

May 2021

# Scriber Lake Park Habitat Management Plan Lynnwood, WA



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# Scriber Lake Park Habitat Management Plan

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All photos and maps in this report by Nelson Salisbury - EarthCorps 2020

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## **1. Introduction**

The City of Lynwood contracted with EarthCorps in 2020 to provide vegetation assessments and habitat management recommendations for Scriber Lake Park. The primary goals of these efforts were to assess the composition of the natural areas located throughout the park and provide recommendations for improving their overall structure and function.

Increasing understanding of the existing conditions will help make informed management decisions and provide baseline conditions that can be used to track and monitor changes to the Park over time. Through these efforts, EarthCorps mapped the natural areas based on forest/ecological types, existing vegetation communities, and topography and created Habitat Management Zones to aid in planning and restoration efforts. In addition, the presence of invasive plant species concerns were mapped and priority recommendations for control were established. The following report summarizes these findings and describes the management recommendations for Scriber Lake Park.

Developing a long-term habitat management plan is an important part of the City's efforts to protect, enhance, and maintain the forests, wetlands, and associated natural areas on the property. Active habitat restoration and vegetation management will help to increase and improve the natural, social, and economic services they provide. These services include storm water mitigation, flood and erosion control, improved air quality, carbon sequestration, enhanced wildlife habitat, public education, passive and active recreation, as well as the many other documented benefits to the health and well-being of the community. Scriber Lake Park offers a unique and highly valuable resource to the community with its expansive wetlands and the important storm water mitigation and habitat value they provide. In addition, the park provides extensive opportunities for recreation and experiencing nature with more than a mile of maintained trails.

## **2. Habitat Mapping and Natural Area Assessment**

This analysis evaluated the existing structure and condition of the natural areas present on the property. The purpose of the forest assessment and analysis was to:

- Create Management Units to prioritize and track habitat restoration and management efforts
- Provide baseline data on the existing structure and composition of the vegetation communities
- Assess for dominant invasive species locations and extents
- Develop specific recommendations to restore and increase the health and structure of existing vegetation communities

## 2.1. Management Units

Initial mapping efforts for Scriber Lake Park involved dividing the natural areas into similar habitat types based on soil moisture, dominant plant species associations, topography, or other existing features during GPS (global positioning system) assisted field surveys.

The natural areas were divided into general Management Units generally based on habitat types, the location of existing trails, and other topographical features (Map 1). These Management Units (MUs) can be used to plan and prioritize restoration priorities and to monitor and track changes over time. However, the linear nature of these habitat types and wetland systems make the creation and classification of management units somewhat difficult. The intent of the MUs was to group similar habitat types together based on proximity in order to help direct and prioritize management and restoration.

The natural areas were delineated into generally similar habitat types based on dominant plant species associations, topography, or other existing features during the GPS assisted field surveys (Map 1). Map 2 and Map 3 showing invasive species distributions are also included below. These habitat types include five different broadly defined ecological systems (Table 1) adapted from the ecological classification approach developed by NatureServe and utilized by the Washington Dept. of Natural Resources (WADNR) (Rocchio and Crawford 2015). Four of the dominant habitat types were adapted directly from the WADNR classifications, while one type was based on the early successional descriptions within these types. Three other park areas that represent lacustrine, developed, or landscaped habitat types were also mapped and quantified. These areas include portions within the property boundaries that are made up of parking lots, trails, landscaped grass, and paved streets. Table 1 shows a summary of these broad habitat types found throughout the property. These general habitat types and Management Unit delineations can be used to plan, prioritize, and track management and restoration efforts throughout the property.

**Table 1. Scriber Lake Park Habitat Types**

Map Label	Habitat Type*	Acres	% of Total
<b>Forested (41% - 10.6 Acres)</b>			
Conifer Mixed Forest	North Pacific Maritime Dry-Mesic Douglas-fir-Western Hemlock Forest*	6.2	24%
Riparian Forest	North Pacific Lowland Riparian Forest and Shrubland*	3.7	14%
Deciduous Forest	(Early Successional) North Pacific Maritime Dry-Mesic Douglas-fir-Western Hemlock Forest*	0.8	3%
<b>Open Canopy (52% - 13.5 Acres)</b>			
Shrub Swamp	North Pacific Shrub Swamp*	8.8	34%
Open Water	Lacustrine Low Elevation Lake	4.4	17%
Emergent Marsh	Temperate Pacific Freshwater Emergent Marsh*	0.3	1%
<b>Developed (7% - 1.9 Acres)</b>			
Trails and Parking Lots		1.2	5%
Landscaped Grass		0.7	3%
<b>Grand Total</b>		<b>26.0</b>	
*Indicates a WNHP Ecological System Classification type			



# Scriber Lake

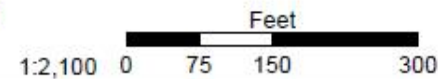
## Habitat Types and Management Units

Map 1



### Habitat Types (26 Acres)

Shrub Swamp (8.8 Acres)	Deciduous Forest (0.8 Acres)	MGMT Units
Riparian Forest (3.7 Acres)	Conifer-Mixed Forest (6.2 Acres)	Lawn (0.6 Acres)
Emergent Marsh (0.3 Acres)	Open Water (4.4 Acres)	Trails (1.2 Acres)

