

CITY COUNCIL AGENDA ITEM
CITY OF SHORELINE, WASHINGTON

AGENDA TITLE:	Urban Forestry Assessment Informational Update
DEPARTMENT:	Parks, Recreation and Cultural Services
PRESENTED BY:	Dick Deal, PRCS Director Maureen Colaizzi, Parks Project Coordinator

INTRODUCTION:

This staff report and presentation is an informational update that provides the Council and community with an opportunity to learn more about the results of the Urban Forest Assessment of four Shoreline Parks: Shoreview, Boeing Creek, Hamlin and South Woods Park.

The City recognizes the need to create a comprehensive management plan to guide future management of urban park forests within the city. A critical first step in the creation of a management strategy is to conduct an inventory of existing vegetation resources in our largest wooded parks.

BACKGROUND:

The City Council approved \$50,000 for an Urban Forestry Assessment in the 2006 Parks Department budget to conduct an inventory of existing vegetation resources within our public parks to guide future forest management decisions. Additionally the preparation of an Urban Forestry Assessment meets Goal #6 of the 2007-2008 City Council Work Plan, Create an "environmentally sustainable community."

The Parks & Recreation Department (PRCS) hired Seattle Urban Nature (SUN) to provide habitat mapping, vegetation surveys and management recommendations. Based on available budget, the proposed scope includes the four largest wooded public parks to begin the City's goal of completing an Urban Forest Assessment of city-owned property.

The City Council reviewed the proposal to conduct the urban forest assessments of Boeing Creek Park, Shoreview Park, Hamlin Park and South Woods in October 2006 and received an updated memo May 2007 when the habitat mapping was complete.

DISCUSSION:

Seattle Urban Nature is a nonprofit organization founded in 1998 to document natural resources on public lands, to inform civic decision-making and support improved stewardship of these lands. SUN is currently moving towards a focus on empowering people in Puget Sound to improve urban habitat through science-based information and methods.

A seven member board of directors, in concert with four staff experienced in performing botanical and biological surveys, developed a system to survey plant communities and wildlife habitats and store the information in geographic information system (GIS) data for mapping. Maps and data have been used by public agencies to help make better-informed decisions about how to manage invasive and native species on public lands and where to undertake restoration.

SUN conducted resource inventories for Hamlin (80 acres), South Woods (16 acres), Shoreview (48 acres) and Boeing Creek (40 acres) for a total of approximately 184 acres. These four parks comprise the largest forested tracts in the park system with a majority of our public parks' important stream corridors, upland forest and wetland natural areas.

The resource inventory performed by SUN has given the City information regarding existing forest habitat types and structure, and native and invasive species distributions. This information provides the City with tools to make planning and management decisions for both forest stewardship and recreational needs at each of these parks.

Based on data that was collected in the field, SUN produced a GIS layer that delineates existing habitat types throughout each of the four parks. A database with collected vegetation data was linked to the GIS files and management recommendations were developed for each of the four areas surveyed. Additional information in the final report includes:

- Identification of invasive plant species and a species list of appropriate plants to replant on each site.
- Recommendations on methods of removal for invasive species and suggested species to replace removed trees and shrubs
- Recommendations for preserving and increasing the number of large downed logs and woody debris
- Recommendations for erosion control and re-establishing understory vegetation that has been removed or disturbed by overuse.

This information is being used to implement the City's forest management strategy within these parks and provide a template for future survey efforts in the remaining forested public parks and open spaces.

FINANCIAL IMPACT:

The report is complete. Staff anticipates that there will be a need for future funding to implement recommendations identified in the report and/or to move forward with assessments of the remaining urban forest parklands in Shoreline.

RECOMMENDATION:

This staff report and presentation is for informational purposes. Staff will begin working on a strategy to implement the recommendations of Seattle Urban Nature.

