Pioneer Park: A case study in root disease management

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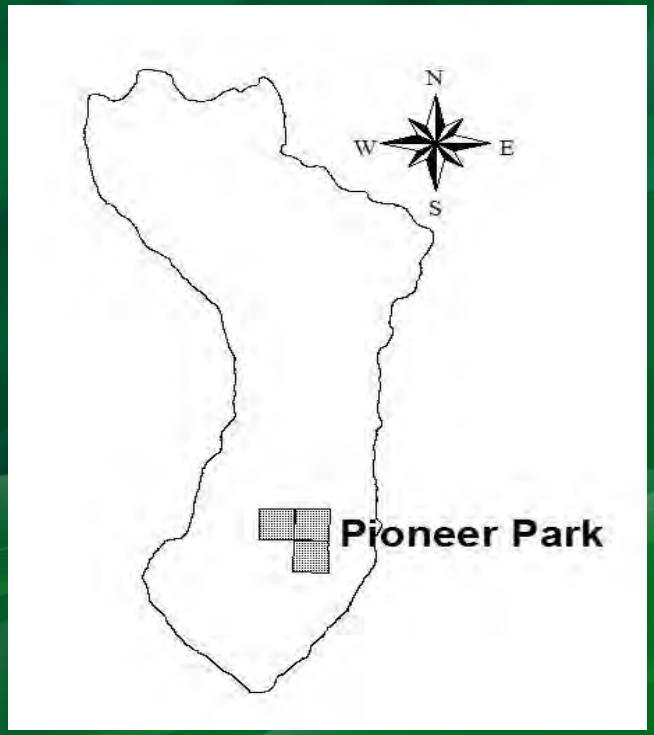
This presentation

- My experience and opinions only
- Nothing is a policy of the City of Mercer Island
- Not a substitution for training in tree risk or pathology
- My contention

Pioneer Park

Setting

- 3 quarters of a quarter section=
- 120 acres
- Flat to gently sloping
- Bounded by roads and houses



Pioneer Park

History

- Second growth forest
- Purchased in 1964
- Put into Trust in 1992
- Volunteer citizen board directs the overall management of the park

Description of the problem

Forest with endemic diseases

- Fungal diseases coexist with trees
- Trees grow and mature while hosting diseases
- Diseases advance when conditions are favorable
- Decay contributes to tree failure

Description of the problem

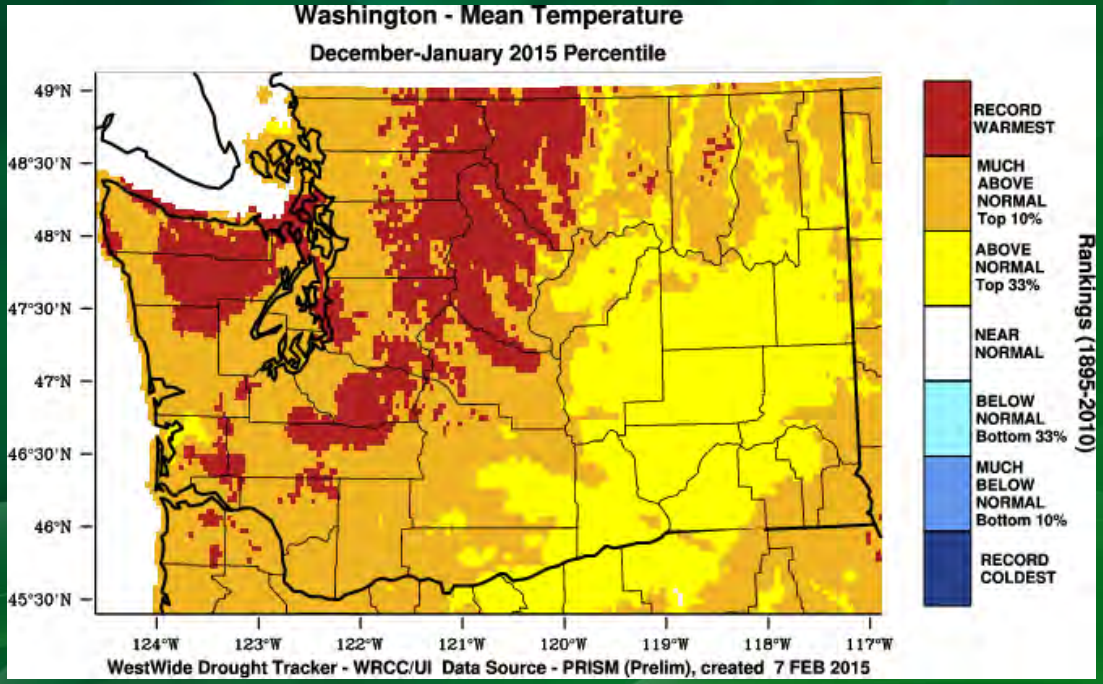
Climate changed, Micro and Macro

- Urbanization caused fragmentation and increased drainage
- Edge effects increased
- Soil temp ↑ 5°F
- Air temp ↑ 10°F

Description of the problem

Climate changed, Micro and Macro

- Regional climate change
- Warmer winter
- 2080 prediction:
  Air temp ↑ 5°F
  Precip ↑ 4%
- Total temp ↑ 10°F!



Description of the problem

Trees near high value targets

- Houses
- Streets
- Park users
- Powerlines

Description of the problem

History of tree failures

- Remnant gap from 1962 Columbus Day Storm
- 2006 Hanukkah Eve Storm gap
- Average winter storm
- Fungal decay a contributing factor

Description of the problem

Available research aimed at commercial forestry

- Goal is avoiding loss of timber assets
- Focus is on disease reduction
- Failure prediction for individual trees not explored
- Research $$ ↓

Description of the problem

Failure prediction is not reliable

- WSU forest, Bonney Lake has LRR
- Ken Russell marked buffer cut
- Buffer trees sorted by crown condition as infected or not
- 40% of “infected” stumps had no staining
- 47% of the stumps with staining had good crown vigor

Description of the problem

More research needed

- 2014 WA State Academy of Sciences report
- "There is now a complete absence of teaching of forest pathology in Washington State due to retirements at the state's two research universities."

