



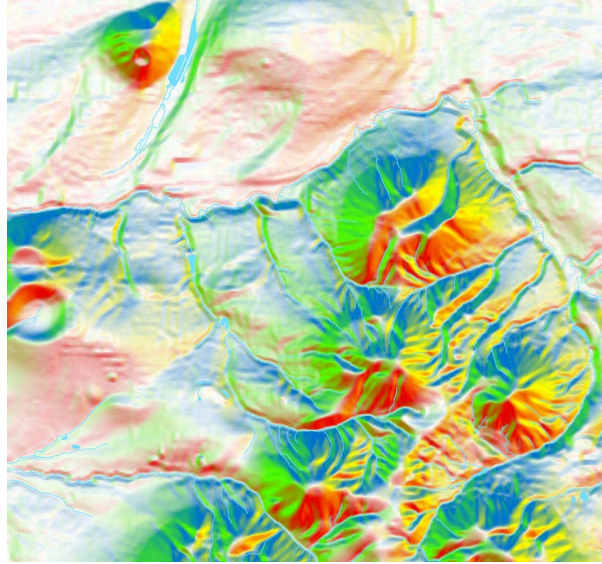
Gresham Forest Dieback Mapping

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Context

Red Alders are dying... Why?



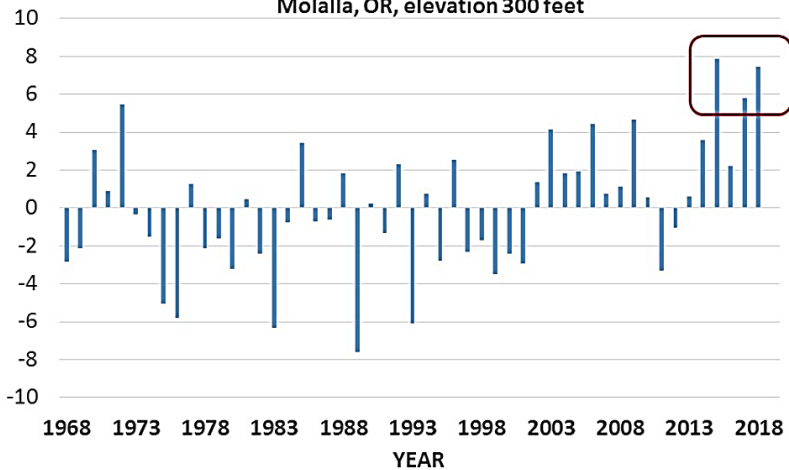
Aging alder stands

Climate change: drought & heat stress

Pests & disease

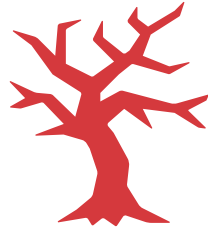
Other abiotic/biotic factors (?)

Summer Moisture Demand - Departure From Average
July-August VPDmax (hPa)
Molalla, OR, elevation 300 feet



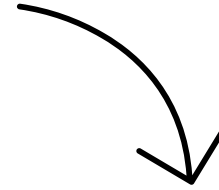
Atmospheric moisture demand during the hot and dry summers of 2015, 2017, and 2018 exceeded past estimates over the last 50 years. Source: Provisional data from the PRISM Climate data explorer <http://prism.oregonstate.edu/explorer/>

Forest Health Assessment Conceptual Overview



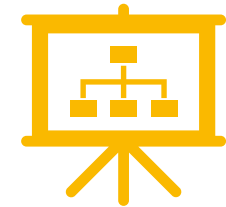
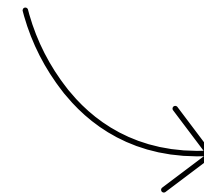
ISSUE

