to the ground as possible should be done when plants are in flower, but prior to seed set as well. Control efforts will likely have to be repeated for 2-3 years in any given area to be effective.

Listed Noxious Weeds

[Garlic mustard (Alliaria petiolata), Tansy ragwort (Senecio jacobaea) are known occurrences at SPMP]

Listed noxious weeds will be controlled as required by County Regulations and in accordance with DPR's BMPs.

Table 6.6. Removal Schedule for Blackberry Thickets (Himalayan, Evergreen)

Size of thicket	<50 sq. ft.	<50 sq. ft.	>50 sq. ft. to 1/10 acre	>1/10 acre
Landscape Setting	***Not*** contiguous with shrub or forest habitat, ***and not*** in Shoreline Zone	Contiguous with shrub or forest habitat, ***or*** in Shoreline Zone	Any Zone, any M.A.	Any Zone, any M.A.
Removal Strategy	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.
Timing	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	Depends on strategy chosen but July 1 - April 1 is preferred
Max. Annual Removal Area	unlimited	Limited only by resources for replanting and 3 year establishment care	Limited only by resources for replanting and 3 year establishment care	Not to exceed 1/3 total acreage of blackberry thickets of this size class in Park
Removal Interval	none	none	none	Every 3 years at the successful completion of 3 yr. establishment care period for previously removed area
Replanting Strategy	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.
Replanting Densities	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)
Species Composition of Replacement Planting	NA	Xeric or Mesic plant community 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	Xeric or Mesic plant community depending on microclimate conditions and existing vegetation at replanting location
Minimum Possible Time to Remove Max. Acreage in Size Class if Effort Optimally Funded	1 year	1 year	1 year	9 years

Table 6.7. Removal Schedule for Scot's Broom Thickets

Size of thicket	<50 sq. ft.	>50 sq. ft.
Landscape Setting	Any Zone, any M.A.	Any Zone, any M.A.
Removal Strategy	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.
Timing	Depends on strategy chosen but July 1 - April 1 is preferred	Depends on strategy chosen but July 1 - April 1 is preferred
Max. Annual Removal Area	unlimited	Limited only by resources for replanting and 3 yr. establishment care
Removal Interval	none	none
Replanting Strategy	No replanting required	Replant removal area with trees and shrubs. 3-yr. establishment care is required.
Replanting Densities	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)
Species Composition of Replacement Planting	NA	Xeric plant community
Minimum Possible Time to Remove Max. Acreage in Size Class if Effort Optimally Funded	1 year	1 year

Table 6.8. Removal Schedule for Non-native Poplar, Norway Maple

Removal Size	Saplings <15' ht. and/or <1" dbh	Canopy trees >15' ht. and/or >1" dbh
Landscape Setting	Any Zone, any M.A.	Any Zone, any M.A.
Removal Strategy	Remove entire group of saplings or individuals and return once yearly for 2-3 years to check for and control vegetative re-sprouting	Thin trees within existing stands and return once yearly to check for and control vegetative re-sprouting.
Removal Quantity	Limited only by resources for replanting and 3 year establishment care	Up to 1/3 the total number of stems in a given stand
Timing	Depends on strategy chosen but July 1 - April 1 is preferred	Depends on strategy chosen but July 1 - April 1 is preferred
Max. Annual Removal Quantity	Limited only by resources for replanting and 3 year establishment care	No more than 1/3 total number of target stems in the Park
Removal Interval	none	No more than 1/3 total stems every 5 years
Replanting Strategy	Replace lost aerial coverage with equal area of tree and shrub plant community around edges of nearest adjacent forest patches. At the time of planting, replacement community must equal or exceed lost aerial coverage. 3-yr. establishment care is required.	Replace lost aerial coverage with equal area of tree and shrub plant community around edges of nearest adjacent forest patches. At the time of planting, replacement community must equal or exceed lost aerial coverage. 3-yr. establishment care is required.
Replanting Densities	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)	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) ***OR*** An association of 6-10 plants per tree removed with at least 2 trees in each association
Species Composition of Replacement Planting	Xeric or Mesic plant community 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
Minimum Possible Time to Remove Max. Quantity if Effort Optimally Funded	1 year	15 years