Pioneer Park Disease Management

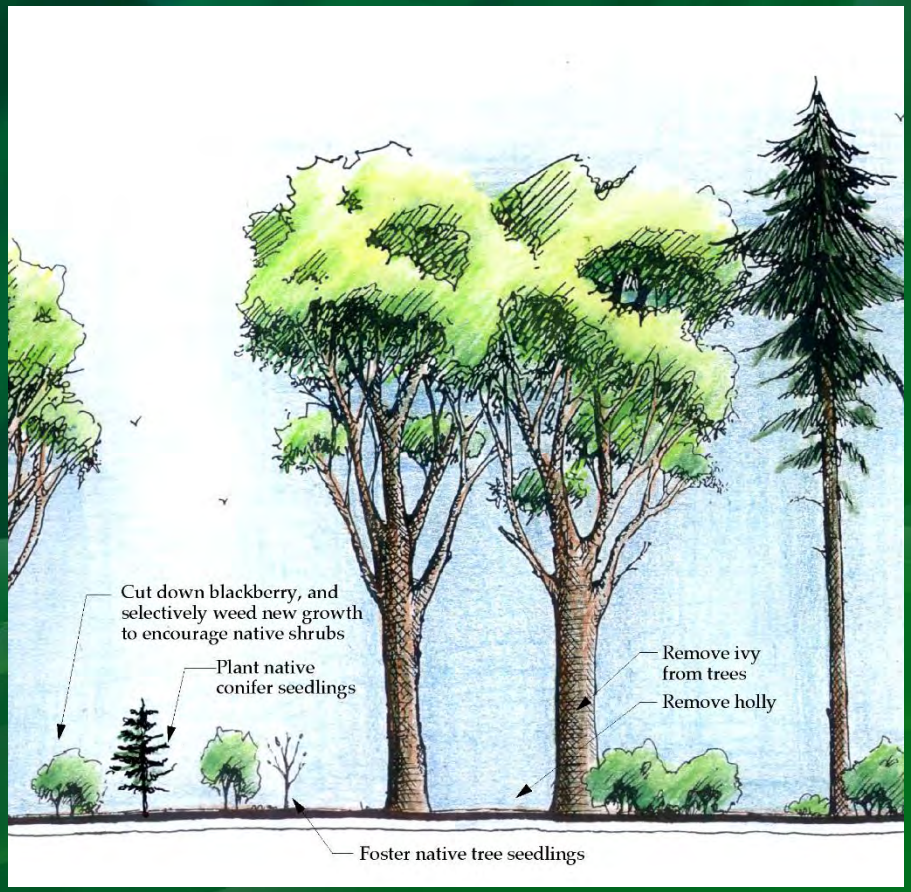
Bob Edmonds Study (1998)

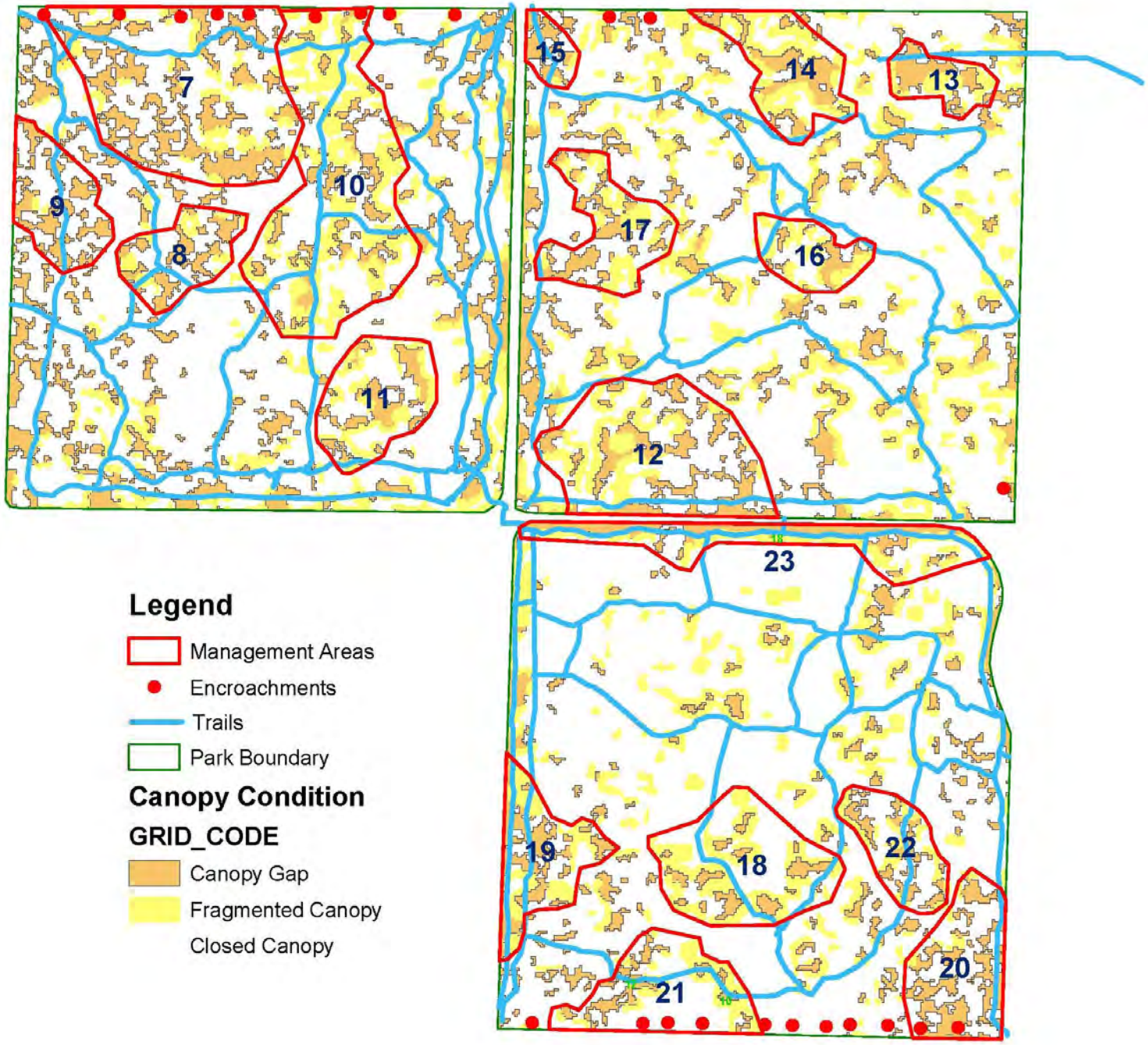
- Trust board recognized problem
- 50 disease centers were identified
- Proposed 6 alternatives
- Trust board decided to plant resistant species

Pioneer Park Disease Management

Pioneer Park Forest Management Plan (2003)

- Incorporated Edmonds report
- Adopted *Evaluating Trees for Defect* (Hayes, 2000) for risk protocol
- Adopted strategy of using native regeneration with conifer planting

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Legend
Management Areas
Encroachments
Trails
Park Boundary
Canopy Condition
GRID_CODE
Canopy Gap
Fragmented Canopy
Closed Canopy

Pioneer Park Disease Management
Hanukkah Eve Windstorm (2006)