Massive die-off of Red Alders



ASSESSMENT

Forest composition, canopy dieback, understory health



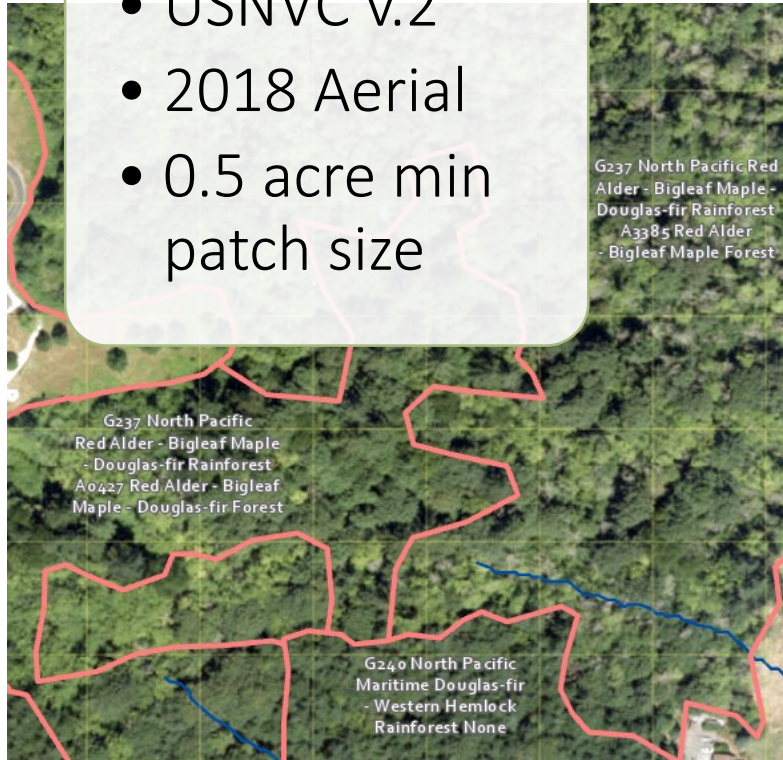
PRIORITIZATION

Ecosystem resilience, risk to city infrastructure & public health and safety

Forest Health Mapping

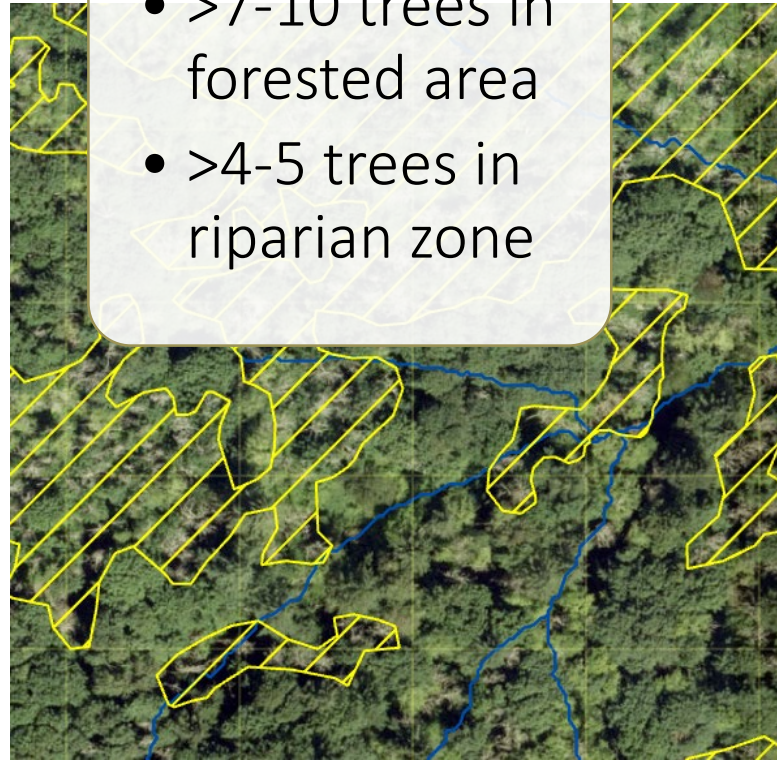
Map Forest

- USNVC v.2
- 2018 Aerial
- 0.5 acre min patch size



Map Dieback

- >7-10 trees in forested area
- >4-5 trees in riparian zone



Map Understory

- % priority invasive cover
- Sig. tree recruitment





Mapping The Forest

Used USNVCv2 system to map
forest stands larger than 0.5 acres
in the City of Gresham

*Pink lines indicate stand boundaries

TOTAL: 3112 ac.