Table 6.9. Removal Schedule for Non-native Hawthorn

Removal Size	All sizes
Removal Strategy	Remove individuals and return once yearly in conjunction with 3 year establishment care to check for and remove re-sprouts.
Removal Quantity	Limited to removal that leaves immediately available nearby alternate habitat for displaced wildlife. Also limited by resources for replanting and 3 yr. establishment care
Landscape Setting	Any Zone, any M.A.
Timing	Depends on strategy chosen but July 1 - April 1 is preferred
Max. Annual Removal Quantity	Limited only by resources for replanting and 3 yr. establishment care
Removal Interval	none
Replanting Strategy	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, ***OR*** around edges of nearest adjacent forest patches. 3-yr. establishment care is required.
Replanting Densities	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)
Species Composition of Replacement Planting	Xeric or Mesic plant community depending on microclimate conditions and existing vegetation at replanting location
Minimum Possible Time to Remove Max. Quantity if Effort Optimally Funded	1 year

Table 6.10. Removal Schedule for Firethorn, Laurel, Holly, Butterfly Bush

Removal Size	All sizes
Removal Strategy	Remove individuals and return once yearly to check for and remove re-sprouts in conjunction with 3 year establishment care.
Removal Quantity	Limited only by resources for replanting and 3 yr. establishment care
Landscape Setting	Any Zone, any M.A.
Timing	Depends on strategy chosen but July 1 - April 1 is preferred
Max. Annual Removal Quantity	Limited only by resources for replanting and 3 yr. establishment care
Removal Interval	3 years
Replanting Strategy	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, ***OR*** around edges of nearest adjacent forest patches. 3-yr. establishment care is required.
Replanting Densities	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)
Species Composition of Replacement Planting	Xeric or Mesic plant community depending on microclimate conditions and existing vegetation at replanting location
Minimum Possible Time to Remove Max. Quantity if Effort Optimally Funded	1 year

Table 6.11. Removal Schedule for Japanese Knotweed

Size of Patch	Any size
Removal Strategy	Remove entire patch and return twice yearly during the next 2-3 growing seasons to check for and remove re-sprouts.
Landscape Setting	Any Zone, any M.A.
Timing	Depends on strategy chosen
Max. Annual Removal Area	Limited only by resources for follow-up control and replanting in year 2 or 3
Removal Interval	none
Replanting Strategy	No replanting and 3 year establishment care are to be done until control of invasion is complete (2-3 years). Replanting of entire removal area with trees and shrubs and 3 year care are required.
Replanting Densities	Trees: 500/acre = 0.012/sq. ft. and Shrubs: 1200-2500/acre = 0.028-0.058/sq. ft. (shrub density depends on optimal spacing for species used)
Species Composition of Replacement Planting	Mesic or moist plant community depending on microclimate conditions and existing vegetation
Minimum Possible Time to Remove Max. Acreage in Size Class if Effort Optimally Funded	1 year for initial removal, 2-3 years for replacement planting

Table 6.12. Removal Schedule for English Ivy

Size of Patch	Any size
Landscape Setting	Any Zone, any M.A.
Removal Strategy	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.
Timing	Depends on strategy chosen
Max. Annual Removal Area	Limited only by resources for replanting and 3 year establishment care
Removal Interval	none
Replanting Strategy	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.
Replanting Densities	Trees: 500/acre = 0.012/sq. ft. Shrubs: 1200-2500/acre = 0.028-0.058/sq. ft.
Species Composition of Replacement Planting	Xeric or Mesic shade-tolerant community depending on microclimate conditions
Minimum Possible Time to Remove Max. Acreage in Size Class if Effort Optimally Funded	1 year

SECTION 7: PLAN IMPLEMENTATION

7.0 PLAN IMPLEMENTATION

Implementation of this plan must be done strategically and incrementally to maximize the potential benefits from efforts expended. This section is meant to provide guidance on setting priorities amongst the numerous maintenance actions and projects described in previous sections of this document. Maintenance and specific projects are treated separately – the former is ongoing, while the latter involves initial implementation directed toward a particular landscape element or area. Over time, the bulk of landscape will shift into the category of ongoing maintenance. To further distinguish among aspects of implementation work, natural and developed landscapes are treated separately, reflecting the different criteria appropriate to use in setting priorities.

7.1 Ongoing Maintenance

Ongoing maintenance consists of the regular maintenance activities that are necessary to simply keep the Park in its current state. The work encompassed by these activities is performed by DPR staff or by paid workers under contract with SPMP. This work includes things like mowing grass, taking care of landscape beds in the Historic District, removing hazard trees after a windstorm, pruning, mulching beds, mowing and weeding of the Fin Project, and mowing meadows in the natural areas. There may be some opportunities for volunteer involvement and stewardship within the framework of ongoing maintenance activities. For example: habitat islands in the Fin Project may be adopted and taken care of by a volunteer group; specific landscape beds in the Historic District could be adopted by citizens in the transitional housing at SPMP who would weed and water them; pruning of specific areas could be done annually by students in local Horticulture programs at Edmonds Community College and/or Lake Washington Vocational Technical College.