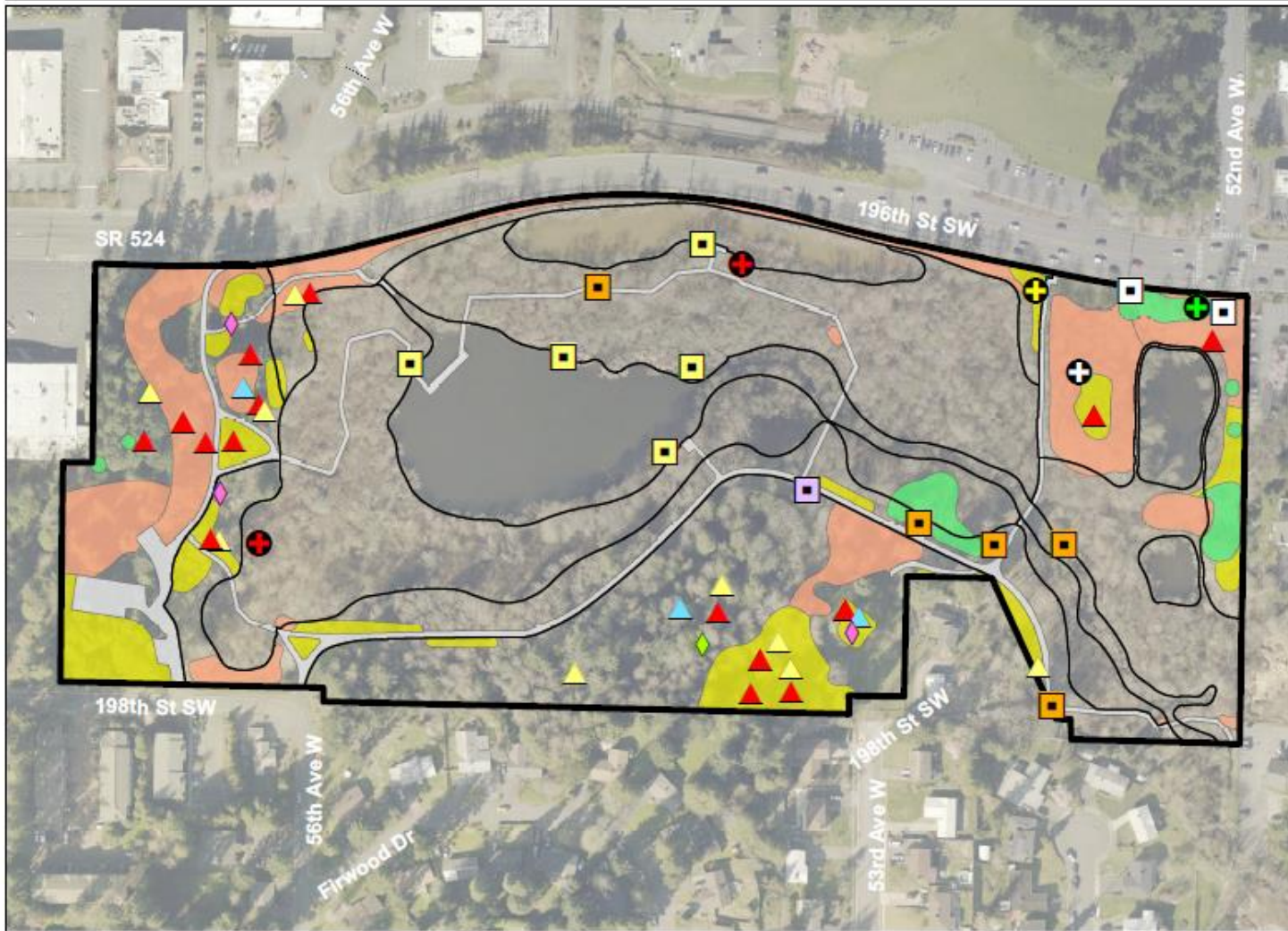


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# Scriber Lake

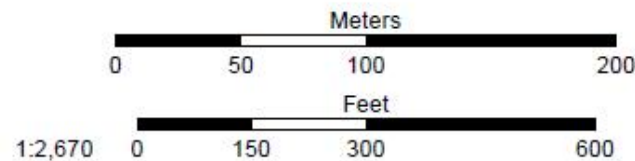
## Invasive Species Distribution

Map 2



### Legend

- Scriber Lake Park
  - MGMT Units
  - Trails
- Dominant Invasive Species**
- Blackberry (3.24 Acres)
  - Ivy (1.95 Acres)
  - Knotweed (0.50 Acres)
- Herbaceous Invasives**
- Bamboo
  - Bittersweet Nightshade
  - Clematis
  - Hedge false Bindeed
  - Periwinkle
  - Poison Hemlock
  - Spotted Jewelweed
  - Yellow Flag Iris
- Invasive Trees**
- Cherry Laurel
  - English Hawthorn
  - English Holly
  - European Mt. Ash
  - Portugal Laurel

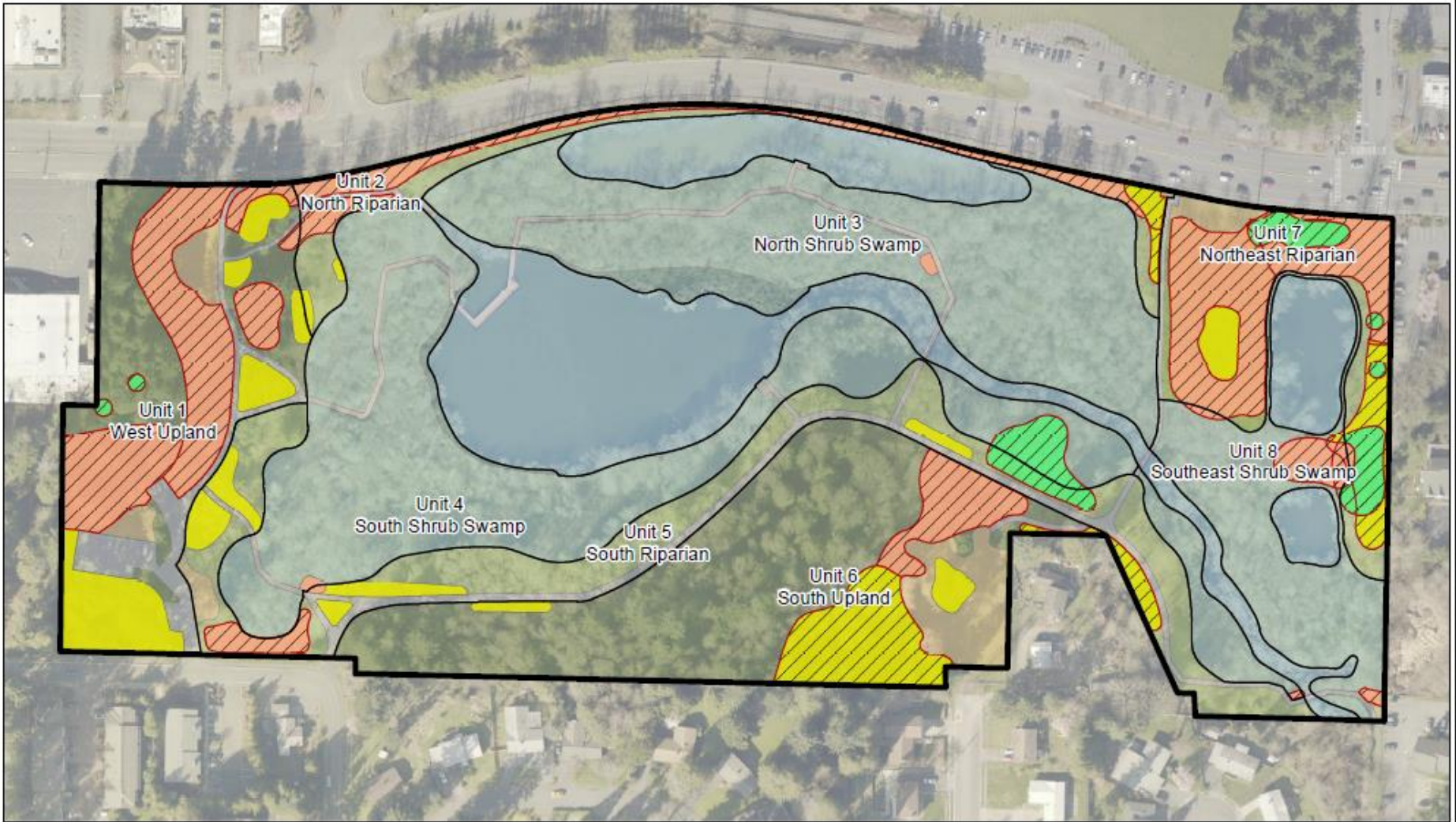


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# Scriber Lake

## Dominant Invasive Species Distribution

Map 3

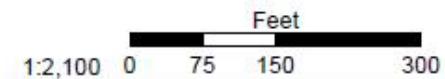


### Legend

- Scriber Lake Park
- Contractor Work Site
- MGMT Units

### Dominant Invasive Species

- Blackberry (3.24 Acres)
- Ivy (1.95 Acres)
- Knotweed (0.50 Acres)



