

# Forest Park research plots

## Predicting long term changes

Impacts from past land uses and  
current conditions

What will Forest Park be like in  
100 years?

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# Understanding the natural world and impacts of human activities

Long term research data reveals patterns we would not otherwise understand.

Long term impacts of human activity on forests?

Data collected in standardized ways, analyzed via statistics, used for evidence

Can we still use past conditions to predict the future?



# Forest Park

Six 1-hectare plots

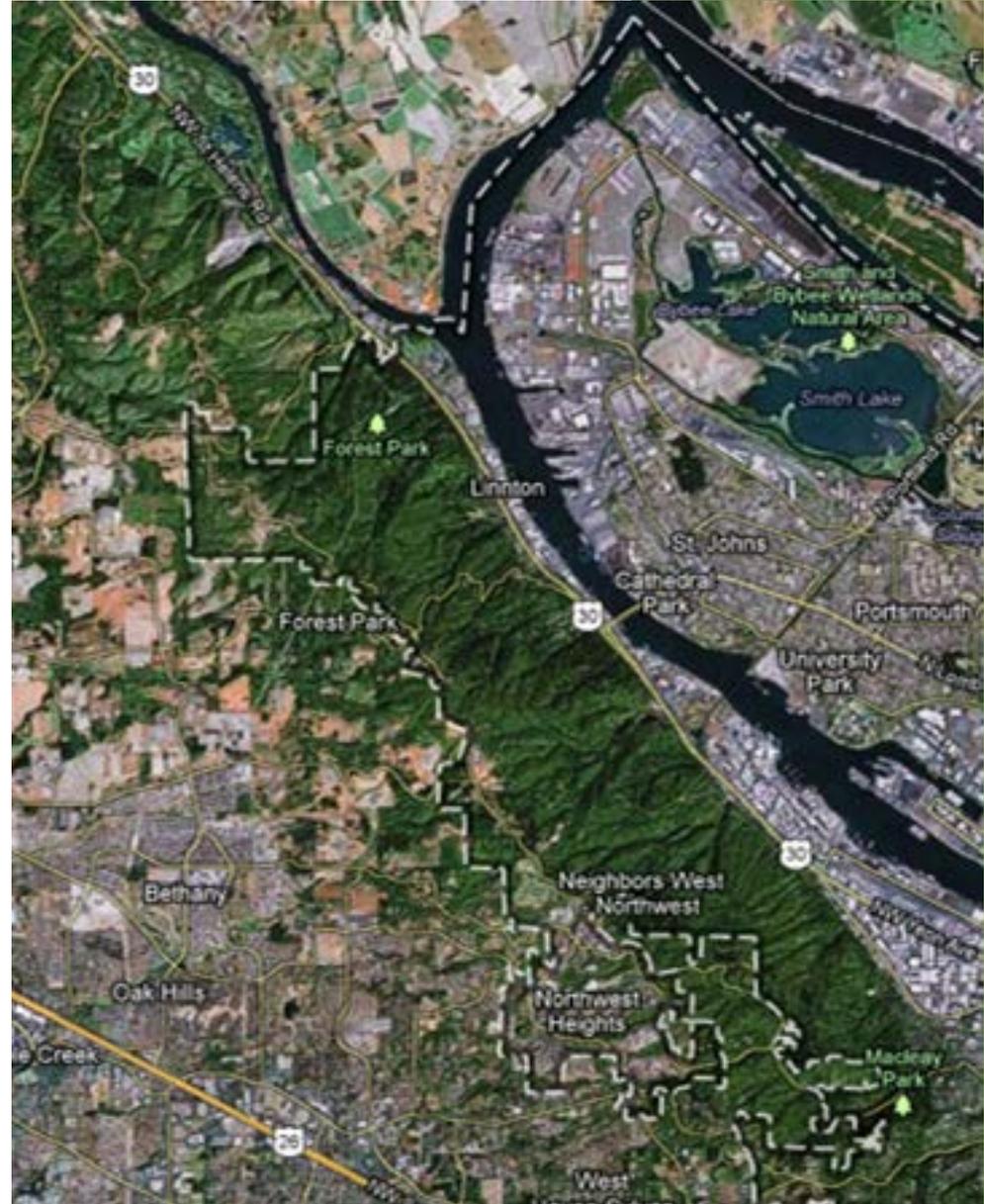
3 Urban: 2 ~120 years,  
one old growth

3 Rural, 2 ~ 140 years,  
one old growth

All 6 Plot are similar

they are set up to  
minimize differences

Both ends of the park  
have different  
disturbance histories



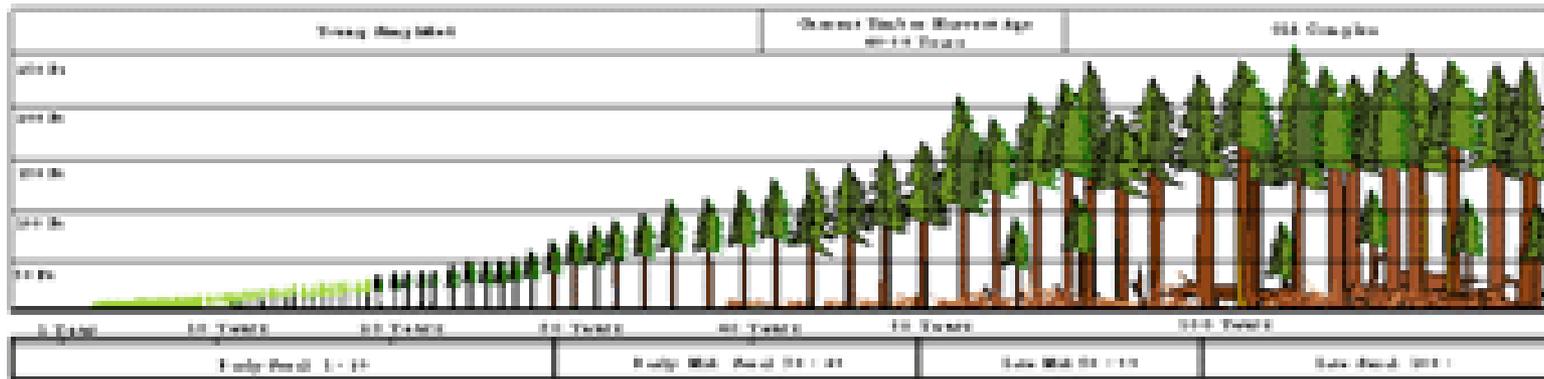
