Seattle Parks and Recreation
Vegetation Management Plan for West Raye Street Bowl - Magnolia Boulevard

Introduction
The following Plan is the outcome of three years of public input and citizen interest in the removal and trimming of trees along a slope of Magnolia Boulevard known as the Raye Street Bowl. The impetus of this Plan was a tree removal for view permit applied for by adjacent property owners. Significant public input and comment led to the revision of the plan by Parks Department personnel. This plan will address slope stability concerns and view enhancement through an application of current Department policies and management objectives. The Plan developed will be used as the foundation for a permit to be let to the original applicants.

The basis for this plan is the original plan developed by Kim Reich for the permit applicants, hereafter referred to as the Reich Plan. The Reich Plan will be referred to throughout the Departments Plan, hereafter referred to as the Vegetation Management Plan, or VMP. Included in the Reich Plan is a report developed by Shannon and Wilson, a geo-technical firm that specializes in slope stability studies. The Shannon and Wilson report will be referred to as the Shannon Report.

Project Location
Seattle Parks and Recreation parkland along the Raye Street area of Magnolia Boulevard, known as the Raye Street Bowl. (See Map 1)

Plan History
In January of 2000 the Reich Plan was submitted as a permit request for tree removal and replacement directed at regaining views for property owners immediately north of the project area. The Department reviewed and responded to this plan recommending a number of changes. While the plan was professionally done and was thorough, Department staff had concerns regarding the proposed scope of work. In particularly, the number of trees proposed to be removed would exceed Park's expectations. Through continued discussions with the permit requestors and with interested community members, the Department developed the VMP. The VMP has the support of the group that submitted the original plan.

Department Objectives and Plan Goals
The goals of the VMP are to:

- Reduce hazardous conditions
- Improve forest stand diversity and health
- Decrease canopy density to encourage healthier trees overall
- Remove non-native invasive plants
- Increase the amount of understory plantings
- Through the above actions, ensure long-term stability of the hillside areas
- Provide view relief to the extent allowed by the Department Policy

The goals of the VMP where derived from the following key principles which are woven into the Department's best management practices for natural/forest areas.

- Insure public safety
- Conserve soil and water quality
- Assist natural processes
- Protect and enhance wildlife habitat
- Promote native character
- Buffer land uses
- Provide recreation and education

The Parks Department Tree Policy (#060-P 5.6.1) was developed as a tool and representation of public will in this type of situation. The following sections of the Policy are cause for removal of trees:

6.1.1 Hazard trees which pose substantial risk to the park users, adjacent properties or park facilities.
6.1.2 Trees, shrubs and vegetation which are dead, dying, or diseased.
6.1.7 Trees on sites that were overplanted by design or are crowded from natural competition. As the landscape grows, the Senior Urban Forester may selectively remove trees on a site to maintain spacing for optimal tree growth and function.
6.1.8 Trees in undeveloped landscapes as part of forest management to create light gaps, snags or other restorative features.

Three core objectives derived from the principles above will form the basis for this VMP. First, Public safety must be protected. Second, Trees and vegetation are a valued asset to the community and to the environment and must be managed appropriately. Third, The Parks Department will strive to balance community values with appropriate management.

As with any complex situation the issues at West Raye Street do not have clear and simple solutions. The Parks Department will utilize the principles and objectives listed above in conjunction with site specific conditions to develop the management priorities for this site.

Site History

In 1926 the Seattle Parks and Recreation Department acquired the West Raye Street Bowl area of Magnolia Boulevard. While no direct references were found for this area of the Boulevard, the Boulevard itself was influenced by the Olmsted plan for the city. The Olmsted vision for the boulevards of Seattle was to provide broad panoramic views, framed views and areas of enclosed forest canopy. In 1998 a vegetation management plan was developed for a large portion of Magnolia Boulevard in response to neighbors concerns for diminished views and slope stability concerns. This plan did not include the subject area between West Raye Street and Magnolia Boulevard.

Over the past 80 years trees have been removed or topped in the Raye Street Bowl in response to view concerns of the property owners to the east and north of this area. The last topping occurred approximately 15 years ago. The permit application that was the impetus for the development of this VMP was first submitted in 1998. Significant public input has been received since that time (see Public Involvement**)**.

In 1999, Seattle Transportation completed a road repair and stabilization project on West Raye Street. This project focused on stabilizing the downhill side of the road cut, and included significant re-vegetation and the installation of a slope stabilization wall. This work required the removal of a number of large trees and understory plants. The project also included a significant amount of replanting of trees and understory plants. Geo-technical studies where done to support this work.

Site Conditions
The project area is defined by the West Raye Street. Magnolia Boulevard and West Amour Street (See Map 1). The majority of the proposed work will be on the south west side of Magnolia Boulevard, however limited work is also proposed along the northeast side of Magnolia Boulevard. See Map 1. Site characteristics are described below:

-Slopes
Slopes in the area range from 40 to 60 degrees and range in height from 5 to 50 feet. Some surface erosion is evident in two areas (Indicated on Map 1). Overhanging soils where found in one area. Soil banking, the piling of soils at the base of a slope, was limited along both Magnolia Boulevard and West Raye Street. As these cutbanks are adjacent to active roadways, road maintenance crews may have cleared any sloughing of soils. Review of records found some sloughing of slope material during a sewer line break in 1989. Slopes and soils in this area appear stable at this time. (Shannon Report)

These slope observations where confirmed by an onsite review completed by Mark Orth (Parks Department Civil Engineer). Shane Dewald (Seattle Department of Transportation Landscape Architect) performed additional review on site. Both agree with the original review in the context of the proposed plan. The Department of Design Construction & Land Use was contacted for review of this area. As the work fell within exclusion clauses within the current City Ordinance and policy this project is covered under a blanket exclusion, and is not required to be reviewed by DCLU. (See Figure 1)

Although no underlying subsurface instability related to geological conditions has been noted (Shannon Report), no assurances can be made that these conditions do not exists. Geological instabilities are related to movements in the earth's surface which are not effected by trees, they are most often affected by large scale revision to subsurface hydrology. This project should not impact subsurface hydrology.

