Inventory 2016: Findings, Analysis, and Recommendations

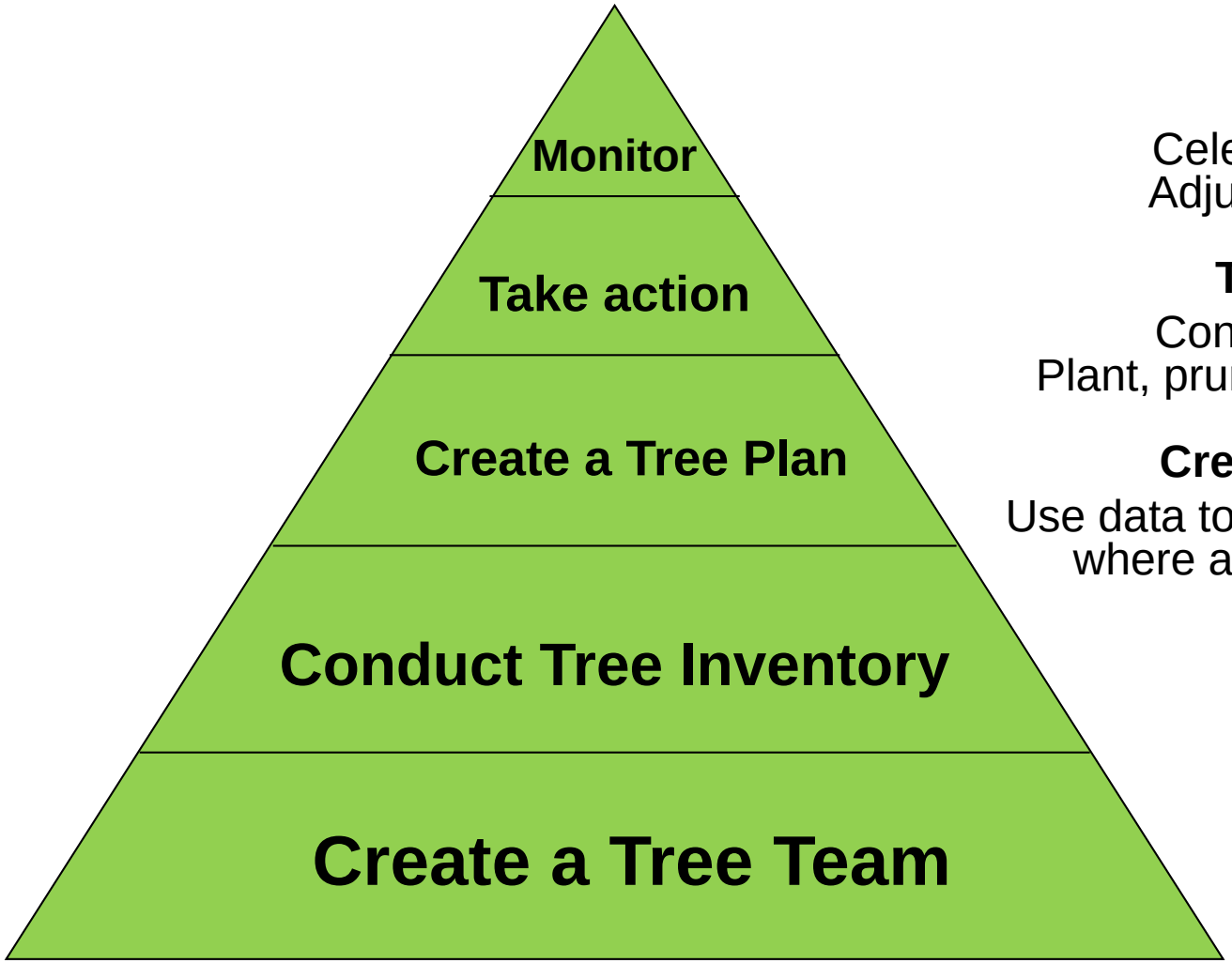
Alameda, Beaumont-Wilshire, Brentwood-Darlington, Creston-Kenilworth, Grant Park, Hillsdale, Hollywood, Humboldt, Lents, Rose City Park, Wilkes

www.portlandoregon.gov/parks/treeinventory

Agenda

9:00am – 9:10am	Welcome *Jenn Cairo, Portland City Forester*
9:10am – 10:30am	Inventory 2016: Findings, Analysis, and Recommendations *Jim Gersbach, Lily Glaeser, and Jeff Ramsey, PP&R UF*
10:30am – 10:45am	**Break**
10:45am – 11:00am	Exciting Finds *Kat Davidson, PP&R UF*
11:00am – 11:15am	Leave a Legacy: Large Trees *Julie Fukuda, PP&R UF*
11:20am – 11:35am	Canopy Analytics – An Interactive Resource for Tree Discovery in Portland *Jackson Voekel, Geospatial Research Analyst, Portland State University*
11:35am – 11:50am	A People's History of Portland's Urban Forest *David-Paul Hedberg, PP&R UF*
11:50am – 12:05pm	Life After Inventory: Where Do We Go From Here? *Angie DiSalvo, PP&R UF*
12:05pm – 12:15pm	Closing comments
12:15pm – 1:00pm	**Lunch**
1:00pm – 1:10pm	Next Steps: Tree Teams, Tree Plans, Workshops *Nik Desai, PP&R UF*
1:10pm – 2:00pm	Inventory Findings Discussion in neighborhood groups
2:00pm – 2:15 pm	Workshop Menu *Mason Wordell, PP&R UF AmeriCorps member*
2:15pm – 2:30 pm	**Break**
2:30pm – 3:30 pm	Tree Plan Drafting Workshop Menu review in neighborhood groups

Neighborhood inventories and tree plans



Monitor

Celebrate success
Adjust plan as needed

Take action

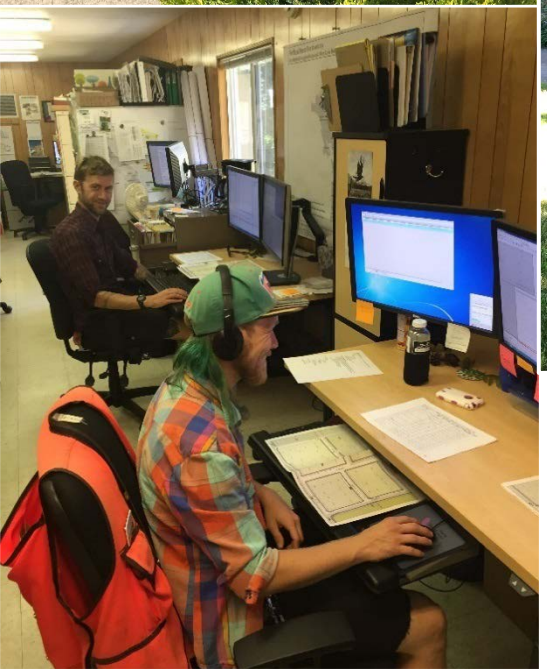
Conduct activities!
Plant, prune, remove, educate

Create a Tree Plan

Use data to create goals and direct where action needs to occur

Why inventory street trees?

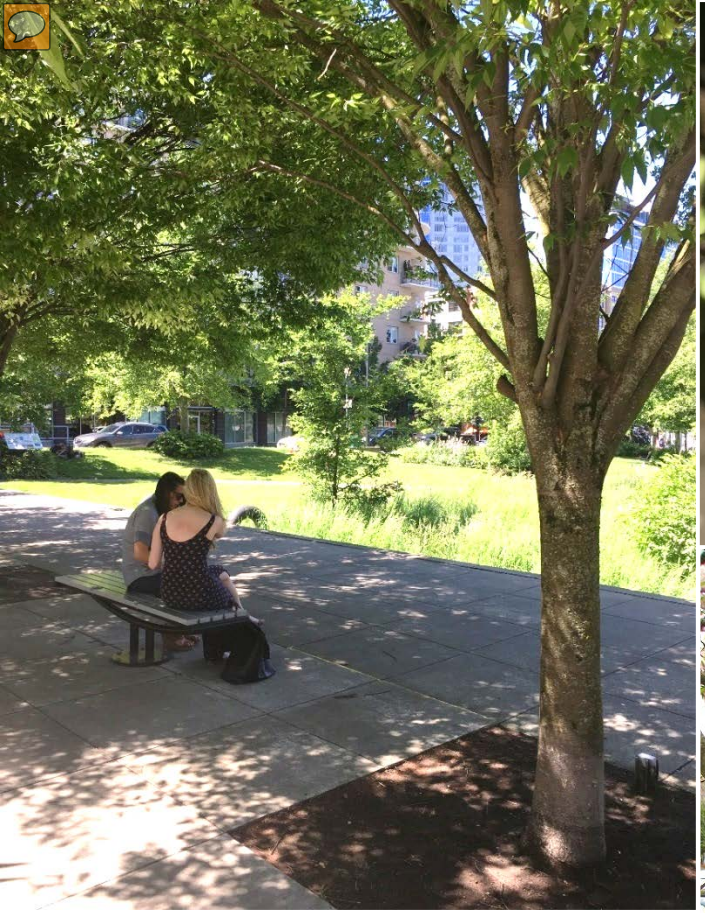
- Helps UF better manage a vital community asset
- Better target resources
- Better identify needs



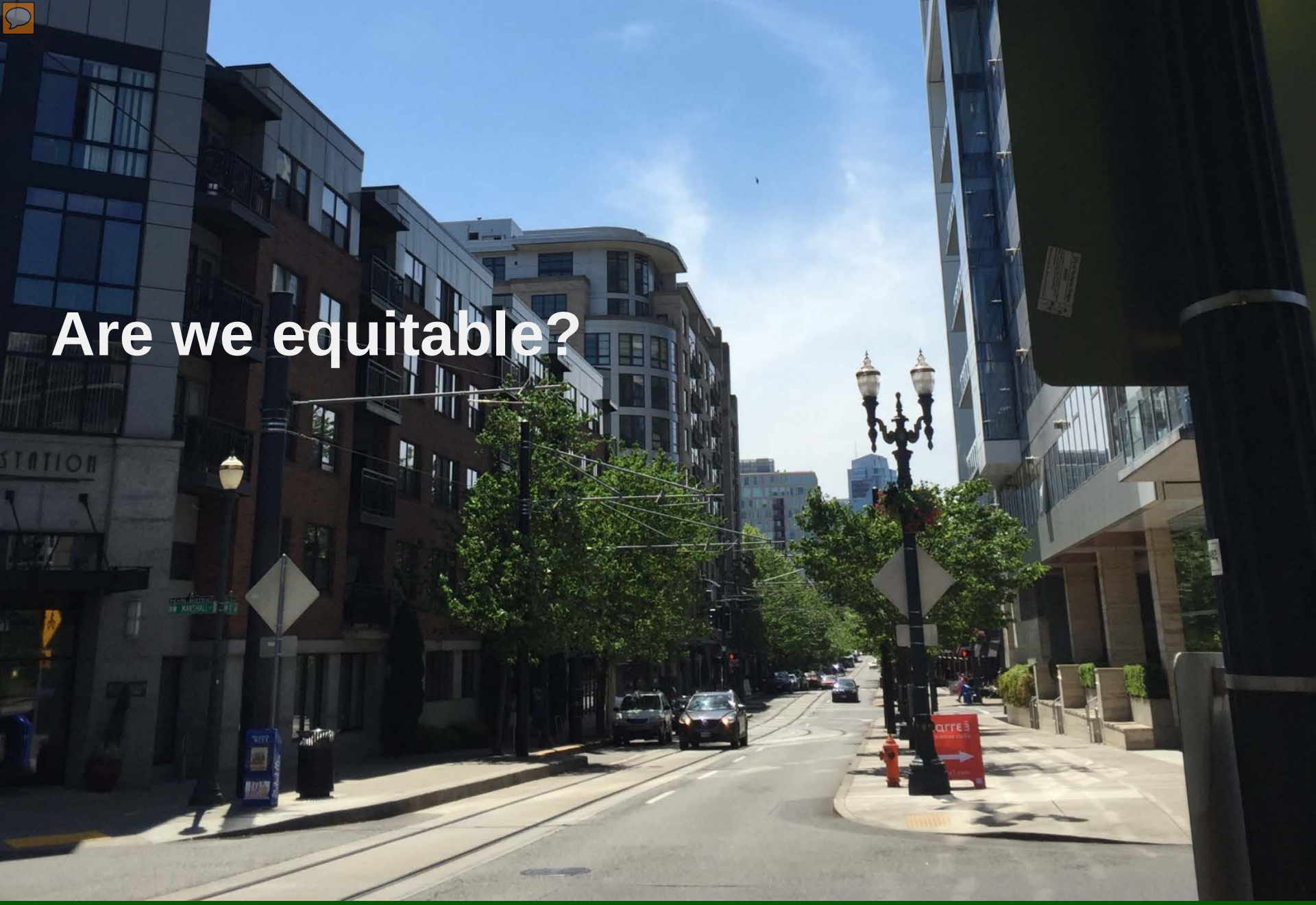
More than **1,300 volunteers**

About **17,000 hours** volunteered

Data entry on **218,610 trees**




PORTLAND
STREETCAR

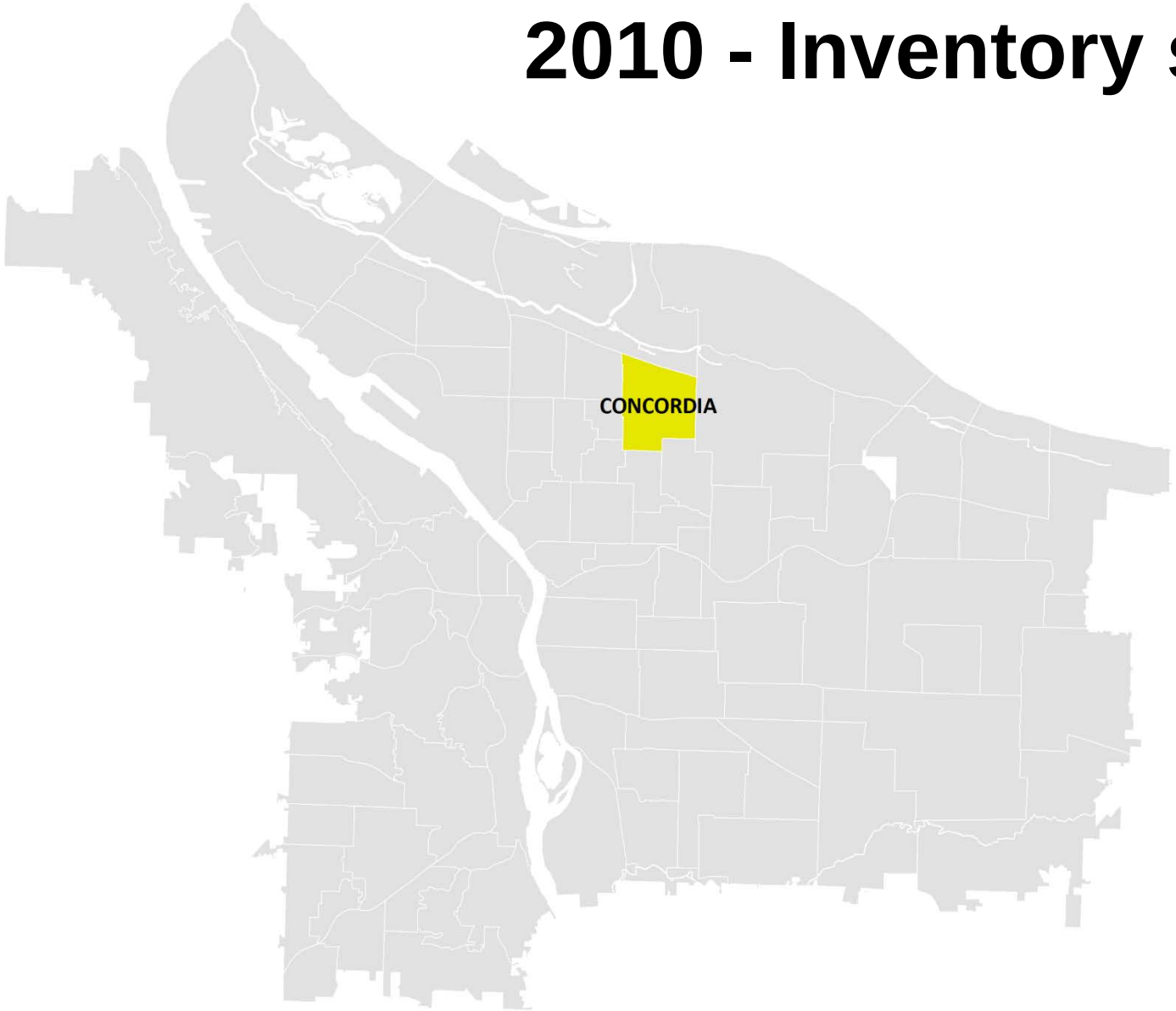


Are we equitable?

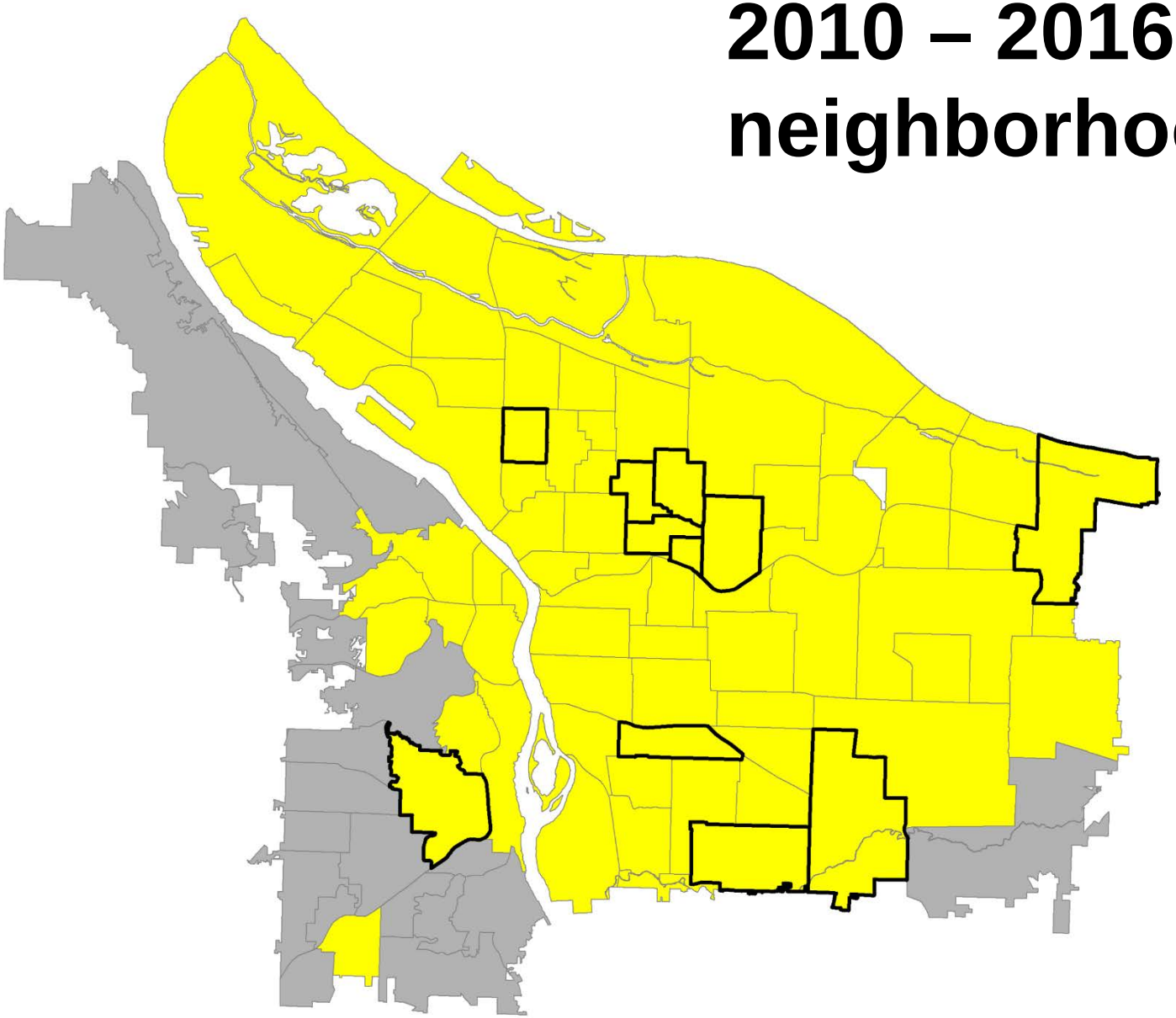
Are we resilient?