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The WNHP Ecological Systems describe the general characteristics of forests and natural areas occurring within our region. These typings were developed primarily to describe relatively undisturbed natural areas and therefore do not always correspond to our fragmented and disturbed urban open spaces. These systems also describe different forest types that represent a gradient of characteristics that transition from one type to another over the landscape. This can be especially evident in areas where there are changes in soil moisture as is evident at Scriber Lake. Despite the potential ambiguity around categorization and boundaries, these broad classifications can help us describe both the existing conditions as well as make inferences as to how active management could affect the future trajectory of the natural areas. Ultimately, comparing these more disturbed habitats to the reference habitats described in the WNHP can provide valuable information and guidance on how active management can work towards shifting away from the current trajectory of disturbance and degradation. While some disturbances (such as fragmentation and invasive species pressures) and continually changing conditions (due to climate disruption etc.) may be persistent, fostering healthy and diverse species assemblages can help increase resiliency and reduce the need for overall management intervention over time.

The WNHP ecological system classifications descriptions (that can be found in the Natural Heritage Report "Ecological Systems of Washington State - A Guide to Identification" (Rocchio and Crawford, 2015)) also include listings for recognized U.S. National Vegetation Classification Groups and Associations for each system. These associations could be used in the future to further describe, classify, or create more specific target forest type systems or species associations for restoration objectives.

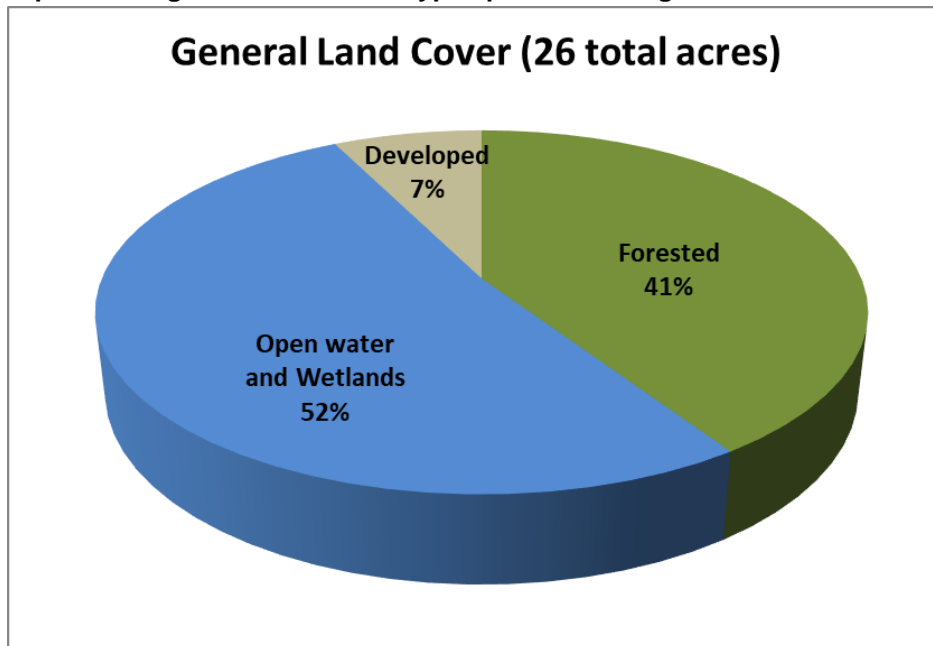
## **2.2. Assessment Procedures**

Each Management Unit was inventoried using a rapid visual assessment procedure to provide a general understanding of the composition of the existing vegetation present throughout the park. Information collected for each area included dominant native plant species (trees, shrubs, groundcovers), presence of dominant non-native invasive plant species, and the presence of other habitat features or general site characteristics. All field surveys were conducted in June and August of 2020 by an EarthCorps ecologist. Overall, more than 26 acres of natural areas were mapped and rapidly surveyed using these general qualitative observations. This survey was intended to provide a broad understanding of the structure and composition of the vegetation present on site and did not consist of a comprehensive species inventory. The management units and habitat type delineations could be used in future efforts to develop a more rigorous or objective survey or analysis.