7.1.1 Natural Area Landscapes

Maintenance in the natural areas of the Park consists generally of the following: mowing of meadow areas, removal of hazard trees, mowing and weeding of the Fin Project, care of previously implemented planting projects, and limited control and eradication of invasive and noxious weeds. This maintenance is currently done by SPMP staff and paid contractors, with significant contributions of time from volunteers for the last two actions. As implementation of specific projects proceeds, expanding the volunteer base to help with the stewardship of newly planted areas will be critical to the success of these projects. Ensuring adequate stewardship prior to project implementation is strongly recommended.

Prioritization of Actions

The following maintenance actions in natural areas should be HIGH priority:

1) Contain thickets of non-native woody species by establishing and maintaining boundaries of invasion.

2) Mow upland meadows and meadow in savanna areas in September to keep woody species and weedy herbaceous species from becoming established.
3) Maintain already implemented planting projects.

The table below lists the landscape zones and management areas where high priority maintenance actions should occur.

Table 7.1 High Priority Maintenance for Natural Areas

Landscape Zone	Management Area	Action
Habitat	Upland Meadow	meadow mowing, thicket containment
	Tree/Shrub Savannah	meadow mowing, thicket containment
Shoreline	Upland Meadow	meadow mowing, thicket containment
	Tree/Shrub Savannah	meadow mowing, thicket containment
Promontory Point	Upland Meadow	meadow mowing (particularly in the NW meadow)
	Upland Forest	maintain perimeter plantings already in place
Forest Remnant	Open Forest Margin	meadow mowing
Community Activity Center	Tree/Shrub Savannah	meadow mowing
Sportsfields	Upland Meadow	meadow mowing

7.1.2 Developed Landscapes

Maintenance in the developed landscape areas of the Park consists generally of the following: mowing of turf, other turf care (aerating, fertilizing, etc.), watering of beds, mulching, pruning, and weeding and invasive control. This maintenance is currently done by SPMP staff and SCC. Volunteers could be included in some maintenance in these areas if associated with new project implementation.

Prioritization of Actions

The following maintenance actions in developed areas should be HIGH priority:

1) Monitor inventory-identified, potentially hazardous trees with target(s), and provide appropriate follow-up mitigation.
2) Apply and annually replenish organic mulch in established planting beds and around bases of trees.
3) Remove weeds climbing up or engulfing ornamental plants.
4) Contain invasive plant spread within current (or as feasible, reduced) areas, and cut back during growing season before seeds mature.
5) Provide training pruning for juvenile trees, to establish good structural framework.

Table 7.2 High Priority Maintenance for Developed Landscape

Landscape Zone	Management Area	Action
Historic District	North Shore Recreation	Invasives containment & cutting back
	Aircraft Industrial	Invasives containment, training pruning
	Historic District Core	Weeding established beds, mulching, monitoring & abating tree hazards
	Officer's Row	Weeding & mulching beds, invasives control along east edge
	Golf Greensward	Invasives control @ south end
	Sand Point Way	Monitoring & abating tree hazards, mulching base of trees
Sand Pt. E. Housing		Meadow mowing, invasives containment, pruning apples

7.2 Specific Projects

The implementation of specific projects at SPMP should always be overseen by DPR staff at SPMP and the DPR Urban Forestry Program (when appropriate). Specific projects include things like meadow restoration at Promontory Point, replacement planting done in concert with invasive removal, planting the grassy islands in the south parking lot with trees and shrubs, and renovating or restoring specific elements of the historic landscape in the Historic District. Volunteer stewardship can and should be a significant part of this type of work at SPMP.

7.2.1 Natural Area Landscapes

In the natural areas throughout the Park, the general and common theme of most of the specific projects is the removal and replacement of invasive plant species with natives, and the supplementation or enhancement of existing habitat. This work should proceed to focus high priority on containment of the most rapidly spreading invasives, removal of those that are the least established but potentially threatening, and removal/reduction of those that can be removed most easily for the greatest habitat benefits. In addition, the most intact habitats, and those that provide the greatest benefit to the greatest variety of species or wildlife guilds should be targeted for protection and enhancement measures to keep them that way. Finally, projects that are good candidates for outside funding or grant money should be high priority as well. Lowest priority should be given to those areas that are the most compromised and will require the highest level of effort to restore to quality habitat. These areas should be addressed with removal/control and replanting efforts with an expectation of a high level of initial effort followed by extensive long-term continuing care. All other areas that do not meet the criteria for either the highest or lowest level of attention are moderate priority.

Specific projects with Zones and Management Areas identified are listed in Tables 7.2 and 7.3 below for high and low priority levels.