Are we maximizing our urban forest's potential?

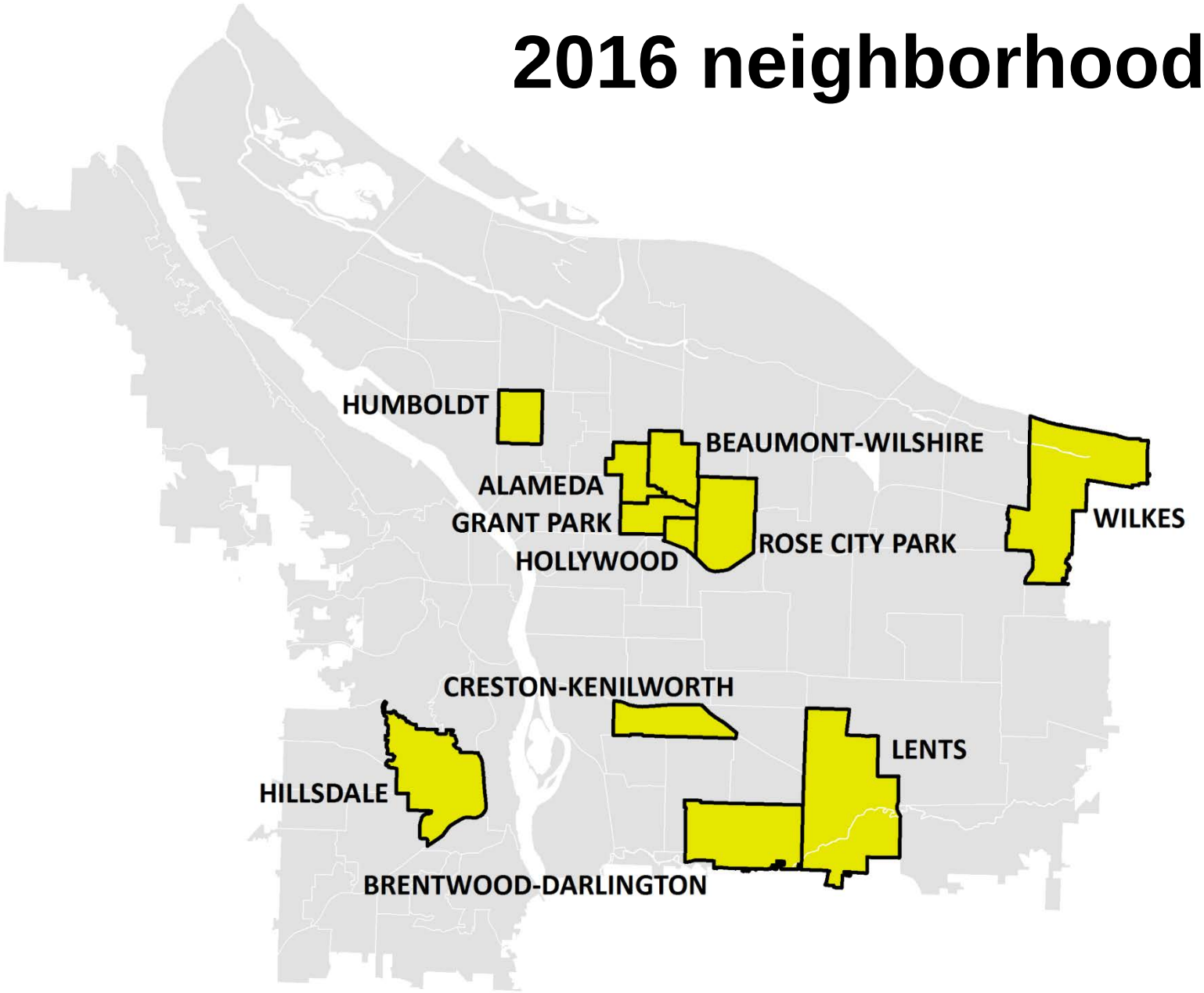
2010 - Inventory starts



2010 – 2016 neighborhoods

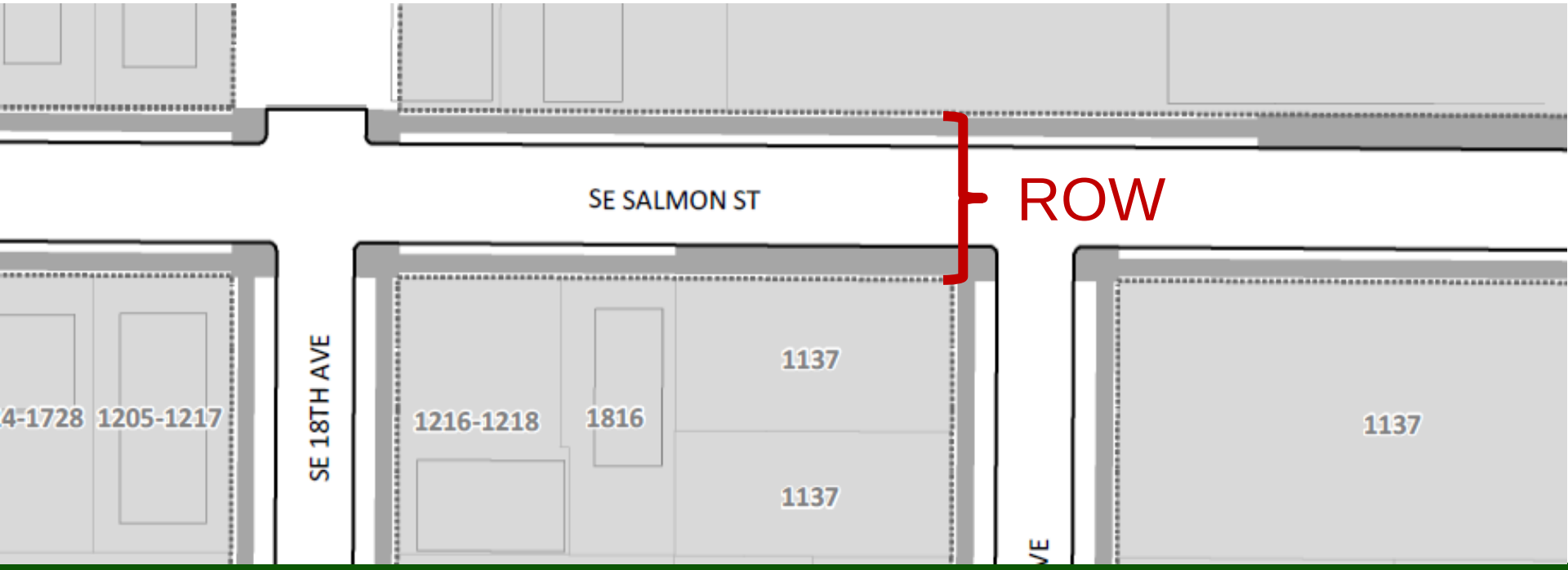


2016 neighborhoods



What is a street tree?

A tree growing in the right-of-way between street and adjacent tax lot



Excluded

- Shrubs
- Dwarf forms
- Hedges
- Self-sown saplings under 6’


Hillsdale

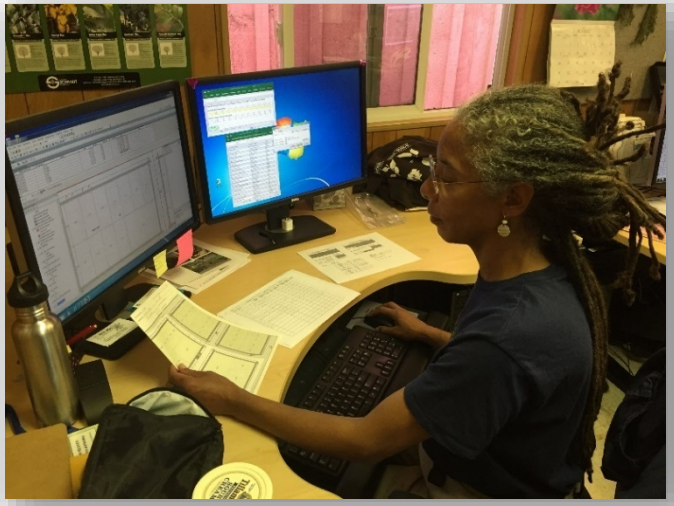
Data collected

- About the tree
  - species/type
  - size (DBH)
  - condition rating
- Environment
  - location
  - planting site type
  - planting site width
  - presence of high voltage wires
- Stocking data from Bureau of Environmental Services

Data accuracy >95%

- Training and access to expert arborist to aid in tree ID and condition rating
- Pairing novices with experienced volunteers
- Every section spotchecked for accuracy

Beaumont-Wilshire

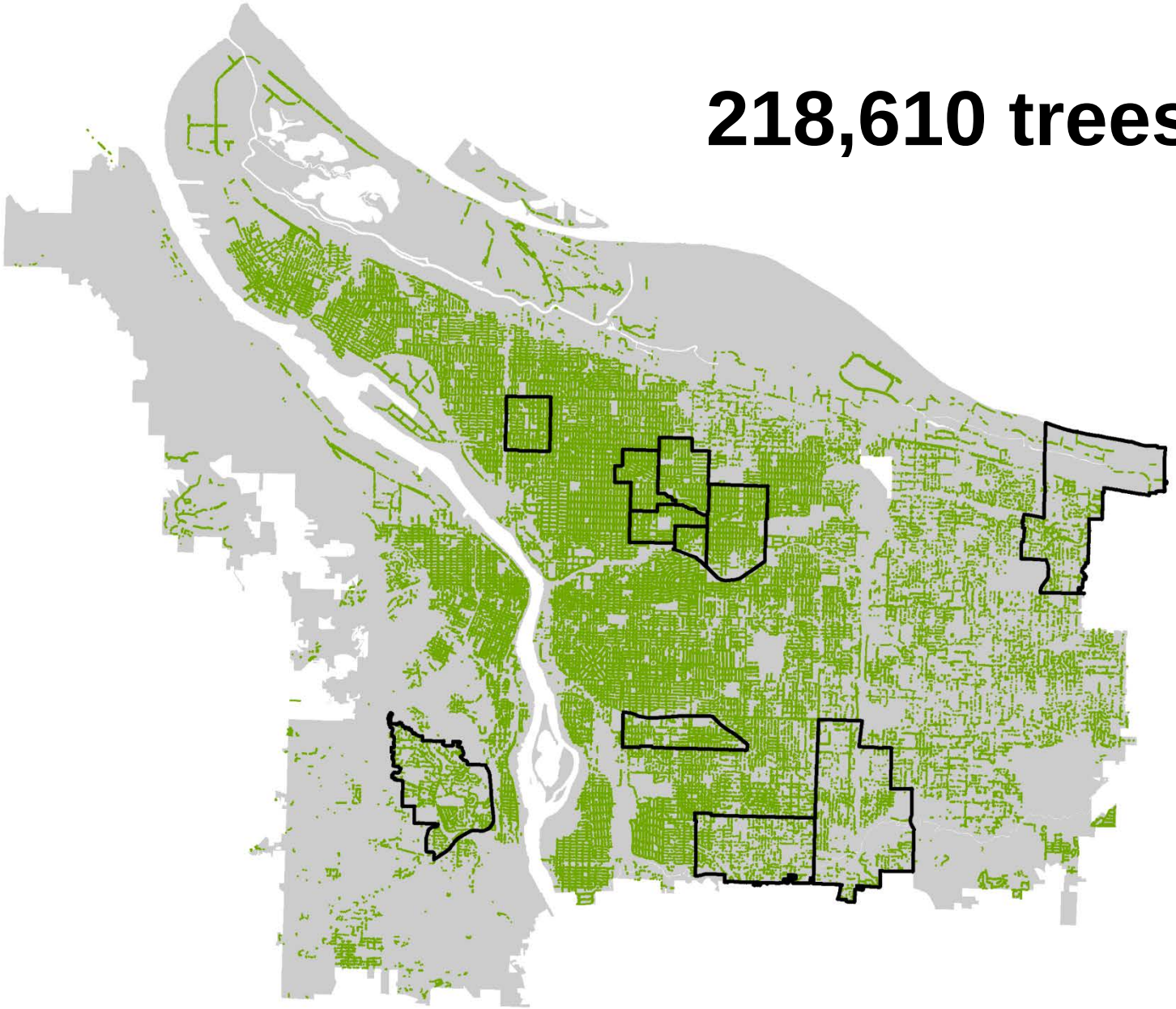


What did we find?

Citywide findings

- Equitable
  - Site types, sizes, and distribution
  - Stocking level
- Resilience
  - Functional types
  - Most common trees
  - Recent trends
- Potential
  - Condition
  - Size class distribution
  - Mature tree size

218,610 trees!