### 3. Scriber Lake Park Vegetation Overview

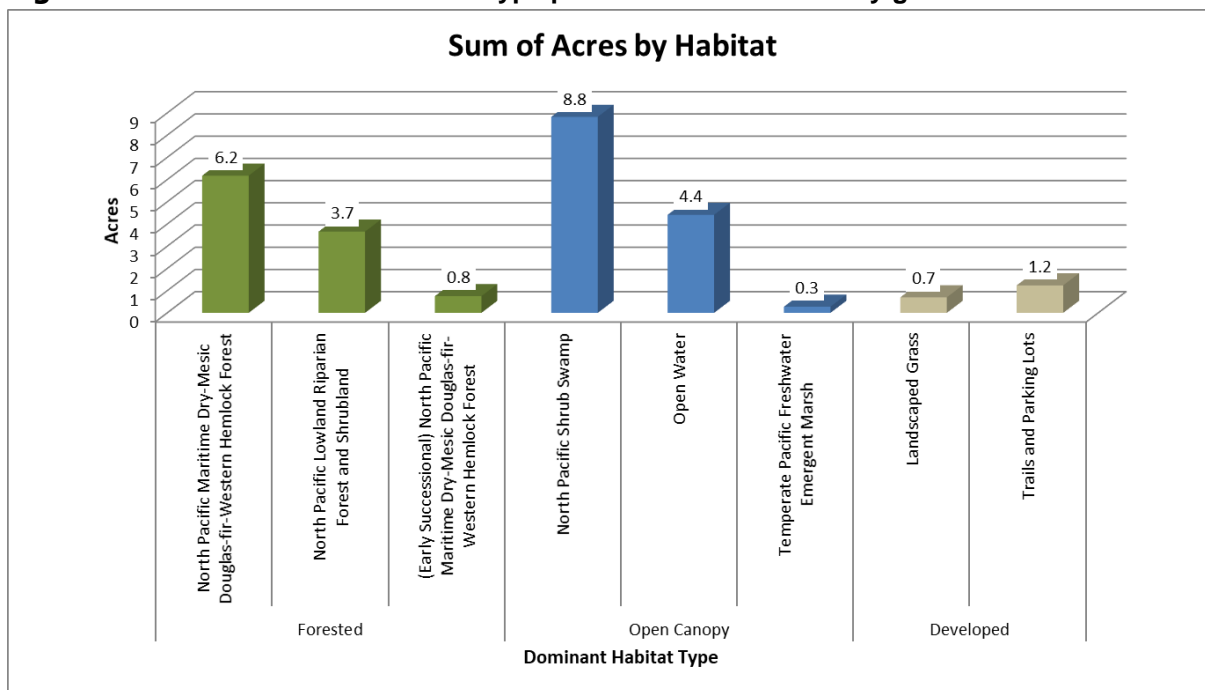
At the center of Scriber Lake Park is the open water of Scriber Lake, a 2.4 acre perennial body of water that is fed by Scriber Creek flowing into the property from the southeast (Map1). Water flows north out of the property through a culvert beneath 196<sup>th</sup> Street SW. There is a smaller complex of two smaller bodies of water in the northeast portion of the property and another linear area of ponded water along the norther boundary of the park adjacent to 19<sup>th</sup> Street SW (the “North Lagoon”). In winter and in times of heavy or sustained rainfall all of these bodies of water can become connected with overland flow. A vast network of scrub-shrub wetlands, swamps, and riparian forests link the standing water together in a complex matrix of wetlands that cover the majority of the property (Map 1, Figures 1 & 2). Areas of higher elevation transition into remnants of upland coniferous forests concentrated mostly along the southern and western portions of the park. A smaller elevated portion of the park in the northeast is also comprised of a generally upland deciduous forested habitat that shows signs of past significant disturbance (categorized as an early successional mixed conifer forest type – Table 1 & Figure 2).

**Figure 1. Proportion of general land cover types present throughout Scriber Lake Park**





**Figure 2. Total acres of each habitat type present at Scriber Lake by general land cover.**



The upland forests are dominated by mature conifer trees and typical Pacific Northwest shrub assemblages. These forests transition to bands of riparian forests that flank the wetland systems providing a buffer to the scrub-shrub swamp habitats. The low-lying areas of the park along the stream and open water are made up of a thick native shrub complex exhibiting a striking diversity of species and providing abundant habitat for birds and other wildlife. These shrub-swamp habitats are comprised of an intricate matrix of plant species that are tolerant of frequent flooding and saturated soil conditions, with most areas not able to support tree establishment. Because of the persistent high water levels, the areas surrounding the lake exhibit bog-like characteristics with patches of dense emergent vegetation adapted to these very wet conditions. While patches of herbaceous dominated marsh vegetation are scattered through the shrub swamp habitat, a narrow but consistent band of this habitat was mapped along the northern portion of the main lake area (Map 1). Plant species here are well adapted to persistent flooding and transition into floating vegetation in some areas. More detailed information on species associations are presented below for each Ecological System type.

The greatest threat to the health and function of these natural areas is the continued spread and establishment of non-native invasive plant species. Many areas of the park have become substantially invaded with a variety of species of invasive plants common in our area. Maps 2 and 3 show the approximate locations of selected invasive species concerns throughout the park. The primary invasive species threats include hybrid Bohemian knotweed, Himalayan blackberry, English ivy, English holly, and cherry laurel. Limited amounts of poison hemlock, a King County Class B noxious weed required for control, are also present in MU 7 (Map2). Other

concerns include smaller infestations of bittersweet nightshade and yellow flag iris in the shrub swamp habitats and around the lake (MUs 3, 4, and 8). The control and eradication of invasive plant species should be considered a high management priority for Scriber Lake Park. Other concerns include water quality issues such as eutrophication and sedimentation resulting from the highly urbanized nature of the surrounding watershed. While water quality is not directly addressed in this report, maintaining healthy riparian habitat can help mitigate the negative effects of ongoing pollution and contamination.

Overall, the park consists of unique natural areas that exemplify a high level of ecological diversity. The wetlands and surrounding habitats serve important stormwater detention functions and provide vital wildlife habitat in an increasingly urbanized environment. These types of wetlands (especially of this size and complexity) are also rare in western Washington due to their sensitivity to disturbance and the degradation and loss from historical filling and development. Combined with the adjacent mature upland forested habitats, these natural areas offer a valuable resource to Lynnwood’s community and provide important recreational and educational opportunities. Maintaining and enhancing the structure and function of these natural areas will ensure that Scriber Lake Park will continue to provide these important resources to the Lynnwood community.

### **3.1. North Pacific Maritime Dry-Mesic Douglas-fir-Western Hemlock Forest (Units 1, 6, and 7)**

Approximately 6.2 acres (24%) of Scriber Lake Park consists of generally upland forest types and were categorized as the North Pacific Maritime Dry-Mesic Douglas-Fir Western Hemlock Forest Ecological System classification

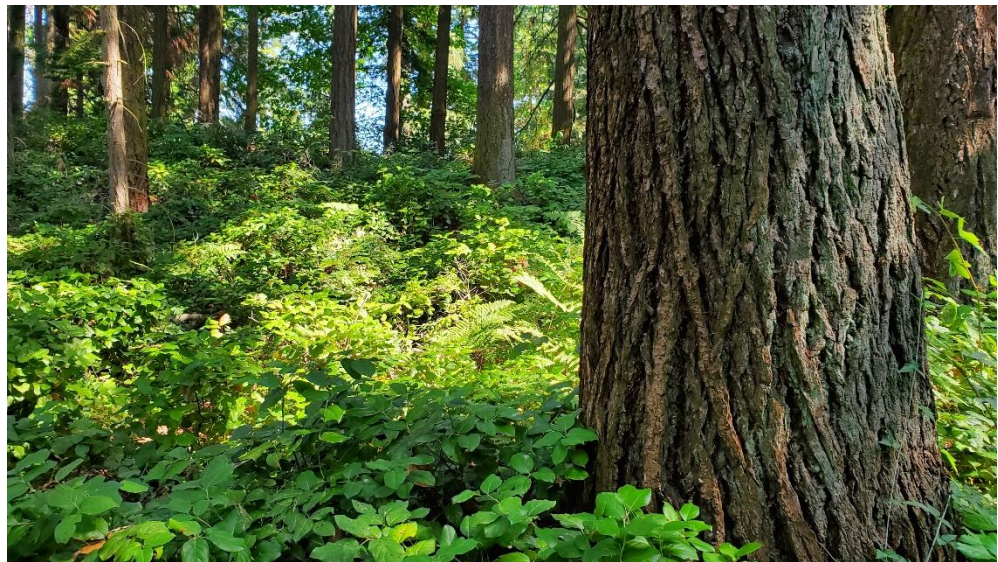


Photo 1: Douglas fir and salal understory in MU 1.