All available data and professional review indicate that the proposed work will not increase or decrease slope stability if proper precautions are taken to protect slopes from erosion and changes in water courses. Protection measures are outlined in the **Work Methods** section of the attached Permit. All prescribed work methods were developed to ensure and encourage tree health and species diversity, consequently improving root mass. Plantings and minimal site disturbance should not increase slide or erosion potential on this site. Tree felling without root removal will reduce erosion and slide potential. Larger and better developed root mass will increase stability of the slopes surface soils. It is the Departments opinion that the work to

be performed (stem removal, pruning, and re-vegetation) are consistent with all applicable City policies and mandates regarding work on steep slopes.

- Uses

The project area provides two functions to the community. First, as major traffic artery for the Magnolia community and second, as a part of the well used Magnolia Boulevard pedestrian route. Although only minor walking traffic from the lower neighborhood (Perkins Lane) was observed during the development of this plan, it is an expected moderate use of the road. The vegetation in the Bowl area serves as a noise and site buffer to adjacent property owners on both sides of the Boulevard.
(See Figure 1)

-Vegetation

Current forest stand conditions for the area are similar to many park owned properties located on slopes below homes. The dominant species is Bigleaf maple, accompanied by limited red alder. Both species are native deciduous trees characterized as early pioneers. There is a small pocket of Douglas fir within the middle section of the work area. Native plant understory consists of primarily sword fern and hazelnut with limited numbers of other native species. Non-native invasive plants, English ivy and Himalayan blackberry, are found in large patches on the site. These invasive plants will continue to spread if not controlled. An extensive site inventory performed as part of the Reich Plan was reviewed by two Senior Urban Foresters and the Parks Horticulturist and found to be an accurate description of the site. (See Figure 1)

The density of this maple stand is an indicator that the stand is reaching a growth period known as stem exclusion. (See Figure 2) Bigleaf maple will fully expresses itself as a single stem tree of large proportions. However, due to coppicing (cutting the tree to the ground and allowing regrowth) and repeated view pruning, the stand now has hundreds of stems in multiple stem and single stem trees. The natural competitive process known as stem exclusion is observed in the numerous dead maple stems within coppiced trees on the site. Competition from the overcrowded trees for light, minerals and available water has excluded understory and native shrub development as well.

To summarize, the following factors were used to determine the type and level of work performed on the site:

- Tree health is declining in a large number of stems due to stem density and competition.
- Limited tree (stem) removal in this area will not significantly reduce the canopy of the site.
- Reduction in stem density will allow for the development of a more diverse understory.
- Abundant vegetative growth indicates that this site can sustain more native understory than is currently on the site.

Current Site Conditions

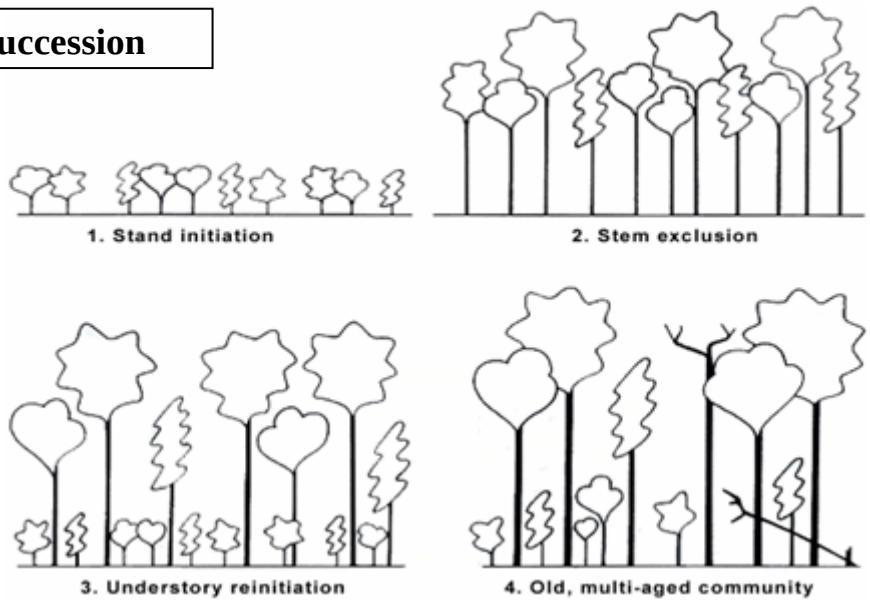
Steep Slopes-Slopes exceed 30% in some locations within the work zone.

Hazardous Trees - Past practices of coppicing and topping have created numerous weakened stems.

Invasive Plants - Non-native invasive plants have taken over some portions of the Raye Street Bowl. Without eradication they will continue to spread.