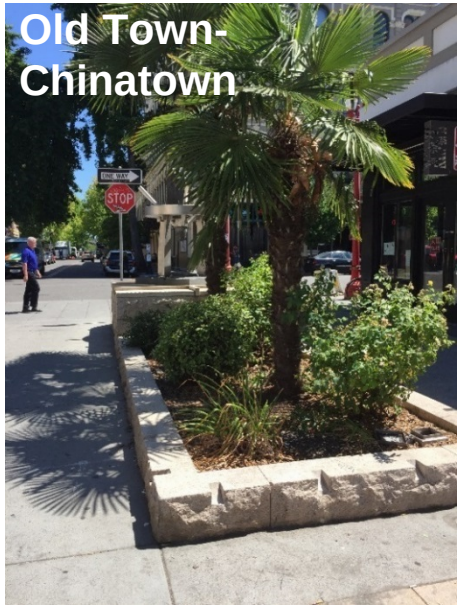


Planting site type

improved right-of-way

unimproved right-of-way

strip



cutout

median

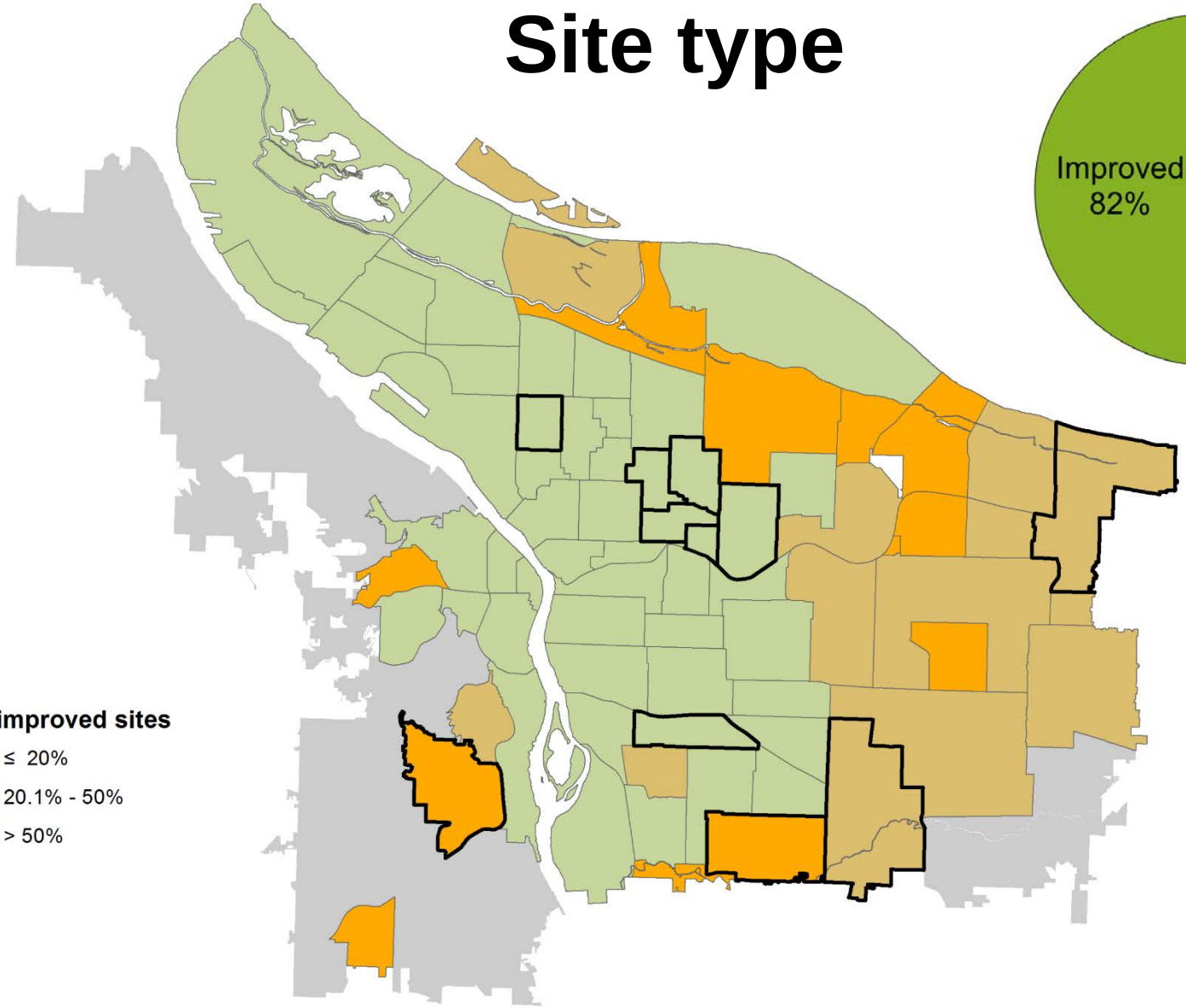
swale

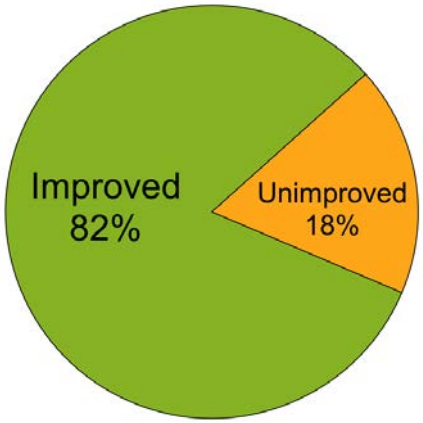
curbtight

curb only

no curb, no sidewalk

Site type





Planting site sizes

Small

- improved sites 2.5-3.9’ wide with or without HV wires

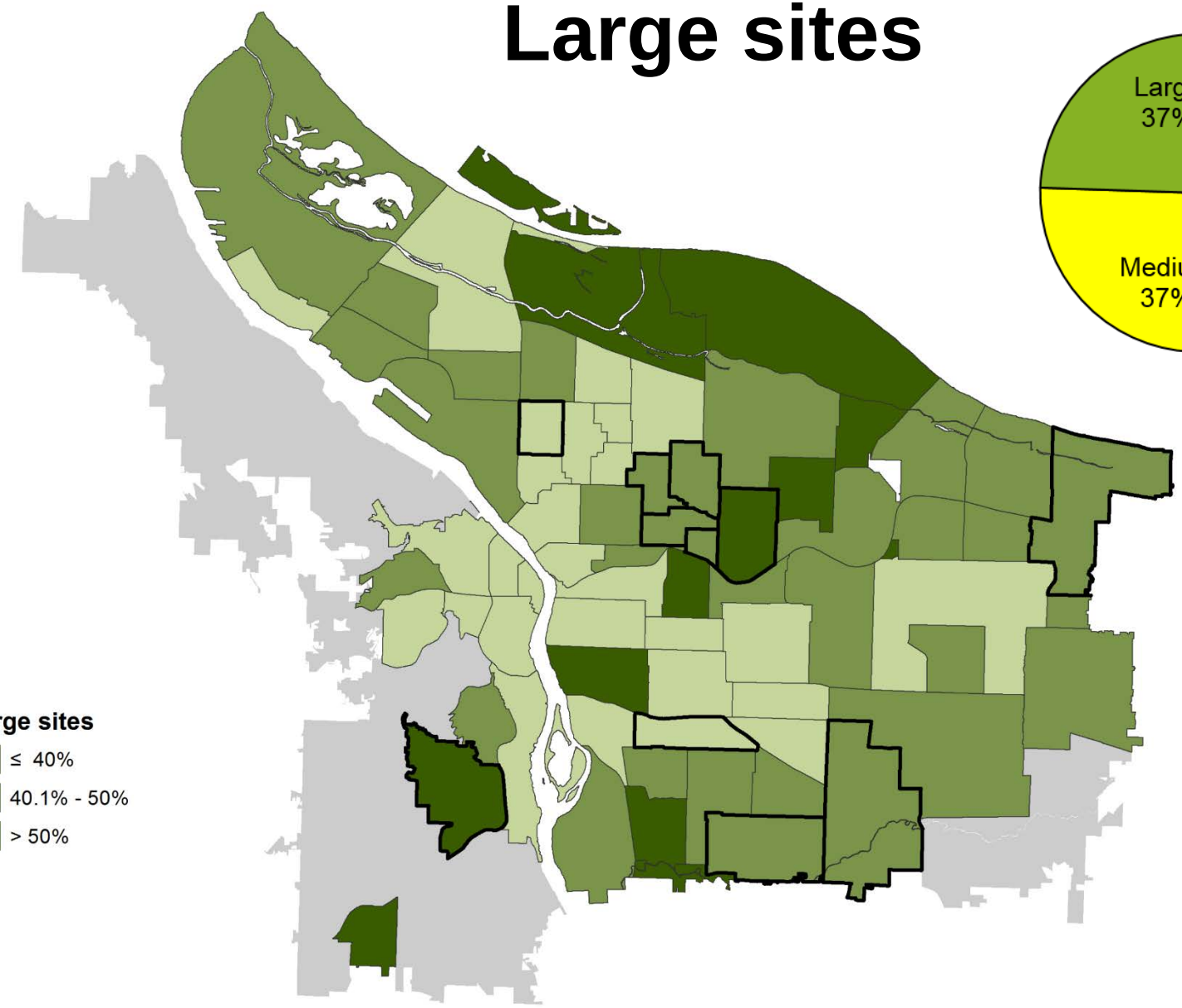
Medium

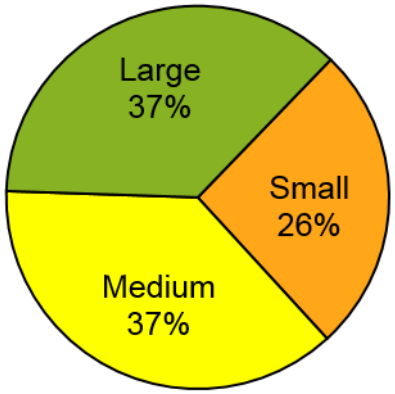
- all sites 4.0-5.9’ wide with or without HV wires
- all sites ≥ 6.0’ with wires

Large

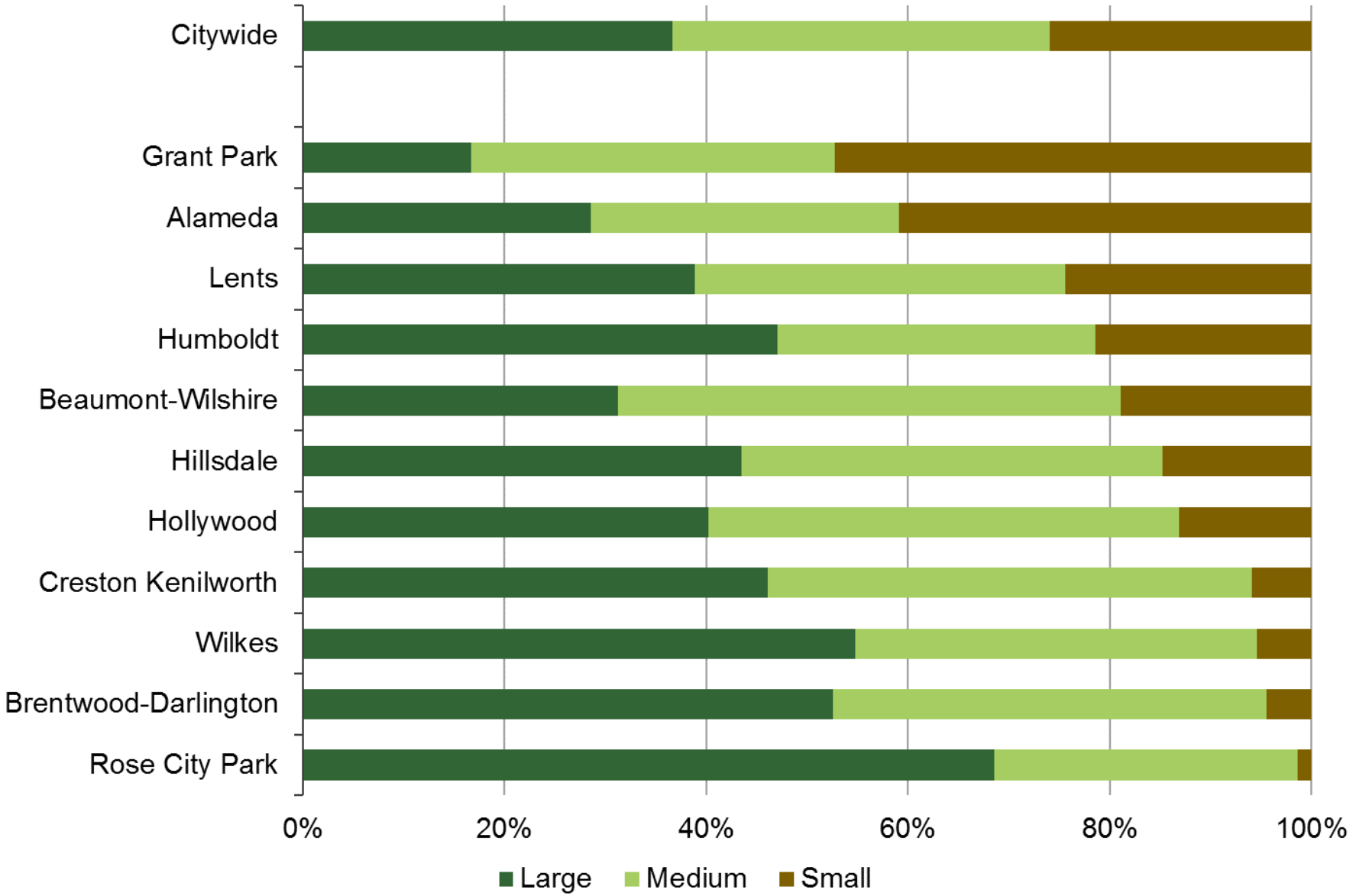
- all sites ≥ 6.0’ wide without HV wires

Large sites





Distribution of site sizes

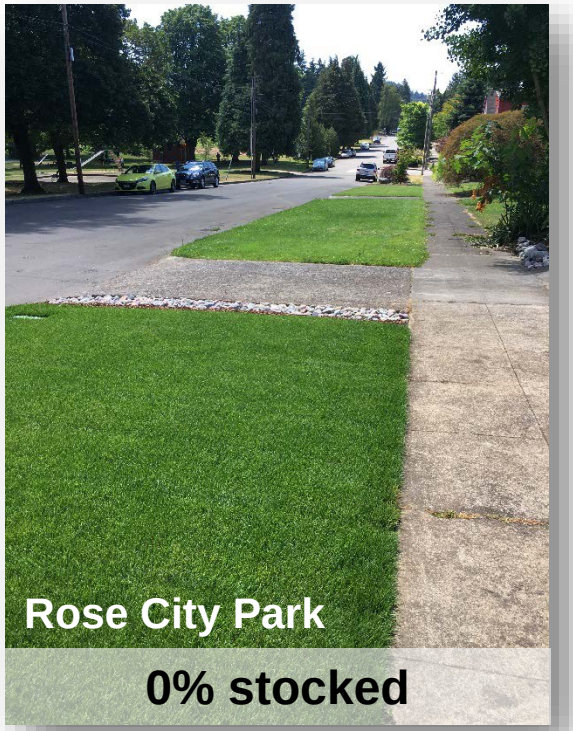


Humboldt

Size of site = size of tree

Stocking level

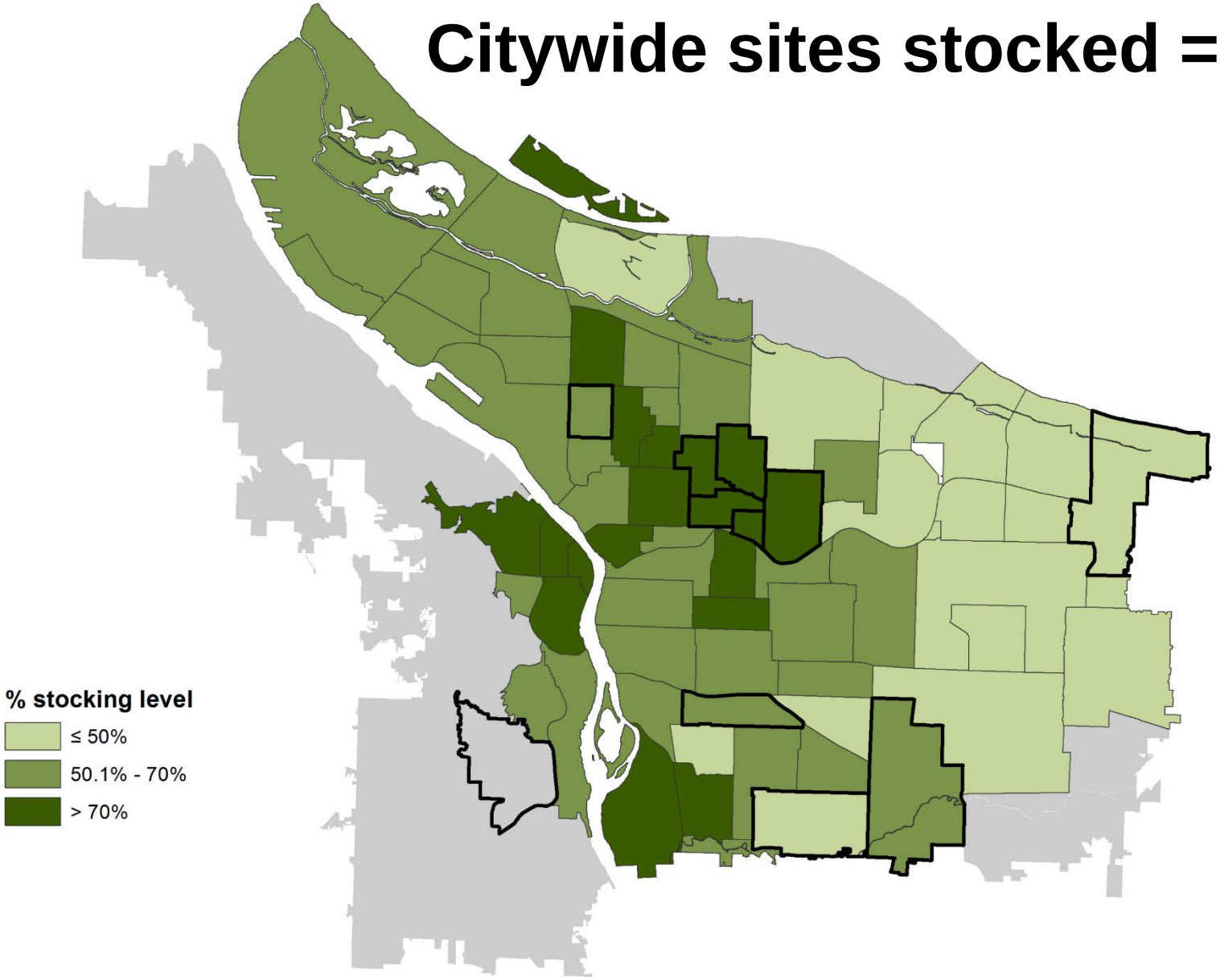
$$\frac{\text{\# of planted sites}}{\text{\# of total sites (planted \& available)}} = \text{stocking level}$$



0% stocked

100% stocked

Citywide sites stocked = 60%



Improved sites

What size site has the most empty spaces?

Small

Medium

Large

Improved sites

What size site has the most empty spaces?

Small
40%

Medium
36%

Large
29%

Grant Park

Small empty sites: 293
Large empty sites: 149

Enough about sites…what about the trees?

Functional types

	Broadleaf	Conifer
Deciduous	 Persian ironwood	 dawn redwood
Evergreen	 evergreen oak	 incense cedar

Deciduous conifers: < 0.1%

Deciduous conifers: < 0.1%

Broadleaf evergreens: 1%

Deciduous conifers: < 0.1%

Broadleaf evergreens: 1%

Evergreen conifers: 7%

Broadleaf deciduous: 92%

Species diversity for Portland

5-10-20 guideline

- No species > 5%
- No genus > 10%
- No family > 20%

Meeting the guidelines

Diospyros kaki
Ebenaceae

Ten most common tree types

Tree type	% of tree population N = 218,6100
Norway maple	**9%**
red maple	**7%**
cherry	**6%**
pear	**5%**
plum	**5%**
maple, other	**5%**
ash	4%
dogwood	4%
oak, deciduous	3%
crabapple	3%

Norway maple
Acer platanoides

Ten most common tree types

Tree type	% of tree population N = 218,610
Norway maple	**9%**
red maple	**7%**
cherry	**6%**
pear	**5%**
plum	**5%**
maple, other	**5%**
ash	4%
dogwood	4%
oak, deciduous	3%
crabapple	3%

Red maple
Acer rubrum

Ten most common tree types

Tree type	% of tree population N = 218,610
Norway maple	**9%**
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cherry	**6%**
pear	**5%**
plum	**5%**
maple, other	**5%**
ash	4%
dogwood	4%
oak, deciduous	3%
crabapple	3%

Cherry
Prunus spp.

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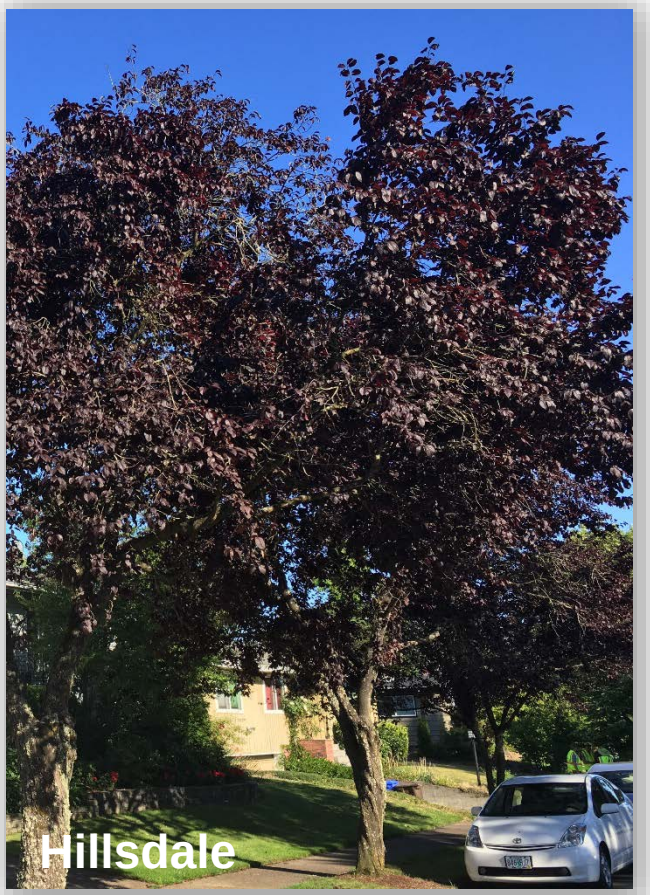
cherry	**6%**
pear	**5%**
plum	**5%**
maple, other	**5%**
ash	4%
dogwood	4%
oak, deciduous	3%
crabapple	3%

Pear
Pyrus spp.