(Table 1). Units 1 and 6 are primarily conifer-dominated generally upland forests. Dominant trees are Douglas fir (*Pseudotsuga menziesii*) and western red cedar (*Thuja plicata*) with lesser amounts of western white pine (*Pinus monitcola*), bigleaf maple (*Acer macrophyllum*), and red alder (*Anus rubra*). Some areas have regenerating western red cedar and cascara (*Frangula*

purshiana) in the understory. Shrub cover is somewhat patchy and open in Unit 1 and generally more developed in Unit 6. Native shrub cover in drier areas is dominated by beaked hazelnut (*Corylus cornuta*), salal (*Gaultheria shallon*), oso-berry (*Oemleria cerasiformis*), Cascade Oregon grape (*Mahonia nervosa*), and bald-hip rose (*Rosa gymnocarpa*) with wetter areas also with red huckleberry (*Vaccinium parvifolium*) and salmonberry (*Rubus spectabilis*). The herbaceous layer is relatively sparse and dominated by sword fern (*Polystichum munitum*) especially in drier areas. Wood fern (*Dryopteris expansa*), bracken fern (*Pteridium aquilinum*), and some patches of vanilla leaf (*Achlys triphylla*) area also scattered throughout, especially in Unit 6. Unit 7 has a mostly upland area (described as Deciduous Forest on Map 1) that is included in this general habitat type. Unlike Units 1 and 6, Unit 7 is dominated by mature deciduous trees made up predominantly of red alder with black cottonwood (*Populus trichocarpa*) and bigleaf maple in lesser amounts. Shrub cover is moderate and comprised of generally upland associated shrubs including ocean spray (*Holodiscus discolor*), oso-berry, and red elderberry (*Sambucus racemosa*). The herbaceous layer here is relatively sparse and



comprised of sword fern and trailing blackberry (*Rubus ursinus*).

Invasive species are generally well established throughout these forest types. Portions of the forests are heavily invaded with large patches of Himalayan blackberry (*Rubus bifrons*) and English ivy (*Hedera helix*) with small patches

of hybrid Bohemian knotweed (*Fallopia x bohemica*) in Unit 1 (Map 2). Much of the understory is dominated with invasive tree species dominated by English holly (*Ilex aquifolium*), cherry laurel (*Prunus laurocerasus*), and Portugal laurel (*Prunus lusitanica*) with lesser amounts of bird cherry (*Prunus avium*), one-seed hawthorn (*Crataegus monogyna*), horse chestnut (*Aesculus hippocastanum*), and European mountain ash (*Sorbus aucuparia*). Other invasive species include spurge laurel (*Daphne laureola*), hedge-false bindweed (*Calystegia sepium*), herb Robert (*Geranium robertianum*), and bittersweet nightshade (*Solanum dulcamara*).

**Photo 2: MU 6 intact upland forest with mixed overstory and Cascade Oregon grape/sword fern in the understory.**

Reduction of invasive species would greatly increase the health and structure of these forests. Minimal planting would be needed due to the relatively high cover of native species and the existing canopy although some areas of heavy invasive cover will require substantial effort to clear and revegetate.

### 3.2. North Pacific Lowland Riparian Forest and Shrubland (Units 2, 5 and 7)

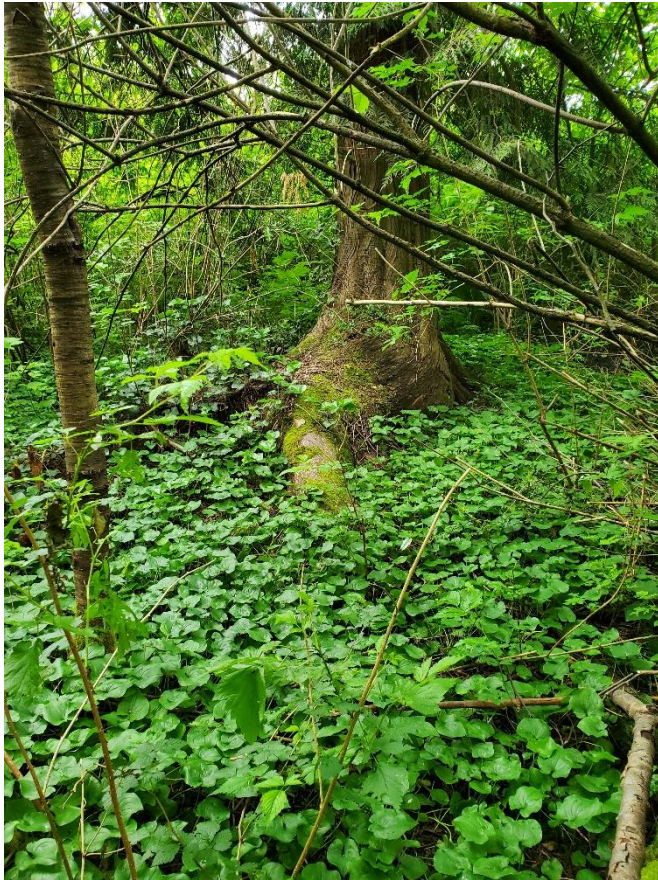


Photo 3: MU 5 showing mature western red cedar tree with false lily-of-the-valley groundcover

The forested areas that transition towards the wetter areas of the park are primarily comprised of moisture tolerant deciduous forests dominated by red alder with some black cottonwood trees. These units make up approximately 3.7 acres or 14% of the park (Table 1). Some large western red cedar trees are present near the transition to the wetter shrub-dominated interior habitats. Drier portions of these areas have relatively high shrub cover made up of beaked hazelnut and oso-berry while wetter areas are dominated by salmonberry, red-osier dogwood (*Cornus sericea*) and black twinberry (*Lonicera involucrata*). The herbaceous layer includes giant horsetail (*Equisetum telmateia*), stinging nettle (*Urtica dioica*), and lady fern (*Athyrium filix-femina*) with some patches of false lily-of-the-valley (*Maianthemum dilatatum*).

Invasive species are prevalent in these areas, especially bordering the trail. These species include non-target invasive species such as creeping buttercup (*Ranunculus repens*) and reed canary grass (*Phalaris arundinacea*) as well as targeted species including hybrid Bohemian knotweed (Units 5 and 7), English ivy, and spotted jewelweed (*Impatiens capensis*). The riparian forested portion of Unit 7 in particular is heavily invaded with non-native species including Himalayan blackberry, English ivy, knotweed, poison hemlock (*Conium maculatum*), hedge-false bindweed, and English holly (Map 2). Unit 2 along 196<sup>th</sup> Street SW is also heavily disturbed and invaded with Himalayan blackberry and evergreen clematis (*Clematis vitalba*).