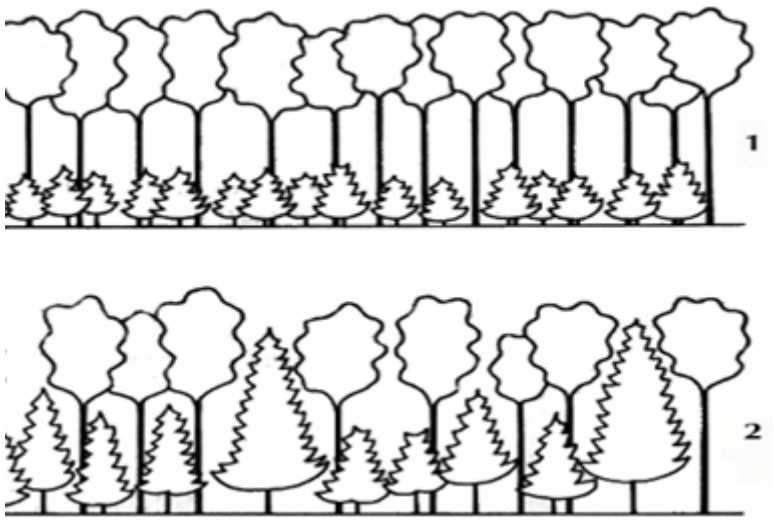
To Many Stems - Coppicing and natural re growth of Bigleaf maple has resulted in competition between stems.

Forest Succession



Forest growth and change has been mapped through numerous methods. Current modeling identifies specific periods of time for a forests progress from cleared ground to "old growth". The forest of Raye Street Bowl is in an early part of this process known as "stem exclusion". During this period the numerous stems that initially sprouted after clearing have grown to a size where they begin to compete for resources. The losers in this battle will die. The winners will continue to grow to the next stage of the forest. The intent of this plan is to aid this process by speeding the removal of stems that are or have already lost this battle.

Understory Replacement



As a forest grows species composition changes due to changes in light, soils, hydrology and inter tree competition. In healthy forests, the composition of shade tolerant and shade intolerant trees will change. In the Pacific Northwest the "climax" species are typically species which will do well in the understory of shade intolerant species. The species selected for replacement in this plan will be from the complement of shade tolerant species.

Public Involvement
Public involvement for the project has been extensive over the past several years. Two well-attended public meetings have been held along with several less formal small group meetings. Public comment has been gathered and attached in Appendix iii.

A variety of questions and concerns have been raised about this project. The majority of concerns raised have been related to the potential impacts of tree removal on soil erosion and/or decreased slope stability. There has been some concern for the loss of a visual aesthetic along West Raye St., and the reduction of bird and wildlife habitat.

The permitee's for the original Reich Plan are concerned with the substantial reduction over time of their private views. They are however, willing to provide financial support for the project even though the extent of view relief they desire might not be attainable.
Citizens have registered differing opinions regarding the proposed work. In an effort to identify opportunities for consensus, the following condensation of the issues involved is provided:

- The community as a whole;
  values the environmental benefits of this stand of trees,
  values the slope stabilizing effects of the vegetation,
  is interested in preserving a majority of the trees in the stand,
  is concerned the proposed work will destabilize the slope.
- The community does not agree on the value of private view, or the need to remove trees to protect private views.
- Where some community members are willing to pay for portions of the proposed plan, the community as a whole has not agreed to assume any costs for the work to be done.
- Financial support is offered to implement the plan which has provisions for some limited view enhancement.
- The Parks Department has limited funding available for projects of this kind, and no direct funding for this project.

Work Plan
The Parks Department proposes the following work to address community values, tree health, and safety. All practices proposed are consistent with current Best Management Practices, City of Seattle Policies and professional techniques. These strategies are listed in order of priority.

- Removal of all dead or dying stems or trees that present hazard to public safety.
- Appropriate removal of stems to enhance individual tree health and to promote overall stand health and diversity. (Most of the trees on the slope are multi-stemmed, reduction of stems does not equate to tree removal.)
- Invasive plant removal as appropriate to reduce their negative impacts and to create space for new native plantings.
- Replanting the areas where vegetation has been removed with native plants.
- Crown reduction and thinning to reduce future hazard potential and strengthen remaining trees. This will also allow understory enhancement to proceed.
- Installation of erosion control measures where needed.

All work will be under direct control by Parks Department via in-the-field selection of tree removal and pruning work on a daily basis. The following sections describe the specific factors by which the Urban Forester will select tree removals and trimming.

Determining Factors for Removals:
Stem thinning of the large maples will be limited to no more than one-third of the total number of stems of the tree and will not total more the one-third of the canopy of the tree.
Overall impact on the canopy shall be the reduction in total number of stems by no more then 30%.
All stem removals greater than 4 inches must be approved by the Senior Urban Forester prior to removal.
No conifer trees will be removed.

Determining Factors for Trimming:
Remove as many dead branches as possible. Dead branches greater than 1.5 inches in diameter (measured at the base of the branch) shall be removed from all trees.
To limit the number of pruning cuts, live branches less than 1.5 inches diameter should not be removed.
To limit damage to stems during trimming no healthy trees or stems less than 8 inches trunk diameter shall be pruned.
No live branches greater than 8 inches diameter shall be removed from the tree without authorization by the Urban Forester.
Reduce the weight of branches with included bark.
Reduce the weight toward the ends of all but one co-dominant stem.
Remove no more than 20 percent of live foliage from a leave tree.

Plant Retention and Planting
To assure the slope stability and erosion control necessary for this VMP it is essential all native understory vegetation be retained where possible. Mitigation for the loss of canopy will require the planting of trees and shrubs as is appropriate for each location. Slope erosion will also be avoided through the application of erosion control techniques as described in the Reich Plan. (Appendix iv) Erosion control will be accomplished as soon after the trimming and removal work is completed. Planting will be accomplished in the fall after the trimming and removal work has been completed. The following factors will be utilized to determine plant retention, erosion control, and planting.