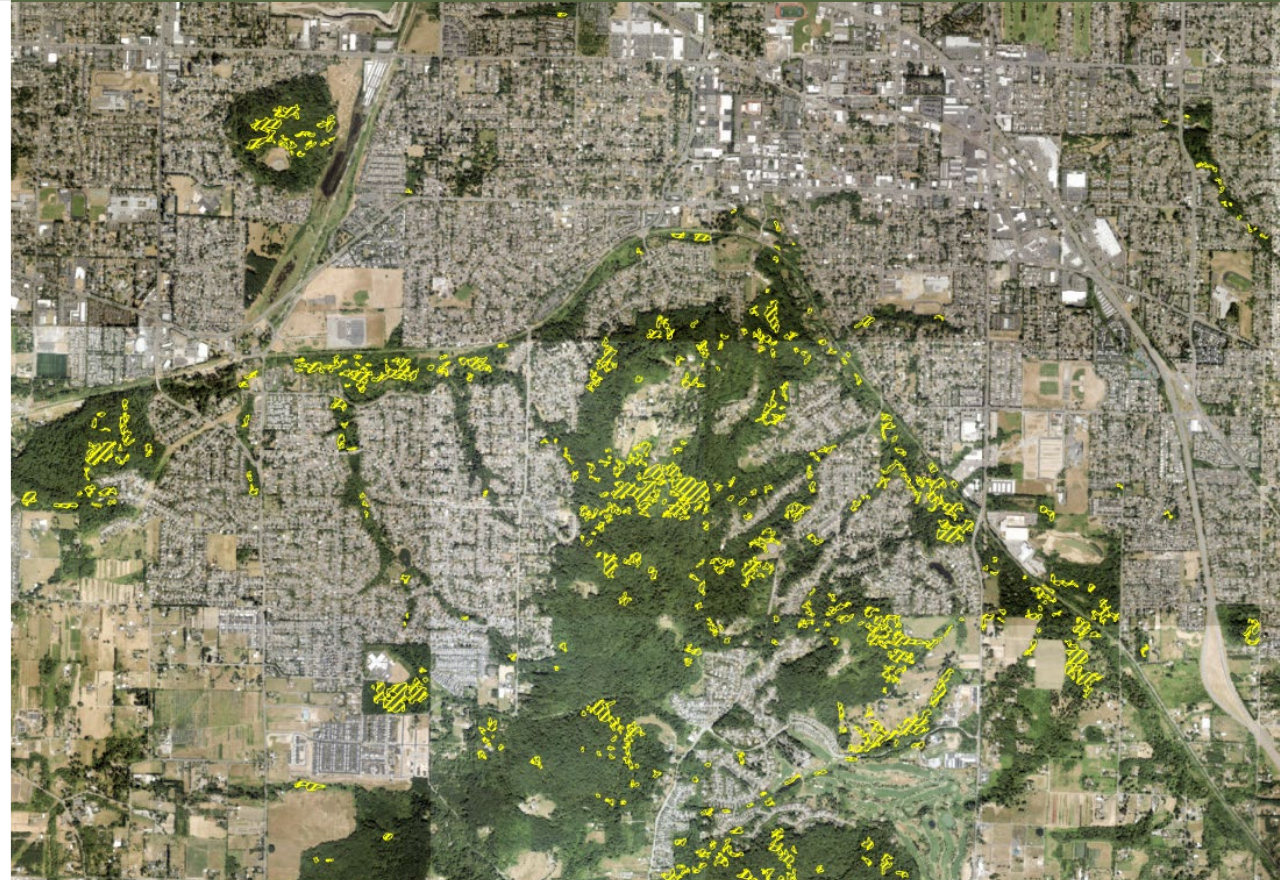
Conifer: 800 ac.

Mixed: 897 ac.

Maple & Alder: 1011 ac.