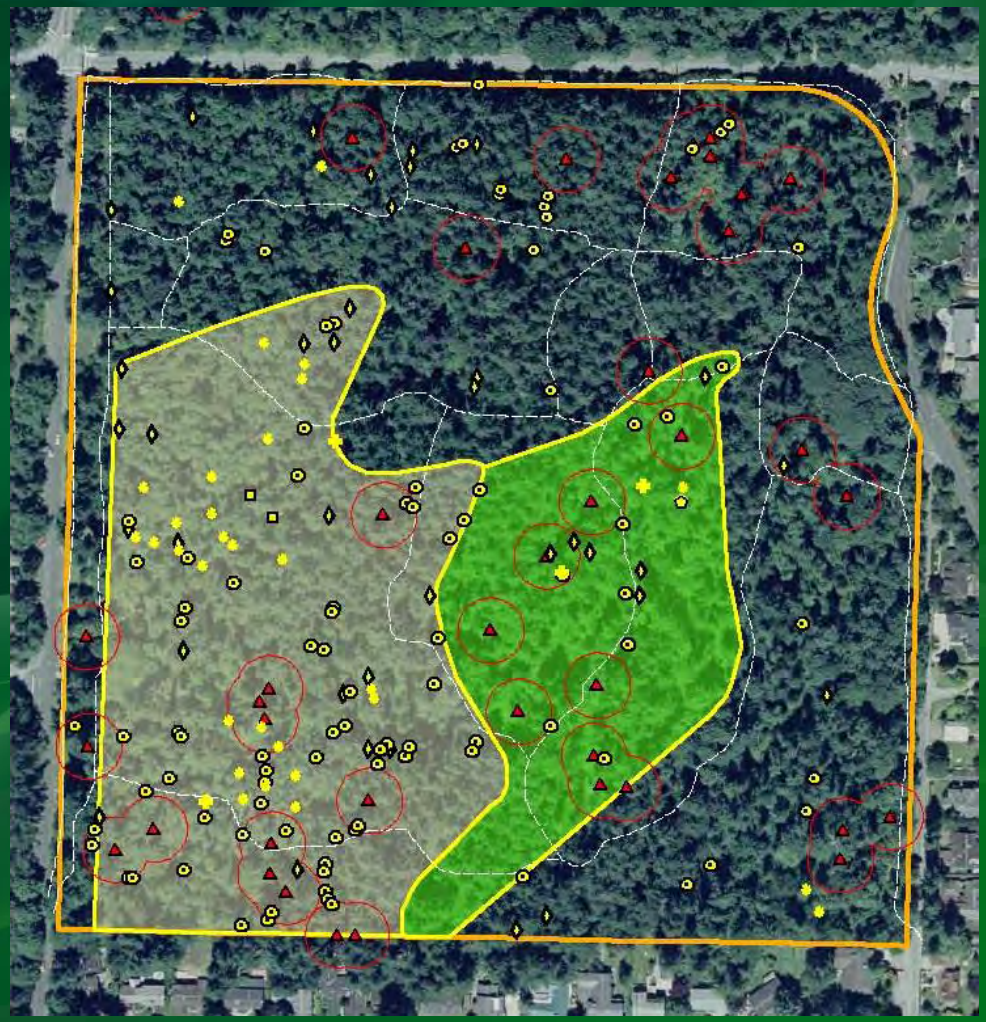
- Peak gusts 90 mph
- Significant blowdown
- Trustee surveyed tree loss
- 2.5 acre gap
- DNR forester painted a gloomy picture

Average Peak Instant Gust (mph)	Windstorm Category	Approximate Return Interval
39-44	Minor	Several per year
45-54	Moderate	Annual
55-64	Major	Once every 2–3 years
65-74	Extreme	Once every 5–10 years
75+	Phenomenal	Once every 25–50 years

Pioneer Park Disease Management

Tom Hanson Plan (2007)

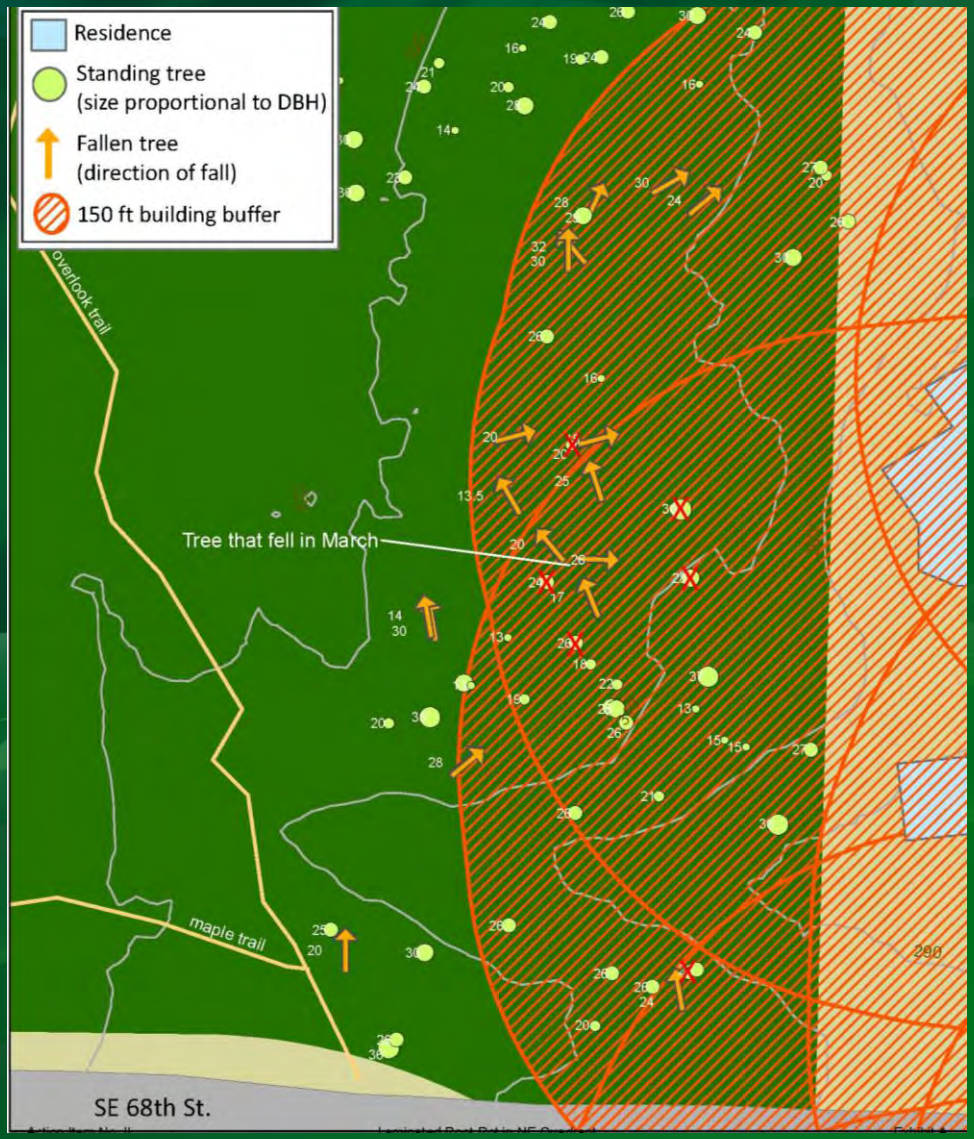
- Trust board wanted to manage root diseases
- Could timber offset restoration costs?
- Hanson proposed 11 acres for clearing and 6 acres for selective cutting
- Not enough timber to cover restoration
- Trust rejected the plan



