Identification, Effects and Management of 5 types of decay organisms found in Seattle Parks

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- Third generation Arborist
- Grew up in the bay area of California.
- Was 16 when I started working with my dad in tree care
- I fell in love with tree work, not trees
- Managed the preventative tree maintenance programs at Stanford University for 14 years.
- Moved to Washington and began working for Seattle Parks 2 ½ years ago

Seattle Parks System

- **6,412 Total Acres**
  - 4,016 Acres of Developed Park
  - 2,396 Acres of Natural Area
- **480 Parks**
  - >300,000 trees
  - >16,000 trees in our tree inventory

Seward Park 1920

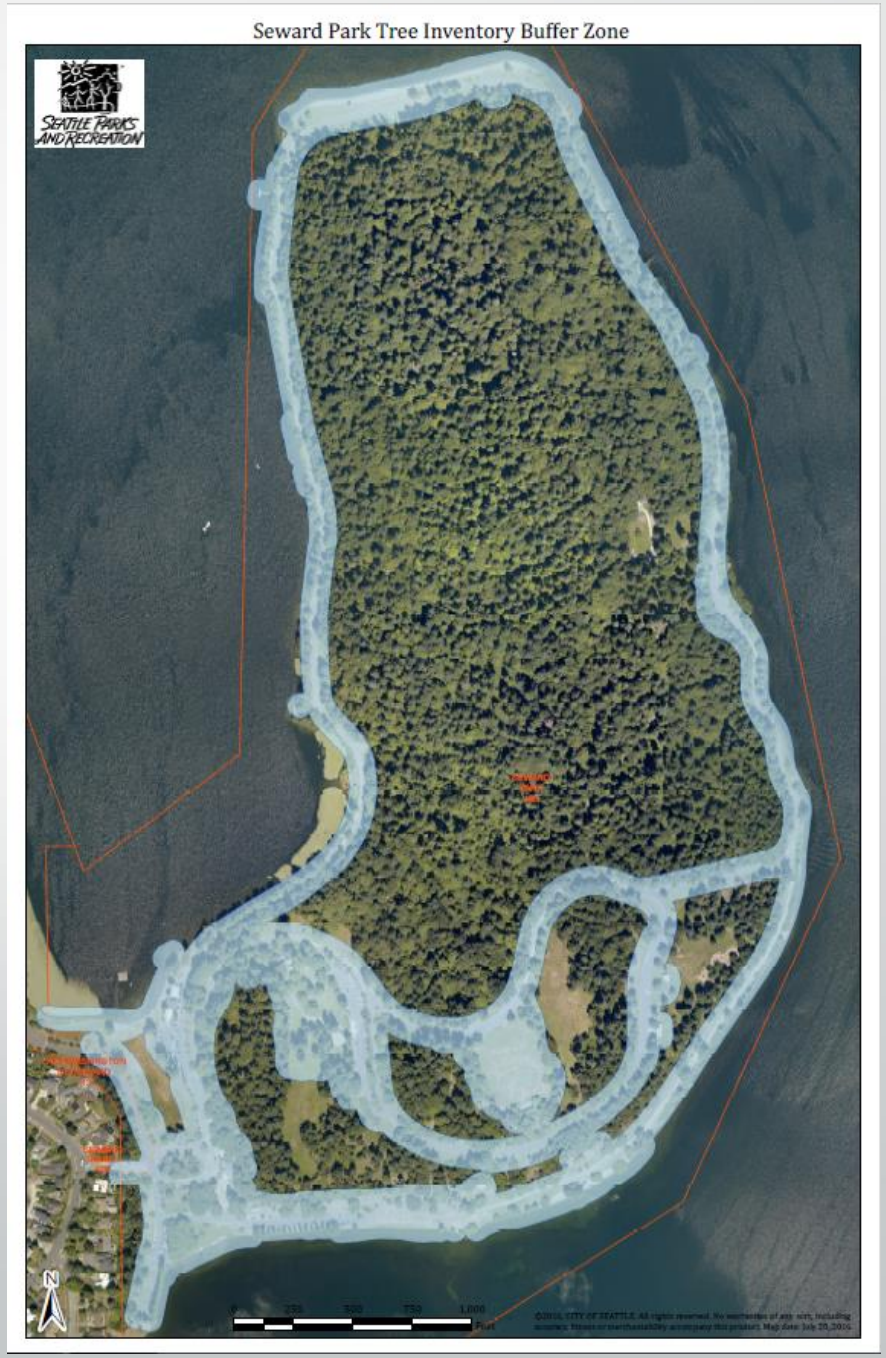
Ravenna Park 1922

What are we focusing on?

- 171,615 trees in our **Buffer Zone**.

- Buffer Zone is a 50’ buffer around high use areas like beaches, paved roads and trails, playgrounds…etc)

