

# **Restoring the Duwamish: Healthy Forests, Strong Communities**

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Seattle Parks and Recreation Natural Resources Unit**



# Outcomes of our Work



**Seattle**  
**Parks & Recreation**

healthy people healthy environment strong communities



## HEALTHY ENVIRONMENT

Restoring the natural functions of our forested parklands improves the quality of our environment, providing cleaner air, cooler temperatures, better stormwater retention and filtration, carbon storage, and wildlife habitat.



## HEALTHY PEOPLE

GSP offers an opportunity to experience urban forests through active restoration and creates a deep connection with the natural environment, proven to improve both the mental and physical health of our volunteers and, by association, the communities around GSP sites.



## STRONG COMMUNITIES

Our volunteer program brings diverse communities together around a common goal and values to restore our forested parklands.



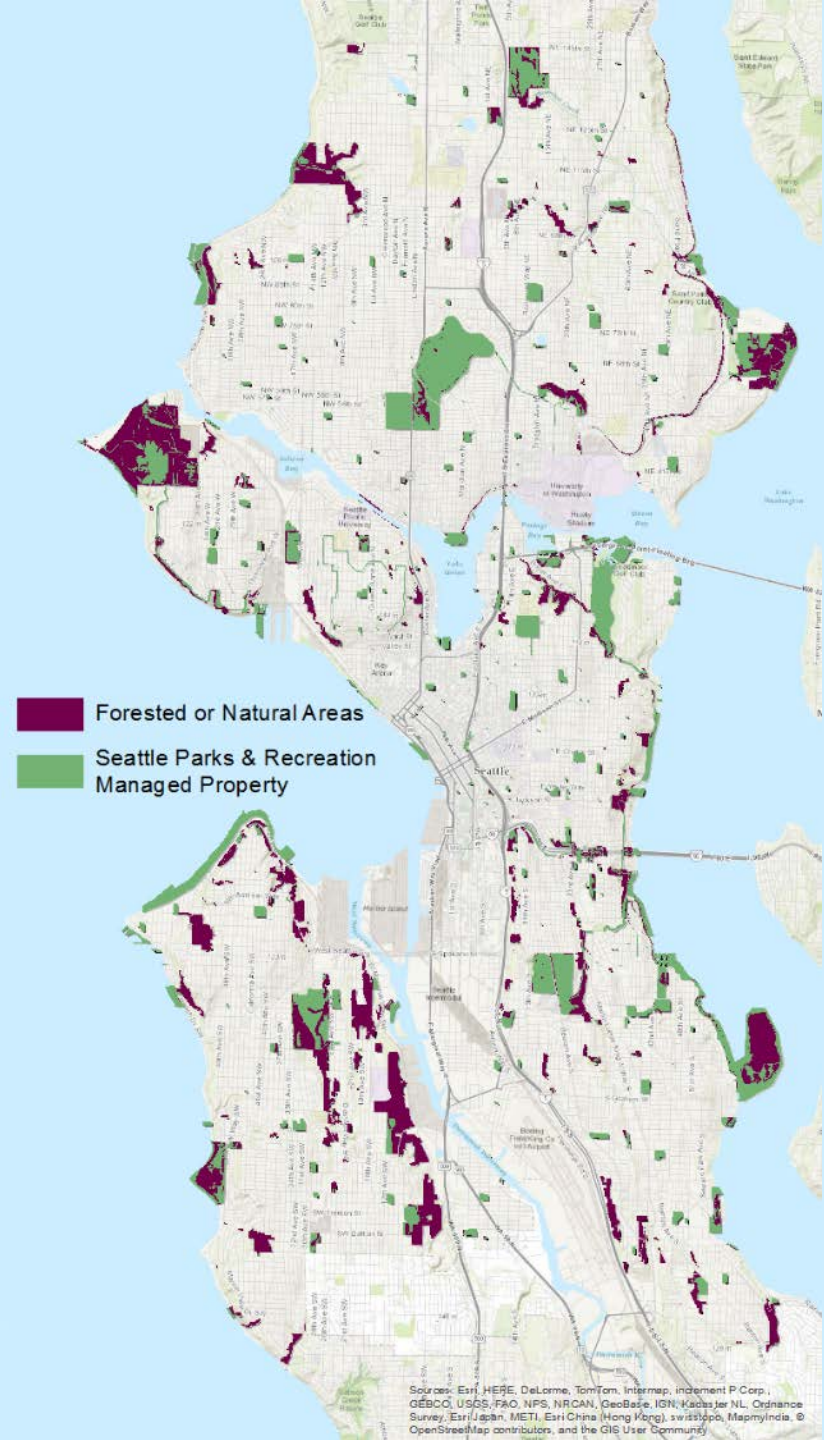
## BEAUTIFUL CITY

Urban forests are a defining element of Seattle, the “Emerald City,” where we celebrate the majestic trees that cover our region, an iconic element of our collective culture and experience.