Project Prioritization

High Priority Projects

The most immediate and focused attention should be directed at those existing habitats within SPMP that are the least compromised and those that have the highest value or the highest potential value. More specifically, these habitats include riparian, wetland and aquatic habitats, and upland forest. Projects that fall under the first of the two categories described below should be implemented as soon as possible. They do not require large capital expenditure, but have substantial positive habitat benefits. Projects that fall under the second category are dependent on more substantial initial implementation capital, and although they are high priority, may not be as immediately possible for budgetary reasons.

1) Removals of invasive non-native species from areas with low levels of invasion that exhibit characteristics of relatively intact and high wildlife value plant communities. Removals of non-native invasives that are relatively easy to remove and result in significant positive benefits to the targeted habitats.
2) Restoration of habitats that are of the highest value, regardless of existing level of degradation.

Table 7.3 High Priority Projects for Natural Areas

Landscape Zone	Management Area	Project
Habitat	Upland Forest	• Removal and replacement of non-native poplar throughout all forest areas • Removal and replacement of all other non-native invasives No specific forest patches are identified as higher priority than others. All patches that meet the criteria for high priority projects are good candidates for immediate action.
	Wetland	• Removal and replacement of non-native poplar in all wetlands and adjacent buffers • Control of non-native invasives (yellow iris, purple loosestrife, Japanese knotweed) • Enhancement of wetland buffers to link wetlands across the landscape with forest
	Wetland Mosaic	• Removal and replacement of non-native poplar in all areas of mosaic • Removal and replacement of non-native hawthorn in all areas of mosaic
	Non-native Shrub	• Removal and replacement of thickets in wetland buffers • Removal and replacement of thickets in between forest patches to promote linkage between isolated patches and increase forest patch size

Habitat	Tree/Shrub Savannah	• Removal and replacement of non-native poplar in all areas of savanna
Shoreline	Nearshore	• Removal and replacement of non-native poplar along edge of shoreline • Removal of knotweed, yellow iris, blackberry and other shrub and herb layer invasives • Restoration of littoral zone substrate and shoreline edge (starting at far north end)
	Wetland	• Removal and control of yellow iris and purple loosestrife • Enhancement of buffer with control of invasives and planting of appropriate natives
	Non-native Shrub	• Removal and replacement of thickets east of the promenade in conjunction with shoreline edge and nearshore restoration • Removal of and replacement of pyracantha north of swimming beach
	Tree/Shrub Savannah	• Removal and replacement of non-native poplar in all areas of savanna
Promontory Point	Upland Forest	• Removal and control of invasives on east-facing slopes above Kingfisher Basin (ivy in trees and cliffs) • Removal and control of invasives on north-facing slope and bench of west ridge • Removal and control of invasives on west-facing slope of central N-S- ridge • Removal and control of Japanese knotweed on north slope of central N-S ridge
Community Activity Center	Tree/Shrub Savannah	• Removal and replacement of non-native poplar in all areas of savanna
Dog Off Leash	Upland Forest	• Removal and replacement of non-native poplar in all areas of forest • Removal and control of shrub and herb layer invasives throughout
Forest Remnant	North Woodland	• Removal and replacement of non-native trees (poplar, London plane, horse chestnut, Norway maple, birch, hawthorn, mountain ash) in all areas of forest • Removal and control of shrub and herb layer invasives throughout
	South Woodland	• Establishment of perimeter protection of area with fencing, dense edge plantings • Restoration of vegetation to central, construction-damaged strip: prep area, add trees & understory • Removal and control of shrub and herb layer invasives throughout, principally at periphery

Low Priority Projects

Projects given lowest priority are in severely infested or compromised areas, and which also may not possess high potential value even if they were intact. These projects have higher implementation and maintenance costs, as well as protracted labor requirements. These projects are also unlikely to receive or qualify for outside funding or grants. Although these project areas fall within the Park and deserve responsible stewardship, faced with the reality of budgetary constraints and the magnitude of the task at hand, it is useful to differentiate between the highest value projects and those that are less likely to fulfill Plan goals. At SPMP these projects are located in the Non-native Shrub and Tree/Shrub Savannah Management Areas in three of the landscape Zones. The main project components are the same in all of these areas – remove severe infestations of invasives, particularly of non-native shrubs (blackberry and Scot's broom thickets) and replace with natives.