Tree data : tree height, species, DBH, age  
Each tree tagged, re-measure every 5 year



Flowering plants and ferns, measured in 64 microplots per plot (384 total) , shrub cover, Coarse wood(CWD), soil chemistry, soil profiles



We expected to see older Douglas fir trees in overstory, and Western Hemlock and Western Redcedar as understory layer of younger trees



Other studies conclude, after massive and continuous disturbance, modern forests are different from forests of the past

Expected pattern of trees changing from 'pioneer' to ancient forest.

A new assemblages of trees and other plants are present even after 200 yrs. "Pioneer species dominate

Why?

Limit to seed dispersal? Seeds germinate but seedlings die off?  
Habitat no longer suitable for secondary successional trees?



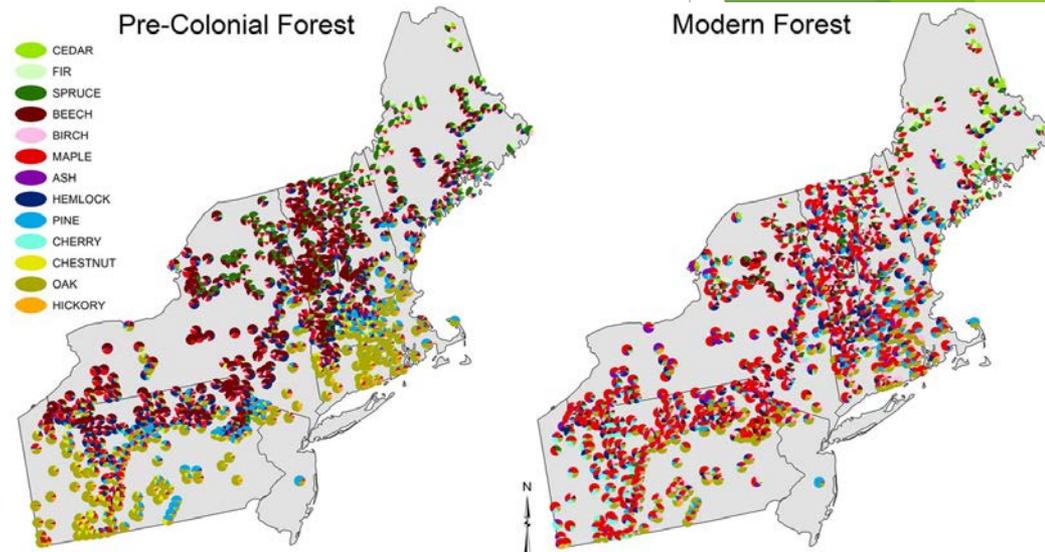
# A new community of trees and other plants cover many forests.