### 3.3. North Pacific Shrub Swamp (Units 3, 4, and 8)

The majority of the natural areas located at Scriber Lake Park were classified as the North Pacific Shrub Swamp habitat type (Map 1), making up 8.8 acres or 34% of the park. These areas are dominated by dense stands of tall and spreading shrubs that are able to tolerate the saturated soil conditions. Prominent species include Pacific willow (*Salix lasiandra*), Sitka willow (*Salix sitchensis*), and coastal willow (*Salix*



Photo 4: Trail in west MU 4 adjacent to dense willow and hardhack shrubs. Note non-native creeping buttercup along trail opening.

hookeriana), red-osier dogwood, twinberry, salmonberry, hardhack (*Spirea douglasii*), Pacific crabapple (*Malus fusca*), and Labrador-tea (*Rhododendron groenlandicum*). These systems are generally too wet for persistent tree establishment, although some red alder trees are sporadically present. Openings in the shrub canopy provide opportunities for herbaceous annual and perennial species to proliferate including skunk cabbage (*Lysichiton americanus*), lady fern (*Athyrium filix-femina*), musk-flower (*Erythranthe moschata*), false lily-of-the-valley, American brooklime (*Veronica americana*), marsh bedstraw (*Galium palustre*), leafy beggarticks (*Bidens frondosa*), mad-dog skullcap (*Scutellaria lateriflora*), and fowl manna grass (*Glyceria striata*).

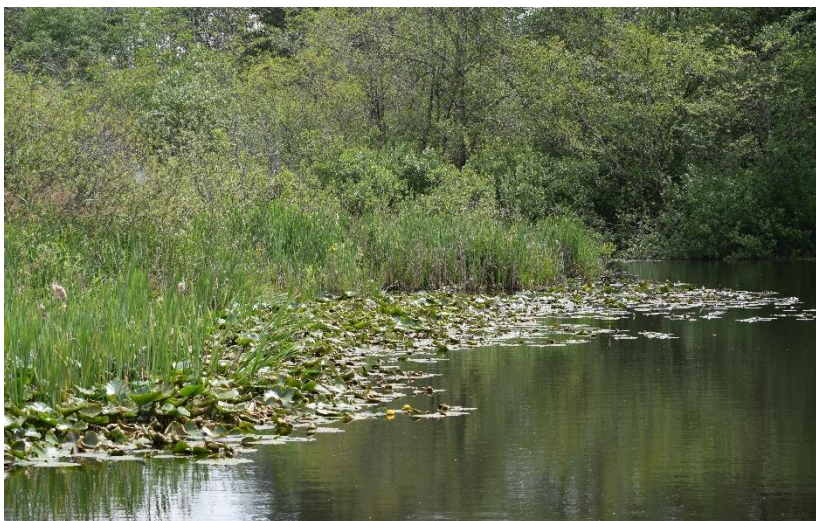
These Units share characteristics with the Vancouverian Lagg Shrub Swamp and the Vancouverian Shrub Basin Swamp wetland and riparian subgroup types (WADNR has a forthcoming guide to these wetland types for Washington State: [Wetland and Riparian Vegetation Types | WA - DNR](#)). Much of the current vegetation is typical of Puget Lowland scrub-shrub wetlands and also share many characteristics of the shrub types described in the North Pacific Lowland Riparian Forest and Shrubland system.

These habitats overlay extensive peat deposits that have accumulated over thousands of years in the poor nutrient conditions created in these types of glacial depressional landforms. Scriber Lake could technically be described as a fen (as opposed to a bog) due to the year-round input of freshwater from Scriber Creek. The high water table results in saturated bog-like conditions although the input of freshwater and resulting nutrients creates a less acidic environment

compared to traditional bog habitats. These conditions allow for more typical freshwater wetland and riparian shrub, herb, and graminoid communities. More acidic bogs would be dominated by Ericaceous shrubs while only limited amounts of Labrador tea were noted at Scriber Lake Park.

Invasive species concerns are predominantly associated with the trails and include creeping buttercup, reed canary grass, spotted jewelweed, and Himalayan blackberry. Some limited patches of bittersweet nightshade and yellow flag iris were also noted (Map 2). A large patch of hybrid Bohemian knotweed extends into the eastern portion of Unit 4 from the adjacent riparian forest.

### **3.4. Temperate Pacific Freshwater Emergent Marsh (parts of Units 3 and 4)**



**Photo 5: North edge of Scriber Lake showing spatterdock and cattails in the emergent marsh.**

The Shrub Swamp wetland transitions towards more emergent vegetation along the lake edge including freshwater emergent marsh species such as spreading rush (*Juncus effuses*), small-fruited bulrush (*Scirpus microcarpus*), sedges (*Carex* spp. Including awlfruit sedge: *C. stipata*), Pacific water parsley (*Oenanthe sarmentosa*), and marsh cinquefoil (*Comarum palustre*). The margins of the lake itself

are ringed with native broad-leaf cattails (*Typha latifolia*) with spatterdock (*Nuphar polysepala*) extending into the open water. Only relatively narrow bands were mapped along the lake shores although pockets of emergent marsh vegetation can be found as a matrix within the Shrub Swamp wetland complex.

Yellow flag iris is the predominant invasive species concern in this habitat type although reed canary grass is also present in some areas along the lake shore (Map 2).

## **4. Management Recommendations**

Much of the natural areas at Scriber Lake Park have been heavily invaded with non-native and invasive plant species (Map 2 & 3). The highest priority should be to reduce the pressure of these species in the vicinity of designated wetlands and to work to incrementally remove them from the park over time. High priority consideration should be given to listed invasive species and those species that are directly compromising the function of the riparian and wetland habitats.

The following is a summary of general restoration management recommendations that are intended to provide overarching guidance towards improving the health and structure of the natural areas. Management recommendations are separated by overall parkwide priorities (4.1), Volunteer recommended tasks (4.2), and Contractor recommended tasks (4.3). See Map 2 for general invasive species locations and Map 3 for volunteer and contractor recommended restoration areas. In general, English ivy areas in upland habitats were considered the most accessible for volunteer restoration efforts. Areas of knotweed, contiguous blackberry, and all work on steep slopes or directly in the wetlands are recommended for initial contractor designated work.

#### **4.1. Overall Priority Restoration Checklist**

The following list is intended to show the overall recommended management priorities across the entire park. Tasks are generally listed in order of decreasing priority although many actions could be undertaken concurrently depending on resource availability and seasonality.