Ten most common tree types

Tree type	% of tree population N = 218,607
Norway maple	**9%**
red maple	**7%**
cherry	**6%**
pear	**5%**
plum	**5%**
maple, other	**5%**
ash	4%
dogwood	4%
oak, deciduous	3%
crabapple	3%

Plum
Prunus spp.



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plum	**5%**
maple, other	**5%**
ash	4%
dogwood	4%
oak, deciduous	3%
crabapple	3%

Other maple
Acer spp.

Ten most common tree types

Tree type	% of tree population N = 218,610
Norway maple	**9%**
red maple	**7%**
cherry	**6%**
pear	**5%**
plum	**5%**
maple, other	**5%**
ash	4%
dogwood	4%
oak, deciduous	3%
crabapple	3%

Ash
Fraxinus spp.

Ten most common tree types

Tree type	% of tree population N = 218,610
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red maple	**7%**
cherry	**6%**
pear	**5%**
plum	**5%**
maple, other	**5%**
ash	4%
dogwood	4%
oak, deciduous	3%
crabapple	3%

Dogwood
Cornus spp.

Ten most common tree types

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Norway maple	**9%**
red maple	**7%**
cherry	**6%**
pear	**5%**
plum	**5%**
maple, other	**5%**
ash	4%
dogwood	4%
oak, deciduous	3%
crabapple	3%

Deciduous oak
Quercus spp.

Ten most common tree types

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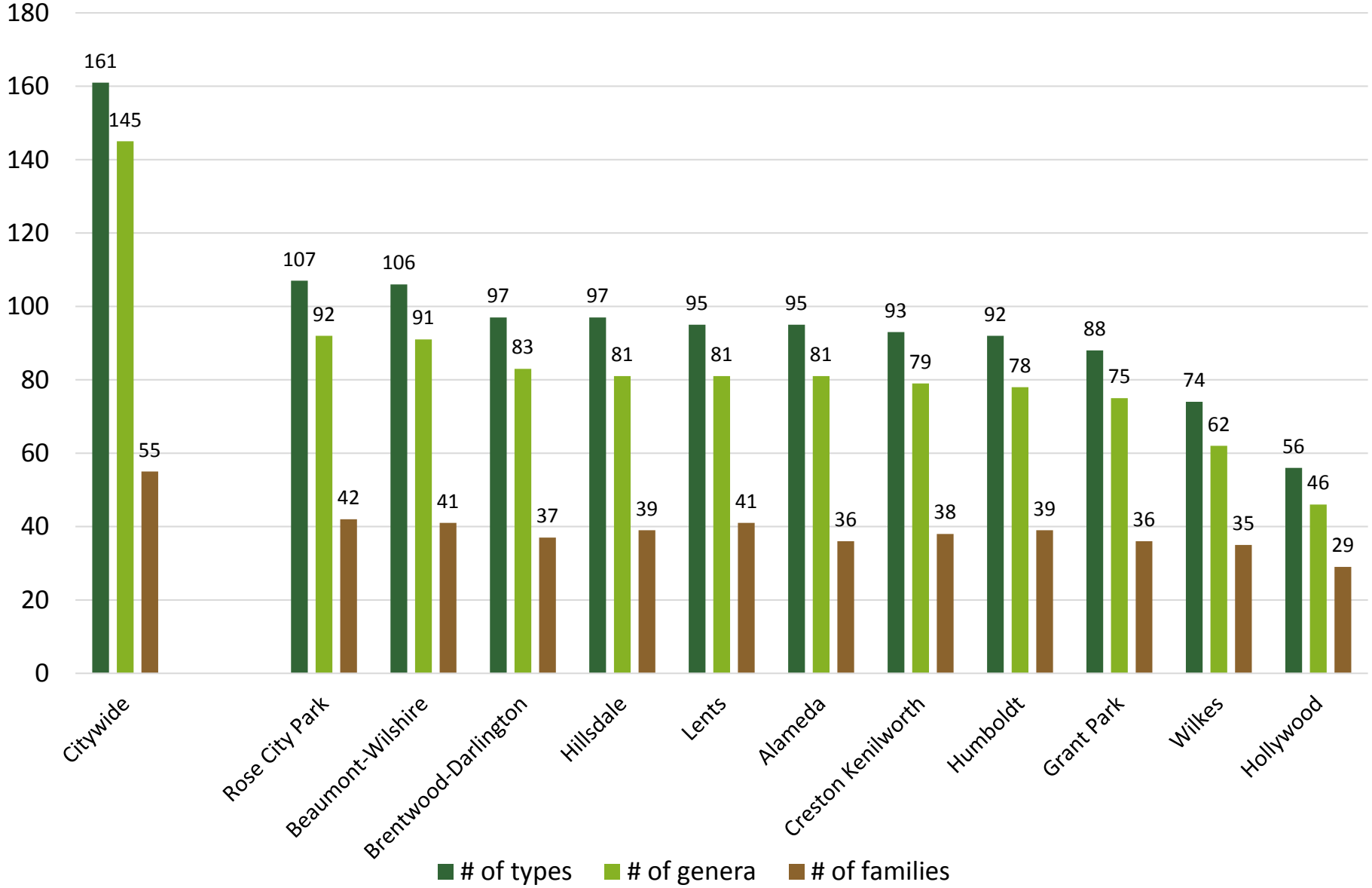
red maple	**7%**
cherry	**6%**
pear	**5%**
plum	**5%**
maple, other	**5%**
ash	4%
dogwood	4%
oak, deciduous	3%
crabapple	3%

Crabapple
Malus spp.

of tree types, genera, and families



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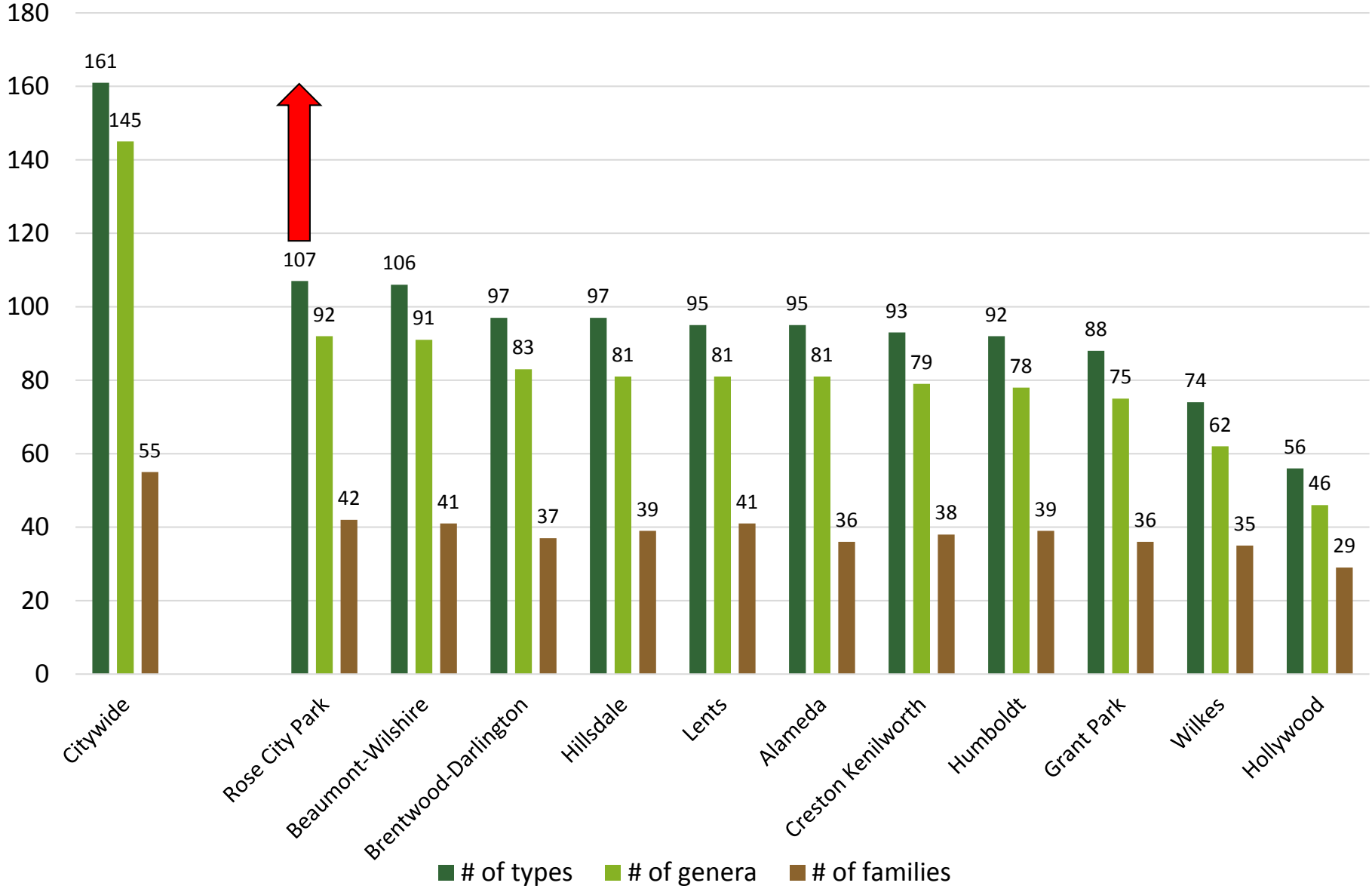
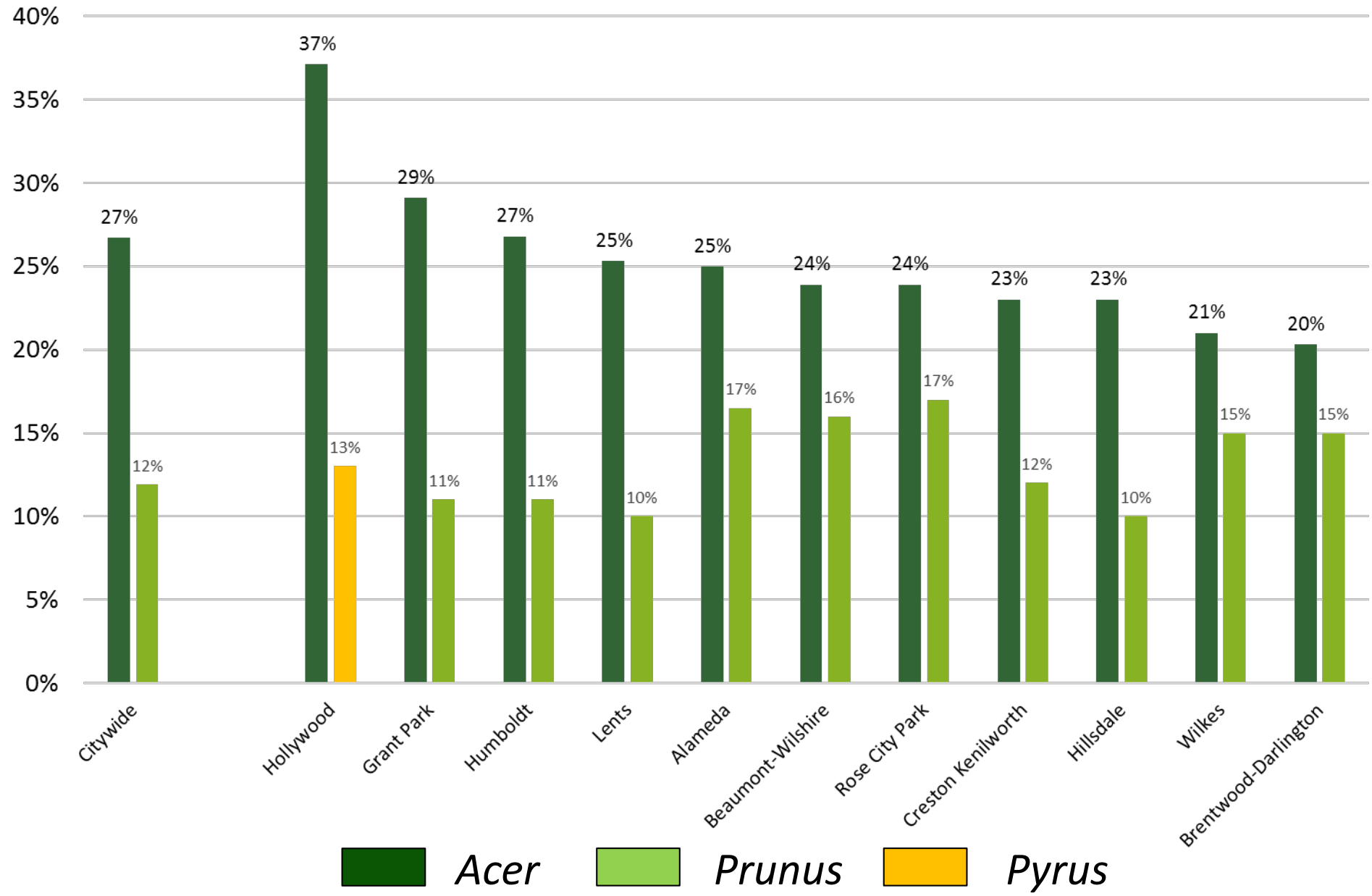


Most common genera and families

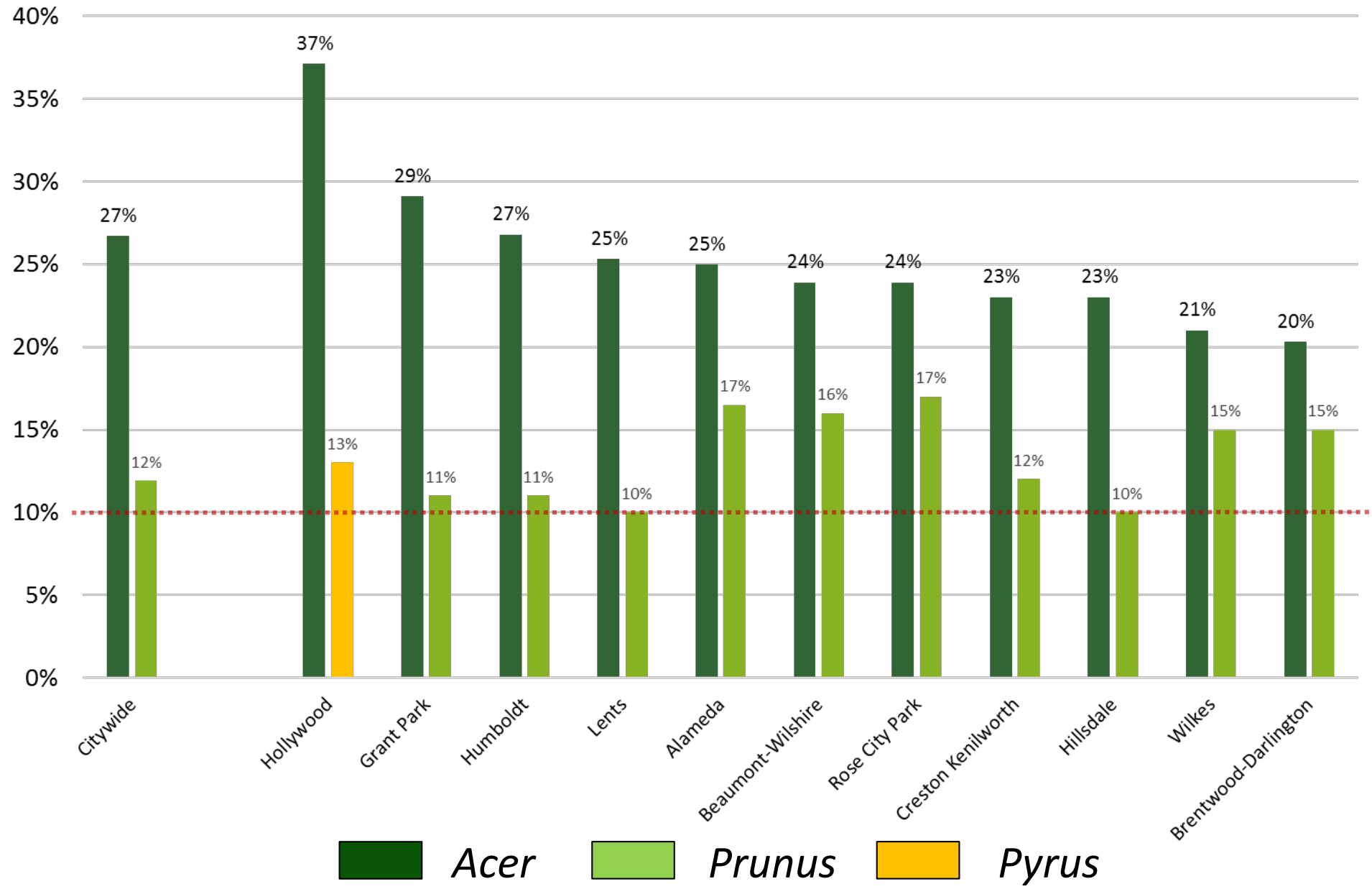
Genus	% of all 218,610 trees
Acer	**27%**
Prunus	**12%**
Pyrus	5%
Fraxinus	4%
Malus	4%

Family	% of all 218,610 trees
Sapindaceae	**28%**
Rosaceae	**25%**
Betulaceae	5%
Oleaceae	5%
Cornaceae	5%