## Unintended consequences

▶ **Eastern US**, once had diverse forest communities, cleared for agriculture 400 years ago, now more homogenous, birch and maple increasing

▶ **Minnesota**, logged over 130 years, once had diverse forest communities including hemlock, now dominated by maple and conifer.

▶ **European forests** still have different composition 2000 years later, once where ancient Roman fields were.



Relative composition of pre-colonial and modern inventory trees in 701 NE townships in the USA.

We expected to find differences between urban and rural ends of Forest Park.

Urban end impacted from history of clear-cutting, erosion, present day trampling .

Ancient forest - recent forest pairs, space for time substitution to compare



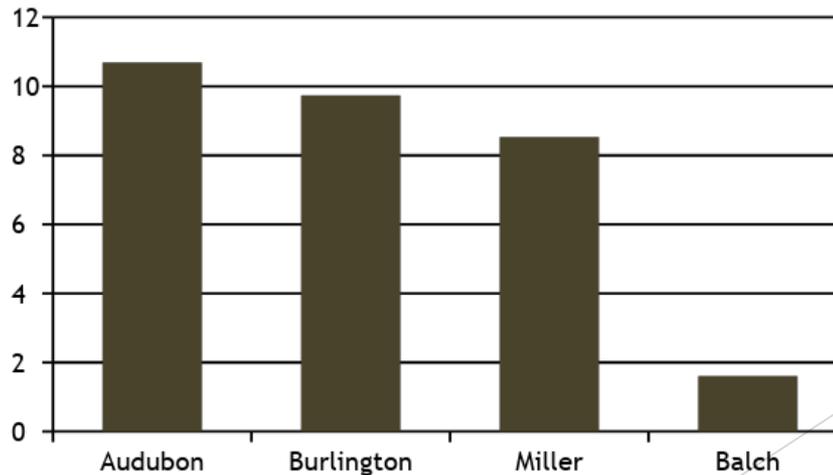


# Past land use influences current vegetation

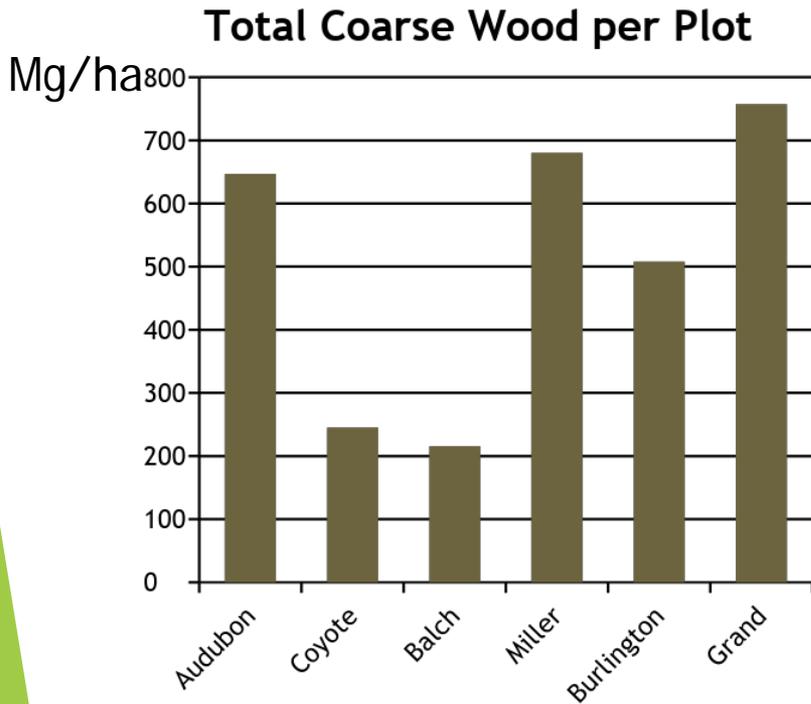
Soil structural differences.