# 2,500 of 6,410

acres destined for restoration  
(5% of City's land mass)

# GSP is active in 100+ parks

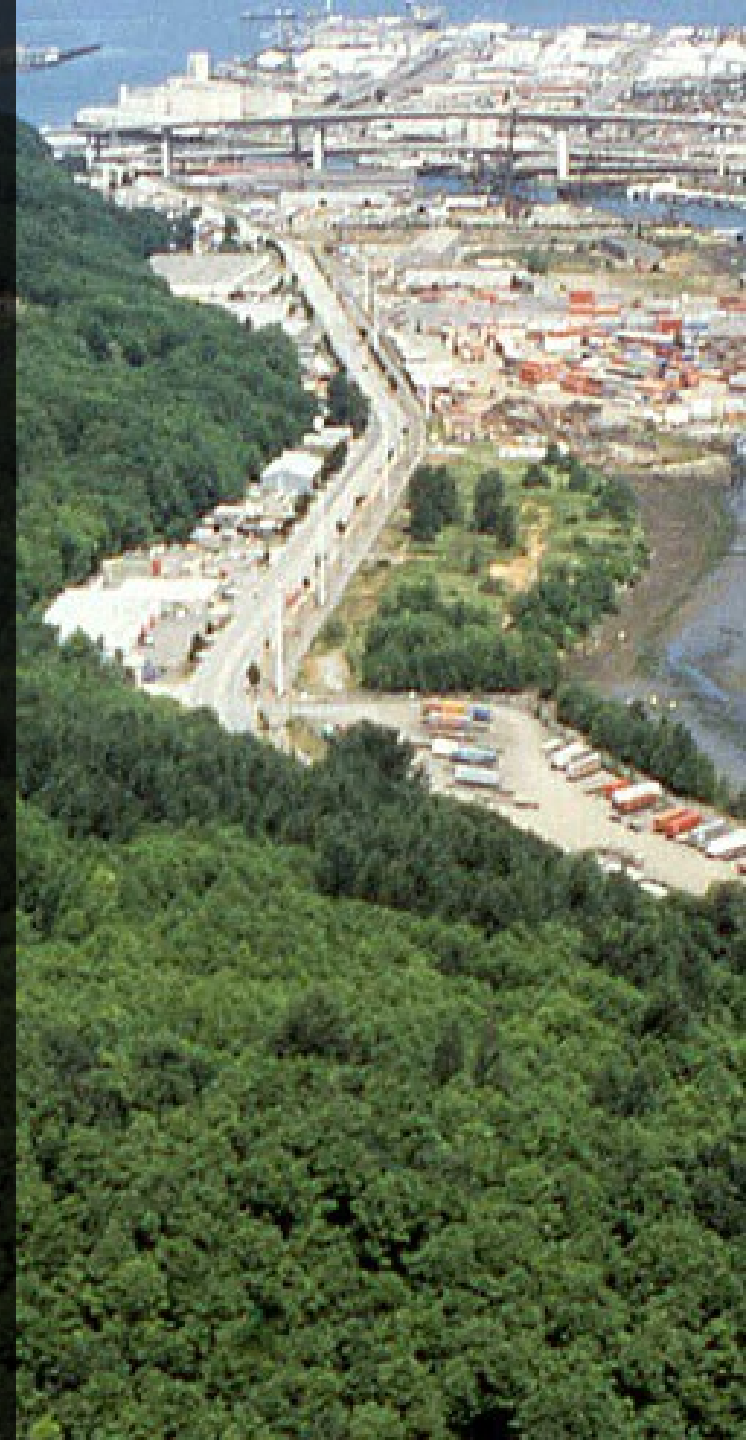


Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, Mapbox India, OpenStreetMap contributors, and the GIS User Community



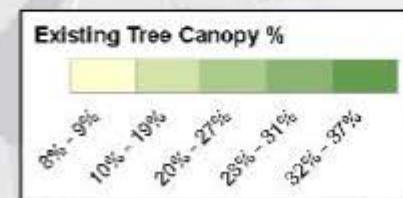
# Duwamish Greenbelts

- Over 800 acres of public land, including the largest remaining contiguous forest within the City
- West Duwamish GS: Four miles long from Pigeon Point to Highland Park