% of 2 most common genera

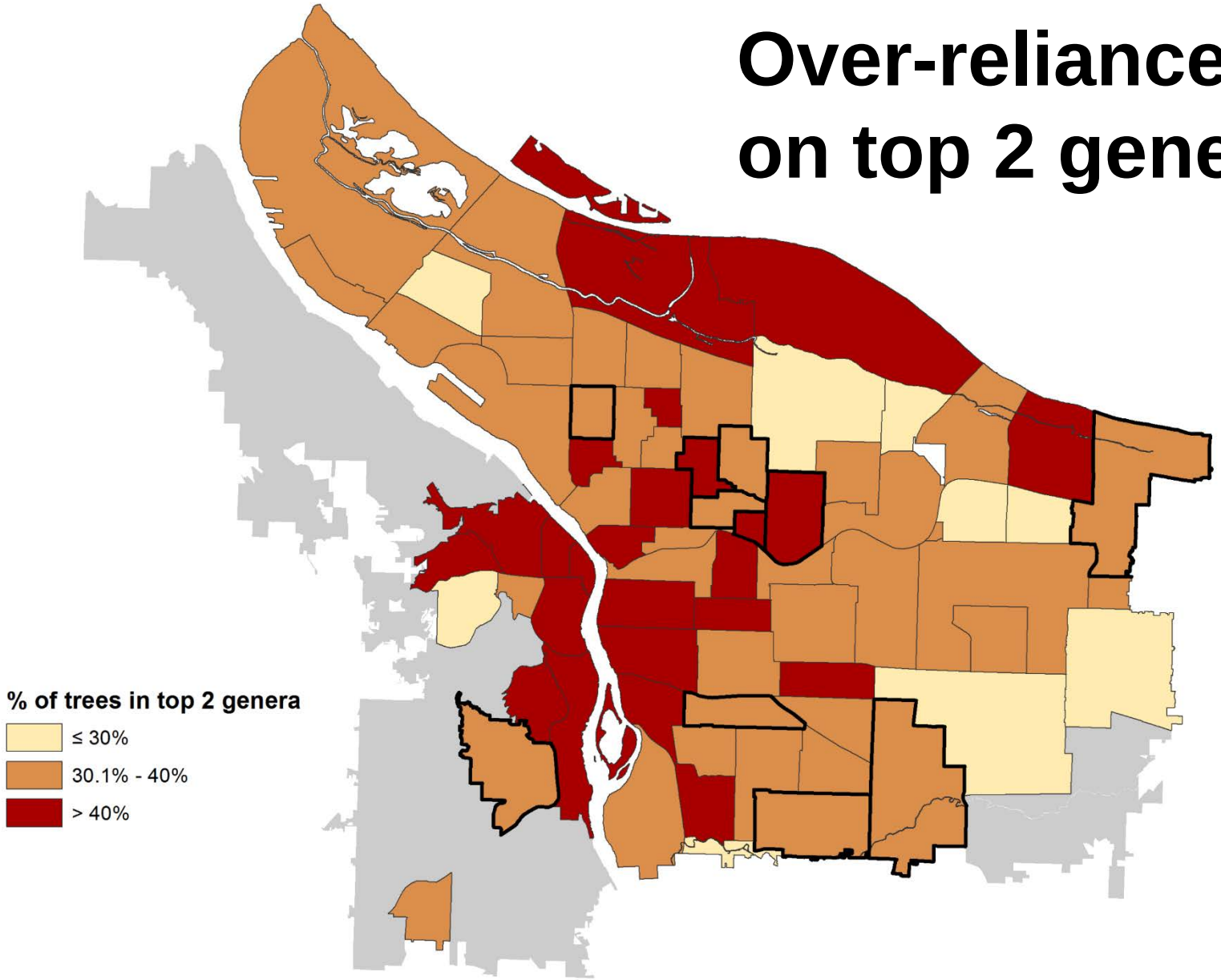


% of 2 most common genera

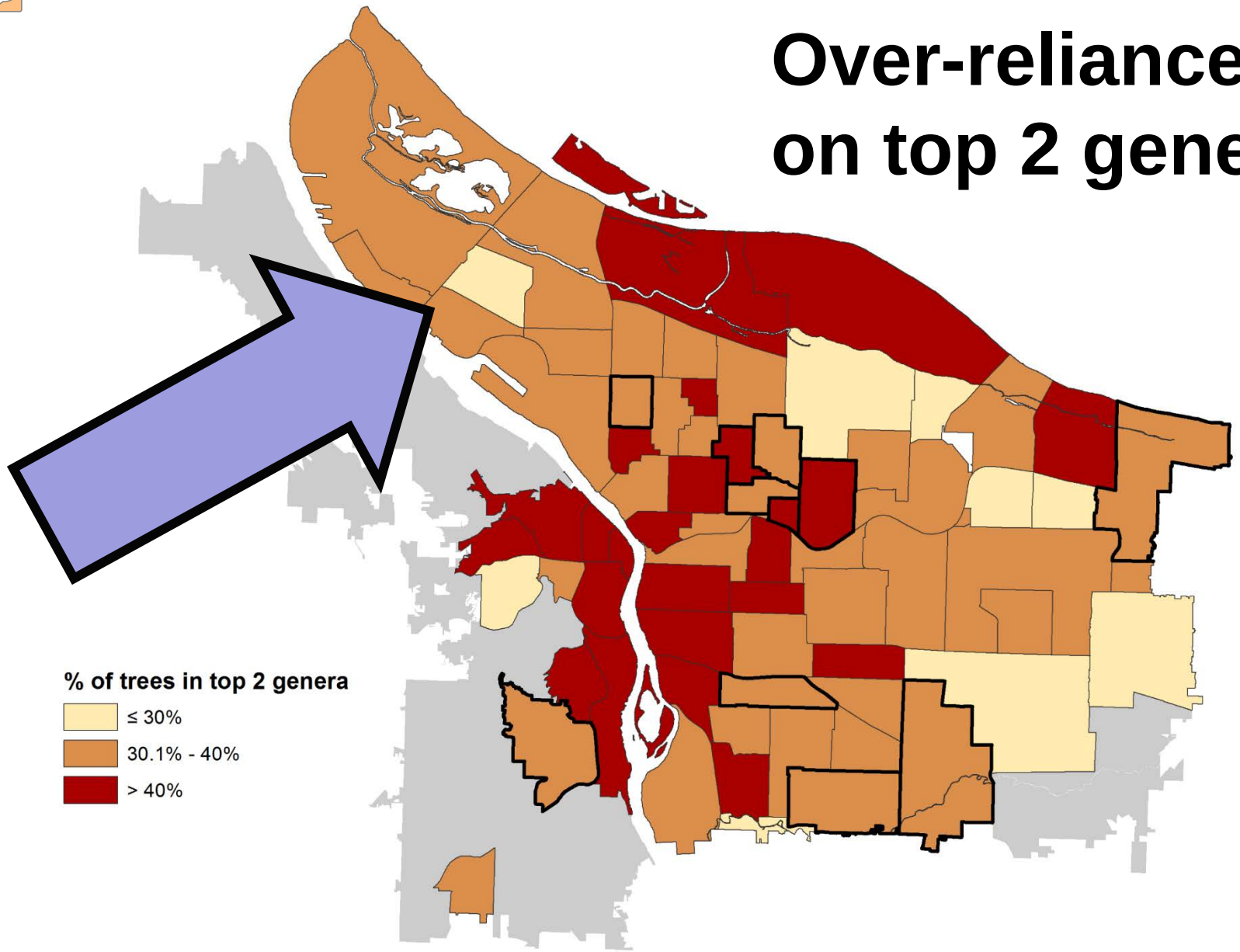


Beaumont-Wilshire

Over-reliance on top 2 genera



Over-reliance on top 2 genera



Intentional diversity in New Columbia

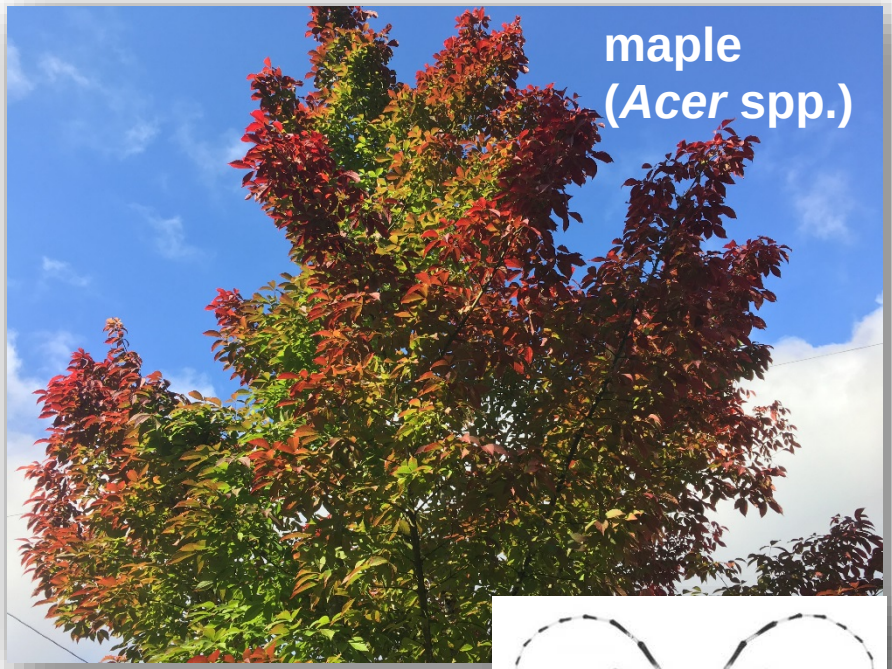
Portsmouth


tupelo

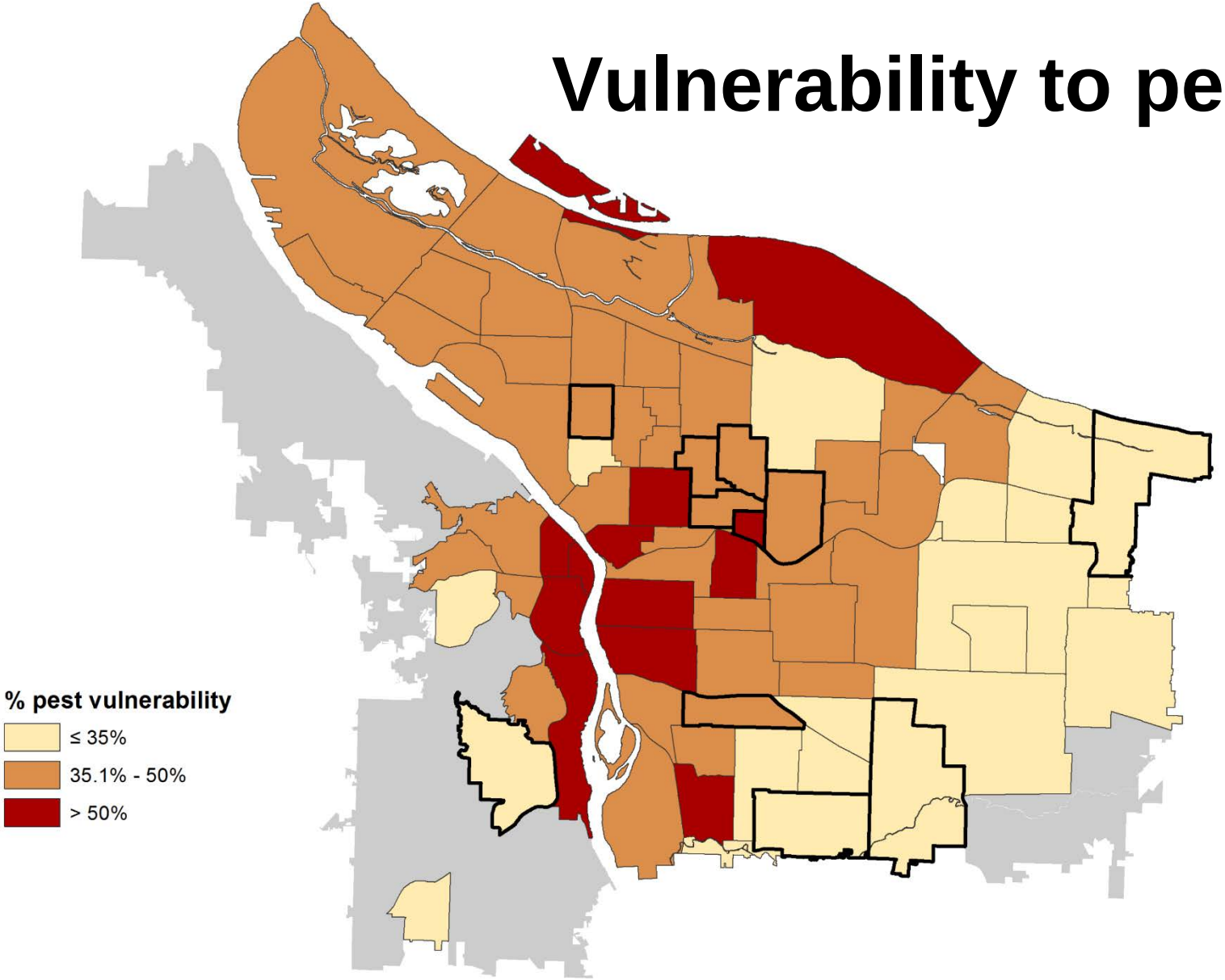

hornbeam


magnolia

Why do we want diversity?



Vulnerability to pests



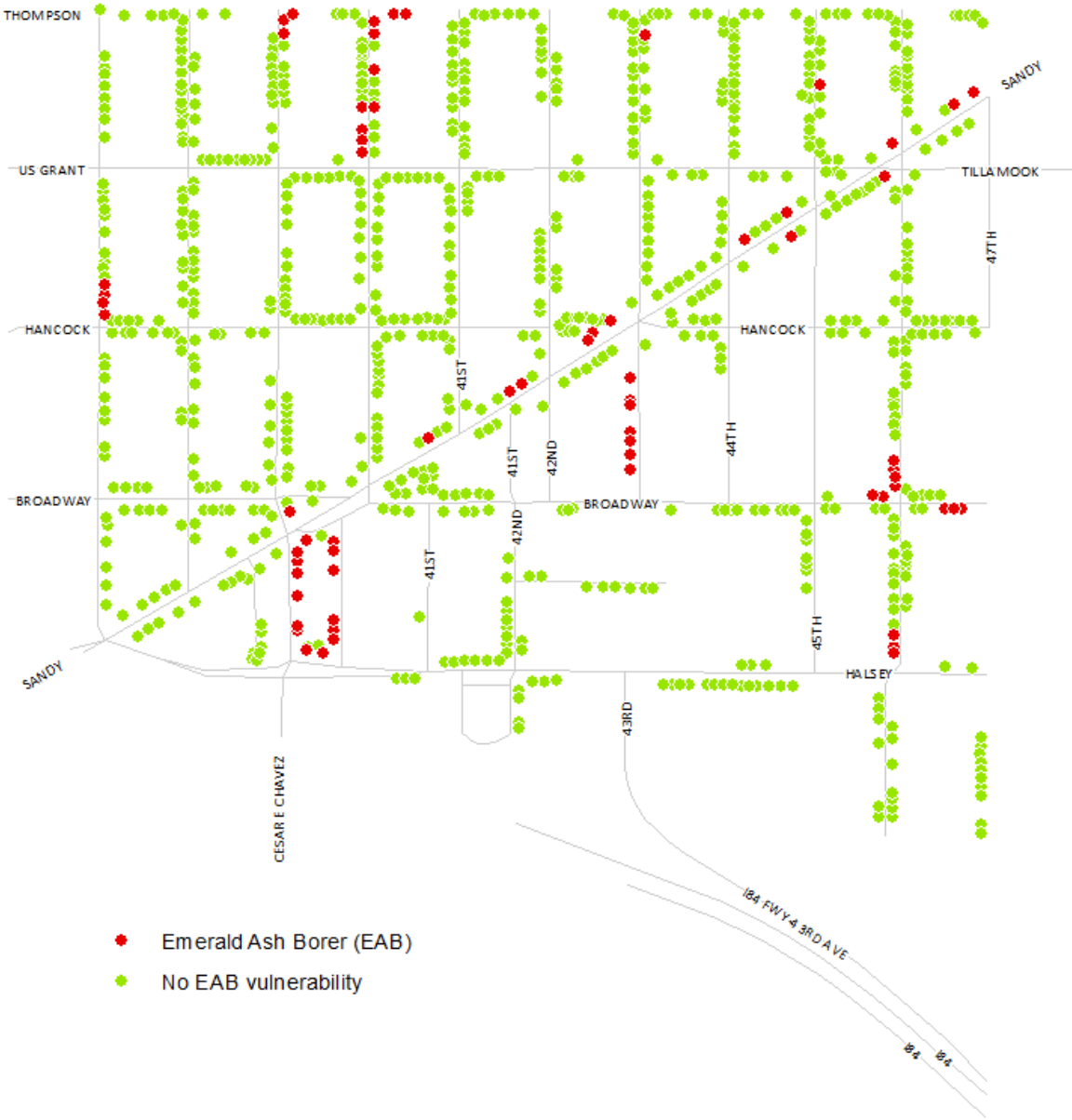
What will loss look like? *Hollywood*

All street trees

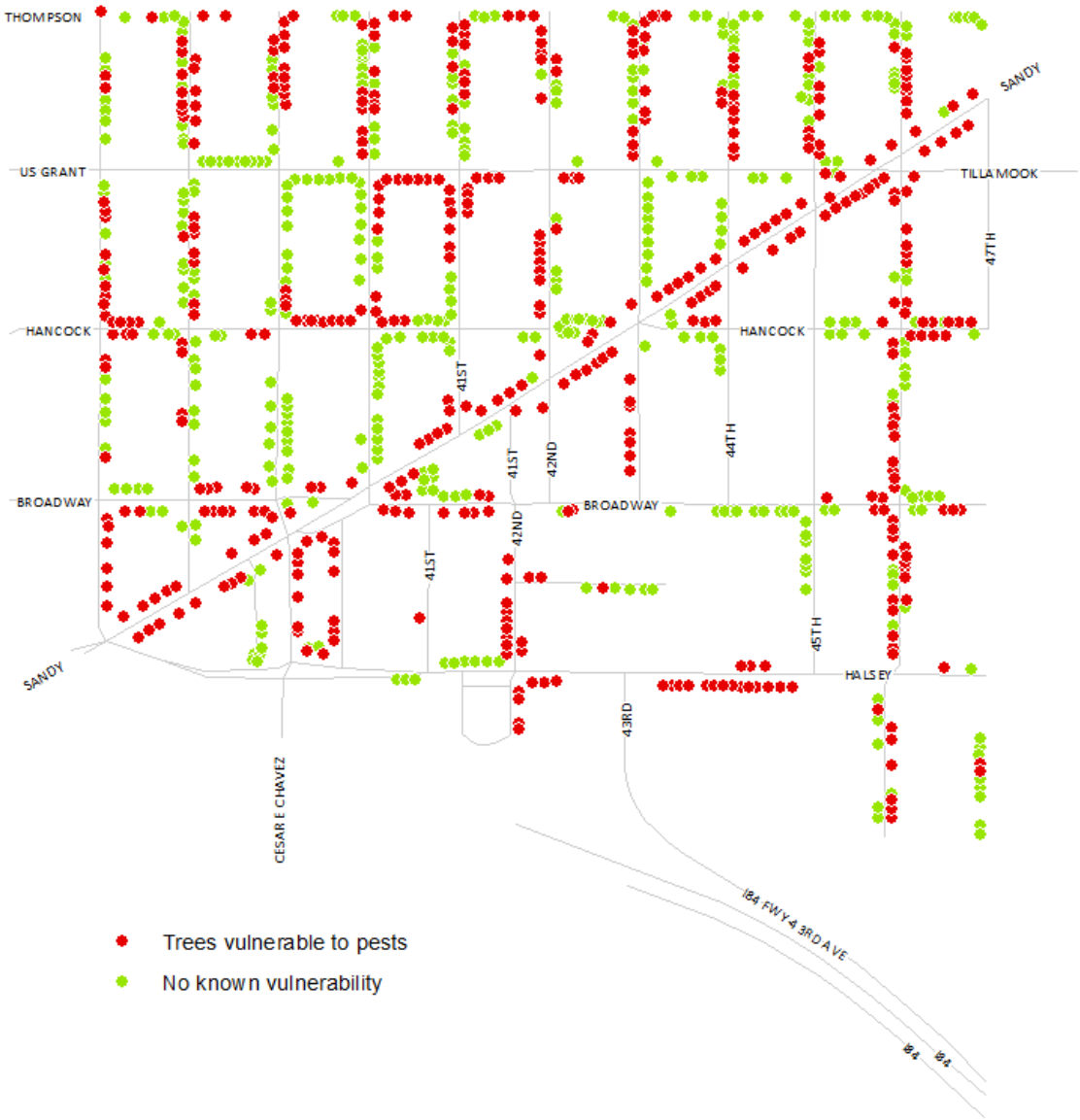
What will loss look like? *Hollywood*

Loss to:

- emerald ash borer



What will loss look like? *Hollywood*



Combined loss to:

- emerald ash borer
- Asian longhorned beetle

What has changed in 40 years?