A Horizons cm.

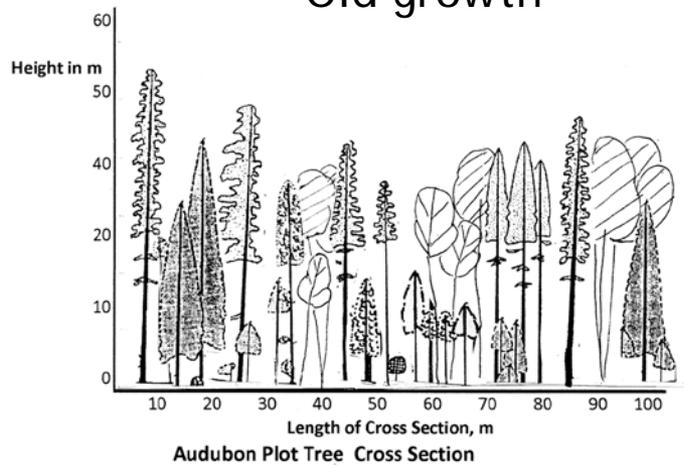


# Very little coarse woody debris on forest floor in urban plots.

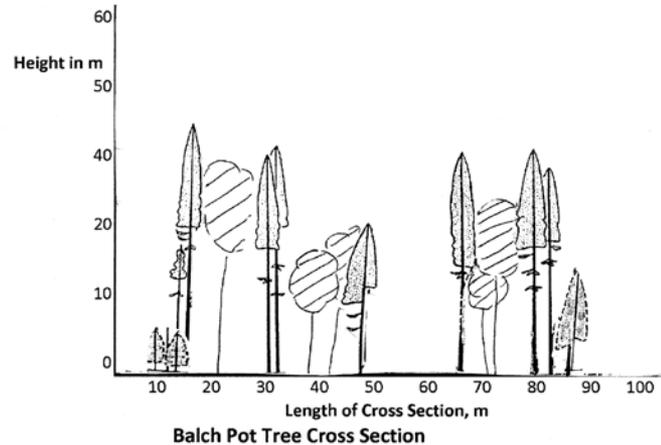


# Comparing tree cross sections in research plots