- Buffer Zones are on average 56% of a given park



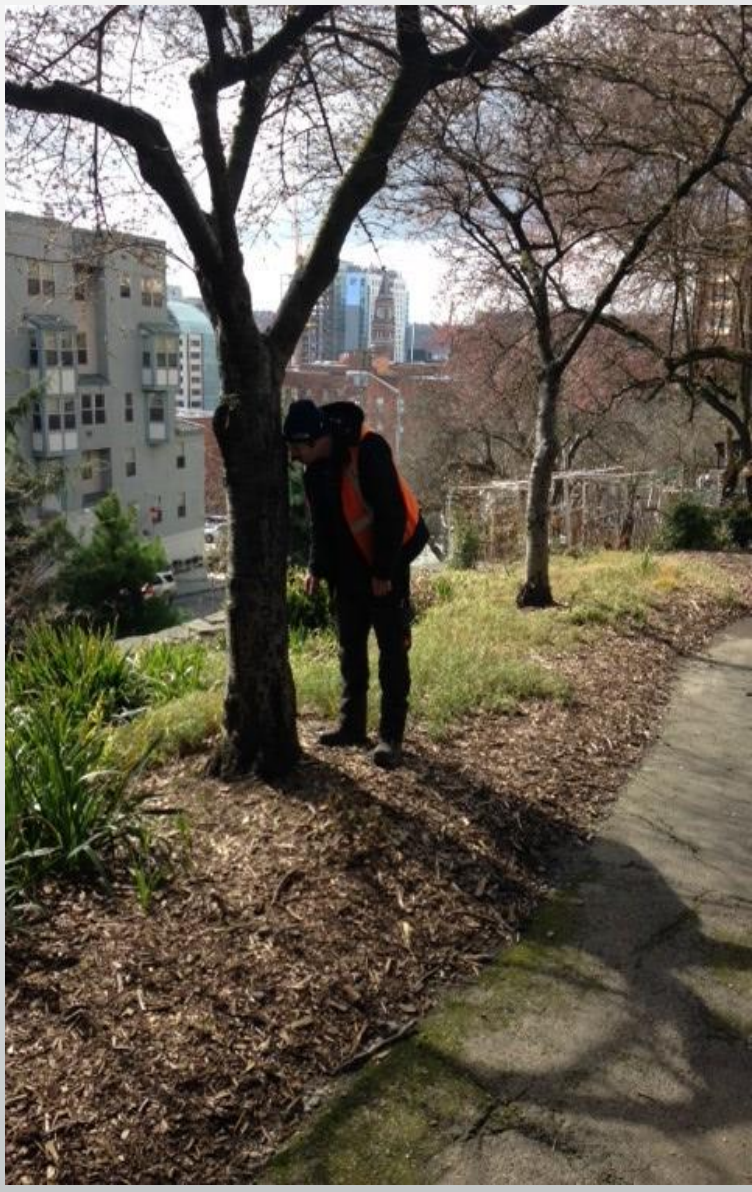
Tree Risk Inspections Terms & Matrix

TERM	DEFINITION
Likelihood of failure and impacts	
Imminent	Failure has started or is most likely to occur in the near future even if there is no weather forces/rare occurrence. Will fail in a storm.
Probable	Failure may be expected under normal weather within a time frame. Likely to fail in a severe storm.
Possible	Failure could occur, but is unlikely during normal weather. May fail in a severe storm.
Improbable	Tree or branch failure not likely under normal conditions and may not fail in severe weather within a time frame.
Risk rating	
High	Failed tree or part will likely impact a target. Fixed target fully exposed or high use road, adjacent street tree.
Medium	Failed tree or part may or may not impact target with equal likelihood. Frequently used area, fully exposed target on one side of a tree – partially protected house.
Low	Is not likely to fail or have an impact. Occasionally used area fully exposed to tree, constant target, well protected.
Very Low	Remote chance of impact. Rarely used site fully exposed, occasionally used but protected.
Consequence of failure	
Severe	Serious personal injury or death, damage to high value property or disruption of important activities.
Significant	Property damage of moderate to high value, damage of considerable distribution or personal injury.
Minor	Low to moderate property damage or small disruptions to traffic or a communication utility.
Negligible	Low value property damage or disruption that can be replaced and does not involve personal injury.
Occupancy rates of target (building, space, structure, person, etc.)	
Constant	Target present at all times or nearly all times
Frequent	Target is present for large portion of the day.
Occasional	Target is present infrequently or irregularly.
Rare	Target is very uncommon in target zone.
Normal Weather	30-year cycle of weather minus the few abnormal weather events.

Matrix 2. Risk rating matrix.

Likelihood of Failure & Impact	Consequences of Failure			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low

Inspections



What we find

Porodadalea pini, red ring rot

- Canker rot which is found on old cuts and can be spread by insects or spores
- Very common on Doug fir trees
- 1-2 small conks could be monitored with inspection interval
- Large conk should have an advanced assessement
- Many small conks or several large conks could be cause for removal

Effects of Porodadalea pini on Doug fir

Phaelous schwinitzii, vevet-top fungus

- Root rot or heart rot
- Very common on Doug fir trees. I have seen it on grand firs, hemlocks and larch.
- Trees will appear bottled and tend to fail at stem around the top of the bottling
- If you choose to retain a tree with P. schwinitzii consider location, root inspection and reducing height of tree as tree will eventually not be wind firm
- Do not replant susceptible species