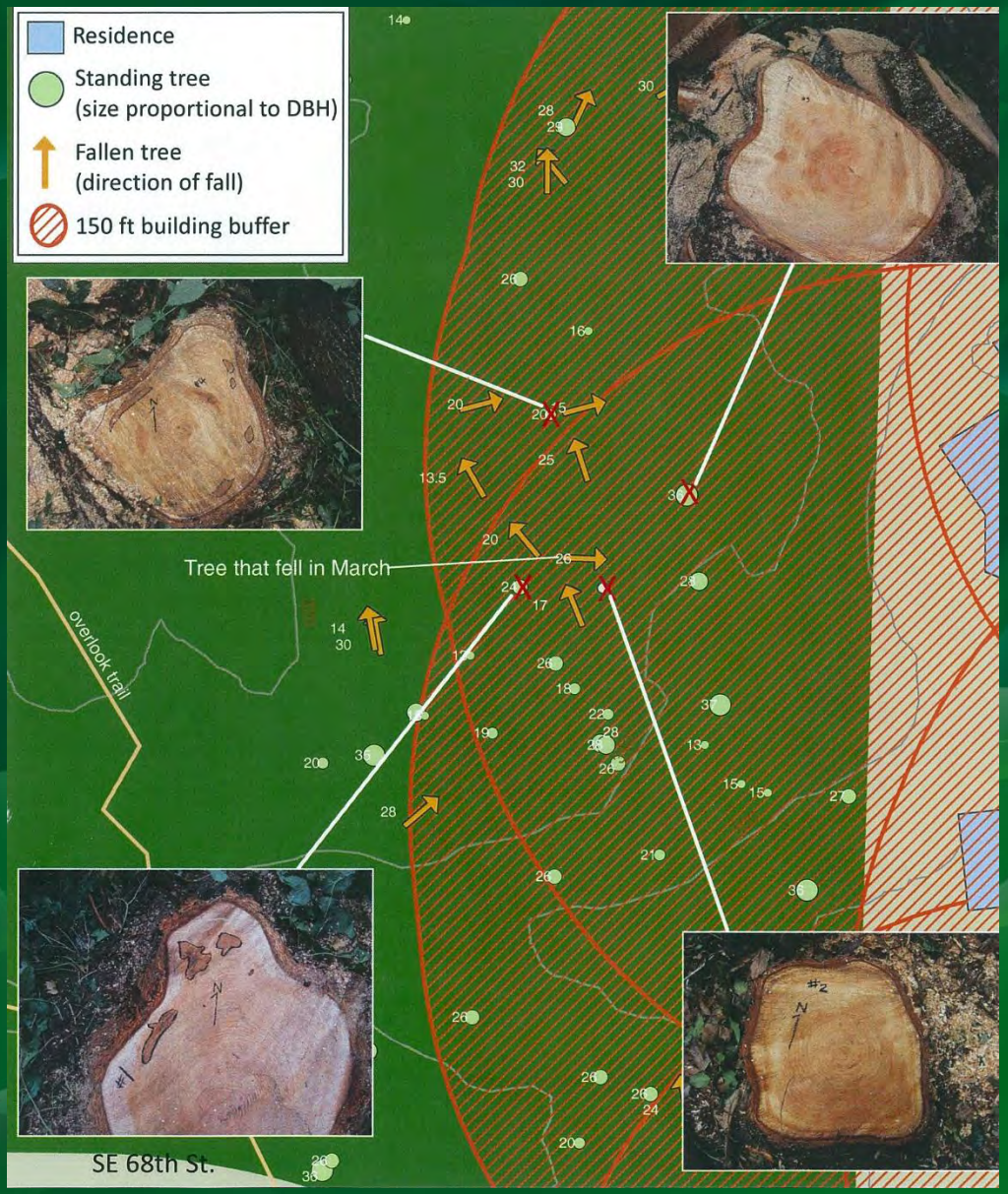
Pioneer Park Disease Management

NE Quadrant blowdown (2009)

- Douglas fir fell on house
- Past failures in vicinity
- Mapped failures
- Trust board approved buffer cutting
- Cut four trees, observed staining



NE Quadrant blowdown (2009)