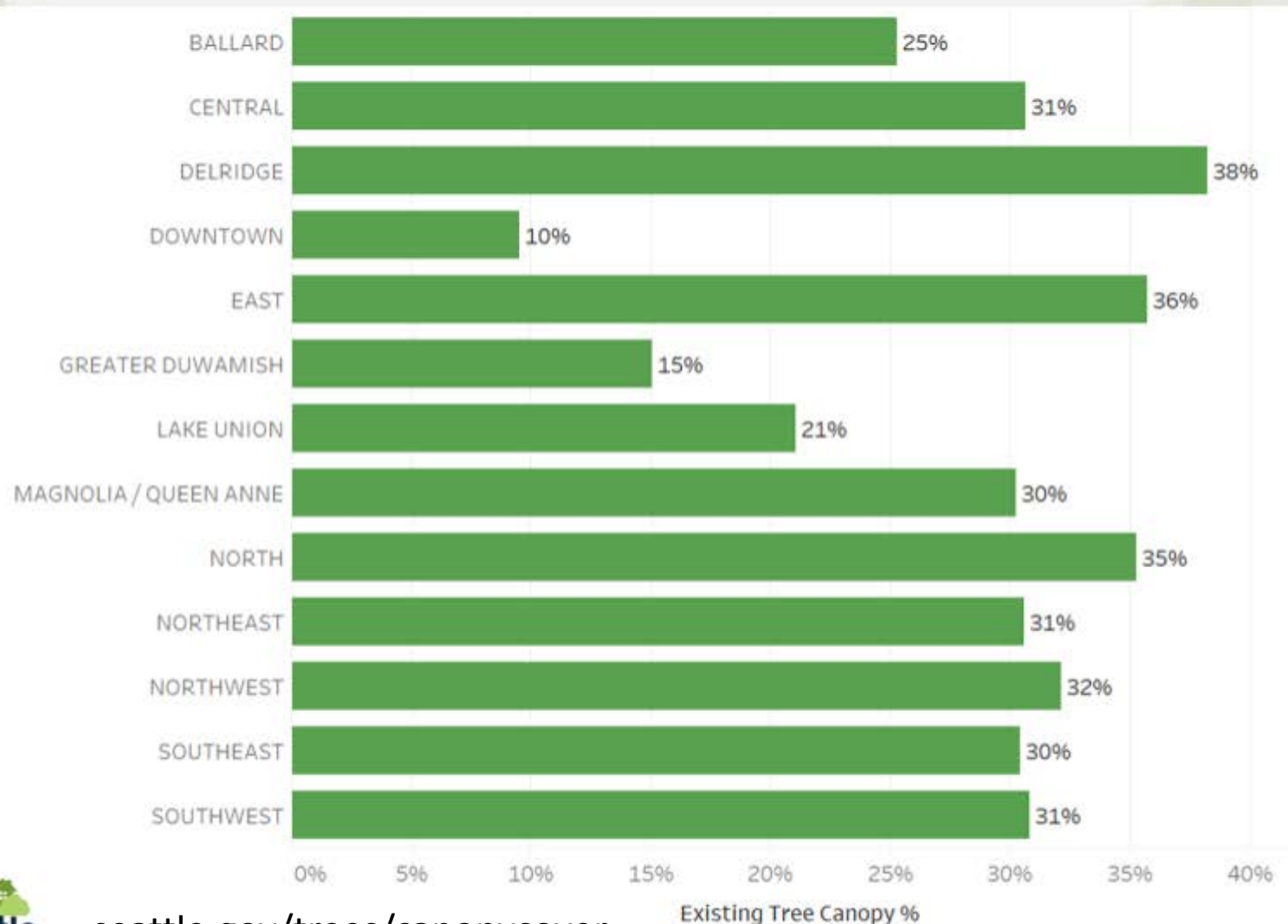




# What's the canopy cover in different areas of Seattle



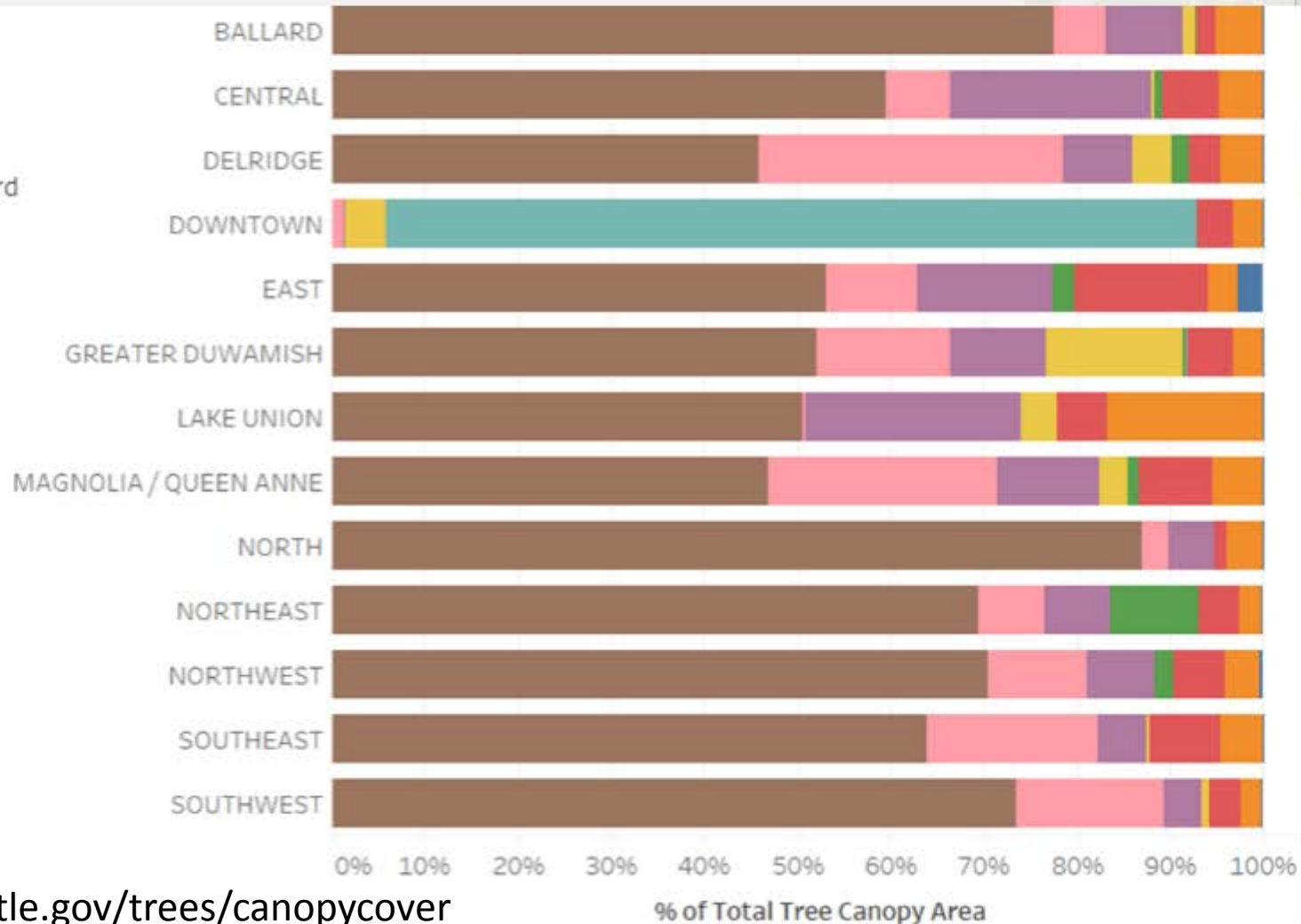
# What's the canopy cover in different areas of Seattle



# What's the canopy cover in different areas of Seattle

## Zoning

- None
- Commercial/Mixed Use
- Developed Park or Boulevard
- Downtown
- Major Institutions
- Manufacturing / Industrial
- Multi-Family
- Parks Natural Area
- Single Family







# W Duwamish: Puget Park







- 
- ✓ Northwest Natural Resource Group
  - ✓ GSP Field Committee
  - ✓ GSP Management Team
  - ✓ Parks Provlew
  - ✓ Nature Consortium (DNDA)
  - ✓ Urban Forestry Commission
  - ✓ South Seattle College
  - ✓ Duwamish Alive!
  - ✓ Duwamish Tribe
  - ✓ West Duwamish Trails
  - ✓ Seattle Audubon
  - ✓ Mountains to Sound Greenway
  - ✓ Seattle Nature Alliance
  - ✓ Plant Amnesty
  - ✓ Community Orchard of WS
  - ✓ Broadview Planning

- ☐ West Seattle Blog
- ☐ Tankwise
- ☐ Lafarge North America
- ☐ Chemithon
- ☐ Alaska Marine Lines
- ☐ Holcim US
- ☐ Sustainable West Seattle
- ☐ Seattle Parks Foundation



# If urban forests are Not Restored



## **PRESENT**

Seattle's forested parklands are dominated by deciduous big-leaf maples and alders nearing the end of their life span. After decades of neglect, non-native invasive plants such as English ivy and Clematis cover the ground and grow up into the tree canopy.

## **IN 20 YEARS**

Invasive plants out-compete and cover existing native vegetation, leaving little light for young plants to establish. English ivy thrives in the tree canopy, making trees top heavy and susceptible to wind. Eventually trees die or fall over.

## **IN 50 YEARS**

The trees are gone. Only a few native shrubs struggle to survive the stress of competing invasive plants.

## **IN 100 YEARS**

The forest is destroyed. Natural native forest regeneration is lost. The landscape is a dense "ivy desert." Few plant species can live. All forest biodiversity is gone. Conditions provide homes for rats and little habitat for more desirable urban wildlife.

# Conifer to deciduous tree ratio

**28%**



**72%**





Maximum height in **~40 years**

High degree of “**plasticity**”

**Seed bearing age: 3-8**

**Distance:**

Several hundred yards

**Germination:**

59 to 84%

**Survival:**

Full sunlight required for normal development

Devine, W. et. al. 2012. *Climate change and forest trees in the Pacific Northwest: a vulnerability assessment and recommended actions for national forests*. Tree species profiles.