Table 7.4 Low Priority Projects for Natural Areas

Landscape Zone	Management Area	Project
Habitat	Non-native Shrub	• Removal and replacement of thickets in all areas that are not wetland buffers or in between forest patches
	Tree/Shrub Savannah	• Removal and replacement of thickets • Removal of non-native hawthorn
Shoreline	Non-native Shrub	• Removal and replacement of thickets inland of the promenade that are not in wetland buffer
	Tree/Shrub Savannah	• Removal and replacement of non-natives other than poplar
Promontory Point	Non-native Shrub	• Removal and replacement of thickets around perimeter edges of the Zone

7.2.2 Developed Landscapes

In developed landscapes of the Park, the general and common themes of implementation projects are hazard abatement, renovation, and improved care of the landscape, particularly in the context of historic integrity. Project priorities should address the most pressing problems first, and focus resources on rehabilitation of the most important historic landscape elements. These actions are often closely linked.

Project Prioritization

High Priority Projects

1) Systematically abate Historic District tree hazards by initiating a program for tree removal and in-kind replacement, corrective pruning, and regular hazard condition monitoring. Deal first with trees that meet all of the following criteria:

- Identified by 2001 inventory as possessing both defects and potential targets.
- Identified as "Historic Landscape Features to be Preserved and Maintained" in Table 2-3 of the 1998 Sand Point HPRP Plan.
- Located in highest use and/or visibility areas of the Park.

Based on these criteria, top attention should be given to:
- Historic District Zone, Sand Point Way MA : entire row of trees
- Historic District Zone, Historic District Core MA: Deodara cedars along both sides of 62nd Avenue NE, white spruce off SE corner of Building 25, atlas cedar on NW corner of 63rd Avenue NE and NE 74th Street

Problem trees in the following areas also should receive priority attention, but with somewhat less urgency than those called out immediately above because their usage level is lower:
- Historic District Zone, Golf Greensward MA
- Historic District Zone, Officer's Row MA

Program components should include all elements described below:
- Full hazard evaluation of all trees in above-described populations, performed by a certified arborist in accordance with current ISA standards.
- Development of a detailed, tree-by-tree removal, pruning, health enhancement, monitoring and replacement schedule, coordinated to achieve maximum possible continuity of historic landscape character while meeting hazard mitigation mandate in prudent time period.
- Review and approval by DPR Senior Urban Forester and designated Sand Point Historic Preservation Coordinator before implementation begins. SHPO Consultation (Level C Review per HPRP Plan) automatically will be required for "Removal of a significant landscape feature (listed in Table 2-3)." Selective removal of portions of a feature, such as individual hazard trees, may not meet this threshold; however, if the ultimate intent is to undertake substantial replacement, full SHPO Consultation is needed.
- Timely implementation: Hazard tree mitigation pruning, removals and replacement planting should be undertaken as quickly as possible, with phasing correlated to the risk to which SPMP users are exposed. Full program should be operational within two years of VMP adoption.
- Implementation documentation: Develop and maintain vegetation management records, linked to and building upon 2001 Historic District Tree Inventory database. Include dates and specific nature of all tree work as it is accomplished: pruning, removal, planting, and establishment care (training pruning, mulching, watering, stake removal). Although primarily intended to serve as a management tool for SPMP facilities staff, progress reports should be generated at least twice annually for the duration of project implementation, for review by DPR Senior Urban Forester, Sand Point HPO, and if involved, Washington SHPO. Thereafter, routine

maintenance records need not be circulated externally. This documentation system could readily be expanded in time, to encompass tree and landscape management activities throughout the Historic District or larger Park areas.

2) Renovate and/or reinstate historic plantings, starting with key contributing historic landscape features identified in the HPRP Plan, as well as landscape vestiges that remain substantially intact elsewhere in the Historic District. With the exception of the rose garden formerly located south of Building 26S, reconstruction of lost historic plantings and creation of entirely new ones, however desirable, rank lower in priority because no historic fabric is at risk. Top implementation projects include:

   Historic District Zone: Officer's Row MA – Front entry landscaping associated with Buildings 330,331 & 332 (Historic Landscape Feature 14), with related side and rear yard plantings as a secondary priority. Project will entail:

   - Completing a detailed review of original archived planting plans, making necessary palette adjustments to exchange taxa that are inappropriate due to invasiveness or severe cultural problems for suitable taxa of similar character. To the maximum extent possible, original species should be retained and alternate species chosen from the appended Sand Point historic plants list.
   - Evaluating all plant material remaining on site for appropriate disposition or treatment (pruning, renovation, removal, replacement), based on whether plants are original varieties or later additions, whether they can be restored to or maintained in good condition at appropriate scale, and whether or not they are healthy, non-invasive taxa.
   - Submitting restoration plan and plant list to Sand Point HPC for advance review and approval, incorporating all modifications directed.
   - Reviewing plan with tenant agencies to inform them about project and encourage their active participation in its execution and long-term care, recognizing that the landscape may provide positive program opportunities for the residents they serve.
   - Undertaking careful, horticulturally-supervised plant removal and site preparation (edging beds, amending soil), irrigation work (if needed), existing plant pruning and fertilization, plant installation following approved plan, mulching and watering.
   - Make and keep in SPMP archive for future reference as-built documents that show any changes from design plan and provide a final plant list and count.
   - Provide and document details of establishment care for three seasons, including adequate watering, weed control, dead plant replacement, mulch replenishment and training pruning. Ideally, utilize a maintenance calendar database to schedule and record establishment care activities as they are completed.