1976 Inventory	% of trees
cherry	12%
maple, Norway	10%
birch	9%
plum	9%
hawthorn	7%
walnut	5%
sweetgum	5%
elm	5%
maple, other	3%
oak	3%

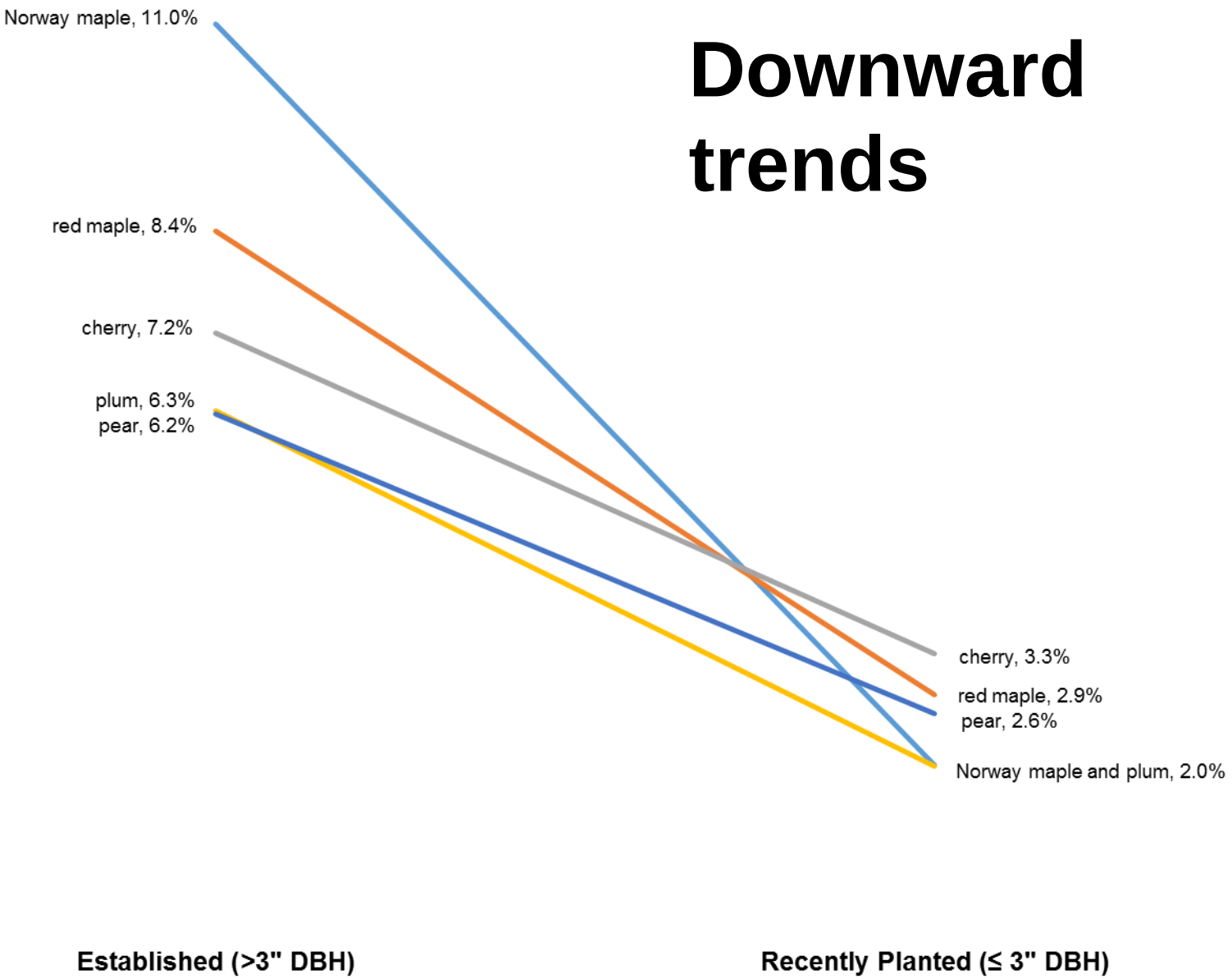
Less common now than in 1976

- birch
- elm
- walnut
- hawthorn
- plum
- cherry

More common in 2016

- red maple
- pear
- ash

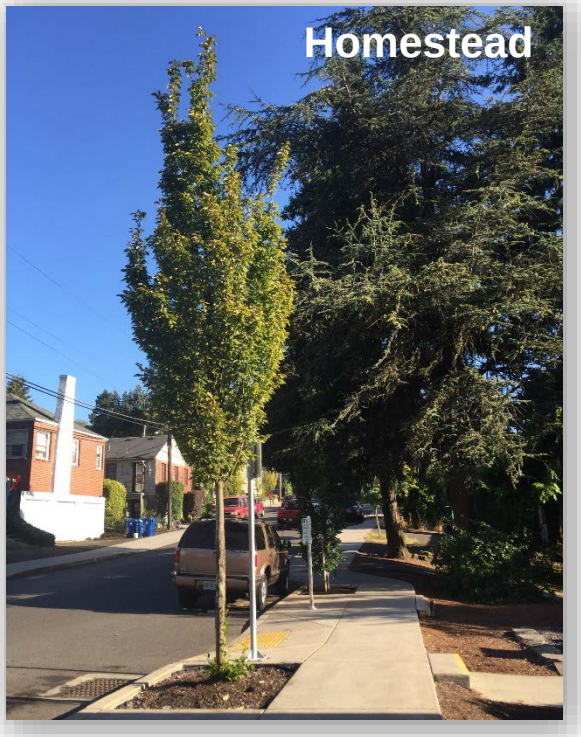
Downward trends



Newcomers

Snowbell

- now 2% of all street trees



Hornbeam

- now 1.7% of the population

Too popular?

Are we getting the most out of our trees?

Tree condition

Good

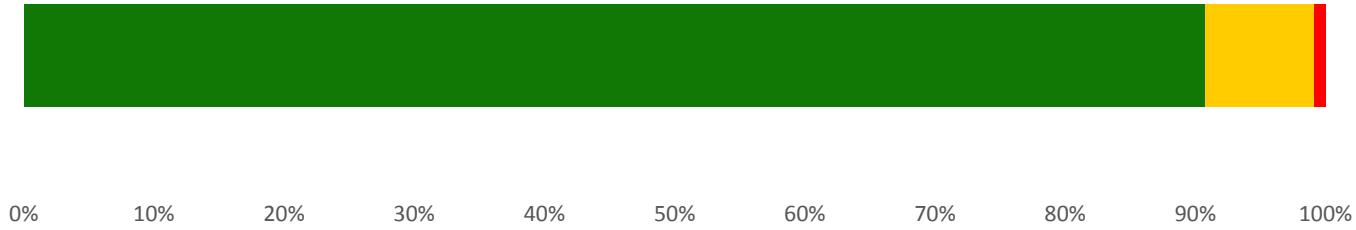
Fair

Poor

Dead

Tree condition

Good **Fair** **Poor** **Dead**



Majority dead are newly planted

Size class

Tree size (DBH) is an approximation of tree age

- 0-6” DBH = young
- 6-18” DBH = midlife
- 18” and above = mature

Size class

Tree size (DBH) is an approximation of tree age

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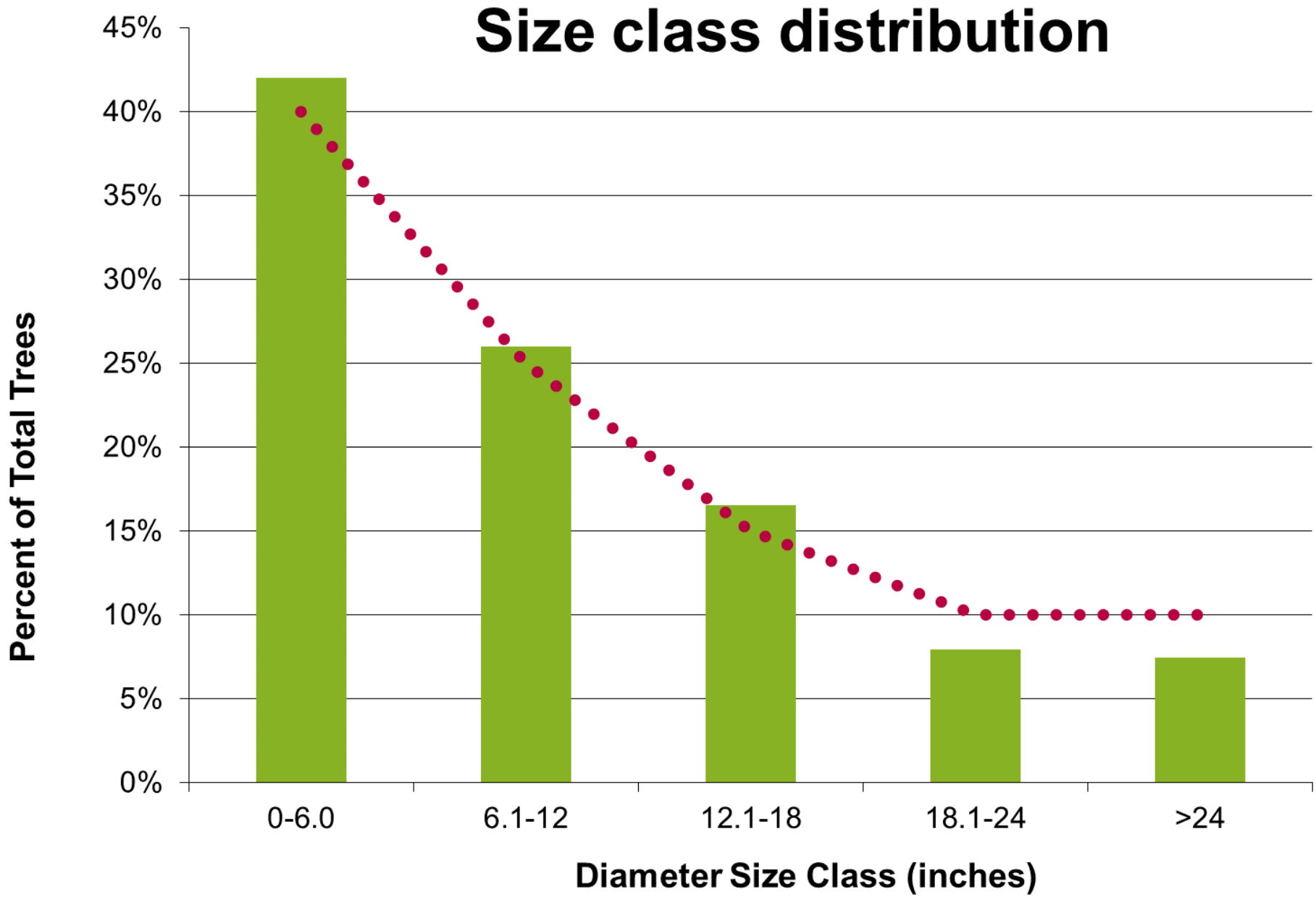
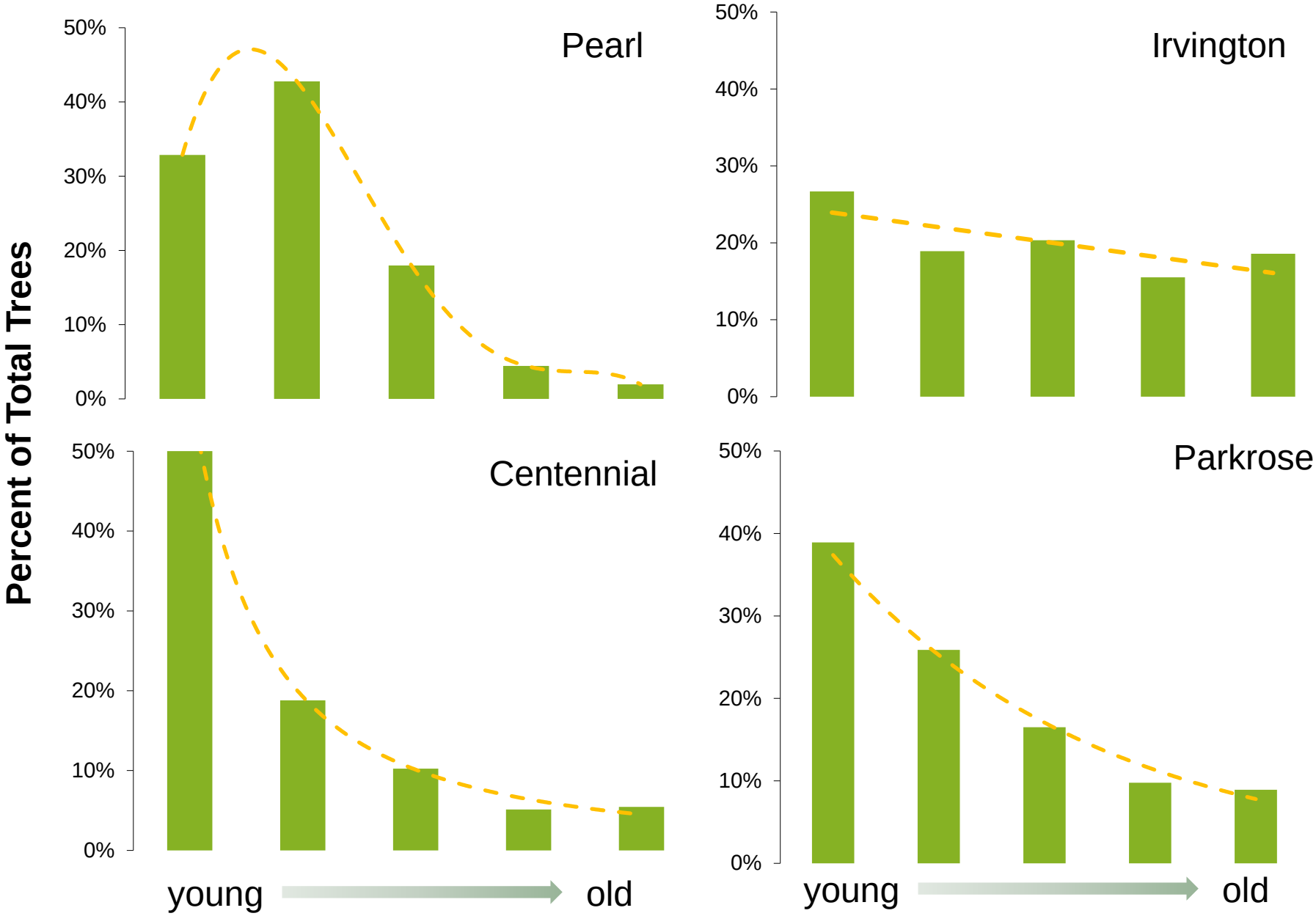
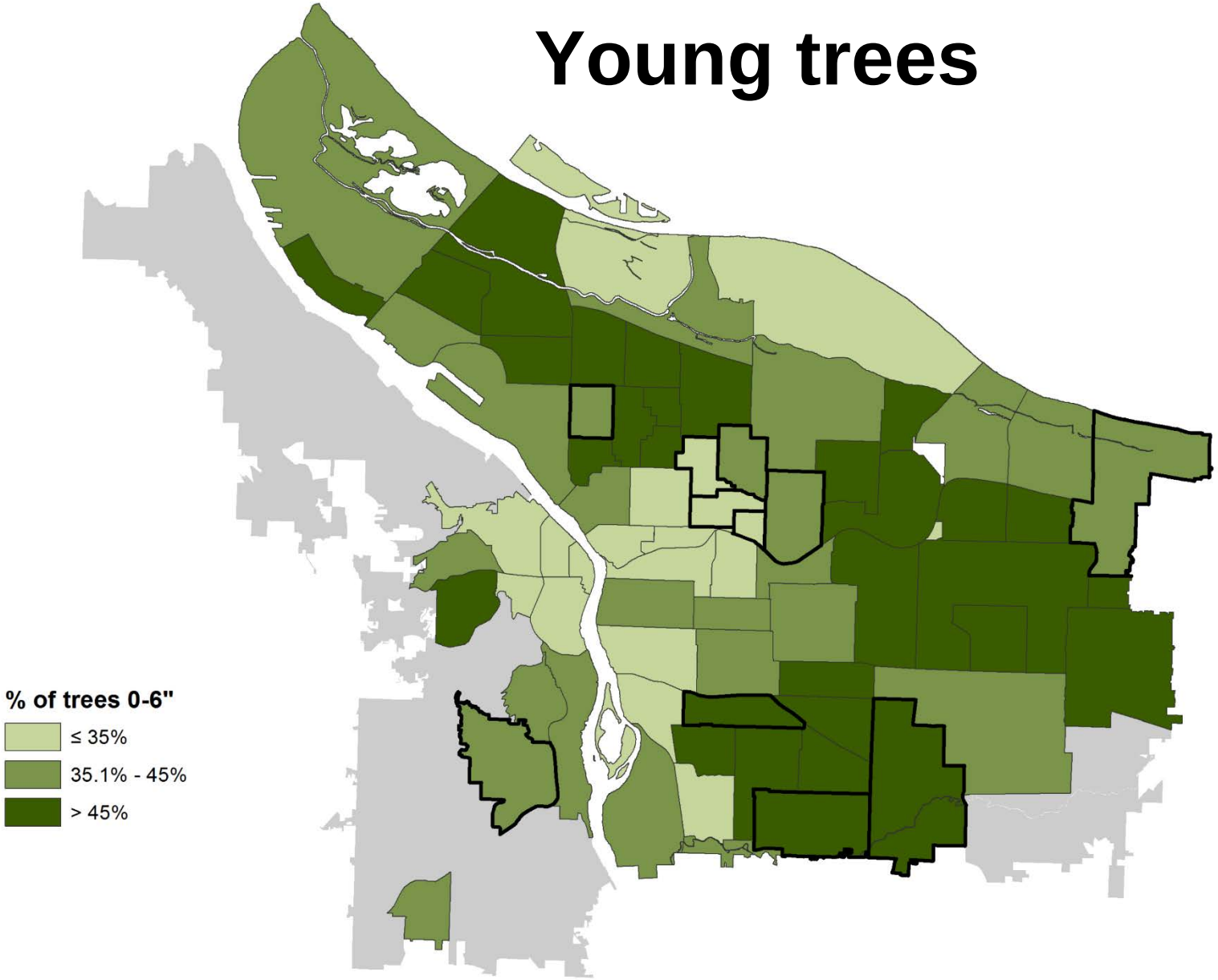
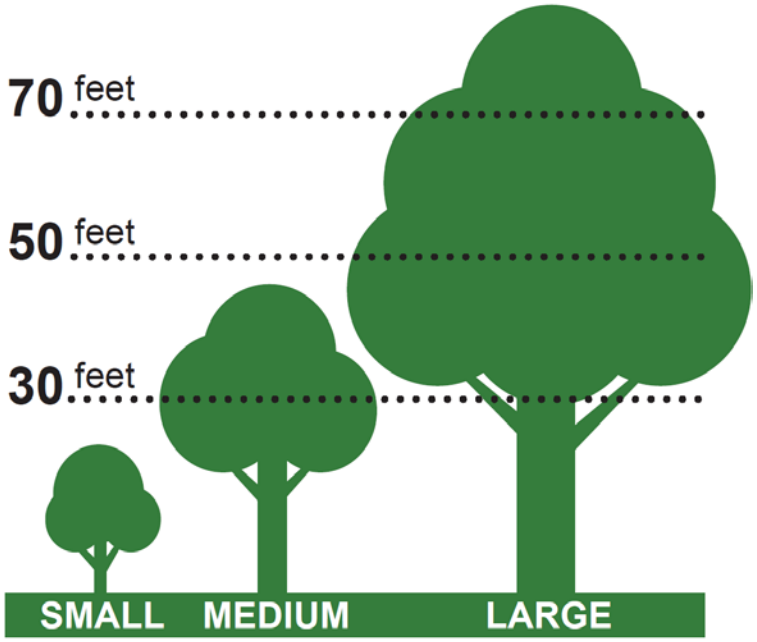