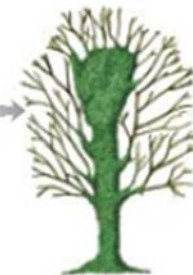




**Healthy Big-Leaf Maple**



**1.** Invasive vines such as English ivy grow up trunks and into the tree canopy.



**2.** Ivy dominates the tree canopy, blocking needed sunlight and creating top heavy conditions.



**3.** The weaker tree die or fall over.







# If urban forests are Restored



## PRESENT

Seattle's forested parklands are dominated by deciduous big-leaf maples and alders, nearing the end of their life. For decades, non-native invasive plants such as English ivy have moved in, weakening the native trees.

## IN 20 YEARS

Through restoration and long term maintenance, non-native plants are removed. Native groundcovers, shrubs, and conifer trees (Douglas fir, Western red cedar, and Western hemlock) are planted.

## IN 50 YEARS

As the evergreen conifers grow, they shade out the sun-loving invasive plants such as blackberry. The native understory thrives.

## IN 100 YEARS

With continued stewardship, the mature forest requires less care. Healthy native forest conditions produce oxygen and diverse habitat for native urban wildlife. Air and water quality improve. Stormwater runoff and erosion are reduced. Communities are more attractive and property values increase.





English holly (*Ilex aquifolium*)







# Preferred Alternative

**Understory Treatment (UT), 30% Thin, Gap Creation/Enhancement:**

**UT + girdle, inject or cut native trees & replant**

GSP will not be pursuing the following alternatives at this time:

- ✓ Understory treatment (UT) only
- ✓ 30% Thin & Understory Treatment
- Commercially thin alder & maple, gap creation/enhancement, understory treatment









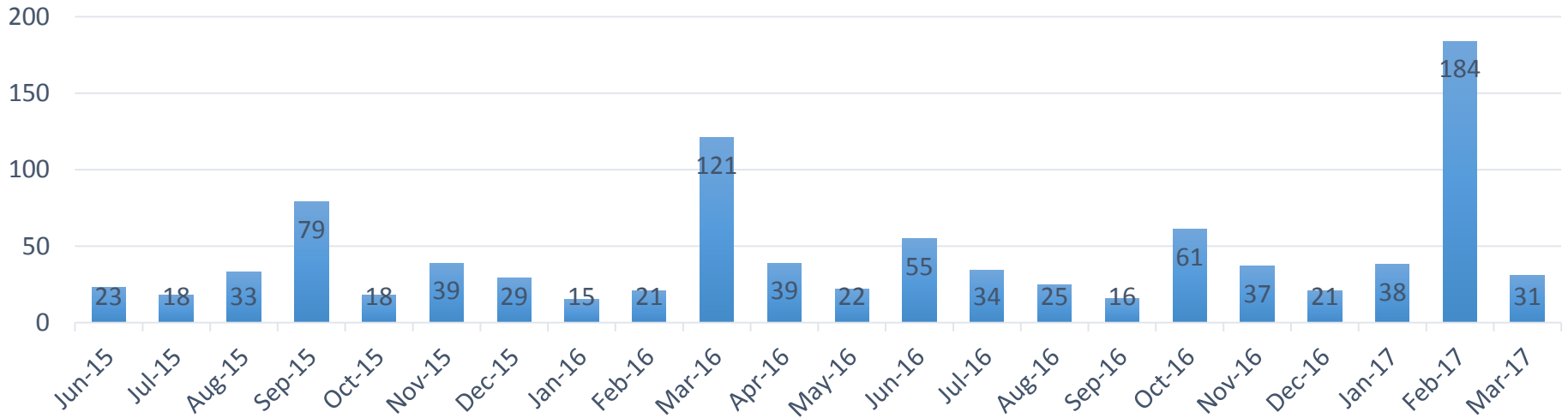
Friends of  
**Cheasty Greenspace**

at Mountain View





# Citywide Tree Failures



## Top 10 failure sites

Seward Park	84
Volunteer Park	62
Burke-Gilman Trail	45
Carkeek Park	37
Green Lake Park	36
Discovery Park	31
Camp Long	29
Ravenna Park	28
Westcrest Park	27
Woodland Park	25

## Top 10 failure species

Bigleaf Maple	203
Red alder	113
Pacific Madrone	60
Douglas Fir	48
Black Cottonwood	48
Willow	31
Deodar	24
Cherry Trees	21
Western Red Cedar	17
Black Locust	16