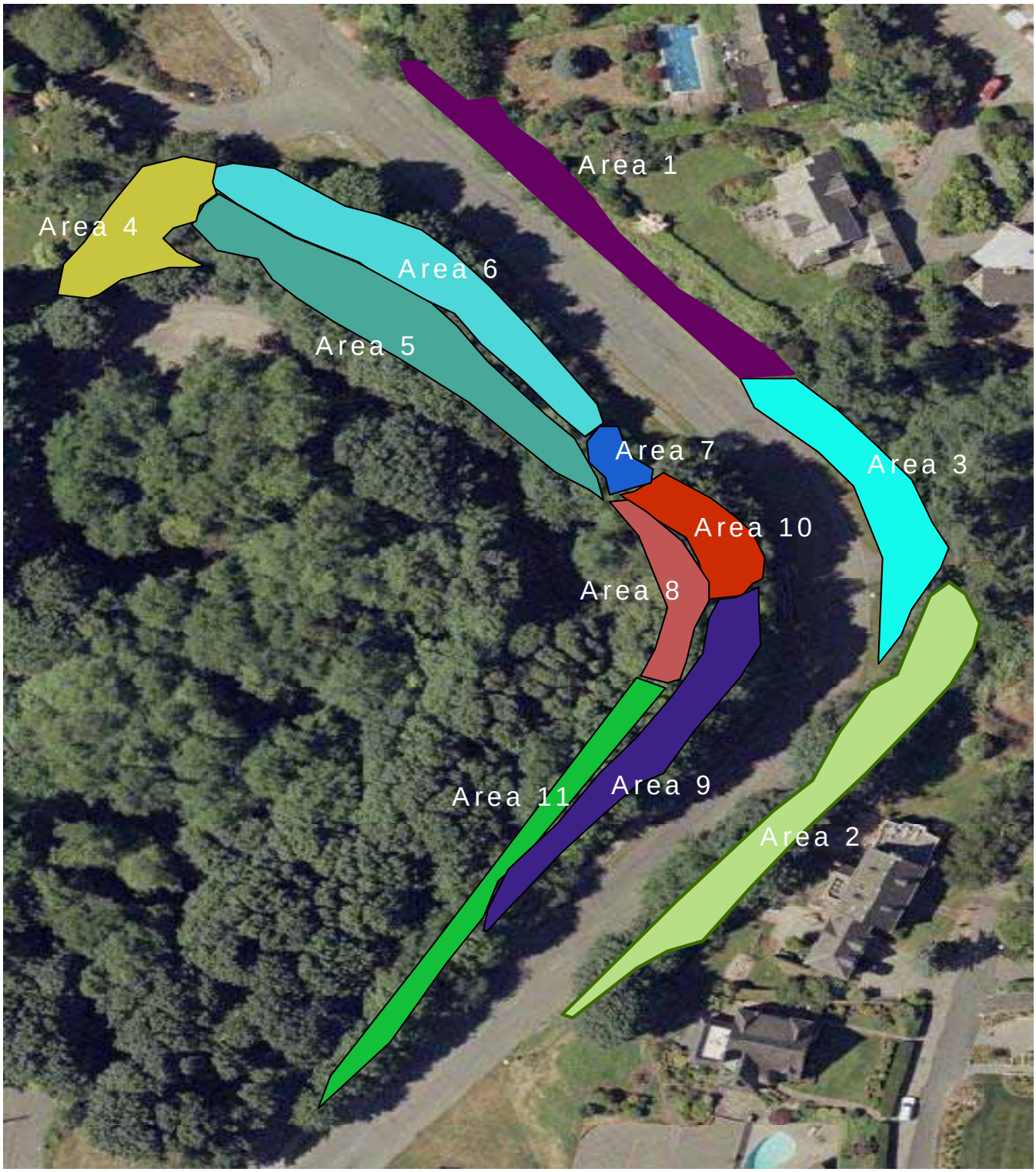
- Retention of all western red cedar and Douglas fir on site. All due effort will be made to protect these trees during work.
- Retention of as many native understory plants as possible.
- Removal of all Himalayan blackberry, English ivy, knotweed and other designated non-native invasive plants within the designated work Areas.
- Frequent removal and monitoring of regrowth of invasive exotic vegetation during the course of the project and 3 years after initial clearing will be required.

- As much woody debris as possible will be left on site to mitigate for low organic content of the soil and to aid in soil erosion control. No stems larger than 10 inches in diameter will be left on site.
- All active and existing erosion sites will be protected from further erosion activities with coir or jute netting.
- The Urban Forester will determine if slope stabilization is required if soils are exposed or dislodged by the work, or work is done on slopes greater than 40 percent slope.
- Replanting of the site will occur as soon as practical.
- Areas cleared of vegetation will be replanted in the fall with trees (min. size 6', 1 tree per entire tree removed if proper spacing allows) and adequate numbers of shrubs (min. size 1 gallon, three plants per stem removed) to provide one plant for every 9 square feet of area cleared. Plant species must be selected from the plant lists attached. (See appendix i)
- Plantings must be maintained according to the maintenance agreement for a period of three years. See Appendix ii.

Work Prescriptions and Phasing

The Department has specified work areas within the project based upon slope, species composition, and tree health considerations. The areas are mapped in Figure 2. All work will be prioritized as mentioned in previous sections of this document. Specific work within each zone is described in following sections. Plantings are based upon native species selected for appropriateness to shade, soil, and water conditions.