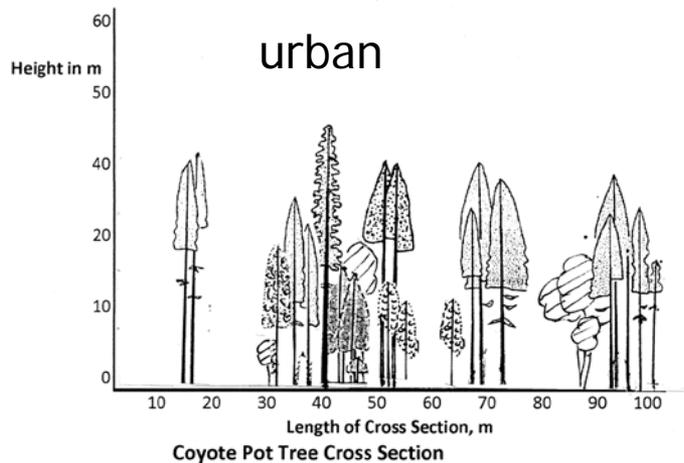
## Old growth



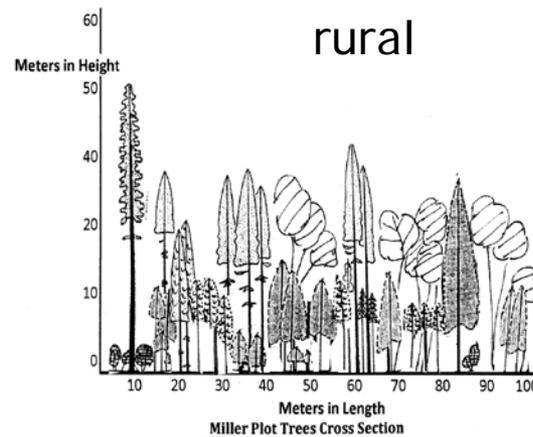
## Urban Balch creek area



## urban

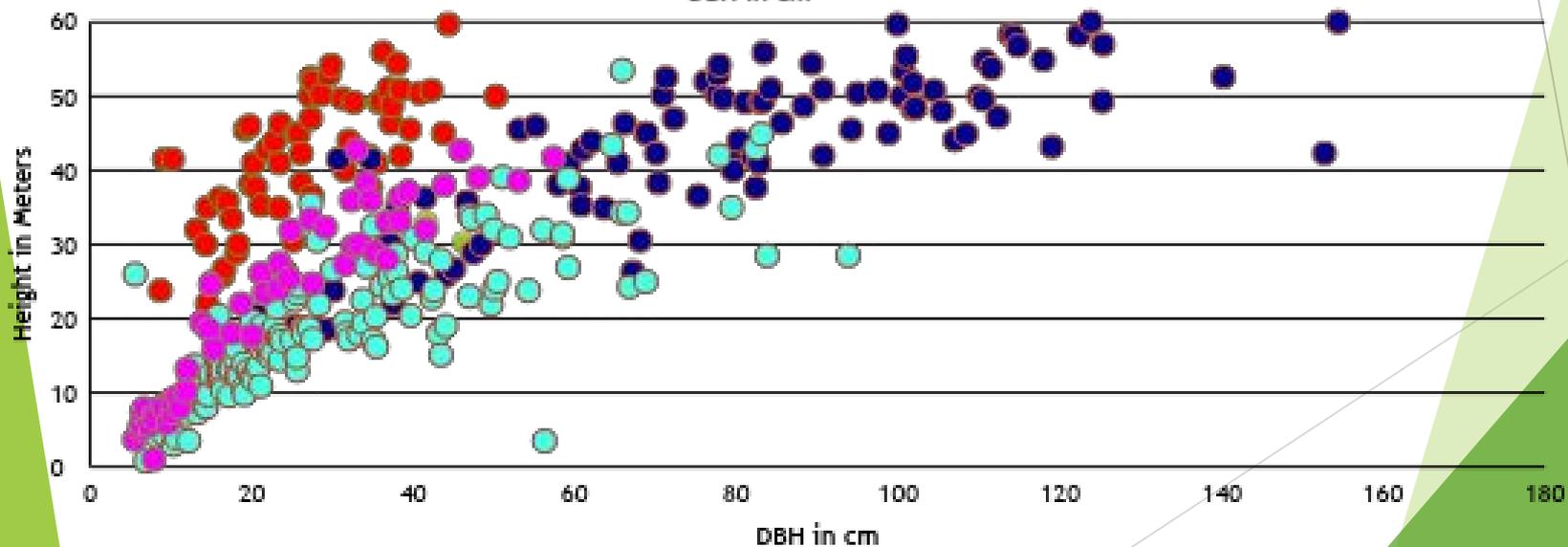
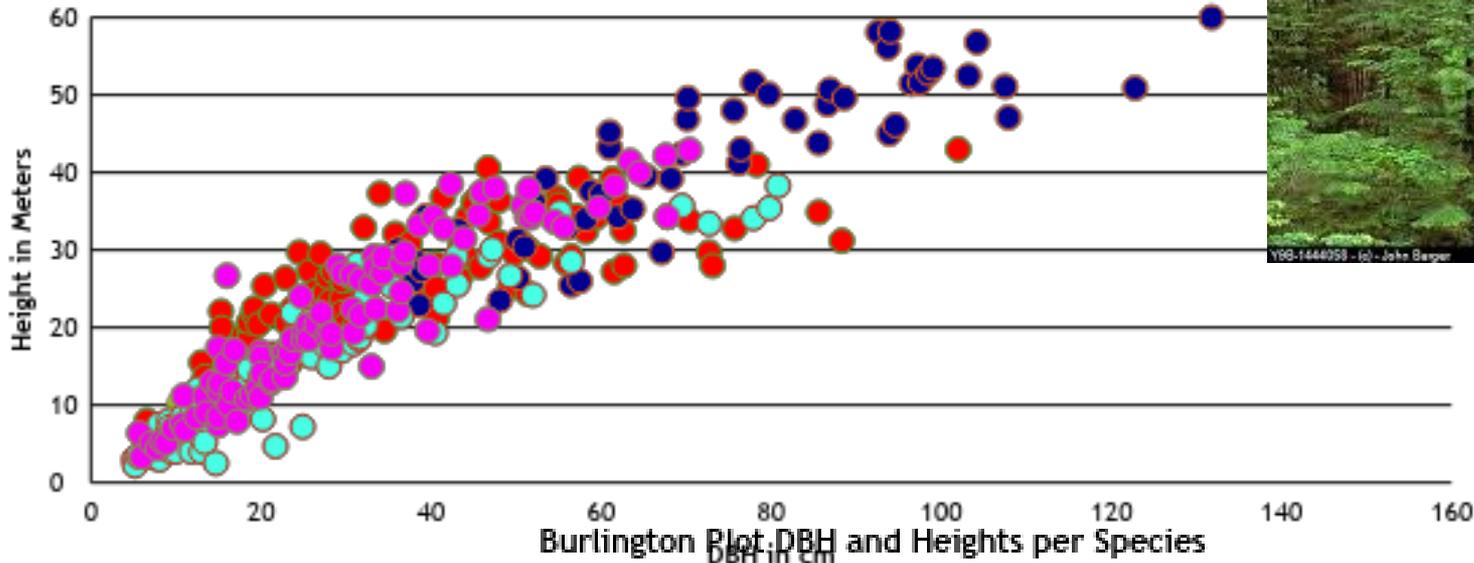