**Protect public safety** - Greenbelt vegetation will be managed to reduce the risk of hazards from trees.



# Verticillium wilt in Bigleaf Maple (*Acer macrophyllum*) dieback in Western Washington

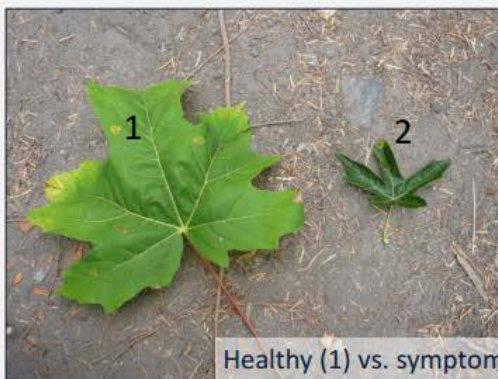
Daniel Omdal and Amy Ramsey-Kroll

daniel.omdal@dnr.wa.gov; amy.kroll@dnr.wa.gov

Washington Department of Natural Resources, Olympia, WA, 98504

## Objectives

- 1) Evaluate the extent of bigleaf maple decline and dieback in western Washington
- 2) Determine if *Verticillium spp.* is the primary causal agent of bigleaf maple dieback
- 3) Identify other abiotic factors associated with dieback and decline



Healthy (1) vs. symptomatic (2) bigleaf maple leaves.



## Results

- All samples were negative for *Verticillium albo-atrum* and *V. dahliae*
- 15% symptomatic trees had signs of other root diseases

Omdal, D and Ramsey-Kroll, A. 2012. *Assessing the role of Verticillium wilt in Bigleaf Maple (Acer macrophyllum) dieback in Western Washington.* US Forest Service/Washington DNR.



**Medium-sized,**  
reaching 200 ft

**Slow grower,** late  
seral

**Seed bearing age:** 20

**Distance:**

Average dispersal  
distance is about 150  
to 200 ft

**Germination:**

50% or less

**Survival:**

40% seedlings die in  
first two years due to  
fungal infection &  
drought



Devine, W. et. al. 2012. *Climate change and forest trees in the Pacific Northwest: a vulnerability assessment and recommended actions for national forests.* Tree species profiles.





West Duwamish GS: Puget Park (Photo courtesy of Northwest Natural Resource Group)









## Puget Park 2017

- restoration history
- treatment 24 acres
- some steep slopes
- soil moisture/quality
- limited recreation
- replanting 40 acres





Maduzia Gap Project

PPGS 03  
PPGS 02

PPGS 03  
PPGS 02

PPGS 04  
PPGS 05

PPGS 04  
PPGS 05

PPGS 07  
PPGS 08

Soundway 03  
Soundway 04  
Soundway 12

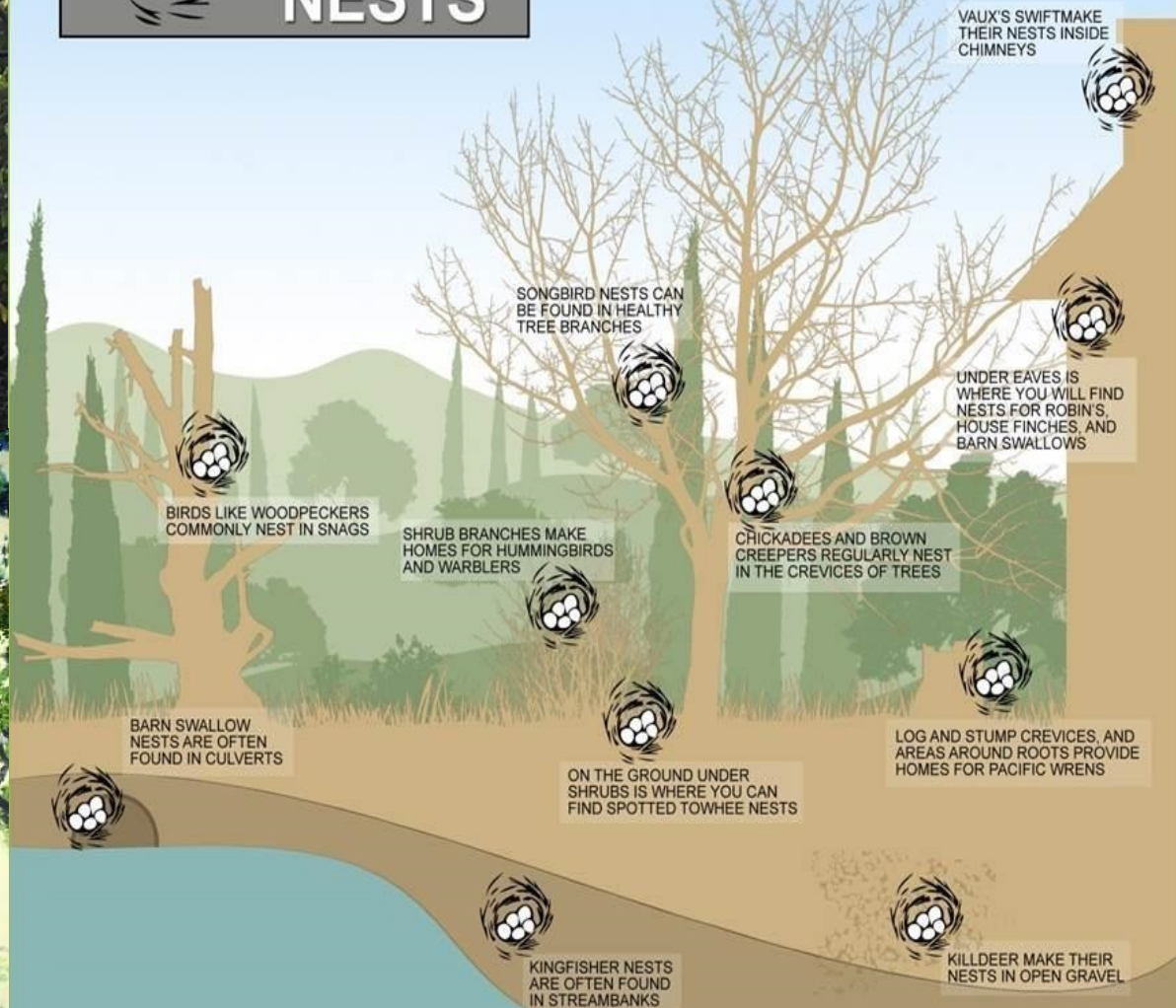
Soundway 09-02  
Soundway 10  
Soundway 16