Size class distribution
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
Percent of Total Trees
0-6.0
6.1-12
12.1-18
18.1-24
>24
Diameter Size Class (inches)


Percent of Total Trees
Pearl
Irvington
Centennial
Parkrose
50%
40%
30%
20%
10%
0%
young
old

Young trees



Mature tree size

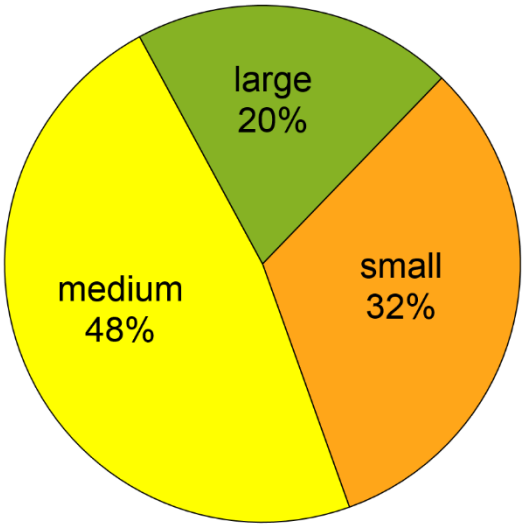


Corresponds to planting site size

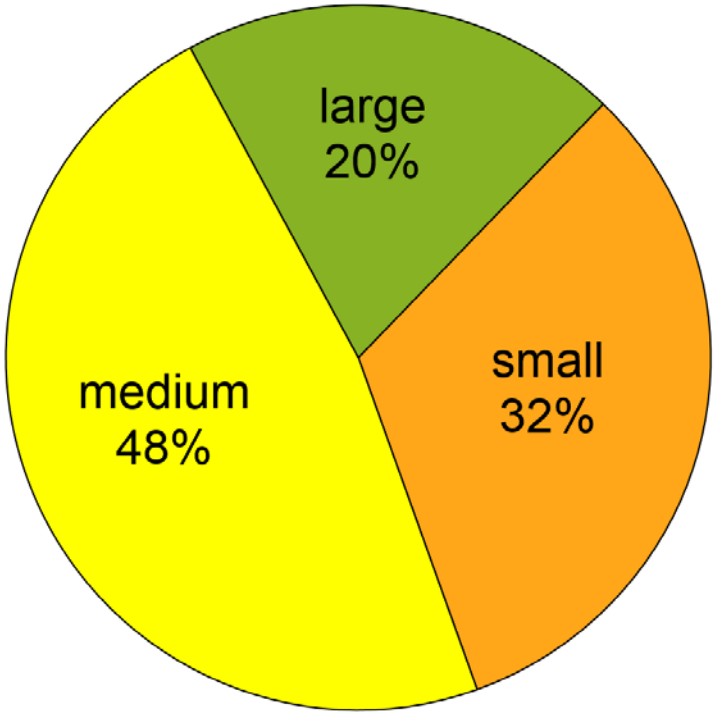
- **small**
  - dogwood, redbud, azara
- **medium**
  - hornbeam, tupelo, katsura
- **large**
  - oak, linden, Douglas-fir

How big will Portland's street trees be?

Mature tree size

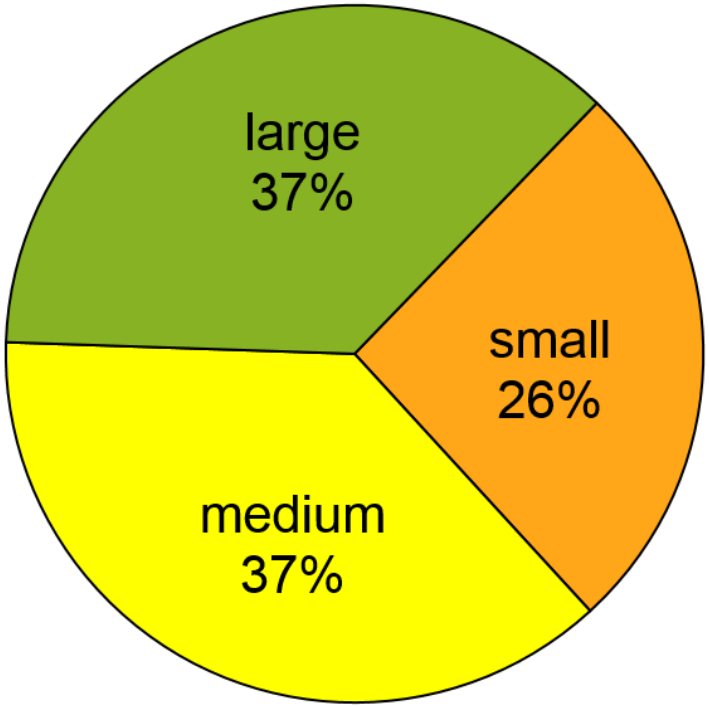


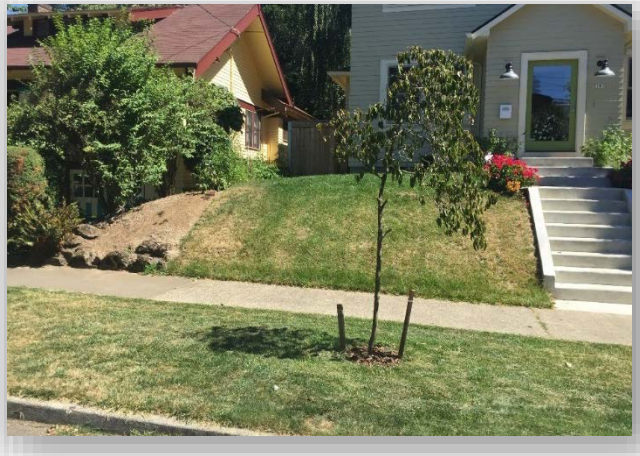
Mature tree size



≠

Site size





Large sites

0% 20% 40% 60% 80% 100%

Large sites

IDEAL

0% 20% 40% 60% 80% 100%

Determining benefits of street trees

- iTree Streets software
  - developed by USDA Forest Service
- input:
  - current city costs for home values, energy costs, storm water management
  - street tree inventory data

Annual benefits

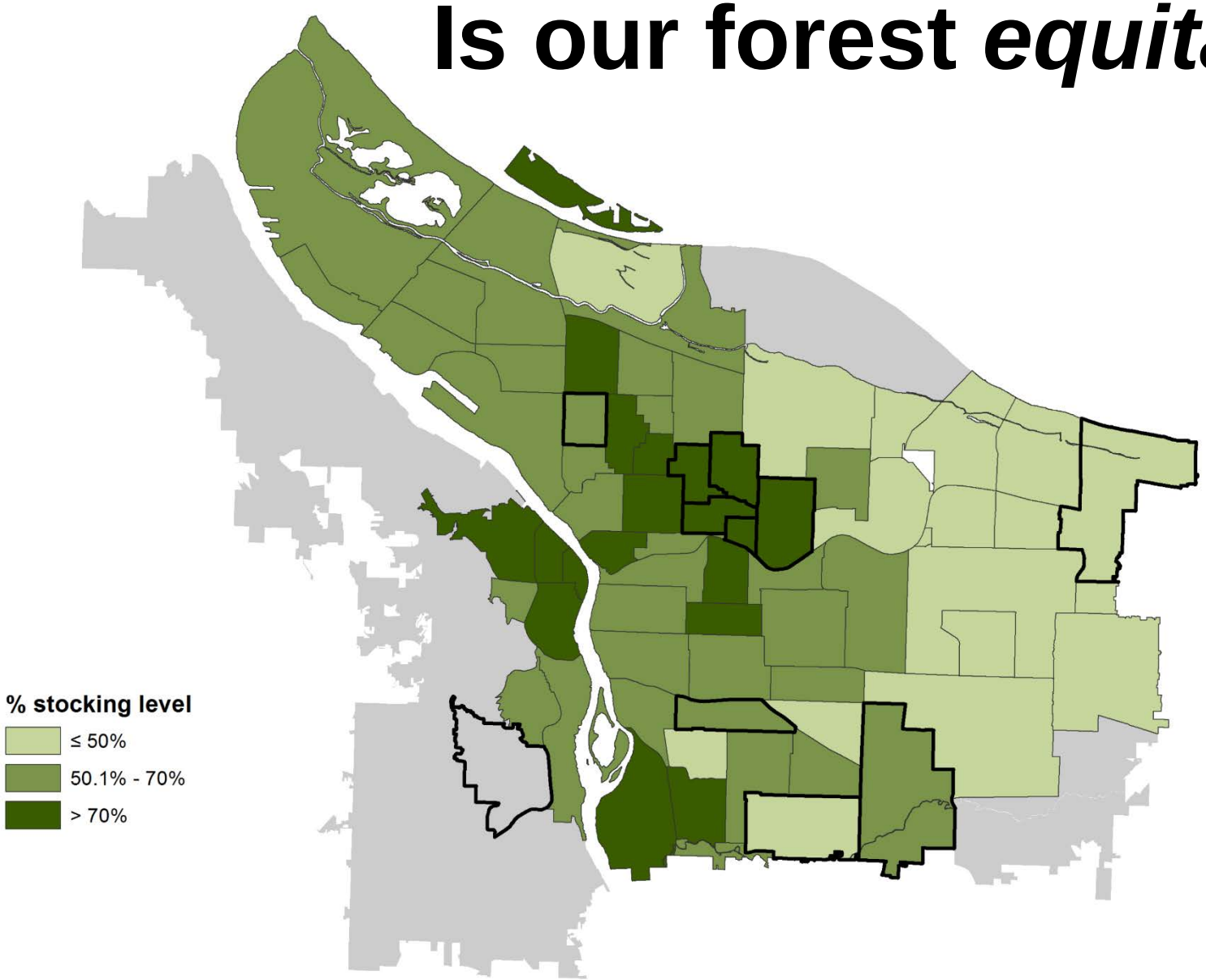
- Total of $28.6 million annually
  - $14 to $250 per tree
- 158 million gallons of storm water
- 10.5 million pounds of carbon
- 76 tons of air pollutants

What do we do with all this information?

Questions

- **Equitable?**
- **Resilient?**
- **Maximizing our potential?**

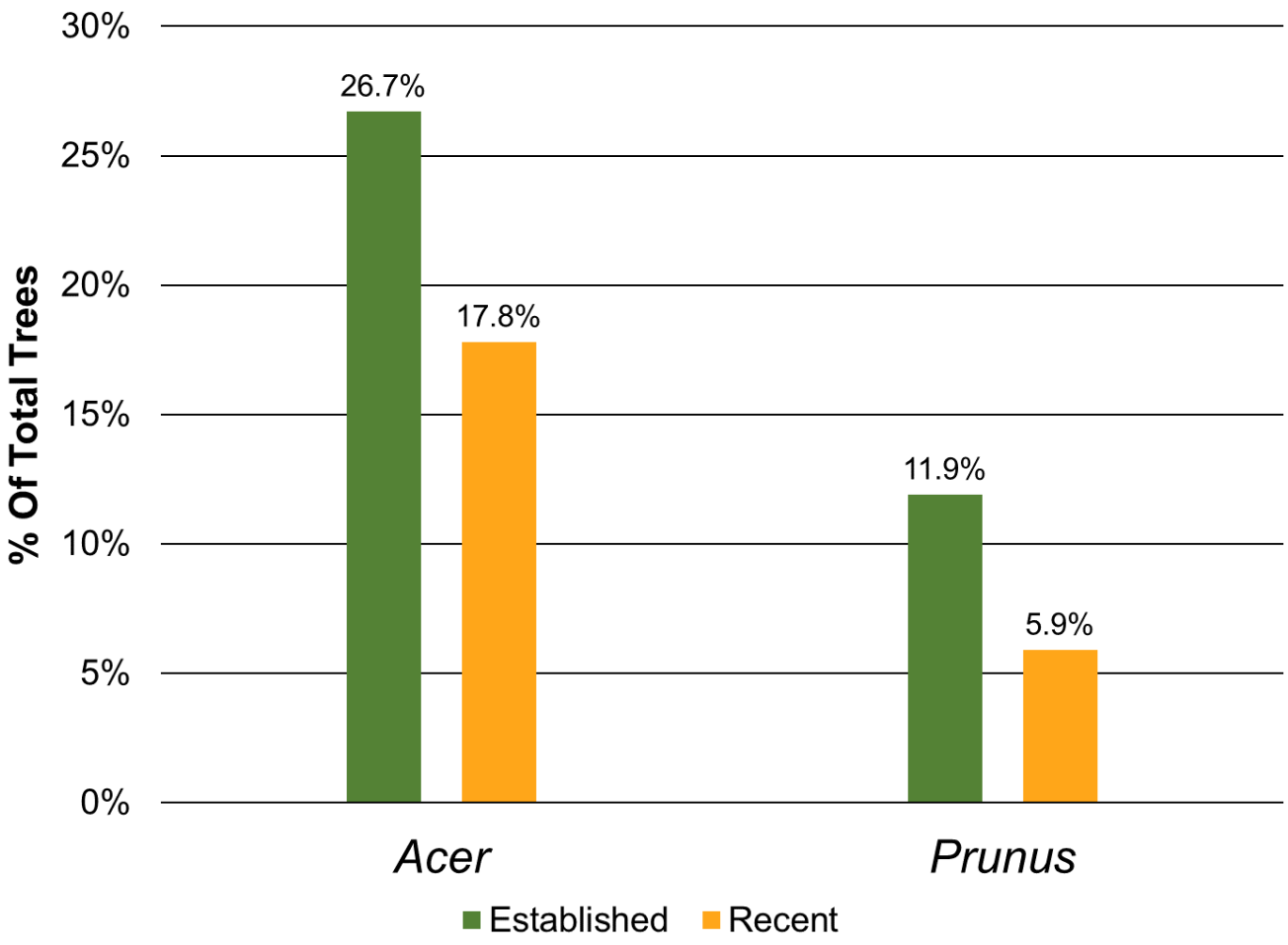
Is our forest *equitable*?



Is our forest *resilient*?

- Species diversity
  - More species, less reliance on vulnerable tree types

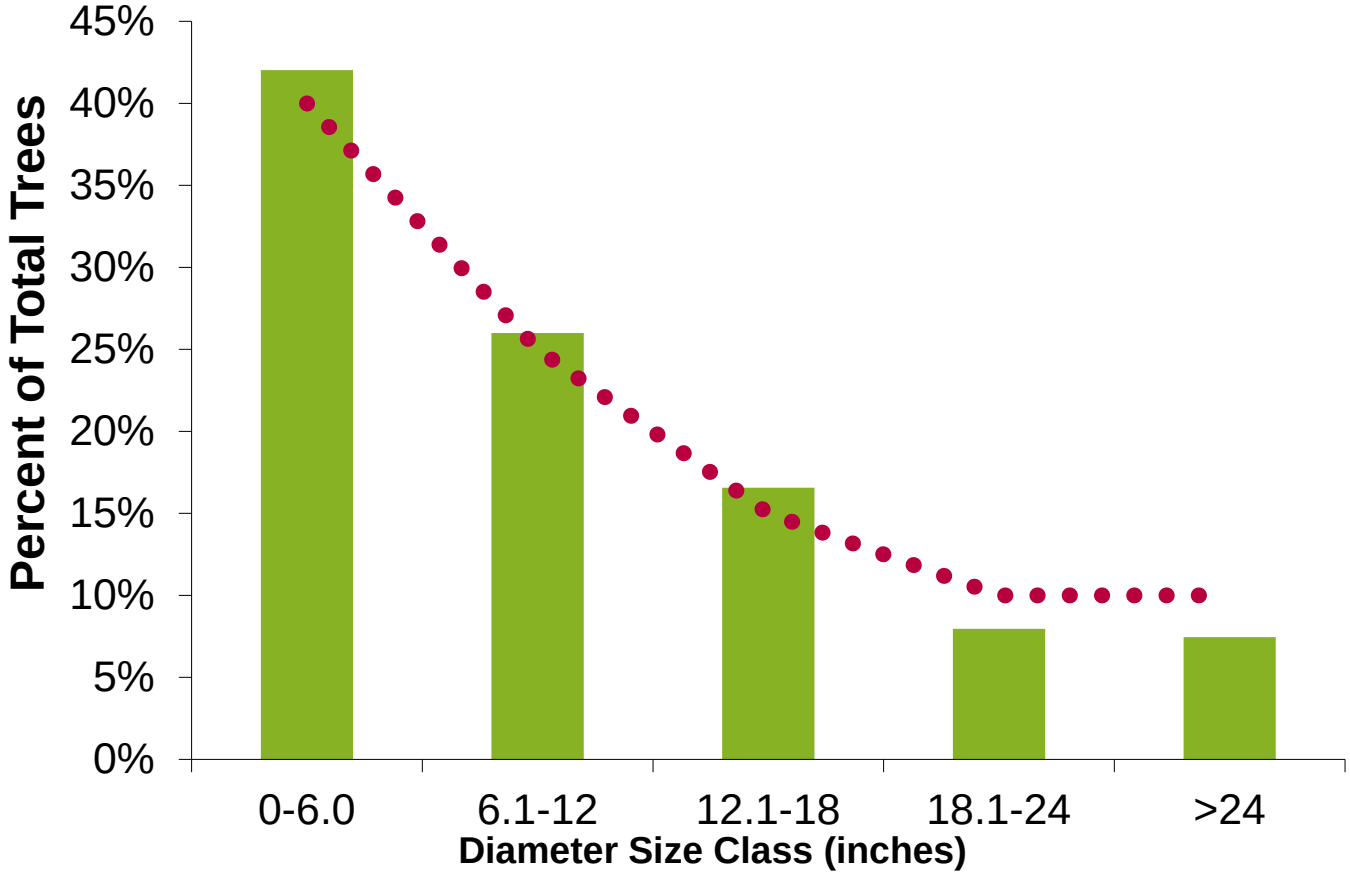
Resilient?