Approved By: City Manager jm City Attorney ____

ATTACHMENTS:

Attachment A: Executive Summary

Attachment B: 15-year Plan for Implementation

Attachment C: Summary of Hamlin Park Trail Revegetation



City of Shoreline Parks Survey Summary

by Seattle Urban Nature

May 27, 2008

Overview

In fall 2006, the City of Shoreline hired Seattle Urban Nature (SUN) to provide an urban forest assessment including vegetation mapping and survey of four parks, totaling approximately 184 acres or nearly half of the city's public park open space. These parks are: South Woods (16 acres), Hamlin Park (80 acres), Boeing Creek Park (40 acres) and Shoreview Park (48 acres). Because Shoreview and Boeing Creek Parks are contiguous, they were surveyed as one parcel. SUN has now analyzed the data and written vegetation management plans for each park.

During the project, SUN surveyed 125 forested acres in the four parks. The forested areas of these parks offer a valuable cultural resource to the community of Shoreline and provide important habitat for a variety of plant and wildlife species. Shoreline's park urban forests' provide important recreational opportunities and vital ecosystem services to residents including improved air and water quality and storm water retention. However, the parks and open spaces are subject to intense pressures from the urban environment such as heavy recreational use, pollution and invasion by exotic species. As urban pressures continue to intensify, areas of natural habitat within the urban growth boundary are becoming increasingly vital. Population growth and expansion in the Puget Sound area has led to increased pressure from development on the remaining open spaces, resulting in fewer intact forests and greater habitat fragmentation. Active management will be required to maintain and improve the aesthetic and ecological values of these areas.

The majority of forests found in the four Shoreline parks surveyed are conifer dominated, a unique feature compared to the deciduous-dominated state of much of the forests found within the urban environment of neighboring Seattle. Prior to European settlement, the Puget Sound region was generally dominated by coniferous forests. However, wide-scale logging at the end of the 19th century and pressures from development have shifted urban forests towards a more deciduous state. SUN's 1999-2000 survey of public lands in Seattle showed that 70% of all forests are deciduous and only 12% are coniferous. In contrast, 60% of Shoreline's surveyed parks are dominated by coniferous forests. In total, seven different forest types were identified within the four parks. The abstracts below are a brief summary of findings from the vegetation management plans (VMPs) created for each park.

South Woods

South Woods, the smallest park surveyed, is also the newest addition to the Shoreline park system. This 16 acre park was purchased in 2007 and has an active group of stewards, the South Woods Preservation Group. Two forest types, conifer and conifer/madrone, were mapped in South Woods (Map 1). Madrone forests are a rare and important forest type in the Puget Sound region. These forests, which usually prefer dry bluffs, make up less than 5% of urban forests in Seattle. Almost four acres of conifer/madrone forest are present in South Woods.

Unfortunately, South Woods poses some of the largest management challenges in the city. Invasive species found in the park include English ivy (*Hedera helix*), English holly (*Ilex aquifolium*), cherry laurel (*Prunus laurocerasus*) and Himalayan blackberry (*Rubus armeniacus*). English ivy and Himalayan blackberry are present in patches throughout the park and cover approximately 3.5 acres of area. However the main culprits are English holly and cherry laurel which are ubiquitously present throughout the entire park in extremely high densities. Our surveys show an average of 3,646 stems/acre, compared to only 159 stems/acre of native regenerating trees. In particular, regeneration levels of Pacific madrone and native conifer trees are very low in South Woods. These are some of the highest densities of English holly that SUN has recorded in any park in the Puget Sound region. Removal of these trees from the park will require a dedicated and long-term effort, but is necessary to preserve the native forest structure of the park.

Hamlin Park

Hamlin Park is a heavily used park containing 80 acres of land, 62 acres of which are forested. The majority of forests in Hamlin Park are conifer, with smaller amounts of conifer/deciduous, conifer/madrone and deciduous/madrone forest types also present (Map 2). Four distinct areas covering more than 15 acres of conifer forests in the center of Hamlin Park have relatively no understory plant species. These areas are lacking any substantial amounts of groundcovers, shrubs or regenerating trees. Many theories have been developed over the years to explain the cause of the bare spots, including motorcycle use, human trampling, lack of light, and soil problems. To better understand the ecology of these areas, SUN is now working with the City of Shoreline to conduct soil tests and establish a scientific study looking at various soil amendments and species survival rates to plan a long-term strategy to re-vegetate these areas. The initial soil analysis suggests that the soils throughout much of Hamlin Park are highly acidic. This acidic property is limiting the number of understory species that are able to inhabit these areas. The study will determine which understory species are better able to tolerate the existing conditions and determine if soil amendments could help with plant establishment.