Historic District Zone: Historic District Core MA – Reconstruction of lost Rose Garden (Historic Landscape Feature 18). Project will entail:

- Investigate site for vestige bed, walk and plant locations; make base record drawing.
- Search available offsite archives for historic garden plan and plant list. If found, assess rose varieties for appropriateness in context of contemporary landscape sustainability requirements (notably disease and pest resistance, hardiness). Substitute superior varieties for highly-problematic ones. If no primary documents exist, seek information from residents familiar with the garden, and select roses from types known to be available in the 1930-1970 time period. Consult with knowledgeable local rosarians.
- Develop garden reconstruction plan for review and approval of HPC. Authenticity of bed and path configurations and materials are primary, exact rose placement and varieties less so. It is likely that the original garden featured hybrid tea-type roses.
- Install hardscape elements, conserving original material where vestiges remain, and provide low-trajectory irrigation to bed areas.
- Prepare soil deeply and amend thoroughly, then plant roses, mulch and water.
- Provide and document establishment maintenance, as described above. Adjacent building tenants may likewise be engaged in project installation or aftercare activities.
- Develop and execute a strategy for long-term upkeep of garden; SPMP grounds staff cannot be expected to provide all required care for this garden, due to its anticipated maintenance needs (particularly annual pruning and disease control).

Additional important renovation projects are listed below; these should follow essentially the same steps outlined above for Officer's Row. Some may be amenable to incremental execution using volunteers, focusing on one or two steps at a time, or on certain bed areas start-to-finish. All, however, should proceed only after careful evaluation of existing plantings for fidelity to archived plans, and based on HDC-approved restoration plans. In some cases, recently-planted material incompatible with the style and palette of the Historic District's period of significance may need to be removed. Such plants might appropriately be incorporated elsewhere in the Park. Project sites include:

Historic District Zone: Historic District Core MA – Foundation plantings fronting/surrounding Buildings 9, 25, 29, 138, 47. Amongst these, the most intact and highly-visible should be restored first.

Historic District Zone: Aircraft Industrial MA – Foundation plantings surrounding Building 2 (Hangar).

3) Remove and control invasive species and replace with appropriate plantings. Implementation priority amongst sites should be given to identified Historic Landscape Features not already taken care of through preceding projects. For specific recommendations on replacement plantings and removal techniques, refer to individual MA treatment types (Section 5) and management and maintenance practices (Section 6).

   Historic District Zone: Golf Greensward MA – predominately south end of area (Historic Landscape Feature 19).

   Historic District Zone: Historic District Core MA – foundation beds around Contributing Buildings.

   Historic District Zone: Aircraft Industrial MA – west of buildings, visible from Sand Point Way.

   Historic District Zone: North Shore Recreation MA – unmanaged upland areas visible from Sand Point Way.

   Sand Point East Housing Zone – where infestations threaten adjacent native or historic landscape areas, predominantly along south edge of zone.

SECTION 8: MONITORING

8.0 MONITORING

Monitoring of the work performed as directed by the VMP completes an important feedback loop by assessing whether or not the management of the Park is meeting the Goals and Objectives laid out in Section 1 of this plan. Management of the vegetation in the Park is accomplished by doing a combination of regular and ongoing maintenance and by implementing specific projects. Monitoring of regular maintenance has to do with making sure that: 1) work is being performed where, when, and how it is supposed to be done; 2) the work being done is having the desired results; and 3) any necessary adjustments are made to the maintenance action(s) in the future if intended goals and objectives are not being met. Monitoring of specific projects has to do with evaluating 1) the success of the project's design 2) the success of the project's implementation. Therefore, monitoring recommendations for ongoing maintenance have been separated from those for projects.

8.1 Maintenance Monitoring

Evaluation of the effectiveness of ongoing and routine maintenance, or measurement of the change over time, should be done by SPMP staff or a designated representative every two years to assess how well vegetation management goals and objectives are being met. Checklists for monitoring of each MA can be found in Section 5 of this Plan. Completed checklists should be reviewed by SPMP staff to identify problems, progress, and the effectiveness of maintenance actions. Information recorded on the checklists is meant to inform and refine ongoing maintenance work and allocation of maintenance resources (personnel, budget, effort priorities). Monitoring is only effective if the results are incorporated into the ongoing management actions in the Park.