Soundway 02





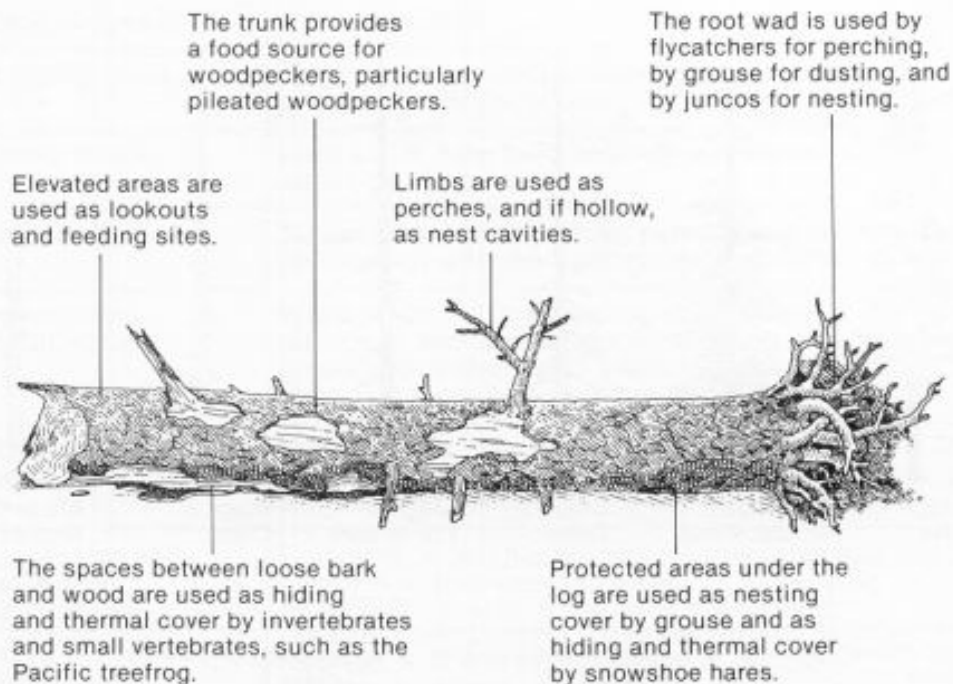

# SEATTLE BIRD NESTS



**Conserve wildlife habitat** – Greenbelt vegetation will be managed to preserve and enhance wildlife habitat



# Within a Forest Stand: Logs as Habitat for Small Mammals



- Protection from physical environment
- Protection from predators
- Food sources
- Lookout structures
- Display structures
- Travel routes





**Maintain buffering and aesthetic value** – Greenbelt vegetation will provide visual screening between land uses and function as an attractive border to the neighborhoods that surround it.

**Mitigate urban pollution**– Greenbelt vegetation will trap air pollutants, provide biofiltration of water, screen excessive noise, and buffer urban microclimates.





**Provide natural drainage** – Greenbelt vegetation will be managed to preserve and increase the land's ability to buffer and direct storm water.



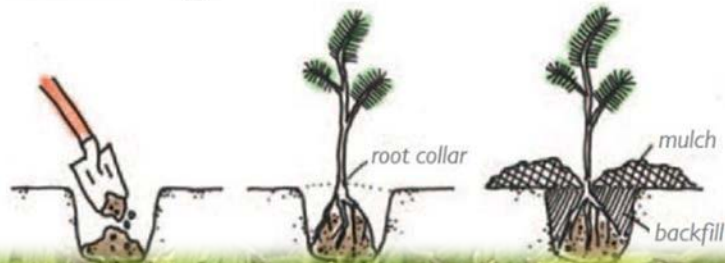


**Protect soil and water quality** – Greenbelt vegetation will be managed to preserve riparian corridors and hillsides by preventing erosion and maintaining vegetative cover.