The presence of these bare areas indicates another management concern in Hamlin Park, the lack of a formal trail network and the presence of numerous social trails spanning the park area. This encourages trampling of bare areas and does not limit

human activity to well-defined trail corridors. The City of Shoreline recognizes this problem and is currently working on developing an official trail plan for the park.

Invasive species also pose a significant challenge in Hamlin Park. Although the central core area of the park is free of invasive species, mostly due to lack of any understory or shrubs, the edges of the park are invaded with English ivy, Himalayan blackberry, Scotch broom (*Cytisus scoparius*) and invasive trees such as English holly, sweet cherry (*Prunus avium*), Norway maple (*Acer platanoides*) and European mountain ash (*Sorbus aucuparia*). Although the density of invasive trees is not as high as in South Woods, SUN recorded an average of 1,083 non-native stems/acre compared to 184 native regenerating stems/acre. As these trees and shrubs have not yet penetrated into the center of the park, it is important to conduct control measures as soon as possible to contain these species.

Boeing Creek and Shoreview Parks

Boeing Creek and Shoreview Parks, which together span 88 acres, represent the gem of the Shoreline park system. These beautiful forests, which used to be the private hunting grounds of William Boeing (founder of The Boeing Company), contain 200 foot tall Douglas-fir (*Pseudotsuga menziesii*) and western white pine trees (*Pinus monticola*), streams, riparian forests and access to Hidden Lake. Five forest types are present in the two parks, of which conifer forests and conifer/deciduous forests are the most common (Map 3). These parks contain the highest plant diversity found during the survey, consisting of nearly 70 different native plant species. In the center of the park, riparian forests run along the stream corridor. These forests represent some of the most important habitat types for wildlife with high plant species and structural diversity due to high water availability. As a result, groundcover, shrubs and trees, provide a rich variety of habitats for wildlife, water sources and travel corridors for birds and animals.

Much of the parks consist of extremely steep slopes, which are prone to erosion. This issue is exacerbated in the riparian forests, which contain many unstable slopes that prevent trees from gaining a foothold. As in Hamlin Park, an official trail network does not exist and many social trails run along the steep slopes in the parks. The city of Shoreline is working on a master trail plan in the parks, which will be implemented in the next several years.

One of the most significant management issues lies in Shoreview Park, which contains 12 acres of shrubland resulting from prior clearing for construction of a school. Although the school was never built, the legacy of the disturbance is evident in the large expanse of Scotch broom, Himalayan blackberry and butterfly bush (*Buddleja davidii*) present today. These shrubs are encroaching on the intact natural areas that surround them, including five acres of adjacent conifer/madrone forests. Additional clearing in the northern end of Boeing Creek Park has resulted in areas dominated by Himalayan blackberry, Scotch broom and English ivy.

One of the most seriously degraded areas of the park is located in the open space parcel across the street from Northwest 175th Street in the northern part of the park. Most of the Boeing Creek Open Space area has been suffocated by ivy, which has

created a true "ivy desert", toppling trees and preventing native species from growing. In fact, only four native species were recorded in the herbaceous layer in this zone. To add to the problems, almost all regenerating trees in this parcel consist of English holly, which was recorded at a density of 1,080 stems, compared to 90 stems per acre of native regenerating trees. Fortunately, as this parcel is separated from the rest of the park, it is not immediately threatening the integrity of adjacent forested areas.

Although some areas of Boeing Creek and Shoreview Parks are facing invasive species problems, overall, these parks are in very good ecological shape. The forests contain many mature trees, a complex forest structure and regenerating native trees. They abound with native wildlife such as Douglas squirrels and pileated woodpeckers. And, they provide a refuge from the urban landscape that is so important to thousands of Shoreline residents.

Note: See the 15 year management plans for specific recommendations for each park. More details about each park can be found in the vegetation management plans.