##### **4.1.1. Targeted Restoration priorities:**

- Herbicide treatment and removal of poison hemlock (King County Class B noxious weed control required) in Unit 7. Recommend foliar spray (2% triclopyr) in spring (March-May).
- Herbicide treatment of Bohemian knotweed (King County non-regulated Class B noxious weed) in Units 1, 4, 5, and 7. Recommend foliar spray (2% glyphosate or triclopyr, or 1% imazapyr) in late summer (July-September).
- Herbicide treatment of yellow flag iris (King County non-regulated Class C noxious weed) in Units 3 and 4. Recommend foliar spray in summer (May-June with 1% imazapyr) or fall (September with 1% imazapyr or 5% glyphosate). Manual control could be considered for smaller isolated populations.
- Manual control of bittersweet nightshade (King County weed of concern) in Units 3 and 4 before seed set (before October).
- Manual control of evergreen clematis (King County non-regulated Class C noxious weed) from the northeast corner of Unit 2.
- Manual control of spotted jewelweed to reduce seed production (King County non-regulated Class C noxious weed) from Units 3, 5, and 8 (Volunteer friendly) before seed set (before October).
- Initial sweep for all invasive tree species (English holly, cherry laurel, one-seed hawthorn, European mountain ash, and Portugal laurel – King County weeds of concern) throughout Units 1, 2, 6, and 7. Recommend stem injection with EZ-Ject lance herbicide shells
- Targeted reduction of smaller populations of English ivy and Himalayan blackberry (King County non-regulated Class C noxious weeds) from Units 1, 3, 5, and 6. Focus on isolated patches or areas adjacent to existing restoration. See volunteer recommended areas on Map 3.
- Targeted and phased efforts to reduce larger populations of English ivy and Himalayan blackberry from Units 1, 2, 5, 6, and 7. See contractor recommended areas on Map 3.

- Consider targeted herbicide applications of English ivy in areas of heavy monocultures especially in Unit 6.
- Consider a combination of mechanical and herbicide treatments of contiguous blackberry. Recommend brush cutting blackberry in spring/summer and then targeted herbicide applied to regrowth 4 to 6 weeks following knockdown.
- Manual and chemical control of relatively small population of bamboo, hedge false bindweed, periwinkle, and other non-native invasive plants throughout the park.

## **4.2. Priority Volunteer Restoration**

Overall primary restoration efforts (suitable for volunteers) should focus on the following general themes:

1. Existing site maintenance and restoration efforts within previously cleared areas including targeted invasive species management of priority noxious weeds;
2. Increasing the structural diversity of the forest with park-wide native tree and shrub planting focused on increasing overall conifer canopy in upland areas where appropriate;
3. Incremental reduction of predominant invasive plant species that are currently widespread or occupy large or dense portions of the park (as time and resources become available).

Primary restoration efforts should focus on maintaining existing areas that have previously been cleared of invasive species. It is important to provide continued resources towards supporting these efforts before instigating new projects in unconnected areas of the park. New projects should only be implemented when enough investment (both labor and capital) can be expected to sustain maintenance on both existing and planned efforts.

### **4.2.1. Zone Summaries for Volunteer Stewardship and General Vegetation Management**

The following recommendations are provided as suggested volunteer appropriate restoration objectives for each general ecological system type and Management Unit.

A general approach to stewardship should follow these overarching guidelines:

- Remove isolated or small patches of invasive plants first before initiating removal of large or dense infestations.
- When dealing with larger or dense infestations, consider the following:
  - Work in small, manageable sections and consider the level of follow-up maintenance efforts that will be required for long-term success.
  - Sheet-mulch in upland areas if practical for invasive species suppression and plant hardy trees and shrubs for initial establishment. Sheet mulching with burlap or cardboard and 6-8 inches of woodchip mulch is recommended in relatively small areas of recently cleared or bare ground for weed suppression and moisture retention.
    - Be mindful of spreading mulch on rare or sensitive plants. Make sure to only use clean material free of weeds to avoid introducing additional



invasive species. Hedge-false bindweed and creeping buttercup can quickly establish on newly mulched areas.

- Mulch provides weed suppression, retains moisture, and adds organic content to the soil. However, it also obstructs ground nesting pollinators and can smother herbaceous plants and bryophytes. Either plan to phase out mulching after your plant stock becomes fully established, only mulch in certain areas (e.g. mulch rings around installed plants), or do without. If you do without, more vigilant weeding will be necessary
- Only initiate new clearing if resources are available to maintain existing active restoration sites.
- Consider late summer or early fall for initial clearing activities to plan for favorable fall plant installation timing.
- Plan for infill-planting one to two years after initial planting occurs. Generally plan for an additional 20% of initial planting density.
- Document and report on restoration efforts in order to track progress and coordinate follow-up maintenance activities.
- Consider establishing photo-points in areas where repeat photographs can be taken prior to initial clearing and again once or twice a year for the first 3-5 years during site establishment. This information can be useful in tracking progress and employing adaptive management.
- Target plant species prioritized for removal should include Himalayan blackberry, English ivy, bittersweet nightshade, spotted jewelweed, hedge-false bindweed, and manageable sprouts of all invasive tree species (English holly, cherry laurel, Portugal laurel, English hawthorn, and European mountain-ash). Small or isolated patches of creeping buttercup and herb Robert may also be considered in areas where manual control is feasible.
  - Larger trees (that cannot be removed by manual digging) should be flagged for treatment by a Park's contracted licensed herbicide applicator.
  - Trees can be limbed up to facilitate access but should not be cut which will result in aggressive re-sprouting.

General recommendations for each Management Unit:

**Conifer Mixed Forest - Units 1 & 6:** These Management Units are predominantly upland forested areas with patches of dense Himalayan blackberry and English Ivy. See Map 3 for areas of English ivy that should be targeted for removal. Areas that have seen recent restoration should receive follow-up removal efforts to ensure thorough control.

Short-term management goals for the Conifer Mixed Forest Management Units include:

- Target maintaining and continuing stewardship efforts in existing restoration sites.
- Hand-remove isolated patches of English ivy throughout Units 1 and 6, focusing on volunteer recommended areas (Map 3).
- Consider phased stewardship of areas where initial contractor work (mechanical and/or chemical treatments) could be followed by volunteer stewardship, maintenance, and planting

**Riparian Forest - Units 2, 5 & 7:** These Management Units are comprised of relatively linear habitats along the edges of the park and wetlands. Unit 5 offers the best opportunities for volunteer stewardship (Map 3) while Units 5 and 7 include steep slopes and heavy invasive species cover.

Short-term management goals for the Riparian Forest Management Units include:

- Hand removal of English ivy and Himalayan blackberry from MU 5
- Possibility for manual removal of ivy and blackberry on the “plateau” of MU 7 avoiding steep slope areas (Map 3).
- Efforts to control English ivy and evergreen clematis in MU 2 could be considered, although initial contractor directed work is generally recommended.

**Shrub Swamp and Emergent Marsh - Units 3, 4 & 8:** These areas are primarily wetlands surrounding the stream and open water areas of the park. Because of the saturated soil conditions and dense plant cover, only limited access should be considered and most short term management should focus on areas directly adjacent to the trails. In general, these areas are relatively intact and do not require direct management action at this time.