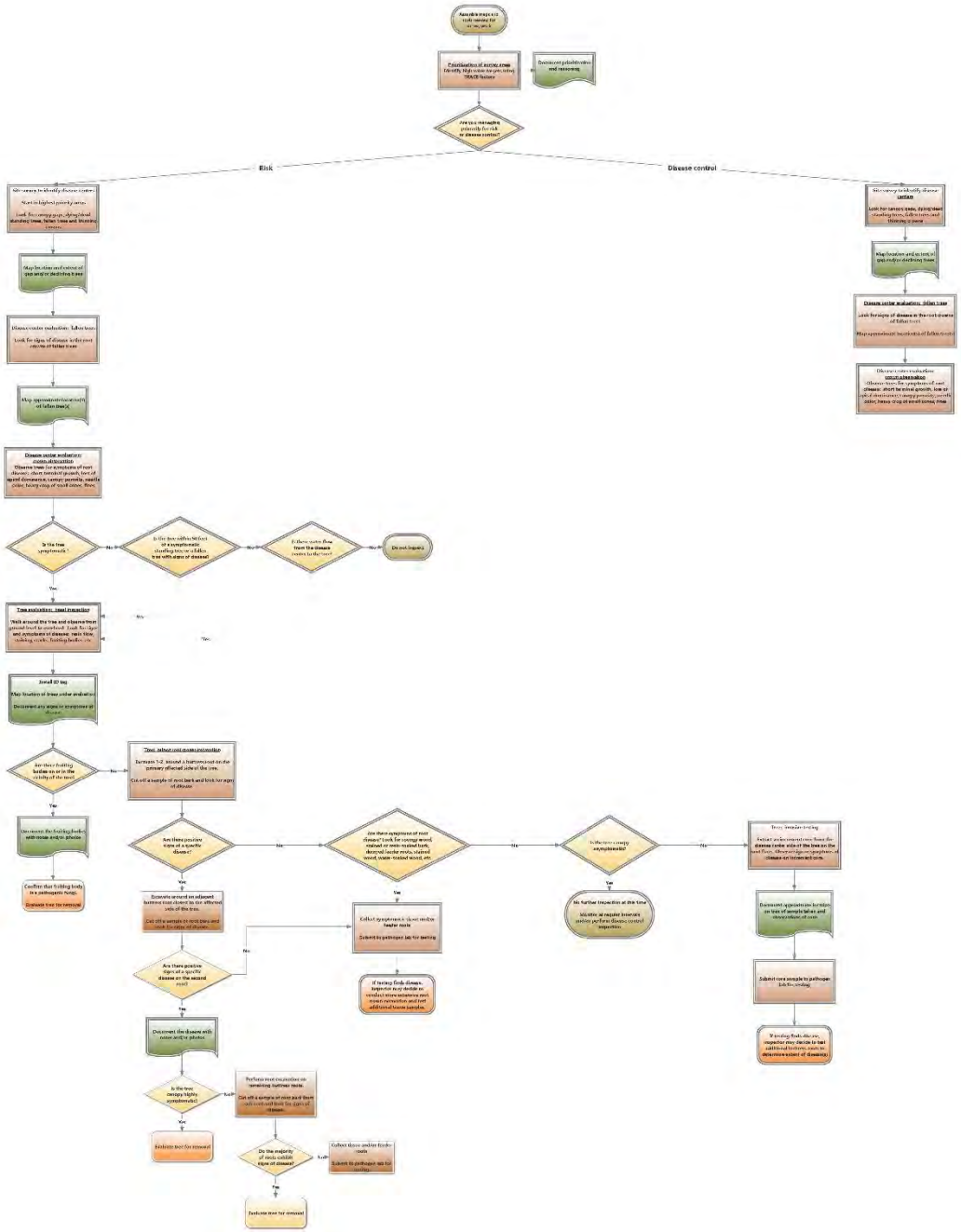
Pioneer Park Disease Management

Olaf Ribeiro, Paul Hans Thompson field study (2011)

- Field visit to Juanita Woods
- Pioneer Park root disease investigation in the NE quadrant
- Bainbridge Island lab study
- Inspection protocol drafted afterwards by MI staff

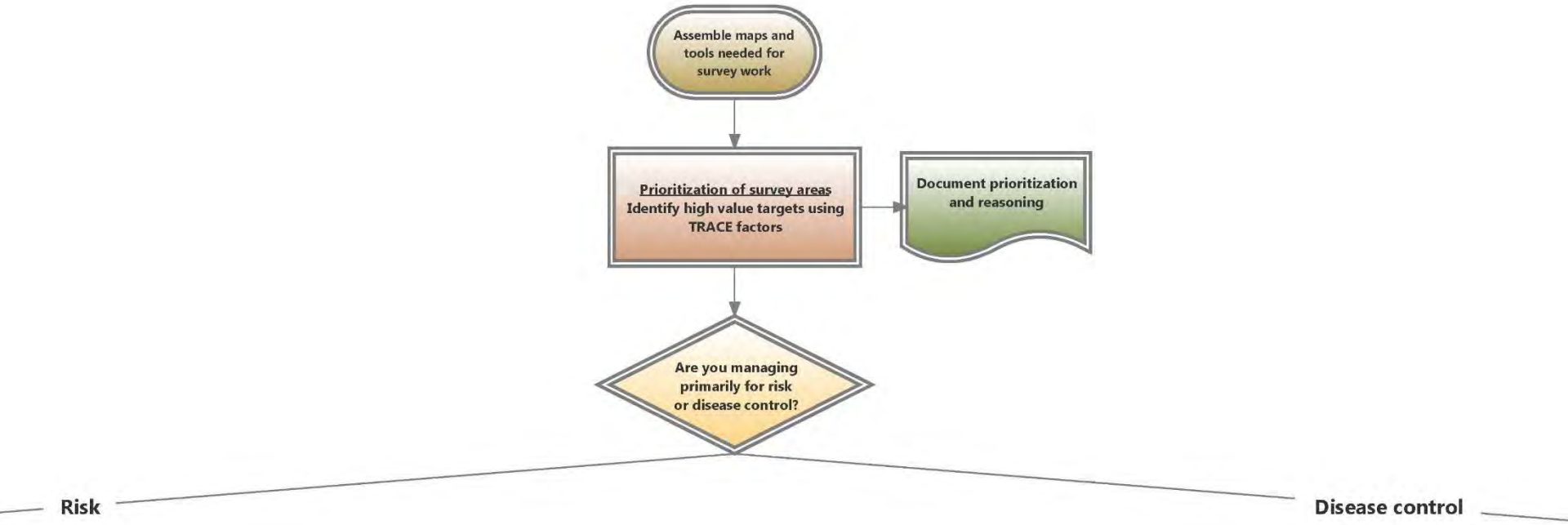
Inspection Protocol

- This is a draft protocol intended to give a general direction for a future standard of care.
- The idea is not that every inspection would follow all of these steps, but rather that the ideal process would be outlined and that one could adapt the process for the realities of the organization or situation at hand.
- This would not a replacement for TRAQ training, but one of many tools for tree risk assessors.


Risk
Disease control
Do not inspect
No
Yes

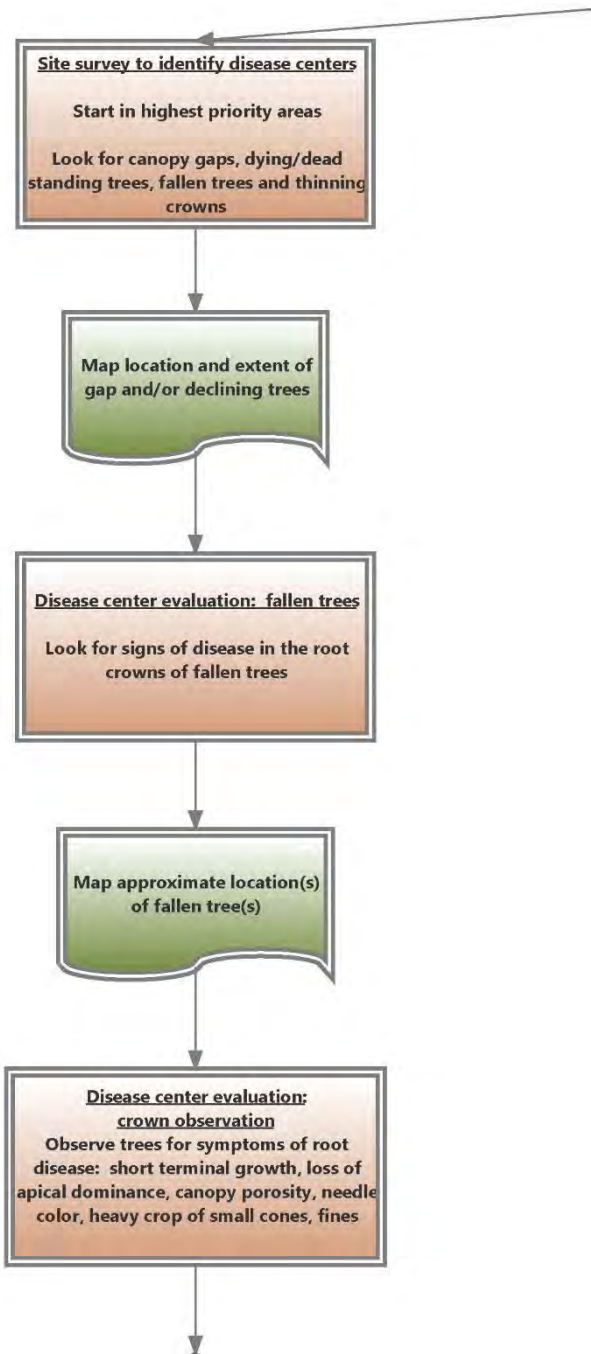
Inspection Protocol

Is the goal disease control or risk management?