## rural

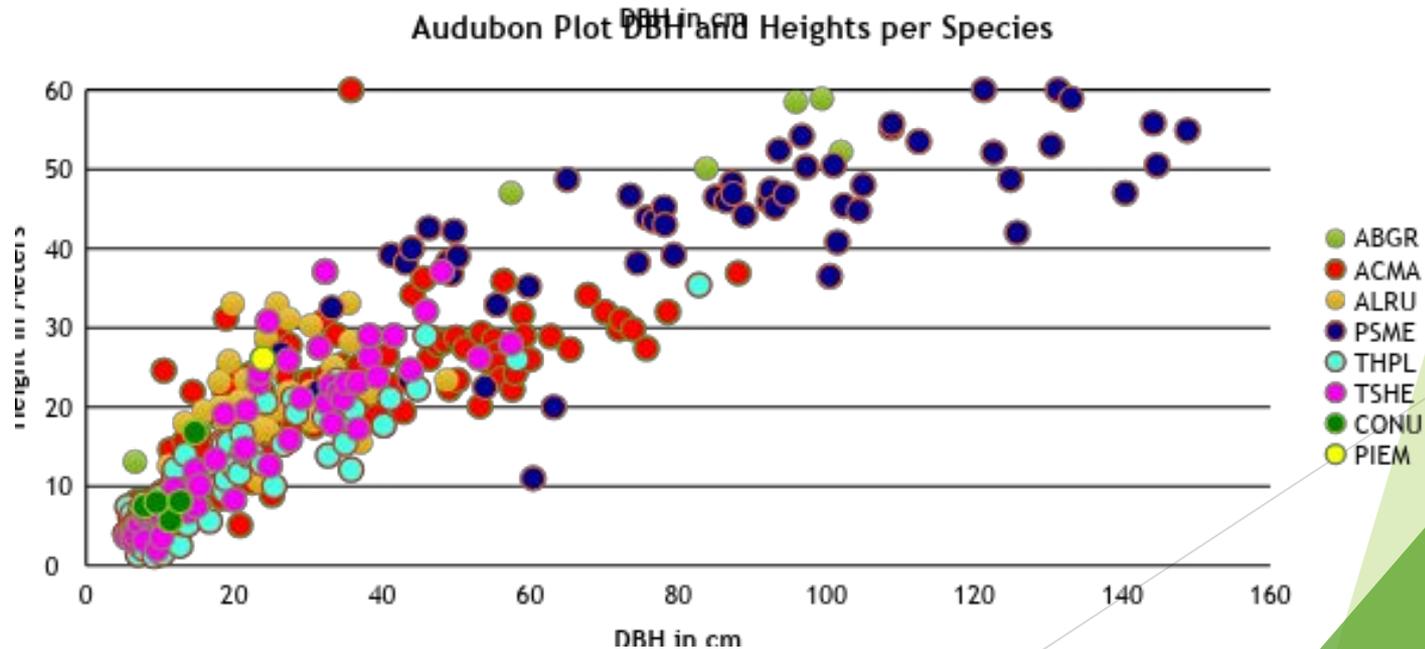