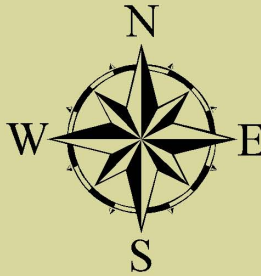


South Woods

Habitat Delineations

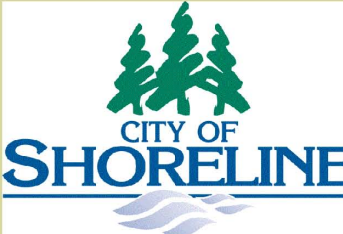
Legend

- Park Boundaries (16.1 Acres)
- Piped Water Course
- Habitat Types (Acres)**
- Conifer Forest (9.9)
- Conifer-Madrone Forest (3.7)
- Grassland (0.4)
- Shrubland (1.5)
- Developed (0.6)



Map produced by
Seattle Urban Nature
April, 2007. Park Boundaries,
water course data, and
orthomimagery provided by the
City of Shoreline, WA.





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





Boeing Creek and Shoreview Parks

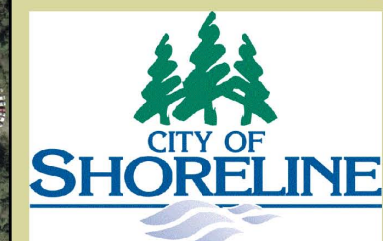
Habitat Delineations

Legend

-  Park Boundaries (87.9 Acres)
-  Open Water Course
-  Piped Water Course
-  Trails

Habitat Types (Acres)

-  Conifer Forest (17.3)
-  Conifer-Deciduous Forest (18.2)
-  Conifer-Madrone Forest (4.0)
-  Deciduous Forest (12.6)
-  Grassland (3.7)
-  Shrubland (12.0)
-  Palustrine Open Water (0.8)
-  Landscaped Forest (1.7)
-  Landscaped Grassland (6.6)
-  Developed (11.0)



Seattle
Urban
Nature



Map produced by
Seattle Urban Nature
April, 2007. Park Boundaries,
water course data, and
orthoimagery provided by the
City of Shoreline, WA.

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



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Hamlin Park

Habitat Delineations

Legend

-  Park Boundaries (80.4 Acres)
-  Open Water Course
-  Piped Water Course

Habitat Types (Acres)

-  Conifer Forest (39.6)
-  Conifer-No Understory (14.6)
-  Conifer-Deciduous Forest (4.0)
-  Conifer-Madrone Forest (0.9)
-  Deciduous-Madrone Forest (0.4)
-  Trail Corridor (1.5)
-  Grassland (0.7)
-  Shrubland (2.5)
-  Landscaped Shrubland (0.3)
-  Landscaped Forest (1.3)
-  Landscaped Grassland (7.6)
-  Developed (7.1)



Map produced by
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South Woods 15 year plan

Short-term management priorities (Years 1-5)	
	These are actions that are of high importance and could be completed within the first five years
Year	Action
1	Conduct inventory of park assets and create Vegetation Management Plan (VMP) (complete)
2	Using information from VMP, create specific restoration action plans for each management zone. This type of information can include specific planting plans, specific invasive removal techniques to be used, specific maintenance activities that will be necessary, as well as a timeline for implementation, maintenance and monitoring
2-5	Implement specific goals identified as short-term priorities in the VMP
	1) Create survival rings around native trees in the park within areas covered by English ivy and continue removing English ivy from contiguous patches in Zone 2
	2) Remove invasive trees in Zone 4, beginning with moderately invaded areas and proceeding into heavily invaded areas and replant with native species
	3) Revegetate Zone 5 with native species and remove invasive trees that are encroaching on this area
	4) Decide the appropriate use for the fenced-off section in the north of the park
Yearly	Conduct monitoring and maintenance of areas in restoration
Medium-term priorities	
	These are actions that will take planning to complete and could be completed within five to ten years
Year	Action
6-10	1) Remove English ivy from Zone 2 and replant with native species
	2) Remove Himalayan blackberry from accessible areas of the park and replant with native species
	3) Remove invasive trees from moderately invaded sections of the park
	4) Begin removal of English holly from heavily invaded sections of the park
Yearly	Conduct monitoring and maintenance of areas in restoration
Long-term priorities	
	These are on-going activities that will take many years to accomplish and can be integrated into other restoration efforts
Year	Action
11-15	1) Underplant tall shrubs within the park
	2) Increase coarse woody debris component in the park by retaining existing logs and bringing in additional wood when possible and preserve large snags when possible
	3) Remove patches of herb Robert from Zone 5
	4) Remove invasive trees from heavily invaded sections of the park and replant with native species
	5) Maintain restored areas which have been replanted with native species
16	Conduct park inventory and reassess management strategies