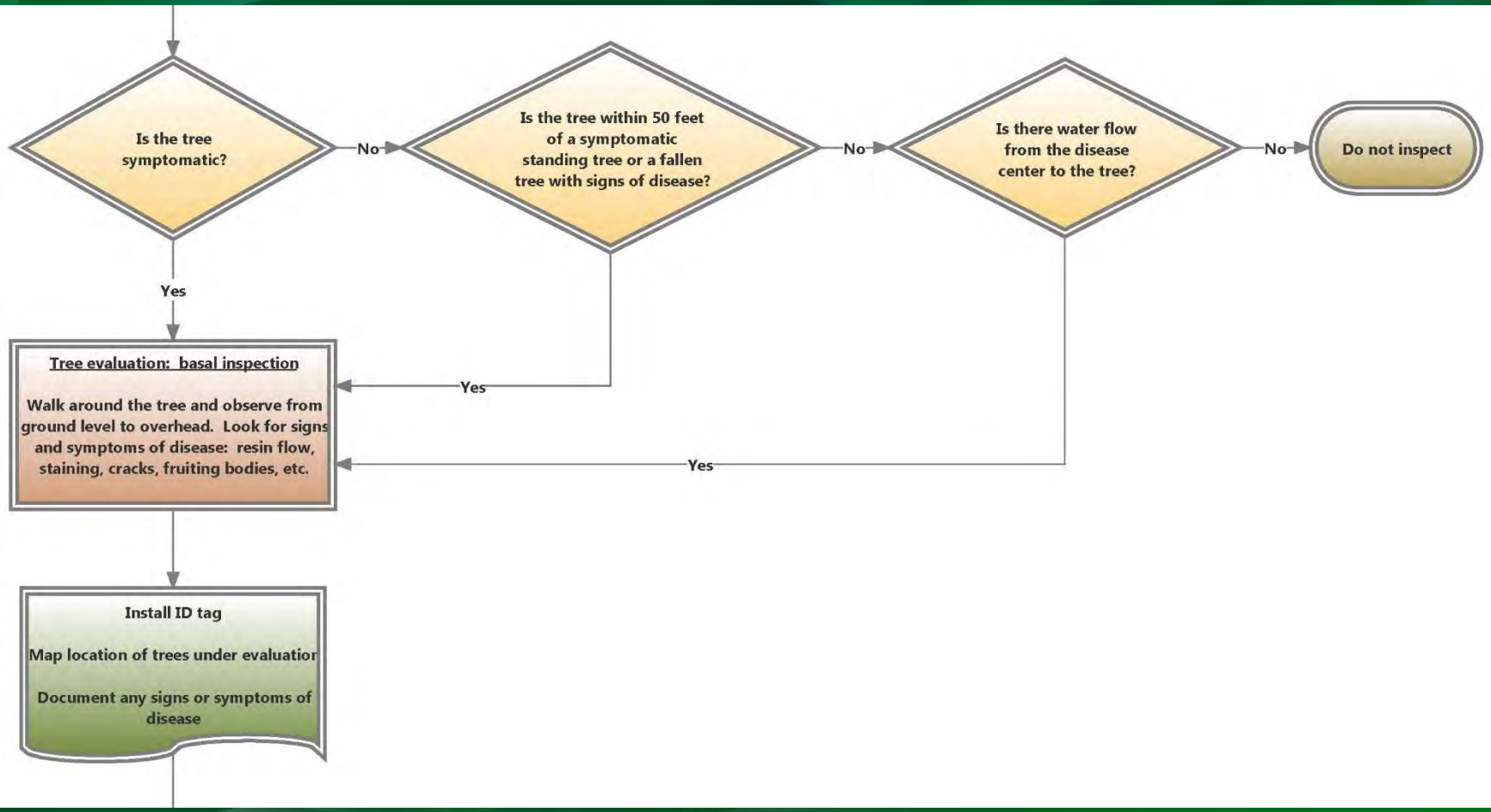
Inspection Protocol

Disease center evaluation – map existing failures

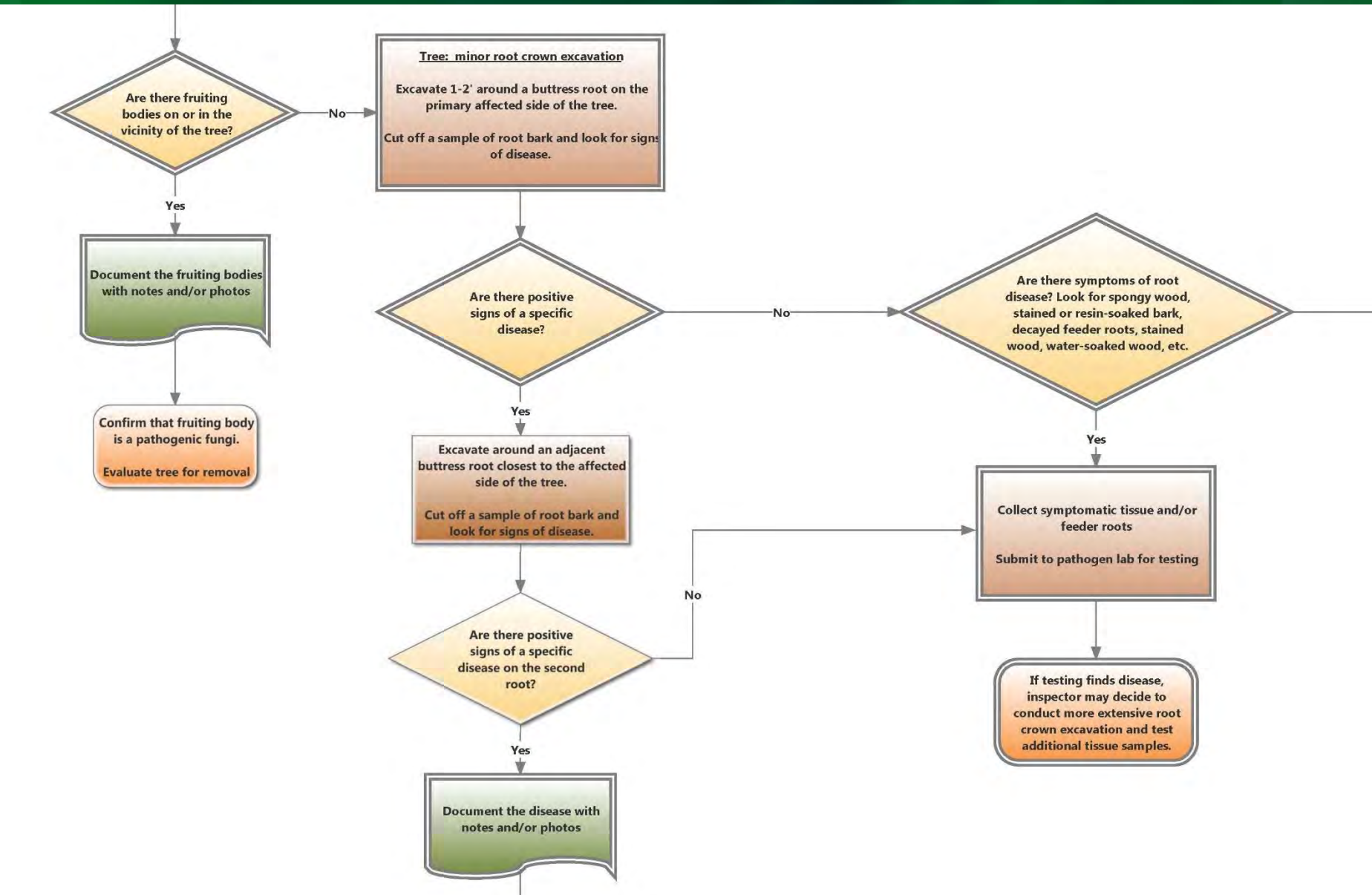


Inspection Protocol

Crown observation

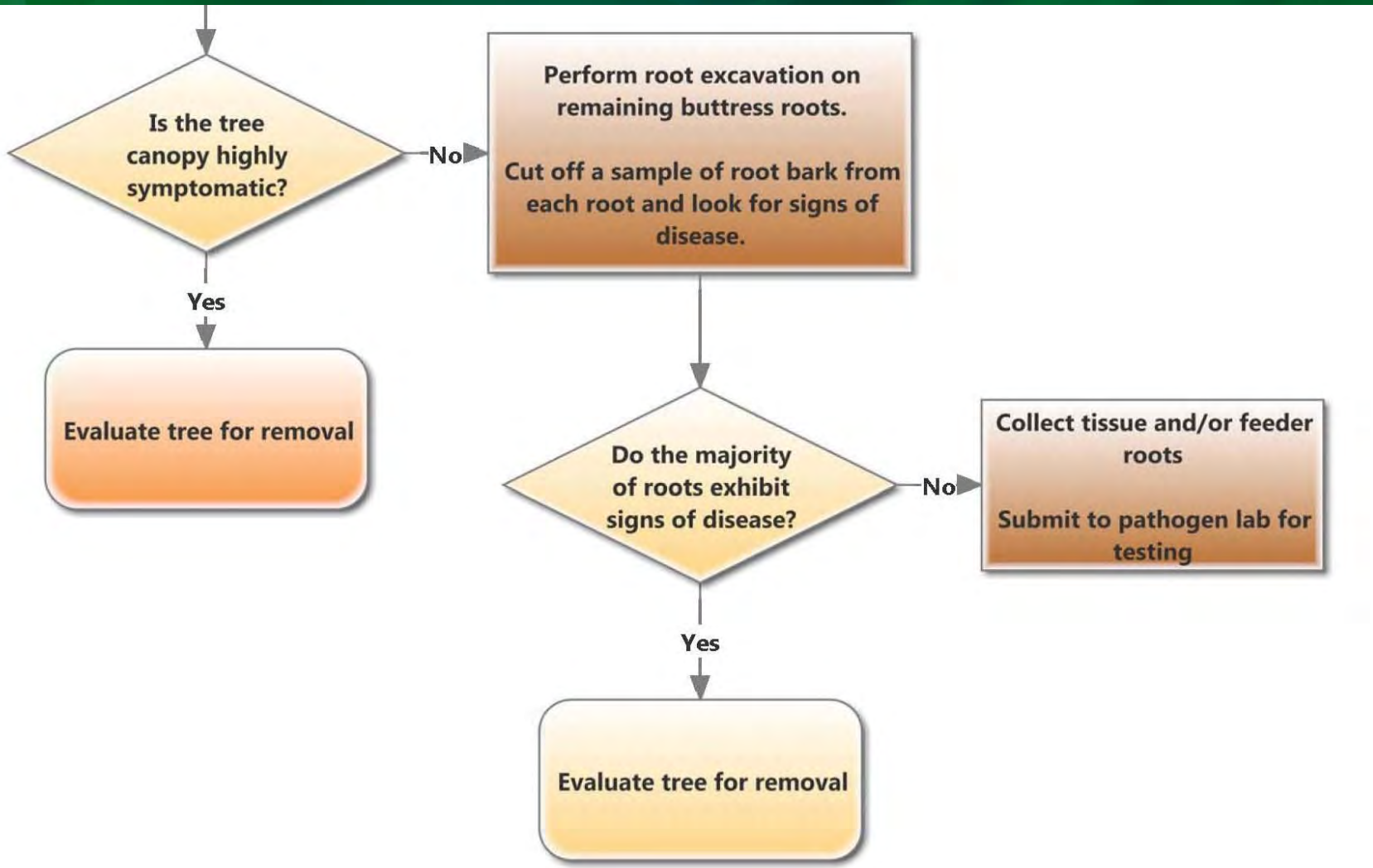


Inspection Protocol - Basal inspection

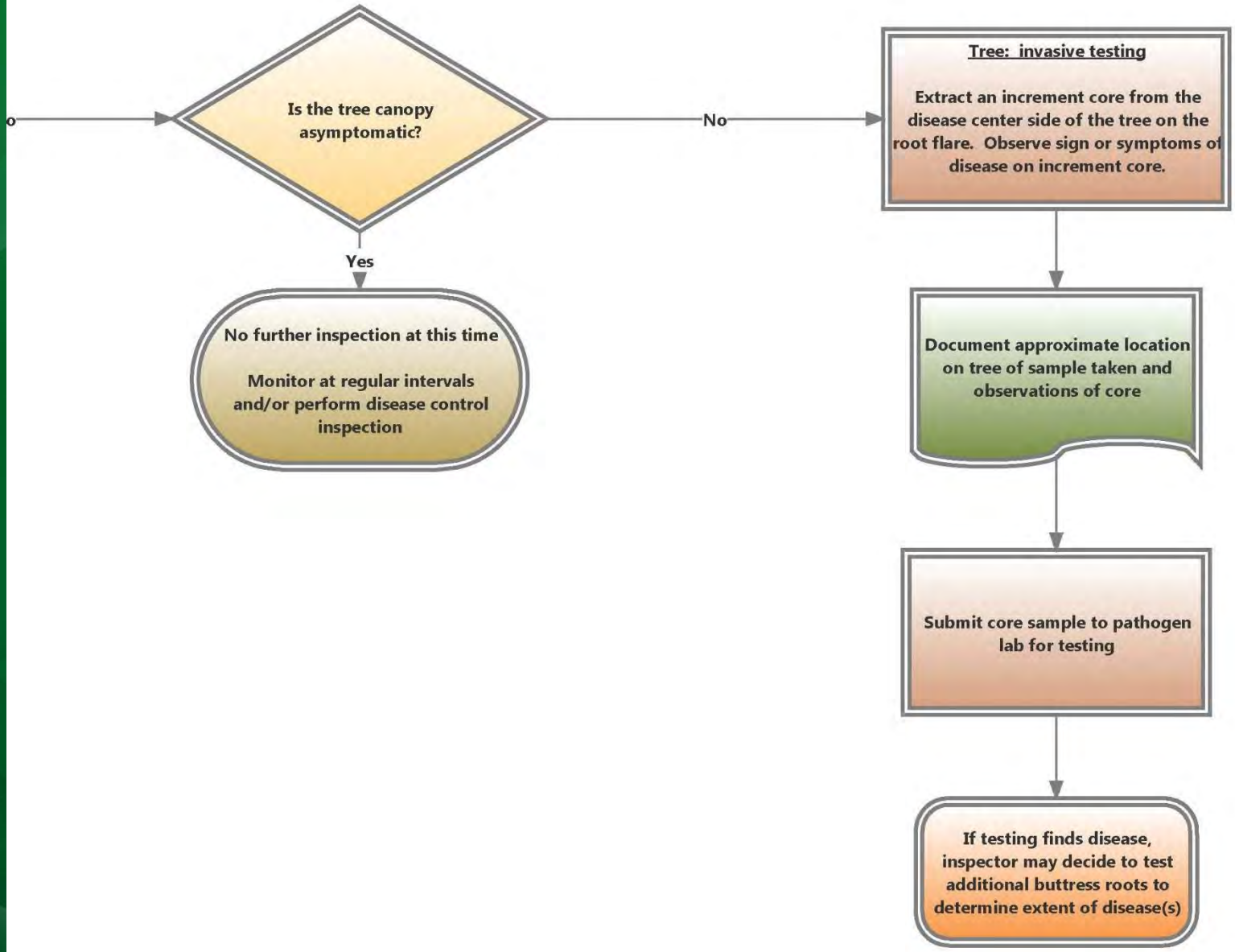