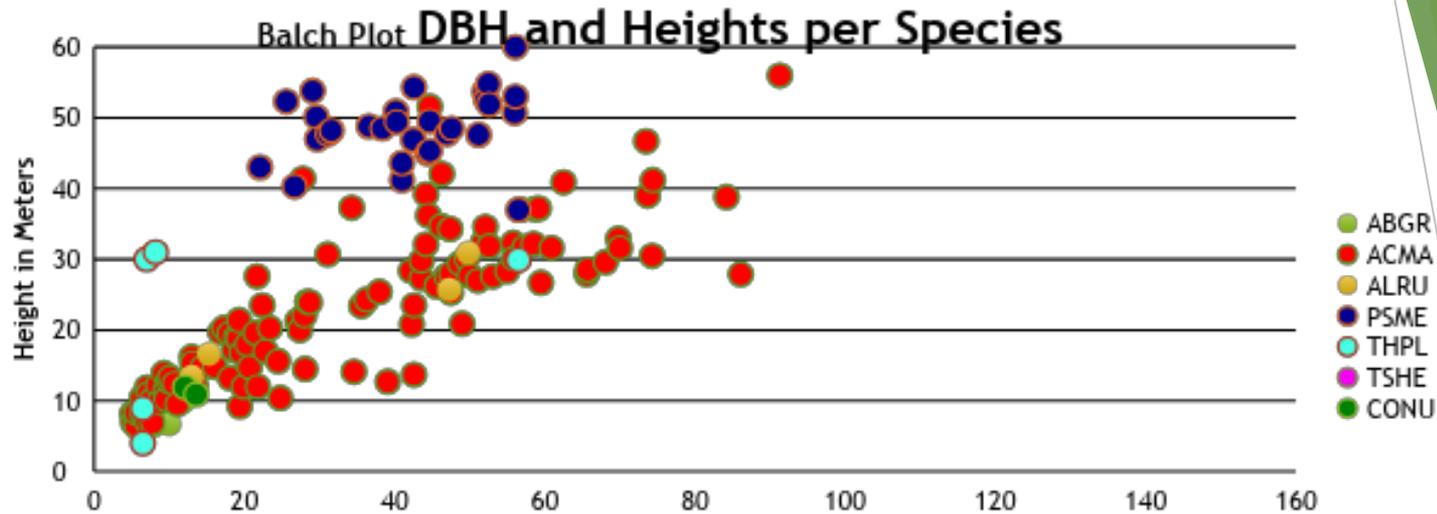