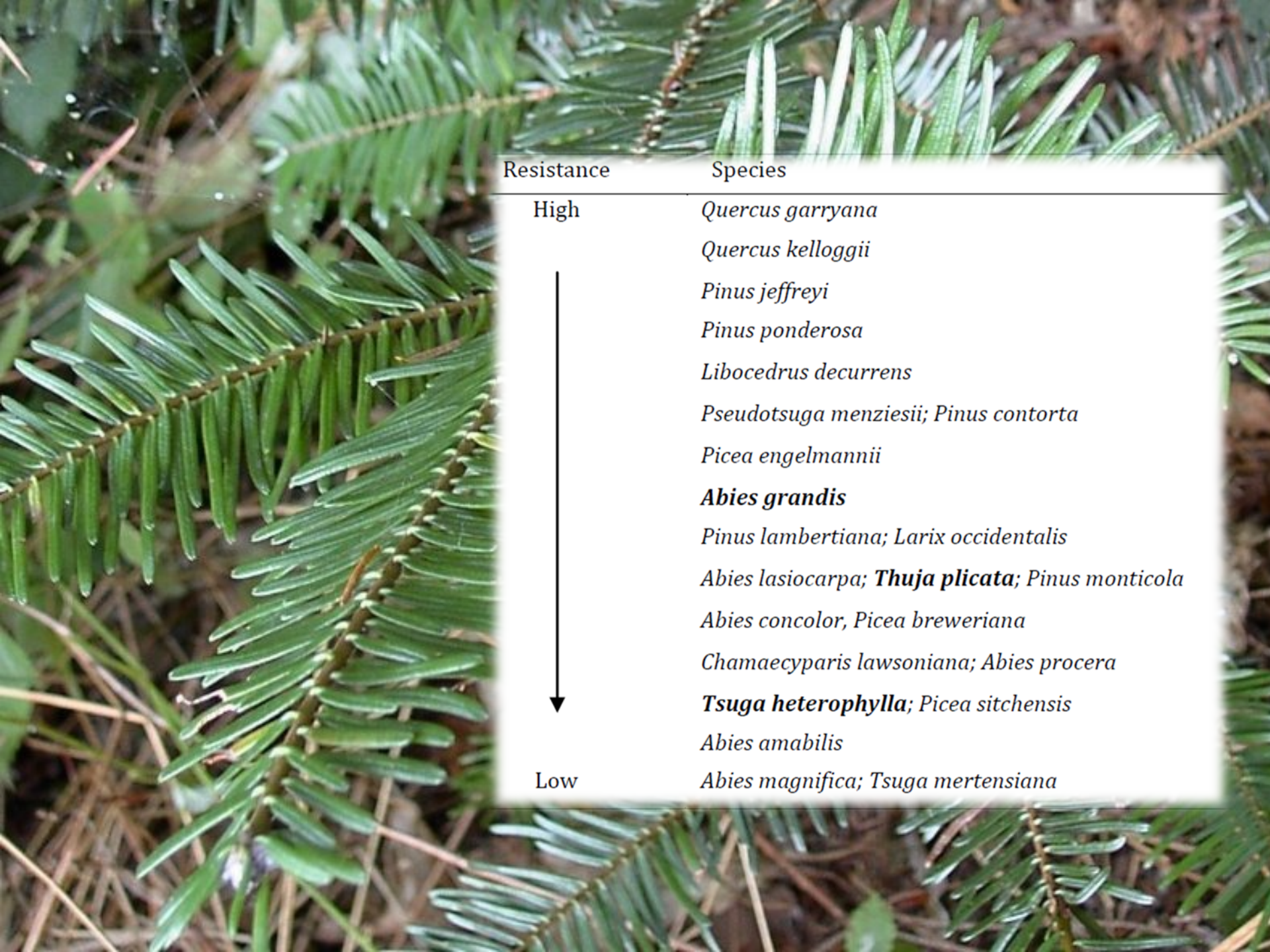


# Replanting

For Bareroot Plants and Plugs







Resistance

Species

High

*Quercus garryana*

*Quercus kelloggii*

*Pinus jeffreyi*

*Pinus ponderosa*

*Libocedrus decurrens*

*Pseudotsuga menziesii*; *Pinus contorta*

*Picea engelmannii*

***Abies grandis***

*Pinus lambertiana*; *Larix occidentalis*

*Abies lasiocarpa*; ***Thuja plicata***; *Pinus monticola*

*Abies concolor*, *Picea breweriana*

*Chamaecyparis lawsoniana*; *Abies procera*

***Tsuga heterophylla***; *Picea sitchensis*

*Abies amabilis*

Low

*Abies magnifica*; *Tsuga mertensiana*









Image from Van Pelt, R. 2007. Identifying Mature and Old Forests in Western Washington.



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Join us July 8<sup>th</sup> Chan  
Center @ South  
Seattle College