Inspection Protocol

Decision to do root crown excavation



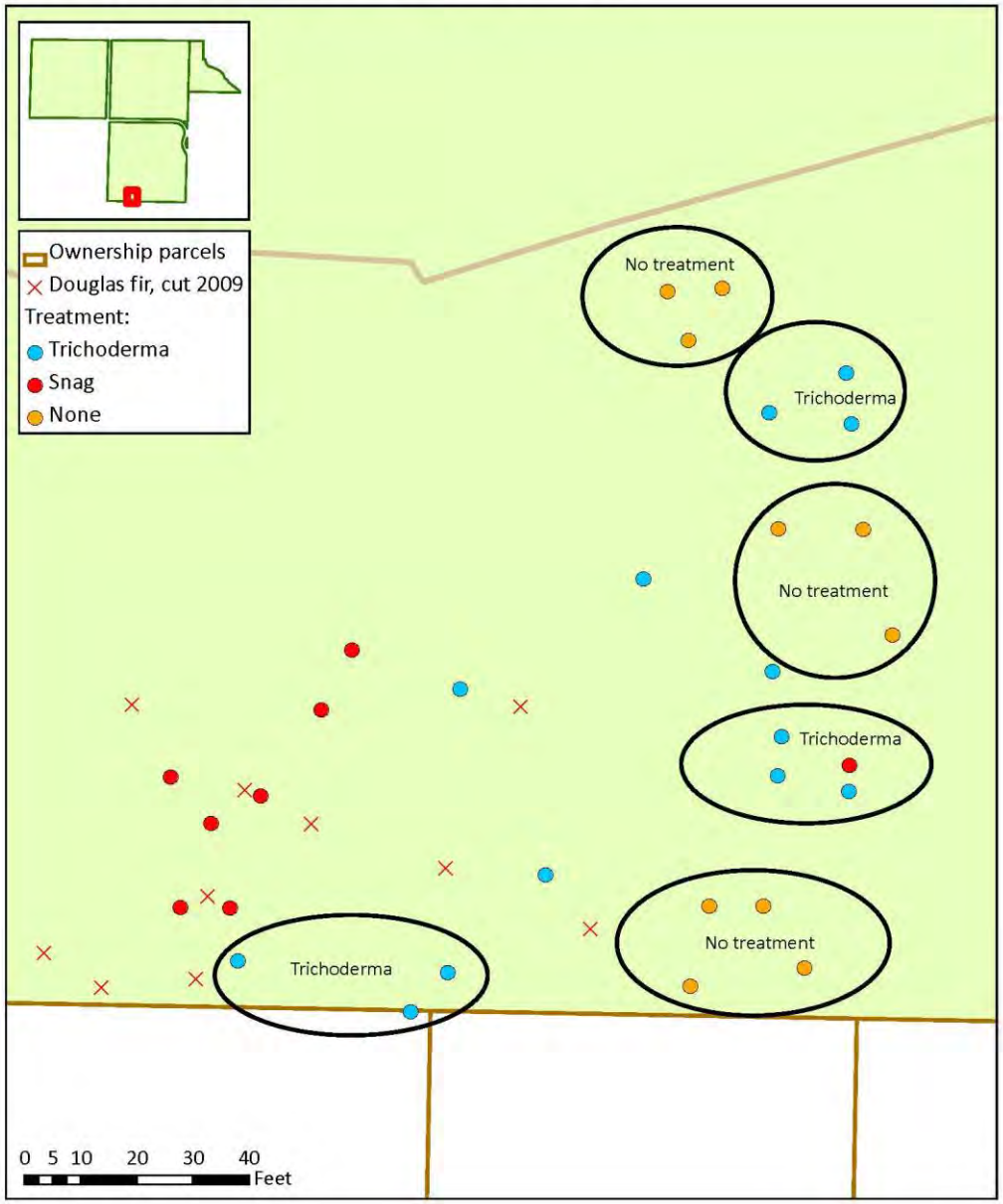
Inspection Protocol - invasive testing



Experimental treatments

- Borax
- Trichoderma
- Stumping

Pioneer Park
Southeast Quadrant Root Rot Area



Disease Profiles

- Armillaria – less strength loss with moderate decay
- Phellinus – strength loss before or during early symptoms
- Phaeolus – is fruiting body really a high risk factor?

Research directions

- Test a protocol to see if it reduces failure
- Disease profiles
- Climate change and tree diseases

Resources

- Walk in the woods after storms
- Books
- Workshops