Hamlin Park 15 year plan

Short-term management priorities (Years 1-5)	
	These are actions that are of high importance and could be completed within the first five years
Year	Action
1	Conduct inventory of park assets and create Vegetation Management Plan (VMP) (complete)
2	Using information from VMP, create specific restoration action plans for each management zone. This type of information can include specific planting plans, specific invasive removal techniques to be used, specific maintenance activities that will be necessary, as well as a timeline for implementation, maintenance and monitoring
2-5	Implement specific goals identified as short-term priorities in the VMP
	1) Remove all discrete patches of ivy in zones 1-A, 1-B, 1-D, 3-A, 3-C and 4-C and replant with native species
	2) Create survival rings in all large ivy-infested areas throughout the park where trees are being threatened
	3) Remove discrete areas of scotch-broom in Zones 1B and 1D and replant with native species
	4) Remove small infestation of yellow archangel in Zone 1 before it spreads further and replant with native species
	5) Remove small, isolated patches of Himalayan blackberry located in management zones 1-A and 1-B, along with the isolated patch in zone 3-B and replant with native species
	6) Remove isolated patches of English holly and cherry laurel infestations throughout the park. A priority area is the infestation spanning zones 3-B, 1-B and 4-B in the center of the park (see the management discussion for zone 4-B for more information)
	7) Remove sweet cherry infestation in zone 4-A and replant with native species.
	8) Establish a scientific study comparing different treatments to re-establish understory in the conifer forest without understory forest type
	9) Establish exclosures to reduce human traffic in restoration areas.
	10) Define a permanent trail network and close off unnecessary social trails.
Yearly	Conduct monitoring and maintenance of areas in restoration
Medium-term priorities	
	These are actions that will take planning to complete and could be completed within five to ten years
Year	Action
6-10	1) Remove English holly and cherry laurel in zones 1-A, 1-D, 3-A, 3-B, 3-C, 4-B, 4-C and 8 and replant with native species
	2) Remove larger Scotch broom infestations in Zones 1-A and 5 and replant with native species
	3) Remove large, contiguous areas of English ivy in zones 1-A, 1-D, 3-A, 3-B, 4-A and 6 and replant with native species
	4) Remove large, contiguous infestations of Himalayan blackberry in zones 1-A, 1-D, 3-C, 4-A, 4-C, 5 and 6
	5) Remove Norway maple from Zone 3-C and replant with native maple species
	6) Remove sweet cherry from Zone 4-C and replant with native bitter cherry
	7) Re-establish understory in the conifer forest without understory forest type using results from the scientific study (number 8 in short-term priorities)
Yearly	Conduct monitoring and maintenance of areas in restoration
Long-term priorities	
	These are on-going activities that will take many years to accomplish and can be integrated into other restoration efforts
Year	Action
2-15	1) Increase CWD component in the park by retaining existing logs and bringing in additional wood when possible
	2) Provide on-going maintenance of restored areas
	3) Underplant tall shrubs throughout the park
16	Conduct park inventory and reassess management strategies