Effects of Phaelous schwinitzii

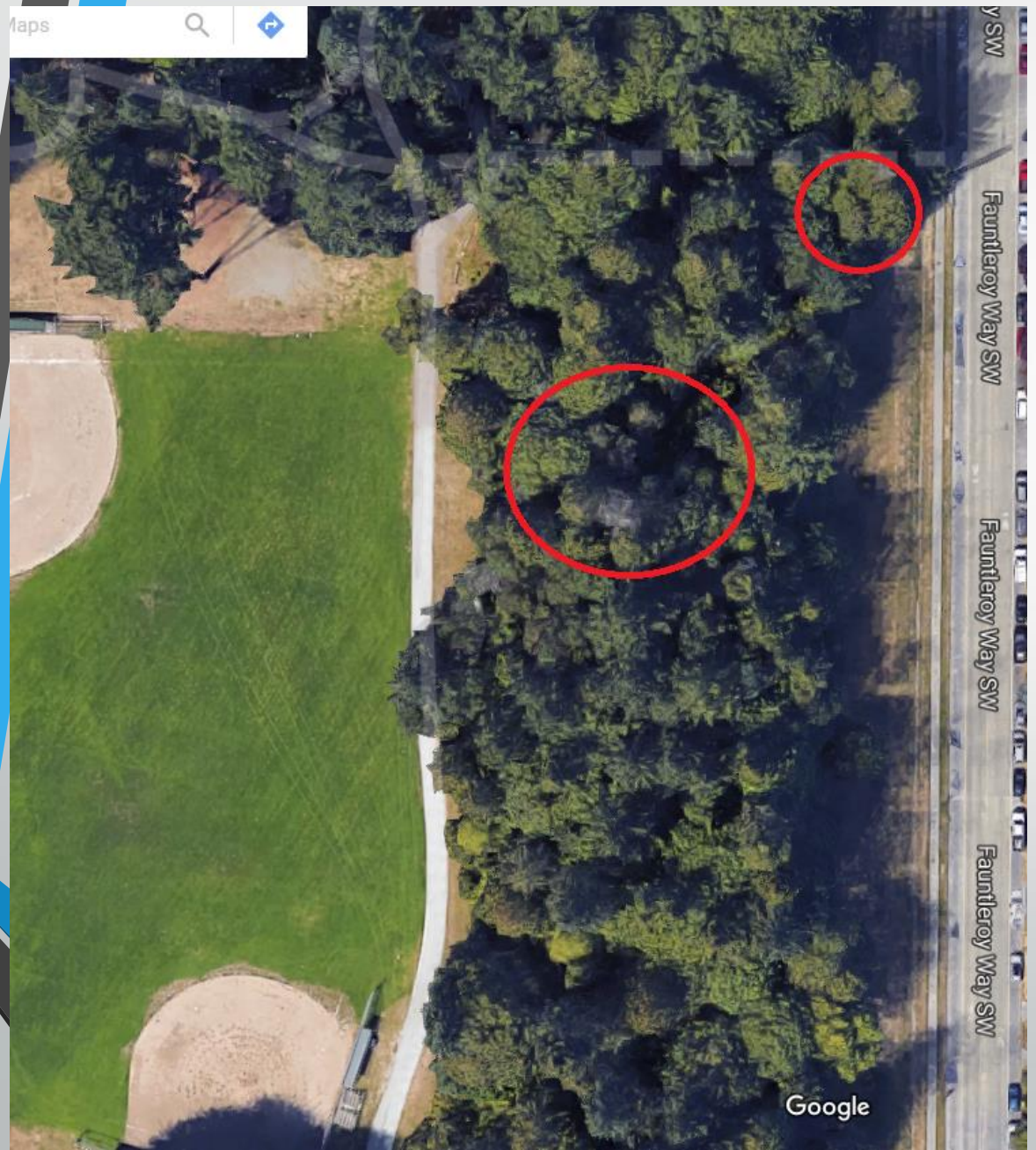
Effects of Phaelous schwinitzii

Phellinus weirii, Laminated root rot

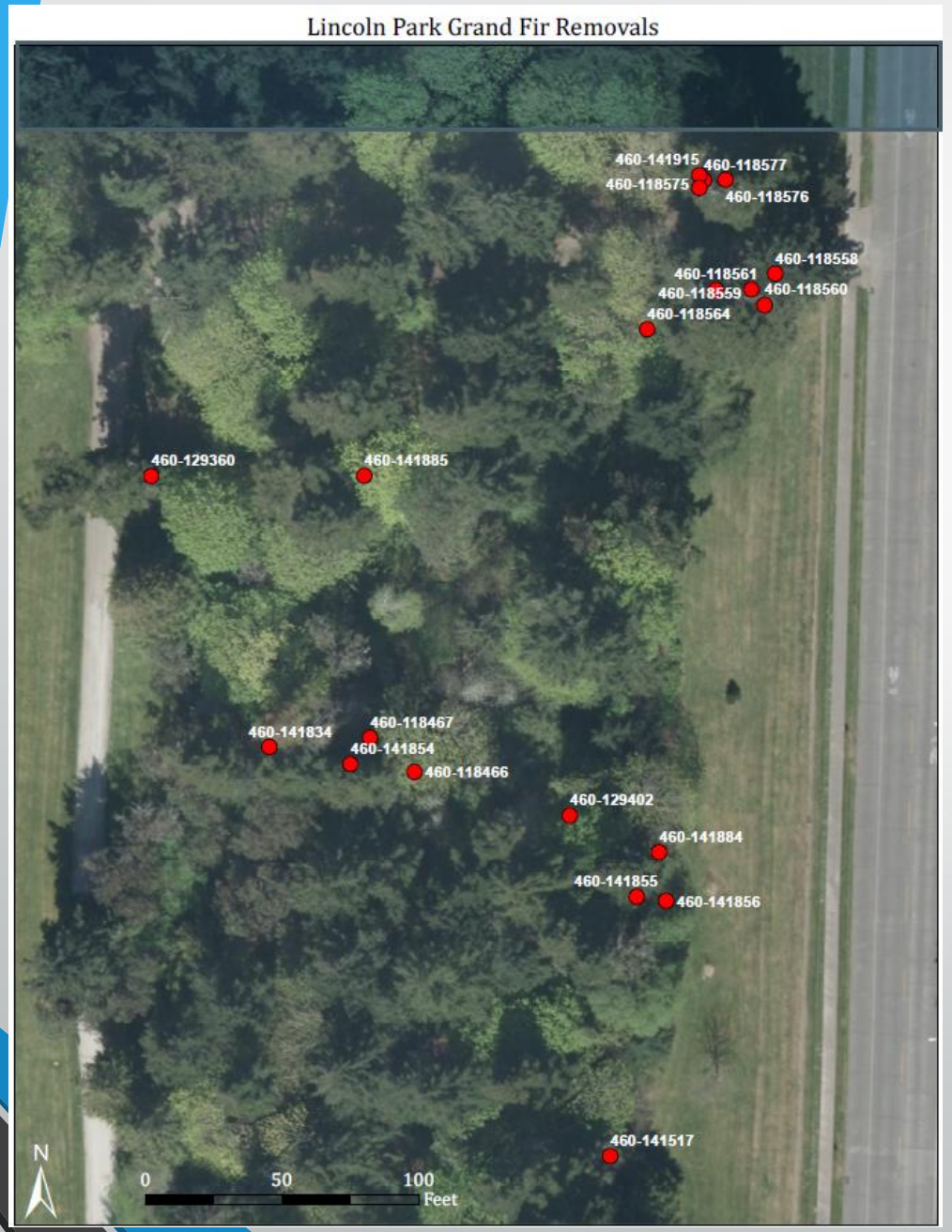
- Root rot that will kill all types of roots thus most likely defoliating the tree before if fails from wind forces
- Effects native conifers especially Doug fir, Hemlock and we're seeing it in drought stressed grand firs.
- Trees will defoliate from top down and die. Trees can also have stunted apical growth.
- Remove effected trees in urban areas
- Can last in area saprophytically for 100 years
- Do not replant susceptible species

Effects of Phellinus weirii

Laminated Root Rot at Lincoln Park



Laminated Root Rot at Lincoln Park



- Over 25 grand fir trees removed or reduced so they would not fail into the road. These trees were very large often over 100’ and old, probably planted in the 40’s