West Raye Street Bowl
Vegetation Management Plan
Area Designations



40 0 40 80 120 160 Feet

	Description	Removal Prescription	Trimming Prescription	Invasive Protocol	Planting Prescription	Phasing
Area 1	Steep slope cut bank along Magnolia Blvd. Heavy blackberry and limited trees.	None (Slope)	Coppice Maples	Remove blackberry	None	Not in the scope of this project
Area 2	Steep slope cut bank along Magnolia Blvd. Multi-story maples with thick understory of maple.	30% of Stems per Specifications, Concentrating on stems less then 6" diameter.	Raise canopy on remaining trees	Remove blackberry	Native palette favoring sword fern	First cycle
Area 3	Flat area along Magnolia Blvd. Extensive invasive plant understory.	NA	NA	Remove all invasives.	NA Replant with full palette of appropriate natives.	Not scheduled at this time.
Area 4	Steep slope area with heavy medium to large overstory trees.	Remove no more then 20% stems per prescription	Crown thinning only for tree health.	Ivy removal	Replant with full palette of appropriate natives.	First cycle
Area 5	Toe of slope along Raye St., enclosed canopy, large maples with multiple leaders.	Dead and dangerous stems only	Crown thinning/crown reduction if possible.	Remove all Invasives.	Taller growing natives to include cedar and Douglas fir.	First cycle
Area 6	Top of slope along Magnolia Blvd., heavy mixed canopy with topped multistem trees, limited Invasives.	Remove no more then 20% stems per prescription	Crown thinning, crown reduction only.	Remove all Invasives.	Replace with understory species, emphasis on fern and hazel.	First cycle
Area 7	Top of slope along Magnolia Blvd. Very steep undercut bank, stable at this time, light mixed canopy with topped multistem trees, limited Invasives.	Dead and dangerous stems only	Limited trimming and crown reduction	Remove all Invasives dependant on slope stabilization	Limited replanting based on slope exposed. Limited removal of Invasives will reduce need for slope restoration.	Second cycle
Area 8	Toe of slope along Raye St., light canopy under conifer and maples, limited invasive under sword fern.	Limited hazard reduction based on stem density and hazard. Remove one overhanging alder at lamp post.	Limited trimming for health.	Remove all Invasives.	Favor taller growing conifer, preference for Douglas fir as slope is exposed.	First cycle
Area 9	Top of slope along Magnolia Blvd., heavy maple canopy with topped multistem trees, extensive die back and diseased trunks, limited Invasives.	Reduce stem density by removal of all hazards and deadwood, no more then 30% stem reduction.	Limited crown thinning and crown reduction based upon need of trees.	Remove all Invasives.	Focus on sword fern and low growing shrub (< 4').	First cycle
Area 10	Top of slope along Magnolia Blvd., large conifers with mixed understory of maple and hazel.	No major removal other then designated hazards.	No trimming unless necessary for tree health	Remove Invasives from area.	Taller growing natives to include cedar and Douglas fir where possible due to light.	First cycle
Area 11	Toe of slope along Raye St., some small to medium multistem maples, mostly single stems, limited Invasives and shrub understory.	Reduce stem density by removal of all hazards and deadwood, no more then 30% stem reduction.	Raise canopy on remaining trees	Limited invasive removal.	Lower growing shrub plants (<4') due to growth into roadway.	First cycle

Permit Language

May 1st, 2002

Bob Heller

Reference: Tree Work Permit 02-06, Magnolia Blvd – Bob Heller et al

Dear Mr. Heller.:

This permit is in response to your request to trim and remove alder and Bigleaf maple located on Department of Parks and Recreation lands immediately adjacent to you property at _____. The plan submitted by Kim Reich in 2000 was reviewed by the Department, as well as, via public process. Subsequent to the public meetings the plan as submitted has been replaced with the attached Vegetation Management Plan (VMP) developed by the Department. The conditions and requirements for removal and trimming of stems trees and replacement with appropriate plants are included in the VMP, the original Reich Plan you submitted, and the attached Vegetation Management Plan Maintenance Agreement. The work was evaluated for compliance with the guidelines set forth in Seattle Park and Recreation's Tree Policy.

Given the condition of the site, the following determinations have been made:

- Slopes stability is a principal concern on this property. Plantings, coppicing of smaller trees in the lower slope area, and minimal site disturbance should not increase slide or erosion potential on this site.
- Tree felling without root removal as proposed reduces the erosion and slide potential.
- Removal and replacement will allow for the development of a more diverse understory.
- Abundant growth indicates that site can sustain more native understory than is currently on the site.
- Practices proposed are consistent with current Best Management Practices and arboricultural techniques.
- Language included in the current Tree Policy allows for trimming and removal as stipulated in the attached VMP.