Boeing Creek and Shoreview Parks 15 year plan

Short-term management priorities (Years 1-5)	
	These are actions that are of high importance and could be completed within the first five years
Year	Action
1	Conduct inventory of park assets and create Vegetation Management Plan (VMP) (complete)
2	Using information from VMP, create specific restoration action plans for each management zone. This type of information can include specific planting plans, specific invasive removal techniques to be used, specific maintenance activities that will be necessary, as well as a timeline for implementation, maintenance and monitoring
2-5	Implement specific goals identified as short-term priorities in the VMP
	1) Remove invasive trees in Zones 1, 2, 3, 6, 8 and 9 and replant with native species
	2) Remove discrete areas of Himalayan blackberry in Zones 1, 3, 6 and 8 and replant with native species, including conifers
	3) Remove discrete patches of English ivy from Zones 1, 2, 3, 6 and 9 and replant with native species
	4) Remove yellow archangel from Zone 9 and replant with native species
	5) Remove scattered infestations of herb Robert from interior forested areas including Zones 6 and 7 within the park complex
	6) Remove infestations of creeping buttercup and common periwinkle from Zones 6 and 8 and replant with native species
	7) Formalize trail junctions in Zone 7 and replant with native species to avoid further effects of trampling
	8) Create survival rings around trees in Zone 12 within areas covered by English ivy
Yearly	Conduct monitoring and maintenance of areas in restoration
Medium-term priorities	
	These are actions that will take planning to complete and could be completed within five to ten years
Year	Action
6-10	1) Monitor cherry regeneration in Zone 1
	2) Create and maintain a buffer zone along the eastern and western edges of Zone 2 and along the eastern edge of Zone 5 to maintain the integrity of the forested areas
	3) Remove Herb Robert from Zones 3, 8 and 10 and replant with native species
	4) Remove Himalayan blackberry from Zones 9, 10 and 11 and replant with native species
	5) Remove Scotch broom from Zones 10 and 11 and replant with native species
	6) Remove ivy from Zone 10 and replant with native species
	7) Remove invasive tree species from zone 10 and replant with native trees
	8) Create a master plan for a trail network and close off and re-vegetate unnecessary social trails, particularly in steep slope areas
	9) Conduct a study focusing on stabilizing and re-vegetating eroded slopes and trails in steep slope areas
Yearly	Conduct monitoring and maintenance of areas in restoration
Long-term priorities	
	These are on-going activities that will take many years to accomplish and can be integrated into other actions
Year	Action
11-15	1) Underplant shrubs and herbaceous species within the conifer/madrone mixed forests in Zones 2 and 3
	2) Augment the shrub layer by underplanting shrubs in Zones 6 and 7
	3) Increase tree and shrub cover in Zone 8
	4) Remove invasive tree species from Zone 12 and replant with native species
	5) Remove English ivy from Zone 12 and replant with native species
	6) Remove Scotch broom, Himalayan blackberry and butterfly bush from Zone 4 and replant with native species
	7) Remove Himalayan blackberry and Scotch broom from Zone 12 and replant with native species
	8) Maintain restored areas which have been replanted with native species
	9) Increase levels of CWD and preserve large snags throughout the park complex.
16	Conduct park inventory and reassess management strategies

Hamlin Park Revegetation Study

In 2007, SUN conducted an inventory of Hamlin Park for the City of Shoreline. During the survey we mapped 12 habitats within the park ranging from developed areas and shrublands to conifer and madrone forests (Map 1). One of our most interesting findings was that 15 acres of the park is covered by a forest type we called "conifer without understory". These forests, located within the central matrix of the park, have a dense overstory canopy mostly consisting of Western hemlock trees with smaller amounts of Douglas-fir, western red cedar and western white pine. However, aside from the trees, these areas are completely bare, containing no shrubs, regenerating trees or any type of understory vegetation.

The City of Shoreline is concerned about this unusual situation and has asked SUN to design a study to look at ways to revegetate these areas. Starting in March of this year, we will establish and install six plots throughout the park (one in each bare area), looking at three different soil treatments and a number of different plant species.

Many hypotheses abound for why these areas do not contain vegetation. One theory is that use of motorized vehicles was prevalent in the park several decades ago and negatively impacted understory plants in these areas. Another theory is that the lack of a formal trail system within the park is leading to trampling of vegetation by visitors. It is also possible that there are some problems within the soil itself. To address these questions, SUN will collect soil samples to test for a variety of factors. The plots will also serve as exclusion areas for human activity as they will be fenced off. This will allow us to see if vegetation will come in by itself into the fenced-off control plots and whether trampling is the root cause of the problem.

SUN will conduct baseline monitoring of each plot prior to treatment installation and will monitor the plots over the next two growing seasons. At the end of that time, we hope to get a good idea of what treatments work best and which plant species are the most successful. This information will allow the City of Shoreline to expand the planted areas and establish more "understory islands" throughout the park.