- Six month monitoring program where any tree with a dying top will be removed

Ganoderma applanatum, artist's conk

- Will grow on dead or live wood
- Causes a heart rot
- Can scratch and easily drawn on white underside. This distinguishes it from Fomitopsis pinicola, red belt fungus
- Effects broad-leaves or conifers but most common on big leaf maple
- Trees can compensate for loss in heart wood stability by "Eiffel Towering"
- Sound with mallet, use resistance drill or tomography unit to determine decay extent. Prune or remove based on findings
- Do not replant susceptible species

Effects of Ganoderma appalantum

Ganoderma applanatum, artist's conk

Kretzchmaria duesta, brittle cinder

- Canker rot that causes a soft wood rot, pocketed heart rot.
- Can consistently defeat wall 4 in an effort to keep wound open to get itself oxygen to grow
- Is not detectable by sonic tomography
- Found on broad-leaves especially big leaf maple and often on trees also affected by G. applanatum
- If found assume some part of the tree is decayed. Sound area with mallet, use resistance drilling, consult someone with experience in this decay organism

Effects of Kretzchmaria duesta

Armillaria sp., Shoestring Fungus

- Root rot and heart rot that effects conifers and broad-leaves
- Associated with over watering and fertilization
- Conks have a ring and usually light colored with darkening towards the center.
- Can cause sap weeping on the lower trunk
- Will destabilize trees and make them susceptible to wind throw
- Do not replant with susceptible species

Armillaria sp., Shoestring Fungus

The Tripler

-K. duesta

-G. appalantum

-Armillaria sp.