Specifically, this permit allows the following activities:

- Removal of approved stems of maple and alder as described in the attached VMP. Stem removal does not mean the removal of entire trees. This technique allows for retention of roots on steep slopes

- Trimming in approved fashion of maple and alder on this site. See attached VMP and below for approved pruning methods and locations.
- Retention of all western red cedar and Douglas fir on site. All due effort will be made to protect these trees during work.
- No topping cuts will not be allowed. Pruning specifications are outlined in the VMP and further in this permit.
- Frequent removal and monitoring of regrowth of invasive exotic vegetation during the course of the project and 3 years after initial clearing will be required.
- As much woody debris as possible will be left on site to mitigate for low organic content of the soil and to aid in soil erosion control. No stems larger than 10 inches in diameter will be left on site. All woody debris left on-site must lie in ground contact and must be spread out to achieve a maximum depth of 18".
- The Urban Forester will determine if slope stabilization is required if soils are exposed or dislodged by the work, or work is done on slopes greater than 40 percent slope.
- All active and existing erosion sites will be protected from further erosion activities with coir or jute netting.
- Removal of all Himalayan blackberry, English ivy, and other designated non-native invasive plants within the areas worked.
- Retention of as many native understory plants as possible is required.
- Replanting of one tree per stem above 6 inches in diameter removed.
- Areas cleared of vegetation will be replanted in the fall with trees (min. size 6', 1 tree per entire tree removed if proper spacing allows) and adequate numbers of shrubs (min. size 1 gallon, three plants per stem removed) to provide one plant for every 9 square feet of area cleared. Plant species must be selected from the plant lists attached. Plantings must be maintained according to the maintenance agreement for a period of three years. See Appendix i.
- Replanting of the site will occur as soon as practical. All planting to be accomplished prior to November 20, 2002.

All work must be done by a licensed, bonded landscape or tree service firm. Work is restricted to weekdays only, not on Saturdays, Sundays or holidays.

Before work may commence, the following conditions must be met:

- The Urban Forestry office must receive a signed acknowledgement and agreement with the conditions of this permit before this permit is valid. A $100.00 non-refundable permit fee is due from the homeowner in order to process this permit.
- You must inform the performing firm to provide the Department with a rider to the firm's existing liability insurance naming the City of Seattle as additionally insured, in minimum amounts of

$1,000,000 general liability. The insurance rider and copy of Applicator's license must be filed with the Department's Senior Urban Forester, 1600 South Dakota Street, Seattle, WA 98108, before work may commence.

- Additionally, the performing firm shall submit a refundable $100.00 performance assurance check to the Senior Urban Forester before beginning work. Once it has been verified that all permit work is complete, the $100.00 check will be refunded to the landscape firm.

- The firm must notify Mark Mead, (206) 684-4113 at least 48 hours before it begins work. Failure to do so will delay permission and work. The firm must also sign this document to acknowledge the conditions of the permit.

- A maintenance plan for the vegetation installed must accompany the signed Vegetation Management Plan Maintenance Agreement (attached). An estimated cost for three years is required. An escrow account has been waived, as extent of work does not reach the criteria established in the 2001 Tree Policy.

Any work not spelled out in this letter of permission is expressly prohibited and may lead to the imposition of civil and/or criminal penalties.

The permit for tree removal will be valid for up to 6 months. A new permit must be obtained after that time. This permit will not be considered to be complete until all areas cleared of vegetation are well established with new vegetation. Activities related to plant establishment and maintenance of the site are permitted as outlined in the Maintenance Plan

Please call me at (206) 684-4113 or Jim Kingman at (206) 386-1688 if you need further assistance.

Sincerely,

Mark Mead

Senior Urban Forester

encls cc

General Permit Specifications
Work Standards
The following specific work standards will be applied as necessary in the specific work Areas listed above.

1) Crowns of trees that were topped will be restored to improve structure and form. Remove or shorten all sprouts except one, which will become the dominant stem at that point. Removal of up to 30 percent of the foliage only, not stems, when performing this work. See 4) below for discussions regarding coppiced stumps.
2) Weight on main scaffold limbs with included bark shall be reduced by approximately one-third by removing some secondary branches toward the ends of the limbs and/or by removing the end of the branch using a drop-crotch cut.
3) If a medium-size tree (less than 15 inches trunk diameter) divides into two or more co-dominant leaders of about equal size in the bottom two-thirds of the tree, reduce the end weight by approximately one-third using drop-crotch and thinning cuts on all stems except the one that you believe will become the strongest and most dominant leader. To accomplish this, remove branches growing toward the center and leave those that are oriented outward. Use mostly thinning cuts, not drop-crotch cuts, on larger trees. (Note: On some trees, you may not be able to perform all of this because you can not remove more than 30 percent of the foliage. Make a note of this on the site map).
4) The number of stems associated with previously coppiced stumps may be reduced by 30%, if it is not in conflict with 1. through 3., above, or Area work prescription. Selection of stems to be removed will be prioritized as follows:

    Dead or dying stems,
    Stems less than 4 inches in diameter,
    Topped stems,
    Stems that may improve view corridors.

5) Identify those significant trees that have included bark in the crotches between codominant stems. Make a note of these on the site map. These trees will be evaluated by the Senior Urban Forester for possible removal. Identify limbs and trunks with vertical cracks. Make a note of these conditions on the site map.
6) If less than 30% of the foliage was removed on a mature tree following procedures 1 and 2 above, thin the canopy to allow more light to reach the ground under the tree and to reduce hazards. The foliage removed shall be taken primarily from the outer edge of the canopy, not from the interior. Interior branches shall be left on the tree. Do not remove water sprouts from the interior of the tree.
7) Invasive species will be removed from and around all trees pruned or removed. All trees on which vines are growing shall have said vines removed. Vine tendrils shall be removed (sever at tree base) in a manner which will not injure trees or cause scarring of low branches and tree trunks.