30%
25%
20%
15%
10%
5%
0%
% Of Total Trees
26.7%
17.8%
11.9%
5.9%
Acer
Prunus
Established
Recent

Are we maximizing the benefits our forest provides?

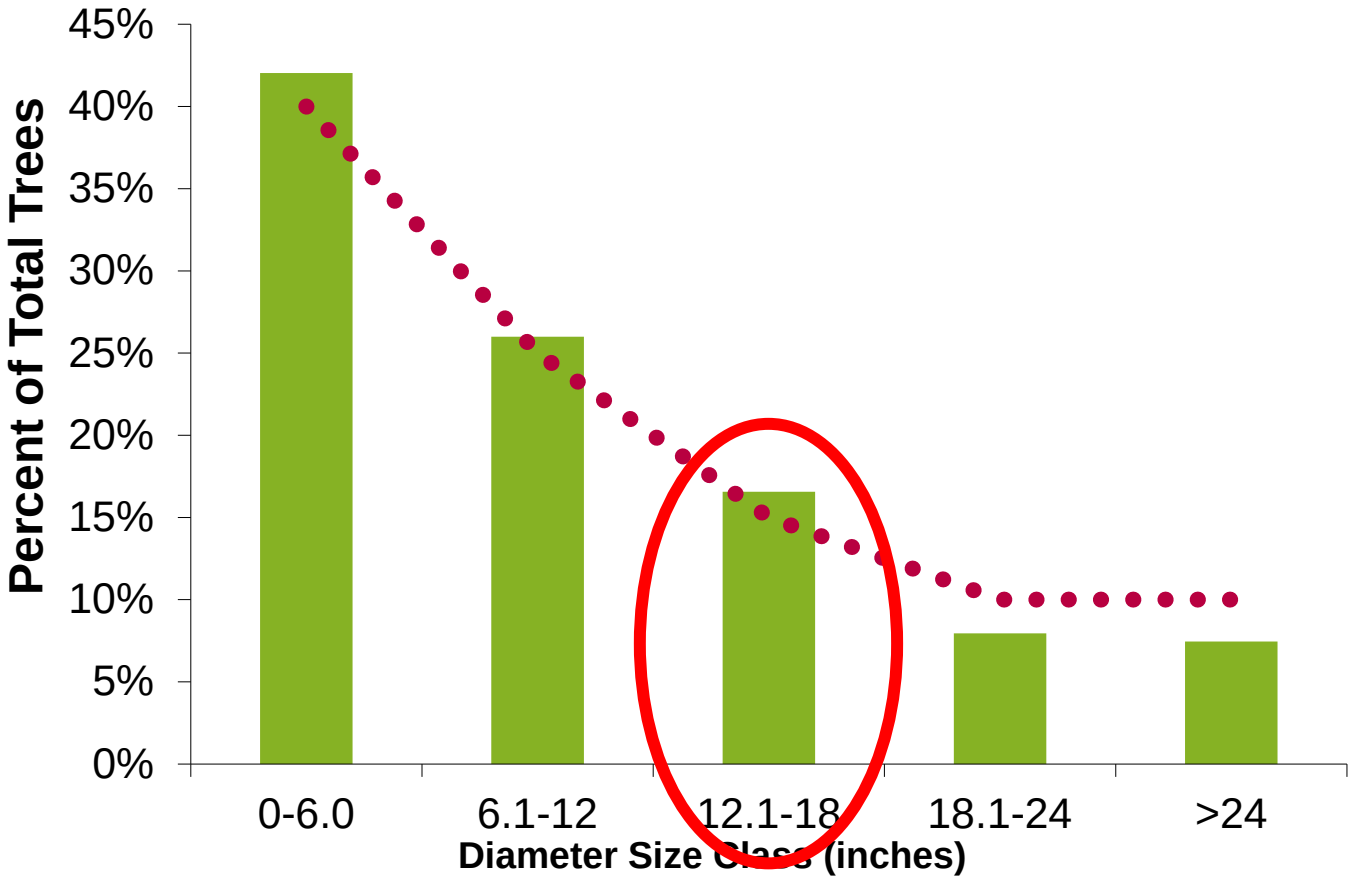
Maximizing potential?

- Size class and mature size of trees planted



Maximizing potential?

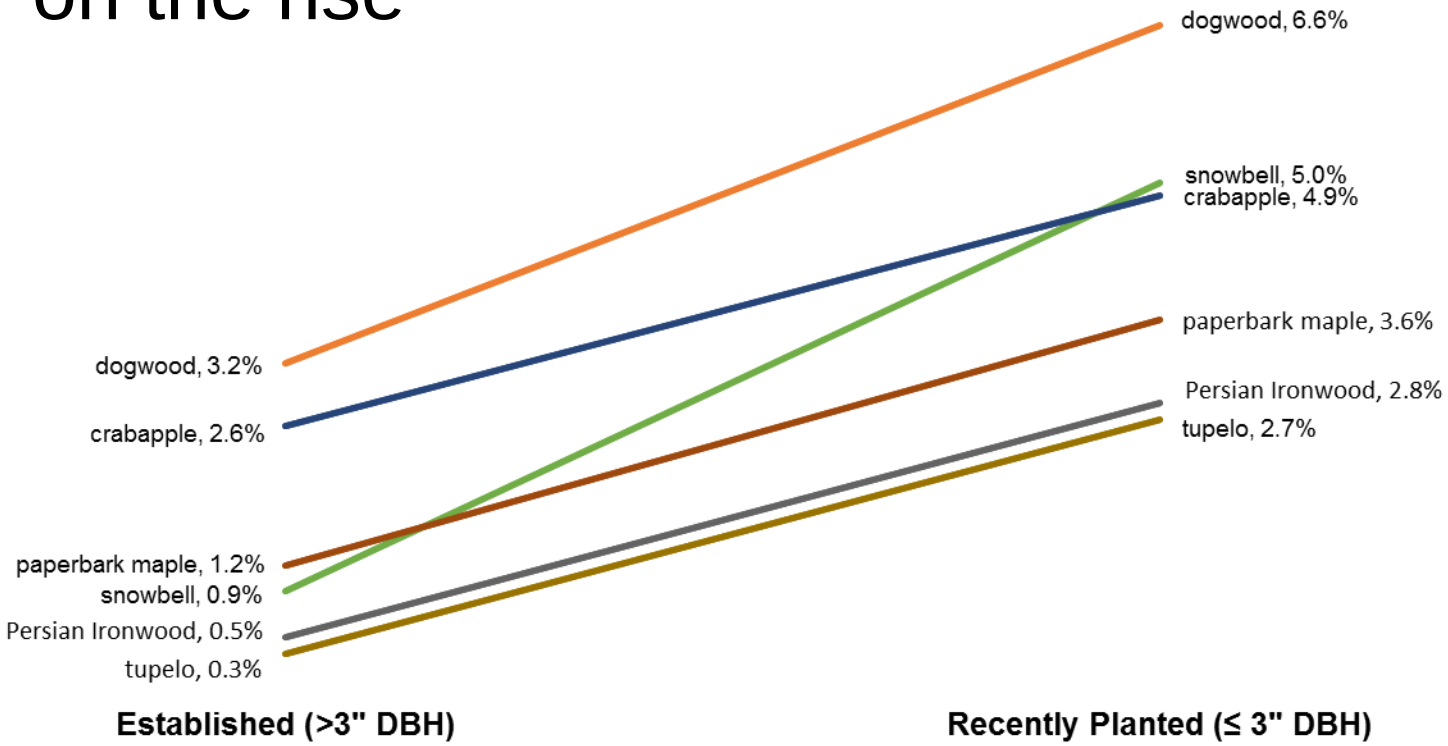
- Size class and mature size of trees planted



Maximizing potential?

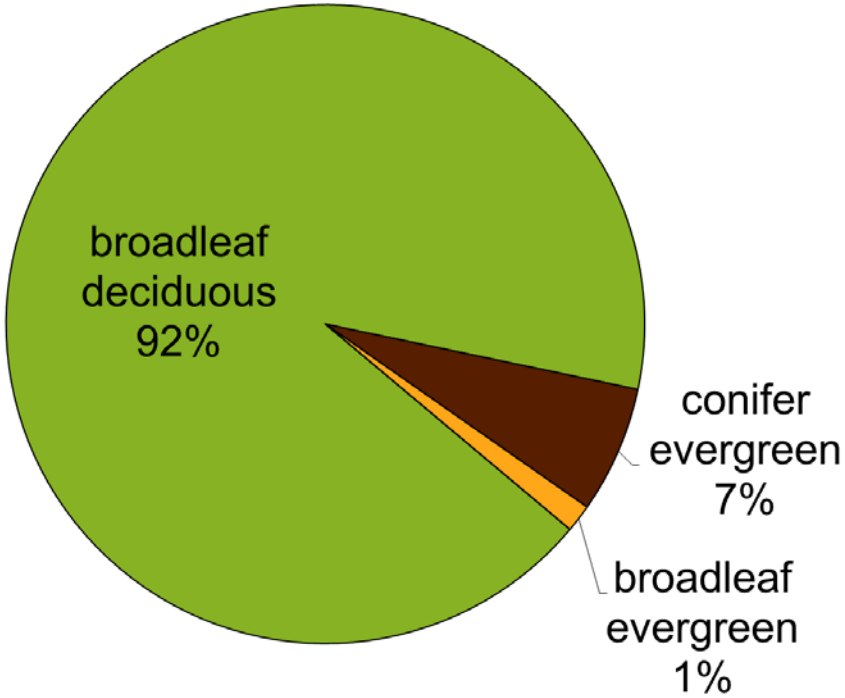
Maximizing potential?

- No large form trees on the rise

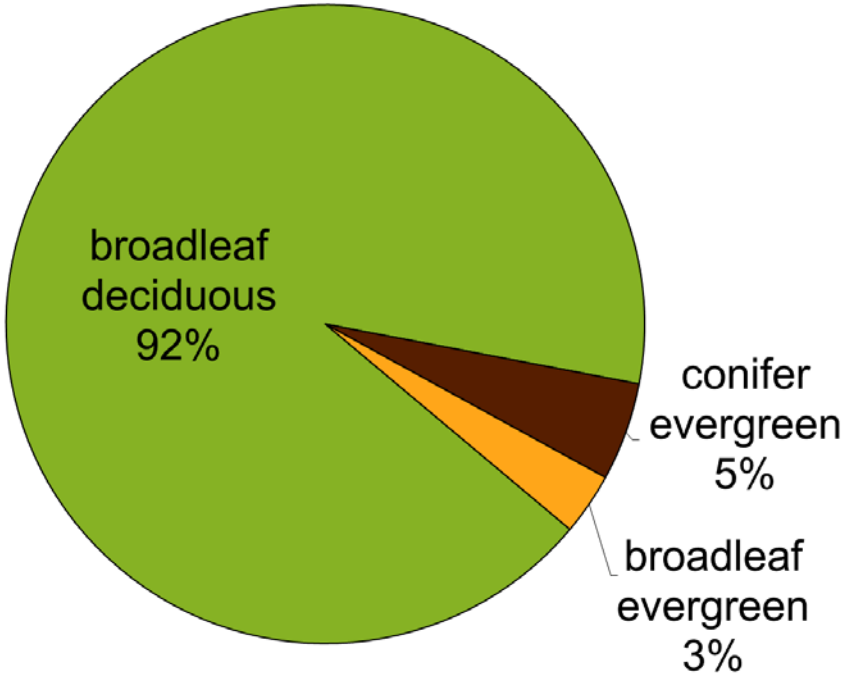


Maximizing potential?

Established Trees (>3” DBH)



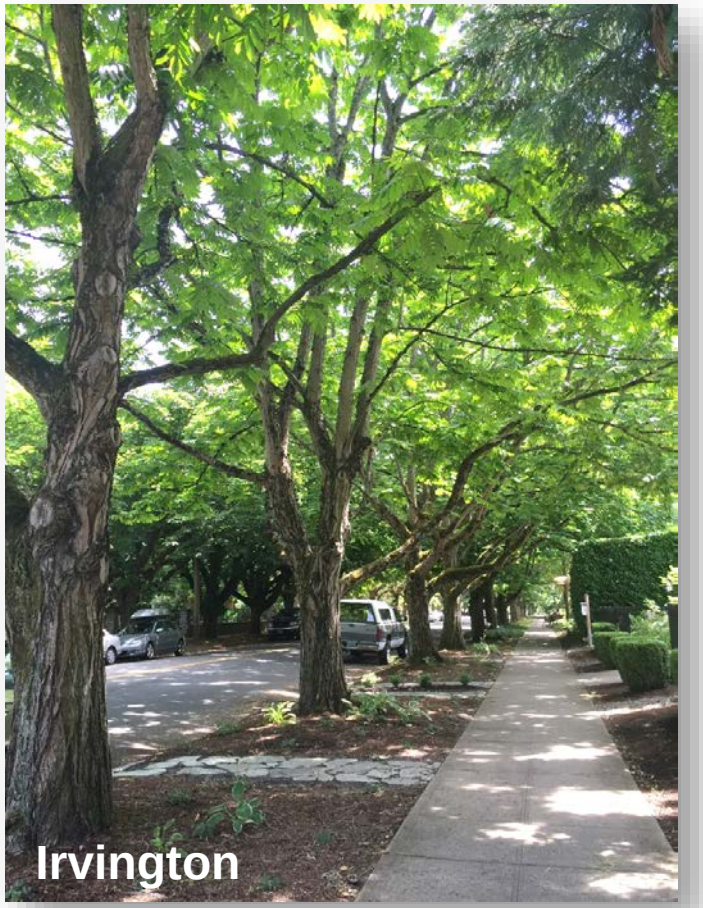
Recently planted trees (≤3” DBH)



Recommendations

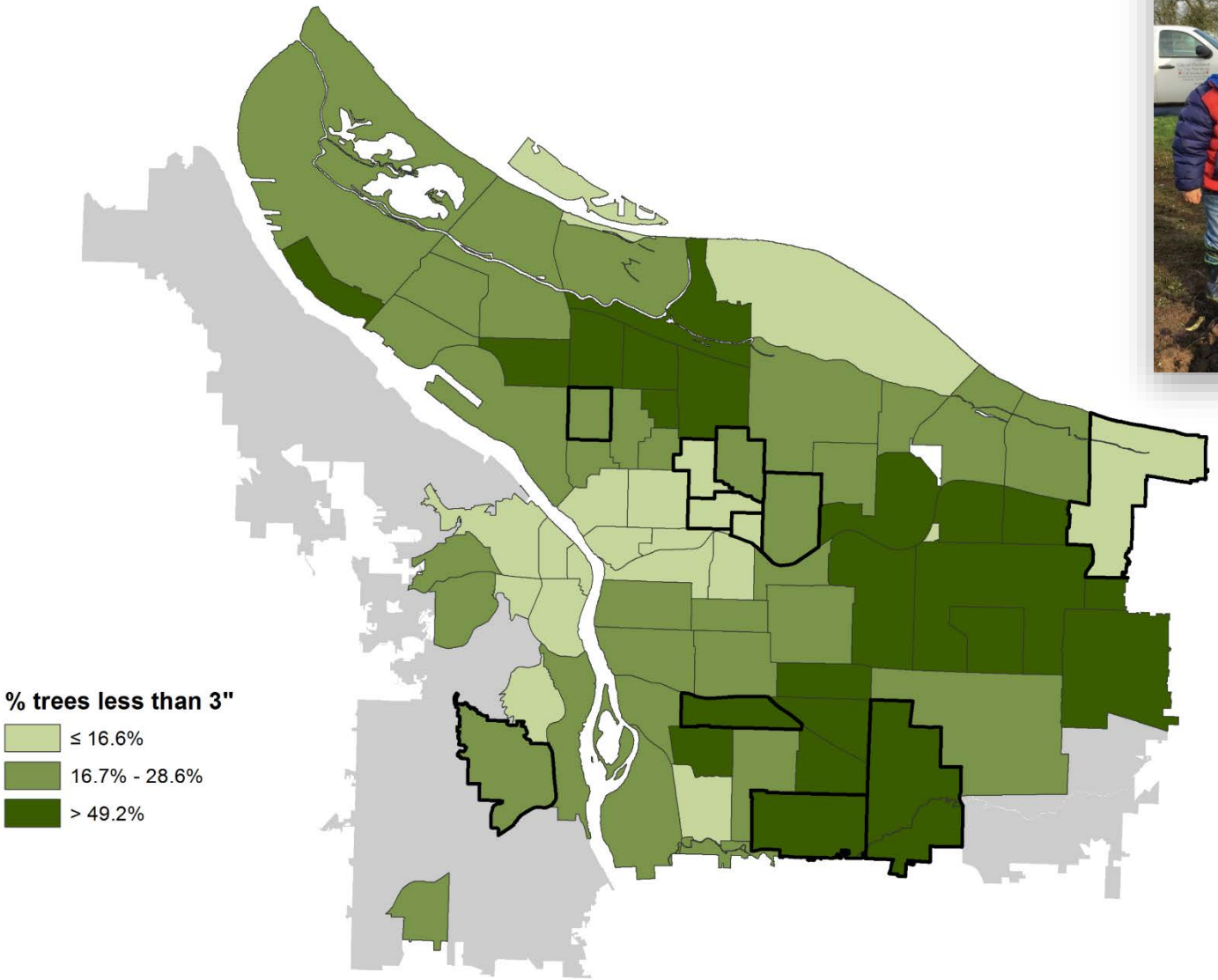
Planting:
highly stocked, low canopy

Planting:
highly stocked, high canopy



Planting: abundant opportunity

Establishment



Maintenance

Preservation


2525 NORTH KILLINGSWORTH
DAYBREAK COHOUSING


Brentwood-
Darlington

Next steps

- Neighborhoods receive report, maps, data
- Tree Teams established
- Neighborhoods create “Tree Plan” to guide activities around street trees (afternoon session)
- UF assists teams with stewardship activities and organization


Pearl