8.2 Project Monitoring

Monitoring is an important part of any project because it allows evaluation of the success of a project and therefore the success of the planning and implementation. Problems can be identified as they occur, and appropriate actions can be taken to keep the project on track to meet its goals and objectives. This ultimately improves subsequent projects because they are informed by lessons learned in the past about what works and what doesn't, and why. The collection of measurable data and its documentation in a format that can be understood and accessed by others is the best way to improve project successes in the future.

8.2.1 Natural Area Projects

Monitoring for 3-5 years is recommended for any project in the natural areas of the Park. Development of a monitoring plan should occur when project is being planned. Monitoring plans are site specific because each project has different goals and objectives, and also has different site conditions. Any number of site parameters can be measured and used to evaluate a project, but most of the projects at Sand Point Magnuson Park (SPMP) have to do with removing or controlling invasive species and replacing them with native plants. Therefore, the information most relevant to evaluating success will have to do with measuring how well the installed plants are surviving and growing, and how effectively the invasive species on the site have been removed and controlled. Below is a list of common parameters to measure as part of

a monitoring program. Those that will be the most appropriate to use for a typical planting project at SPMP are marked with an asterisk. In the monitoring plan, some acceptable threshold or standard of performance should be chosen for each parameter. SPMP staff or designated representative with a background in or knowledge of ecological restoration should perform monitoring. Reports should be completed annually and submitted to DPR Urban Forester and to SPMP staff.

Some Required Components of Monitoring Plans

- Clearly stated Goal(s) of the project: a general statement of what result you are trying to achieve

  Example:
  - 0.5 acres of mixed forest and shrub plant community

- Clearly stated Objectives of project: the more specific description of the goal

  Examples:
  - Create forest canopy with at least three species, and shrub layer with at least species.
  - Create wildlife habitat features for birds and small mammals.

- Performance Standards: must be measurable, quantifiable indicators of performance of the project relative to the stated goals and objectives (is the project doing what you said it would or wanted it to do?), and should relate to baseline of pre-project conditions

  Examples:
  - **plant species diversity** (minimum # of species)
  - **plant survival*:** (minimum acceptable at Year 1, Year 3), depends on harshness of site conditions and level of follow-up care but usually something in the range of 60-85%
  - **aerial coverage by desirable species (planted and volunteers)***: again depends on the site conditions and planting density but are usually not too high the first year and increase to the third year, usually done by vegetation class/layer (shrub/tree, herbaceous)
  - **aerial coverage by non-natives/invasives***: maximum thresholds, depends on species and degree of pre-installation coverage
  - **growth of installed plants**: usually just for trees, measured by doing subset of stem diameters of planted trees using calipers
  - **soil standards**: % organic content in top 12" (not a very commonly used standard, and hard to measure – need burn test)

- Monitoring Methods: how often, when, what data to collect and how; description of report format; identification of who gets the report and when do they get it

Monitoring should be done once a year during the growing season (usually June or early July is a good time) for 3-5 years, twice a year (May and August) for sites that are anticipated to have more problems or need more care. All reports should

include: a brief project background with the goals, objectives, and performance standards included; summary of the results; assessment of project with regard to performance standards; and a description of any recommended actions.

- Contingency Plan: describe some likely scenarios of what might go wrong, and what contingency actions will be taken to remedy problem

  Example:

  - Problem = re-invasion by weeds is beyond acceptable threshold
    Action Needed = weeding 3 times per month instead of once per month until weeds are under control

8.2.2 Developed Landscape Projects

Monitoring for a minimum of five years is recommended for any project in the developed landscape areas of the Park. As for natural area projects, a monitoring plan should be developed as part of overall project planning, tailored to fit particular project goals and objectives, site conditions, and component tasks involved. Information most relevant to evaluating success of landscape projects in developed areas likewise will include measuring how well installed plants are surviving and growing, and how effectively weeds and invasive species are being controlled. Below is a list of useful parameters to measure, as part of a monitoring program; appropriate thresholds or performance standards should be selected for each parameter used. Horticulturally-knowledgeable DPR/SPMP staff or a designated representative should perform monitoring. Reports should be completed annually and submitted to DPR Urban Forester and to SPMP staff.

Some Required Components of Monitoring Plans

- Clearly stated Goal (s) of the project: a general statement of what result you are trying to achieve

  Example:

  - "healthy mixed ornamental plantings closely matching arrangement and palette of original 1939 landscape"

- Clearly stated Objectives of project: the more specific description of the goal

  Examples:

  - Create a sustainable plant community, which embodies historic precedent but eliminates problematic plant varieties.
  - Conserve appropriate existing plant material, bed layout and walkways.