2014 Aerial Image
1.4 acres, 57 patches



2018 Aerial Image
180.8 acres, 365 patches

Mapping Dieback

*Yellow hashed lines indicate mapped dieback patches

Saddle Trail Alder Dieback Progression (2006-2018)



● 2006 Dead Trees



● 2007 Dead Trees



● 2008 Dead Trees



● 2009 Dead Trees



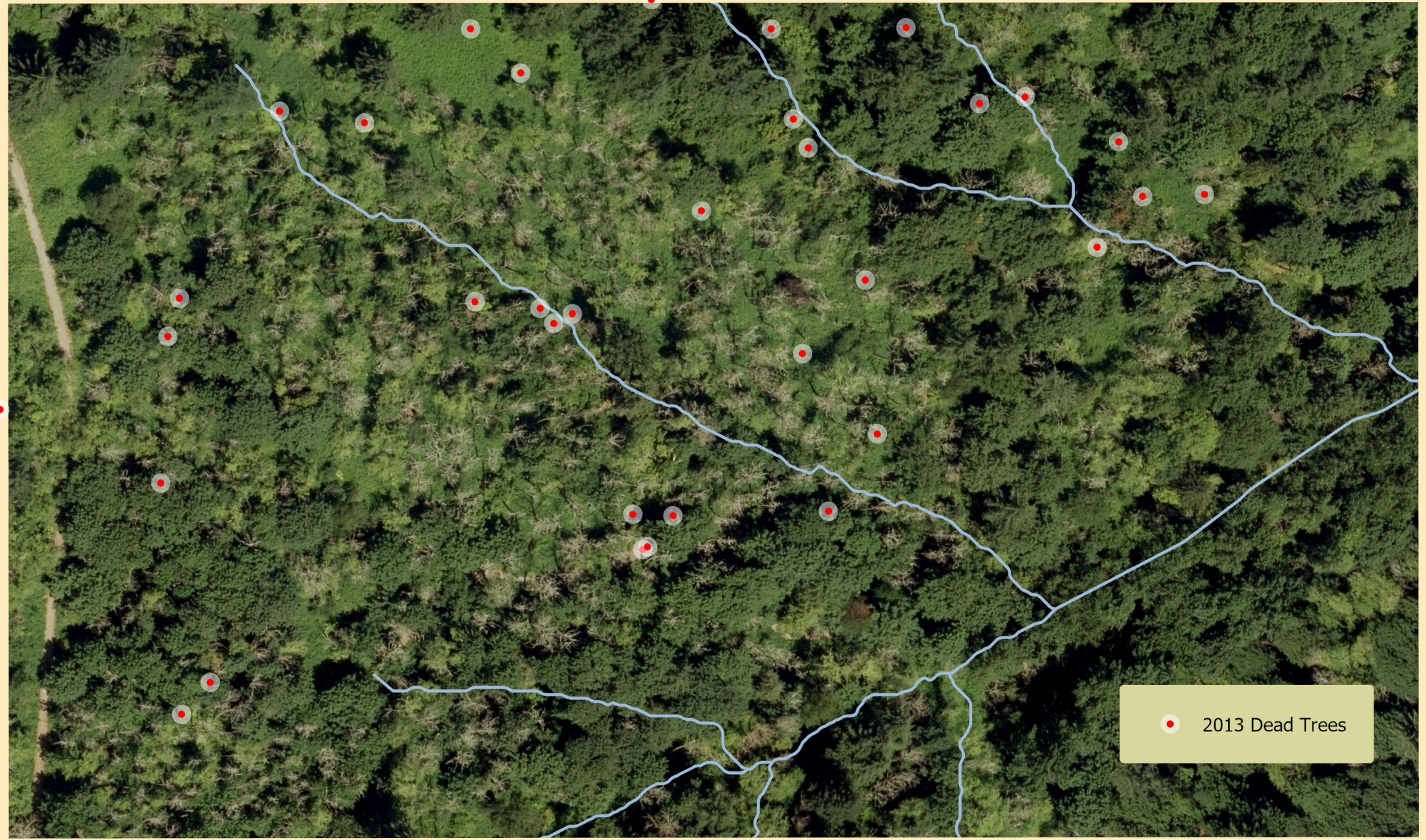
● 2010 Dead Trees



● 2011 Dead Trees