# Successional Trajectory

## Rural Plot DBH and Heights per Species



# Successional Trajectory Urban

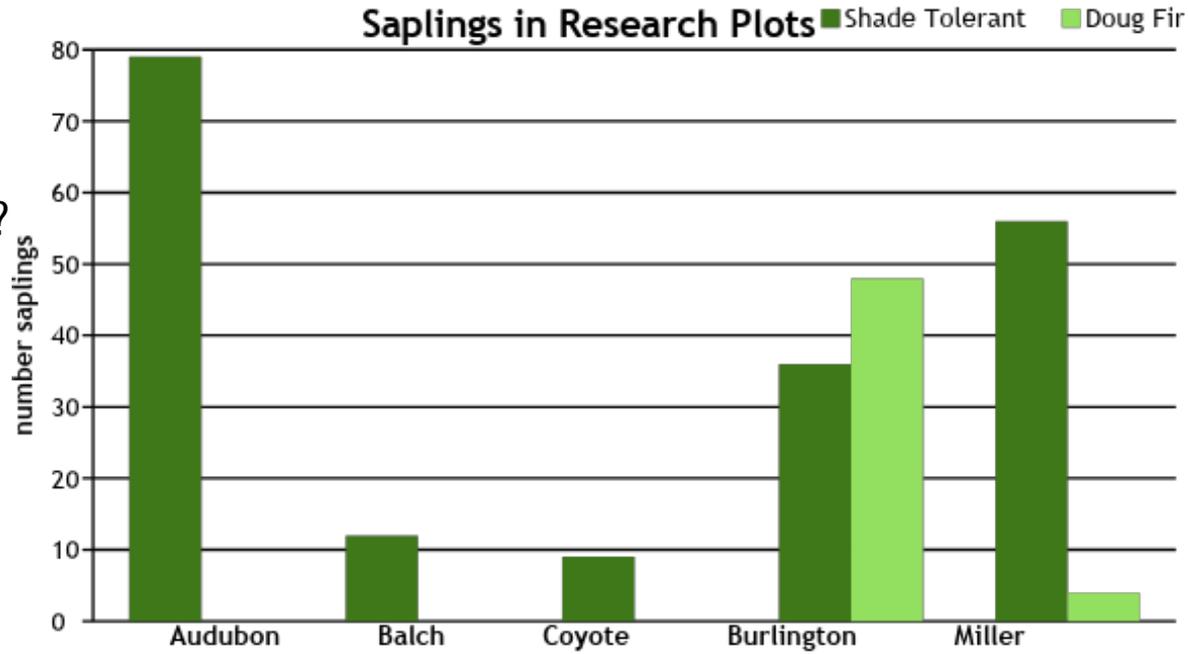


Hemlock

Cedar

# Fewer Saplings in urban plots

Any Hemlock?  
Cedar?

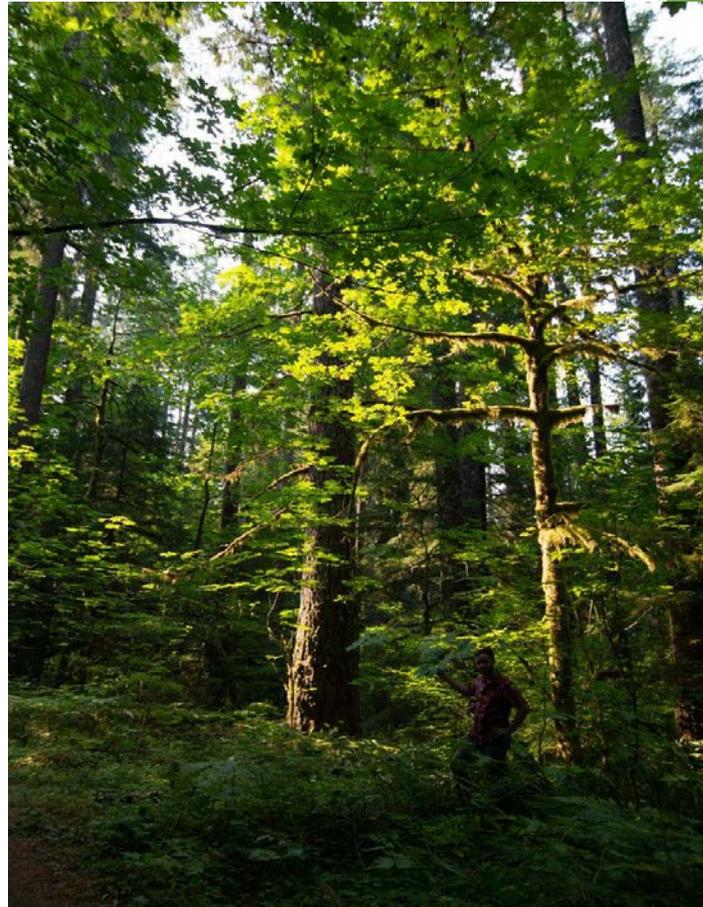


# Are impacts reversible? Irreversible due to climate change?

Plant seedlings/saplings shade-tolerant trees?

Seedling survival may be problematic

Climate change; longer, drier summers?



# Consequences for wildlife?



Thank you to...



and Bobby, Katie,  
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Leah, Lainey, Pad...

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