Recent Lincoln Park Stem Failure

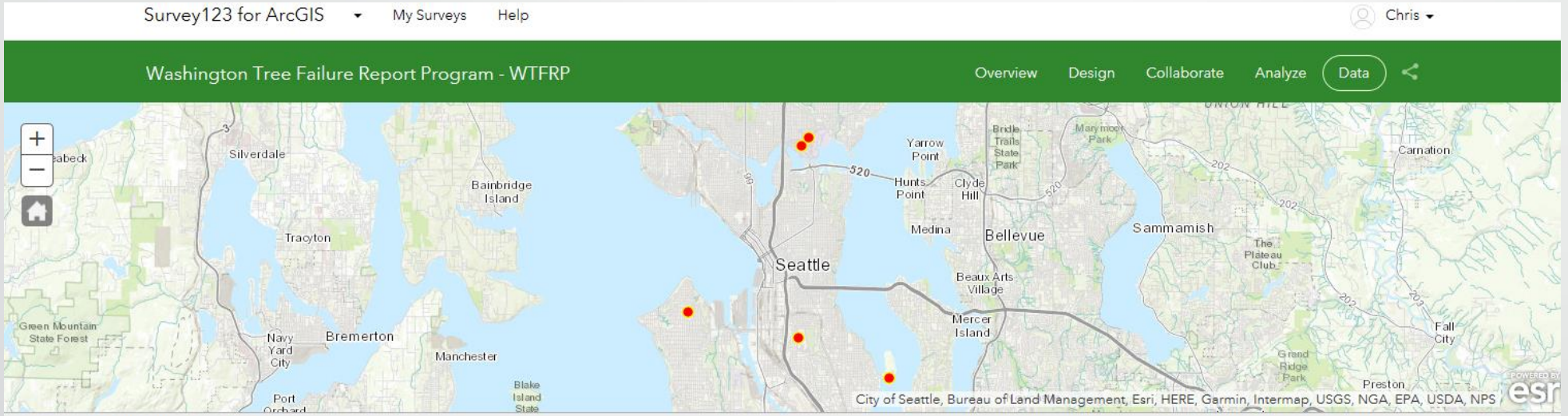
- Big Leaf Maple off low use trail
- Inventoried by Contractors in 2016 as "Low" risk
- 89" DBH and 80' tall
- Large honey bee nest in upper crown
- Had previous failure but no signs of decay organisms during visual inspection
- I agreed that is was a low risk tree and did not prescribe pruning

Recent Lincoln Park Stem Failure

- Tree had evidence of Armillaria sp., Kretzchmaria duesta and possibly some other kind of decay organism

- But it was still a "Low" risk tree and we do not have the resources nor would the public tolerate us removing or drastically pruning all the "Low " risk trees in the park system so failures like this will continue and sometimes people or property will be impacted

Washington Tree Failure Report Program



surveyPoint (5 features, 0 selected) Options

Date Of Failure	Tree Specie	Diameter of Tree	Height of Tree	Condition	Failed Part	Root Failure	Branch Failure	Stem Failure	Notes
Mar 31, 2017	Acer macrophyllum (Big Leaf Maple)	32	80	Dead	Stem			Decay_Present_ (enter_name_if_known)	
Oct 14, 2016	Ulumus Americana (American Elm)	34.5	71	Fair	Stem			Bad_Attachment_ (included_bark/codominant),Weather_Forces_ (wind/rain/snow)	Tree was cabled. See story here. https://facilities.uw.edu/blog/posts/2016/10/07/george-washington-tree-splits
Apr 7, 2017	Pseudotsuga menziesii (Doug Fir)	23	70	Good	Stem			Weather_Forces_ (wind/rain/snow),Decay_Present	at one point the tree had a co-dominate top. It was either pruned off