● 2012 Dead Trees



● 2013 Dead Trees



● 2014 Dead Trees



● 2015 Dead Trees



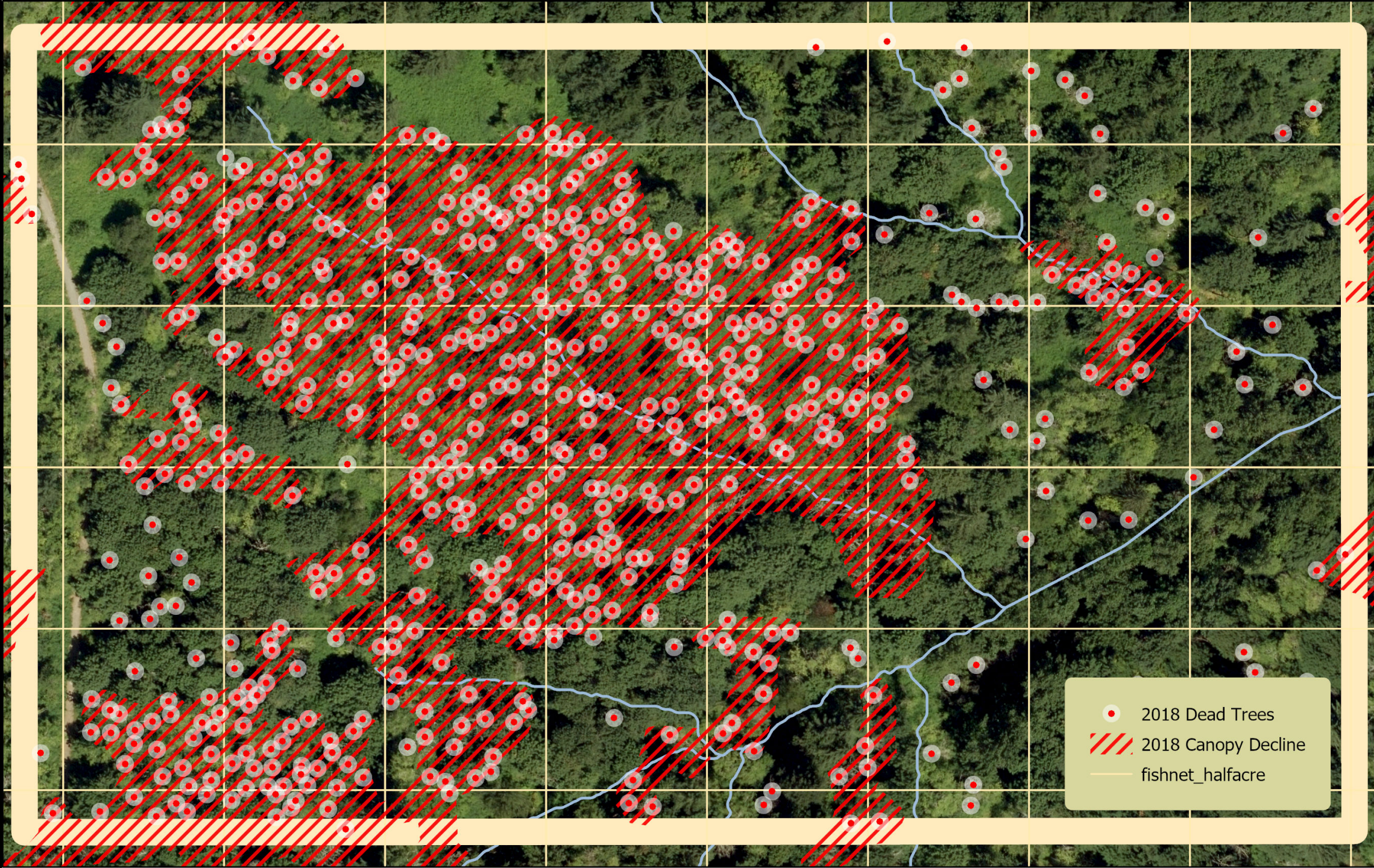
● 2016 Dead Trees

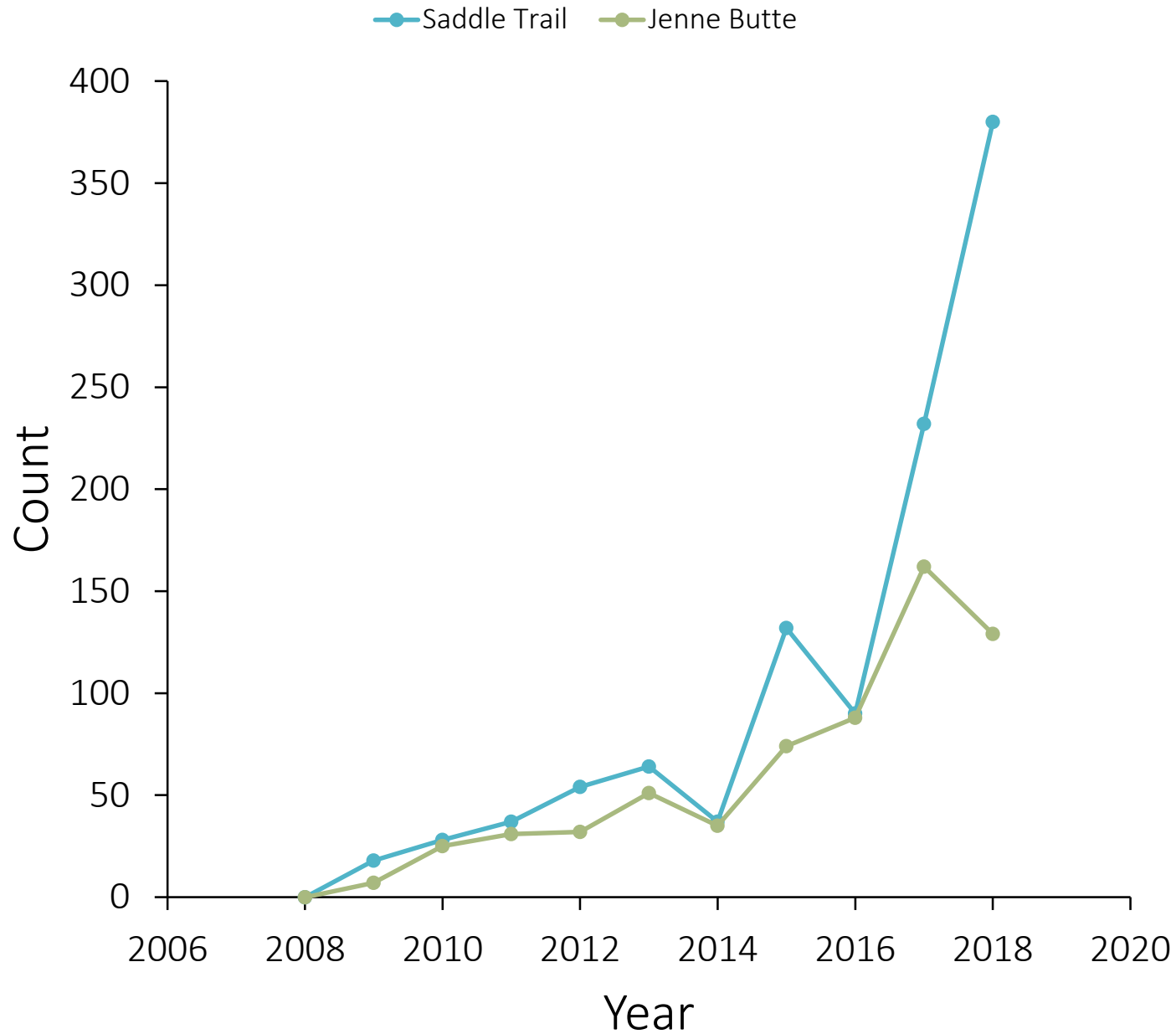


● 2017 Dead Trees



● 2018 Dead Trees





Rate of Dieback

3.6-acre sample sites

Accelerated dieback
2016-2017 at Jenne Butte
2016-2018 at Saddle Trail

Why is this a problem?

Himalayan Blackberry (*Rubus armeniacus*) interrupts natural forest succession

Increased fire risk

Decreased slope stability

Jenne Butte 2014



Jenne Butte 2018



Next steps

City working on mapping invasive cover & native tree recruitment

Forest resiliency – restoration, planting diverse tree canopy

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