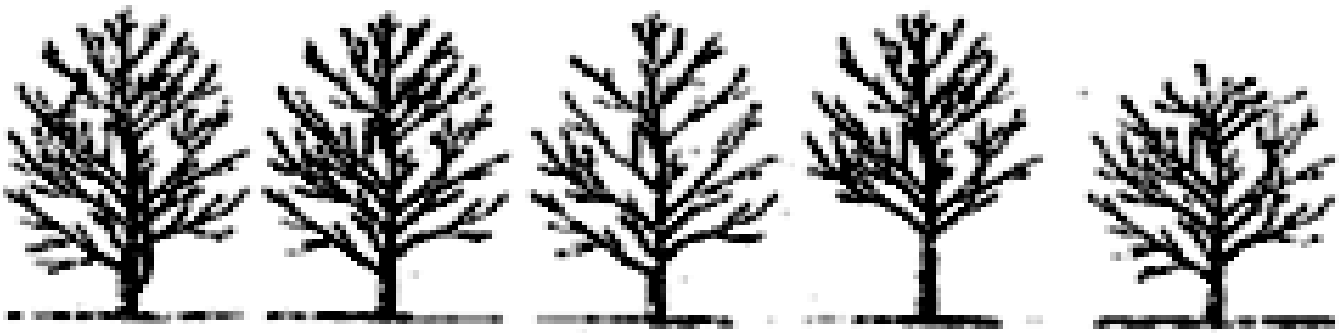
Pruning Techniques
Pruning cuts shall be in accordance with ANSI A300 pruning standards, all of these methods may be used on this project if necessary to accomplish the objectives mentioned above. See diagrams below. Definitions of the types of pruning are as follows:

1. **Crown Cleaning**: or cleaning out is the removal or dead, dying, diseased, crowded, weakly attached, and low-vigor branches and water sprouts from a tree crown.
2. **Crown Thinning**: includes **crown cleaning** and the selective removal of branches to increase light penetration and air movement into the crown. Increased light and air stimulates and maintains interior foliage, which in turn improves branch taper and strength. Thinning reduces the wind-sail effect of the crown and the weight of heavy limbs.
3. **Crown Reduction**: is used to reduce the height and/or spread of a tree. Thinning cuts are most effective in maintaining the structural integrity and natural form of a tree and in delaying the time when it will need to be pruned again. The lateral to which a branch or trunk is cut should be at least 1/2 the diameter of the cut being made.
4. **Crown Restoration**: can improve the structure and appearance of trees that have been topped or severely pruned using heading cuts. One to three sprouts on main branch stubs should be selected to reform a more natural appearing crown. Selected vigorous sprouts may need to be thinned to a lateral, or even headed, to control length growth in order to ensure adequate attachment for the size of the sprout. Restoration may require several prunings over a number of years.
5. **Crown Raising:** removes the lower branches of the tree in order to provide clearance for buildings, vehicles, pedestrians, and vistas. When pruning for view, it is preferable to develop "windows" through the foliage of the tree, rather than to severely raise or reduce the crown.

Inappropriate Pruning

Improper pruning has resulted weakly attached multiple leaders and weakened main

Appropriate Pruning



Before | Crown Cleaning | Crown Thinning | Crown Raising | Crown Reduction

Utilizing appropriate pruning techniques trees can be pruned in a manner which allows strong growth while reaching management goals.

Certifications
Firm completing this work will have at least one certified arborist on their staff. Certification is through the International Society of Arboriculture, Savoy, IL. A certified arborist shall be on site at all times during work activities.

Violation of these procedures and techniques could result in termination of permit and revocation of all rights to work on Parks and Recreation managed properties.

Records
Contractor will photograph "Before and After" pictures of trimming which will be suitable for reproduction.

Safety
All work shall be performed by workers trained in accordance with ANSI Z133.1 safety regulations as required by OSHA.

The Contractor will be responsible for supplying and using all safety equipment necessary to close or delineate traffic lanes. Traffic control devices used must be in accordance with existing laws. The City, prior to use must approve all traffic safety equipment for use.

All work will be performed within a safety zone developed and maintained by the contractor. The safe work zone will protect pedestrian and vehicular traffic from hazards.

Adequate notification, street signage and work safety zone delineation will be maintained by the contractor at all times.

Tools and equipment
Climbing spurs shall not be used when climbing trees, except to climb a tree to be removed or to perform an aerial rescue of an injured worker.
Equipment and work practices that damage bark or cambium shall be avoided.
Rope injury from loading out heavy limbs shall be avoided.

Areas of inclusion
The area of pruning work is described on the map found in the attached VMP. No work outside of this area is authorized. All work authorized is on DPR owned lands.

Exclusions
No native species of brush (mature height of less than 20 feet) or ground cover may be removed. Activities prohibited include clearing of brush for felling or cleanup or removal of stems for views.

Additional Requirements
All native shrubs and ground cover species will be protected as much as possible from damage due to felling, pruning or worker traffic.

All equipment shall be removed from the site by the end of each workday. All debris along West Raye Street and the sidewalk will be removed each day. No material will be left on site that will present a hazard to traffic.

The selected contractor shall be required to furnish a certificate of insurance to include liability, automotive, and worker's compensation before commencing work.