Short-term management goals for the Shrub Swamp and Emergent Marsh Management Units include:

- Manual removal of small patches of Himalayan Blackberry directly adjacent to the trail (Maps 2 and 3).
- Manual removal of spotted jewelweed along trail corridors. Spotted jewelweed is an herbaceous annual that can be effectively controlled by hand removal before the plant goes to seed.

### **4.3. Contractor Recommended Invasive Species Management**

It is recommended that new clearing efforts focus on expanding and connecting existing active restoration sites. More intensive efforts should only be considered if there are enough resources to actively maintain these areas during the site establishment phase that will require follow-up invasive species control, planting, and ongoing invasive species management for several years. A combination of contracted crew work followed by volunteer planting and maintenance can be an effective approach in accessible areas. Work on steep slopes will require ongoing contractor crew work. High priority noxious weeds should be addressed as an initial priority. Some high priority management considerations involve tasks that are not recommended for volunteer activities. These priorities primarily represent tasks that involve the use of restricted chemical herbicides or include projects occurring in designated wetland areas or steep slopes. Herbicide is only recommended for targeted use on invasive plant species that have been given a legal definition by Washington State and King County Noxious Weed Control Boards or specific weeds that are difficult and costly to control using manual methods.

- High priority noxious weed control with targeted Herbicide applications are recommended for these projects as the most cost effective and efficient treatment option. If use of herbicide is not desired, manual efforts could be employed but will require substantial and sustained efforts over many years.:

- Chemical control of known locations of poison hemlock from MU 7. While only limited instances of this plant were noted, repeat efforts will likely be required to completely eradicate.
  - Chemical control of all known locations of bohemian knotweed from MUs 1, 4, 5, 7 and 8. Priority locations include the area where control efforts have already begun in Units 4 and 5 that extend into the shrub swamp habitat (Maps 2 and 3).
    - The infestations in Unit 7 will require substantial efforts and should overlap with initial blackberry and ivy reduction efforts in this zone.
  - Chemical and manual control of yellow flag iris from Units 3 and 4. While current populations of this species appear to be relatively sparse, this plant can rapidly spread in riparian areas and should be considered a priority for control at this time.
- Long-term invasive species restoration considerations:
    - Control of heavy blackberry in MUs 1 and 6.
    - Control of large infestations of English ivy in MUs 1 and 6. Initial herbicide treatments should be considered, especially for heavy cover in Unit 6.
    - Full park sweep of all invasive tree species. This effort will require follow-up retreatment for several years.
    - Targeted control of evergreen clematis, English ivy and Himalayan blackberry from the northeast corner of MU 2 near the park entrance along 196<sup>th</sup> Street SW.
    - Large-scale reduction of Himalayan blackberry and English ivy from MU 7. Initial efforts should focus on areas adjacent to knotweed control and avoiding steep slopes.
    - Treatment of Himalayan blackberry from Unit 2. Initial efforts should focus on the area in the southwest directly adjacent to shrub swamp habitat (south of the culvert access trail).
    - Targeted treatment of Himalayan blackberry from MU 2 on slopes and adjacent to 196<sup>th</sup> Street SW.
    - Phased control of Himalayan blackberry on steep slopes adjacent to the northeast pond in MU 7. These efforts will require rope work and slope stabilization measures.

## **5. General planting recommendations**

Overall goals should focus on amending and increasing future conifer canopy cover where appropriate. Short term goals should work towards creating a dense native understory that will limit the potential for invasive species re-establishment. Vegetation planting of the upland and riparian forested natural areas on the site should be guided by the following general goals and objectives:

1. Increase evergreen canopy cover (where applicable).
2. Increase structural diversity by creating multiple layers of vegetation using a variety of tree, shrub, and groundcover species.

3. Increase overall native species richness (number of species) of vegetation, especially in upland and riparian areas.
  - Species selection should focus on hardy native plant species that are suited for the particular conditions at each site location (soil moisture, sun exposure, etc.).
  - General spacing guidelines should consider shrubs placed at approximately 4-6 feet on center and trees placed approximately 10-15 feet on center (considering existing plants as appropriate). Herbaceous plants (such as annuals or perennial wildflowers) are not generally recommended until site is well established or in limited areas where regular maintenance is no longer necessary.
  - Any plant species native to the lower Puget Sound ecoregion may be considered for planting, although hardy species well adapted to existing site conditions should be prioritized.
    - Recommended species for generally upland areas (MUs 41, 6, and 7) could include (but should not be limited to): Douglas fir and grand fir (sunny and generally dry areas), western hemlock and western red cedar (shady or moist areas), Sword fern, oso-berry, vine maple, beaked hazelnut, red-flowering current, serviceberry, thimbleberry, snowberry, Cascade Oregon grape, bald-hip rose, evergreen huckleberry, and Pacific ninebark.
    - Wetter site locations could also consider red-twig dogwood, twinberry, willow species, Nootka and cluster rose, red elderberry, salmonberry, Pacific crabapple, black hawthorn, hardhack (*Spirea douglasii*), Labrador-tea, western red cedar, Sitka spruce, or other trees and shrubs adapted to moist conditions.
    - Additional deciduous trees could include Oregon ash, red alder, black cottonwood, bitter cherry, and cascara.
  - When possible, plants should be installed from mid-October through April (prioritize fall planting where possible) to ensure adequate root development and to minimize the need for irrigation or supplemental watering. Planting can occur outside this window in wetter areas of the park.

## **6. Wetland restoration considerations**

Special consideration must be taken when working in and around designated wetlands. In most cases, it is recommended that no stewardship activities take place directly in any of the delineated wetlands found throughout the park. Restoration work taking place in the vicinity of these areas (especially MUs 3, 4, and 8) should take extra precautions to ensure that these sensitive areas are not disturbed. These precautions include (but are not limited to) the following:

- Limit access and restoration to the summer months in order to minimize soil disturbance and damage to sensitive vegetation. It is also advisable to conduct most work after August 1st to minimize disturbance to nesting and breeding birds. Non-nesting season in our region is generally considered to occur from August 1st through January 31st.
- Limit the size of volunteer restoration work parties within wetlands and their buffers. Reducing the number of individuals in sensitive areas at a given time will help limit disturbance.

- Avoid leaving weed fragments or composting invasive plants in or around wetlands as the wet or moist soils may promote re-rooting. Plant material should be removed from the area or placed on cardboard or dry debris piles (avoid letting the plants come in contact with moist soil) and checked throughout the year for growth or re-establishment.
- Planting in wetter areas can often occur in late-spring or summer if the root zone remains moist.

## **7. References**

Rocchio, F.J. and R.C. Crawford. 2015. Ecological Systems of Washington State: A Guide to Identification. Washington State Department of Natural Resources.  
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