- Performance Standards: serve as objective indicators of project performance relative to stated goals and objectives.

  Examples:

  - **Plant survival:** (minimum acceptable at Year 1, Year 3, Year 5) for developed landscapes should approach 100% for woody shrubs and trees, 85 – 90% for groundcovers and herbaceous plants. Replacement

planting is the usual remedy, since attrition compromises landscape integrity.

- **Ground plane coverage by weeds/invasives**: maximum thresholds, which depend on aggressiveness of species and ease of eradication. In areas being converted from rough to planted, degree of pre-installation coverage affects thresholds at different monitoring intervals; for restored ornamental plantings the presumption is that site preparation will eradicate weeds and invasives as a prerequisite, with a correspondingly high standard post-installation.
- **Invasives encroachment on desirable plants**: degree to which invasives have grown into, through or over desirable woody plants, as percentage covered or infested. For ornamental landscapes, the standard should approach zero tolerance.
- **Growth of installed plants**: for trees, stem diameters of planted trees should be measured using calipers, and annual branch elongation using tape or ruler. Standard will vary by species and planting environment (sun/shade, irrigated/nonirrigated). For shrubs, height and spread - or degree of fill in mass plantings, with standards varying by species.
- **Planting bed condition:** measures such parameters as presence and amount of litter, depth, type and extent of mulch, bed edge maintenance at lawns, and presence of excessively wet or dry soil (indicating irrigation problems).
- **Condition of installed plants:** records whether or not woody plants show evidence of appropriate care or neglect and damage. Observable factors include proper pruning for training and maintenance purposes, according to standards for species or individual specimen, presence and degree of disease, insect infestation or cultural problems (such as over- or underwatering, excess or inadequate light, herbicide damage), visible damage to crown, stem, branches or roots and apparent extent.

- Monitoring Methods: how often, when, what data to collect and how; description of report format; who is to receive it when, and how they are expected to use it.

Monitoring should be done once a year during the growing season (for most parameters, July or August is a good time for three years following installation, then at five years, and ideally again at eight. More intensive plant establishment care and related monitoring should segue to a routine maintenance level after 3-5 years. For projects implemented in developed landscape areas, a final monitoring visit can be instructive as to ultimate project success at relative plant maturity. As for natural area projects, all monitoring reports should include: a brief project background with the goals, objectives, and performance standards included; summary of the results; assessment of project with regard to performance standards; and a description of any recommended actions.

- Contingency Plan: describe some likely scenarios of what might go wrong, and what contingency actions will be taken to remedy problem

  Example:

  - Problem = Plants show signs of severe drought stress. Action(s) needed = immediately supplying water by hand to replenish soil to depth of 6", monitoring soil moisture weekly for duration of dry season, adjusting irrigation schedule, diagnosing and making necessary system repairs.

It should be noted that some projects will straddle the somewhat arbitrary margin between natural and developed landscape types. Predominantly natural park zones often contain developed landscape areas, and vice versa. It is, in fact, a stated planning goal for Sand Point Magnuson Park that formal and natural landscape elements become integrated over time. Common sense should dictate which parameters to draw upon in assembling an appropriate and effective project monitoring plan.

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APPENDIX A: Summary of Public Comment

Document	No. of Pages
Compendium of Public Comments Regarding Sand Point Magnuson Park Vegetation Management Plan	12

APPENDIX B: Vegetation-related Design and Historic District Documents

APPENDIX C: Sand Point 2001 Tree Inventory

Document	**No. of Pages**
2001 Tree Inventory - Sand Point Magnuson Park (narrative – scope, methodology & findings)	5
Inventory Abbreviations Key (list)	2
Sand Point 2001 Tree Inventory Data (electronic format only - Excel database)	
Data Summary & Analysis (databases)	
Tree Demographics – Historic District Zone	2
Tree Condition & Hazard – Historic District & Sand Point East Housing Zones	1
Individual Tree Management – Sand Point East Housing Zone	1
Priority Management Trees – Historic District Zone by Management Area	18
Tree Location Maps (11x 17 and electronic formats)	
Sand Point East Housing Zone	1
Historic District Zone Management Areas	7

- Sand Point Way (2)
- North Shore Recreation
- Aircraft Industrial
- Historic District Core
- Golf Greensward
- Officer's Row

APPENDIX D: Existing Vegetation Characterization & Maintenance

Document	No. of Pages
Forest Remnant Zone Existing Vegetation (narrative)	3
Sand Point – Existing Understory Vegetation (database)	2
Sand Point Maintenance Monitoring Form (database)	1