Appendix i
Planting Palette

	Species	**Common Name**	**Spacing Between Plants (Ft.)**
OVERSTORY	*Abies grandis*	grand fir	20
	Cornus nuttallii	Pacific dogwood	12
	Prunus emarginata var. mollis	bitter cherry	15
	Pseudotsuga menziesii var. menziesii	Douglas-fir	20
	Rhamnus purshiana	cascara	12
	Thuja plicata	western redcedar	15
UNDERSTORY	*Acer circinatum*	vine maple	12
	Berberis aquifolium - Mahonia aquifolium	tall Oregon-grape	4
	Berberis nervosa - Mahonia nervosa	low Oregon-grape	2
	Corylus cornuta var. californica	beaked hazelnut	2
	Gaultheria shallon	salal	2
	Holodiscus discolor	oceanspray	5
	Oemleria cerasiformis	Indian-plum	5
	Philadelphus lewisii var. gordonianus	mock-orange	5
	Rhododendron macrophyllum	Pacific rhododendron	3
	Ribes sanguineum var. sanguineum	red flowering currant	5
	Rosa gymnocarpa var. gymnocarpa	baldhip rose	5
	Vaccinium ovatum	evergreen huckleberry	3
	Vaccinium parvifolium	red huckleberry	3
GROUND COVER	*Achlys triphylla ssp. triphylla*	deerfoot vanilla-leaf	1.5
	Gaultheria shallon	salal	2
	Linnaea borealis ssp. longiflora	twinflower	1.5
	Polystichum munitum	sword fern	5
	Symphoricarpos albus var. laevigatus	common snowberry	10
	Trillium ovatum ssp. ovatum	western trillium	1

Appendix ii

VEGETATION MANAGEMENT PLAN MAINTENANCE AGREEMENT

Scope of Services:
In order to insure successful implementation of the approved vegetation management plan for West Raye Street Bowl, we will provide all services described in this Vegetation Management Plan Maintenance Agreement.

I have reviewed this letter and agree with the conditions and activities as described within. All work will be performed in accordance with the said conditions and permitted activities.

Name:(print)_____

Signature:_____

Address:_____

Telephone:(home)_____(work)_____

Date:_____

Service Provider:

Name of Firm_____

Address_____

Phone _____

Owner Name_____

Authorizing Signature_____ Date _____

Services to be performed are designed to enhance view corridors and to re-establish vegetation in compliance with the West Raye Street Vegetation Management Plan.

Services to be provided include, but are not limited to, removal of non-native exotic species, tree removal, planting, watering, and weeding. Other services may include necessary erosion control methods to cover and stabilize bare soil. All tree work must be performed by, or under the supervision of a licensed and bonded landscape or tree care firm.

The maintenance period will continue for the first three years after the initial establishment period to prevent exotic weed competition and ensure survival of new plants. Successful plant establishment will be defined as having at least 80% of the new plants and trees alive and healthy three years after planting.

This agreement does not guarantee that the City will maintain the newly planted areas in perpetuity, nor does it offer any special rights to perform tasks other than those mentioned in this agreement.

THIS IS NOT A PERMIT.

_____

Vegetation Maintenance and Establishment Agreement for West Raye Street Bowl

This agreement is between the Seattle Department of Parks and Recreation and Brian Stevens (???). It is the intent of this agreement to create a cooperative partnership for implementation of a vegetation management plan for public property known as the West Raye Street Bowl and the residence known as_____. This agreement and partnership will help insure that the natural resources of the greenbelt are properly managed and preserved for public benefit. This agreement addresses community issues and concerns through consistency with similar projects in other locations within this Park and the Seattle Parks System.

The Seattle Department of Parks and Recreation's primary interest in this partnership is in improving the environmental values of the natural area in this section of the trail. View management must also lead to improved habitat value. Two activities would accomplish most of this goal: controlling invasive exotic plants, and maintaining healthy forest canopy.

Phasing

Parks shall issue a permit for removal and replacement of alder and maple trees within the designated Areas of the plan. The correct pruning of all trees will be allowed within the limits of the Plan.

Tree Debris Handling

The removal of trees may generate more debris than the site can safely handle. The tree material is to be chipped and well dispersed on-site if possible or material must be removed from the site. Large piles of chips will be unacceptable. Wood chips may not be distributed below the line of alders removed.

Hardwood Tree Management
The selected Tree Service will begin tree operations to include removal or trimming of the tree after giving 48 hours notice to the department's Senior Urban Forester.
Existing trees will be removed to the stump no higher then three inches above ground level.

Revegetation
Due to density of existing canopy trees Parks requires that trees be replanted to replace those removed at a rate of one tree planted for each tree removed. Areas cleared of vegetation will be replanted this fall with trees (min. size 6', 1 tree per entire tree removed if proper spacing allows) and adequate numbers of shrubs (min. size 1 gallon, three plants per stem removed) to provide one plant for every 9 square feet of area cleared. In addition shrubs and other ground cover plants will be installed to provide 100% ground cover within 5 years including retained existing shrubs and groundcovers. Plant species must be selected from the plant lists specified.

Planting timing
Planting of new trees, shrubs, and groundcover plants shall occur after September 2002 and not later then March 2003. Planting timing is meant to give the plants the best possible chance for establishment.

Future Site Maintenance
_____ agrees to assume all costs for future tree planting, weed removal, and exotic species control beyond the initial phase of work. Continued maintenance as per the included specifications may continue after the first three years, however no tree removal or pruning beyond that outlined in this permit is authorized by this agreement. As an improvement of the environmental values of West Raye Street Bowl it is of paramount importance to the Department of Parks and Recreation that the applicant commit to the long term care and maintenance of new plantings installed under this scope of services.

Maintenance shall include, but not be limited to:
Watering of new plantings each week that actual precipitation totals less than one inch, May through September;
Monitoring and suppression of invasive and competing weeds throughout the site by hand weeding once a month, . Invasive plants will at no time during the maintenance period make up more then 20% of the ground and shrub layers.
Mulching with weed-free mulch materials such as wood chips, ground bark, or other organic barrier;
Replacement of dead plants up to and including during the third year of the project: