How Fire History and Stand Development Can Guide Management Decisions in SJC February 25th, 2017



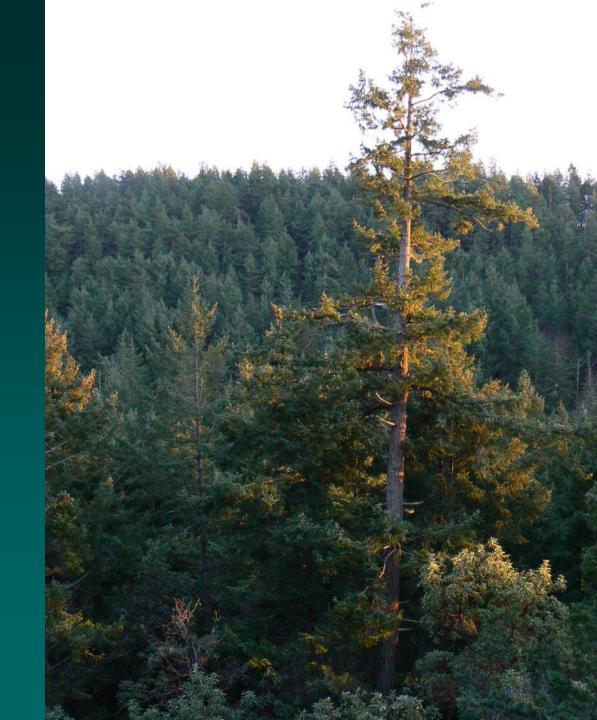
Carson Sprenger, Rain Shadow Consulting

Outline:

- Describing our local forests
- Fire History
- Management Options
- Project Examples

What Defines Our Forests? -Low Rainfall

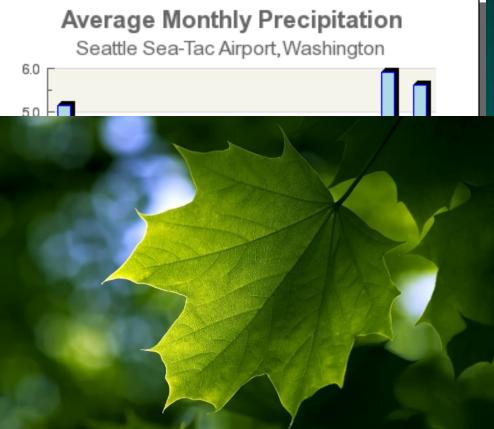
-Summer drought



Trees must be drought tolerant.

Friday Harbor average Precip 28 inches

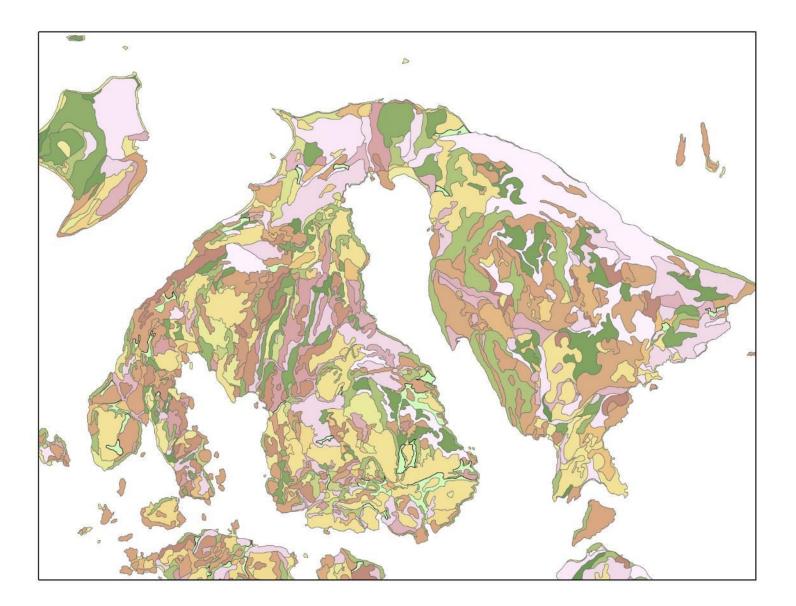




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Disease



Most Disease are Native Pathogens

- Root Rots
- Stem Rots
- Cankers
- Foliage Diseases
- Important for Ecosystem Function
 - Important for Creating Habitat
 - Drive Nutrient Cycling
 - Increase Complexity of Forests

• Typically Small and Episodic

Occasionally Very Damaging

- 1989/1990 Storm
- Brought Down 4 million feet of timber
- Equivalent to over 1,000 log trucks

Damage higher in dense & overcrowded forests.

- What Defines Our Forests?
- -Low Rainfall
- -Summer drought
- -Soils (thin, rocky, glacial)
- -Natural Disturbance
- Wind, Fire, Disease, Insects
- Human History
 - Pre-settlement
 - Fire
 - Post-settlement
 - Grazing, logging, lack of Fire









Most Historic Logging

- Highgrade Harvesting
 - Largest / best trees cut
 - No thinning, no planting
 - No proactive management
- Salvage Harvesting
 - Extraction of most large trees
 - Loss of biological legacies
 - Development/ land clearing – Permanent loss of forest



Recent Trends in Forestry

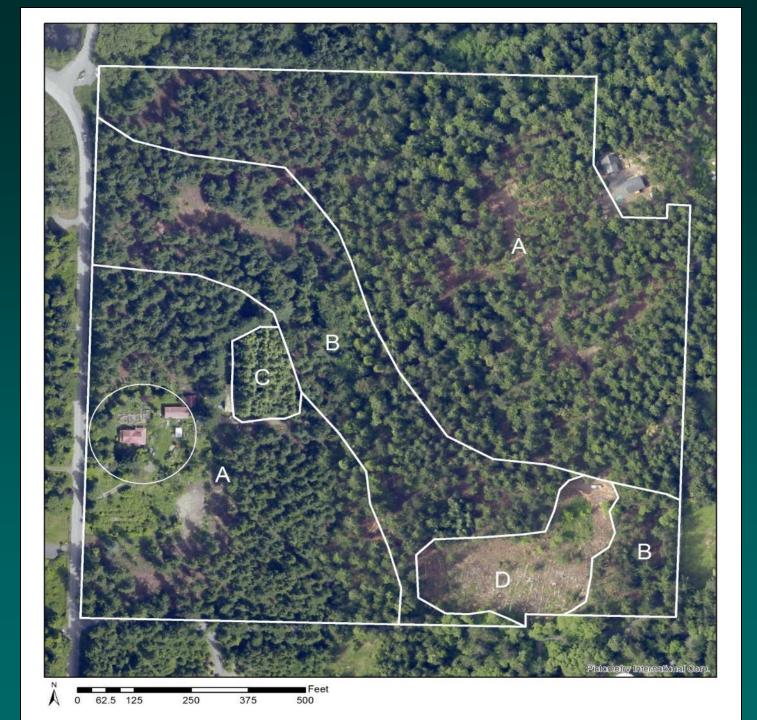
- Emphasis on ecosystem based management
 - Largest trees retained
 - Managing for diversity, resiliency
 - Modeling management after natural disturbance
 - Restoration

Fire

- Intensity varies by fuel, weather, topography
- Kills some plants, others resistant
- How often fires burn (frequency) strongly influences vegetation

Forest Stands: (what is a *stand*?)

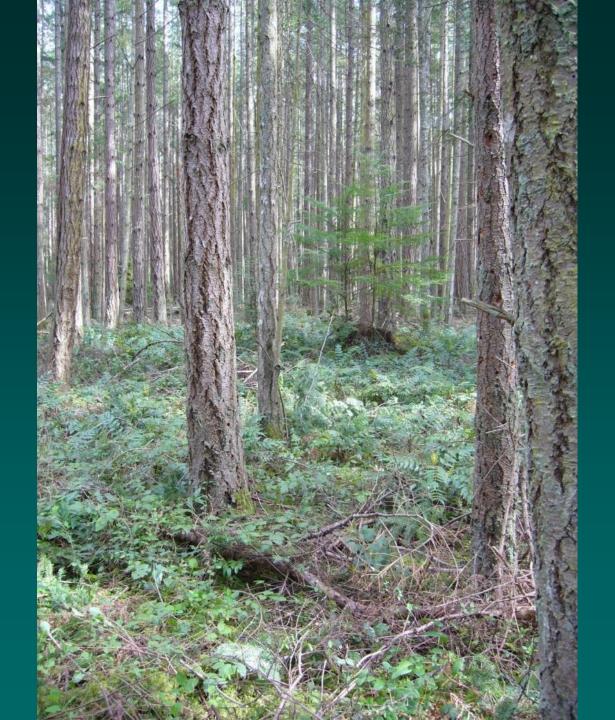
- Stand: a contiguous group of trees sufficiently uniform in age, species, and structure..... to be distinguishable.
-where a standard set of management decisions can be implemented.



Stand Types: (common)

- 1. Douglas-fir
 - Single-age and multi-age
- 2. Mixed conifer (multi-age)
 - Cedar/ hemlock/ spruce/ grand fir
- 3. Pine
- 4. Hardwood / mixed conifer & hardwood
 - Alder
 - Douglas-fir/ madrone
 - Douglas-fir/ oak

















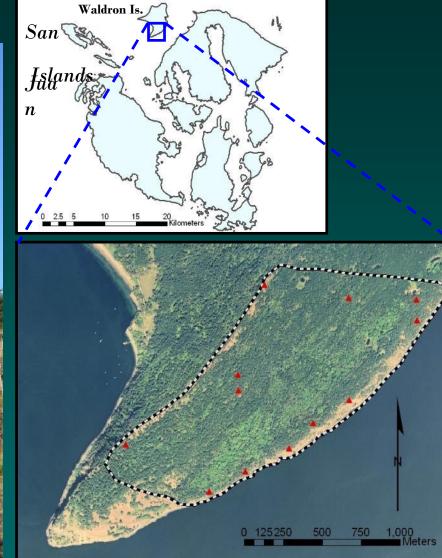
Case Study: Fire History of Southern Waldron Island.

- 1. Much of the landscape (forest and grasslands) historically maintained by fire.
- 2. Fire effects structure and composition of forests.
- 3. How frequent were the fires? When did burning cease? How large were the fires?









Sampling Methods:

- Located fire scarred trees (29)
- Removed partial and full cross-sections

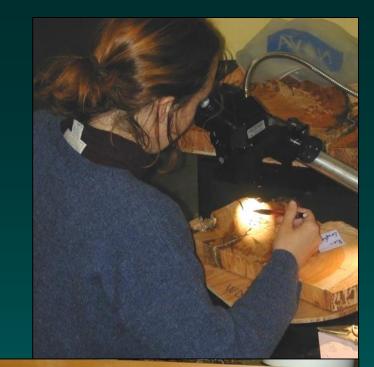






Lab Methods:

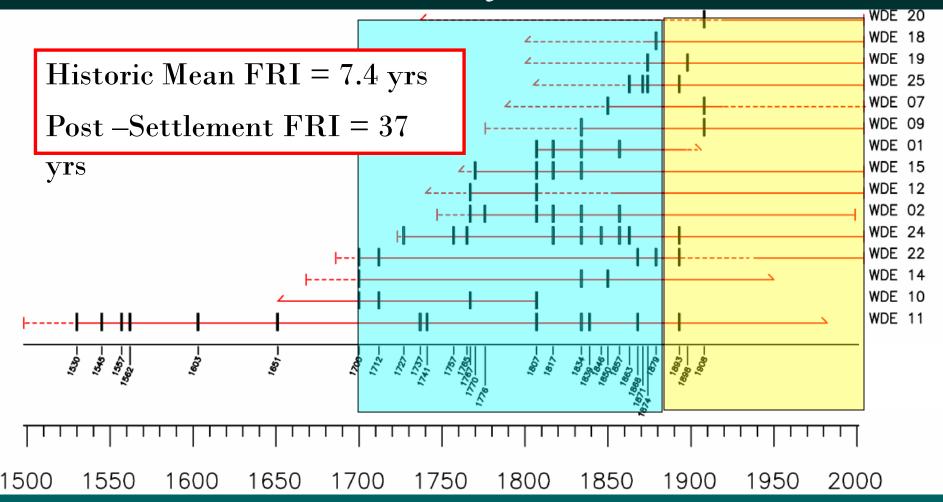
- Sanded & aged
- Scars identified
- Dates assigned & verified







Results: The Fire History



Management implications:

- Historic fires burned at least every 7.4 years.
- Current fire-free period (109 years), longest in at least 500 years.
- Humans were largely responsible for ignitions (managing fires)
- Current fuel load is very high.
- Habitat loss and major vegetation shift well underway.
- If we want to restore/ maintain oak habitat, must consider fire or vegetation removal
- Major challenge in returning fire to landscape.

Other Study Sites:

Kellett Bluff on Henry Island = 6 year FRI

Turn Point on Stuart Island = 6 year FRI

Point Coleville on Lopez Island = 15 year FRI

Iceberg Point on Lopez Island = 11 year FRI

- OUR FORESTS BURNED
- SAME STORY THROUOUT THE ISLANDS & MUCH OF PUGET SOUND
- REGIONAL & NATIONAL



Do we have overcrowded forests?

- What are the signs?
 - Mortality
 - Lack of understory
 - Dense, uniform canopy
 - Excessive woody fuel

Do we have overcrowded forests?





Do we have overcrowded forests?



- Why is it a problem?
- Reduced growth
- Reduced vigor/disease resistance
- Increased windthrow
- Drought susceptible
- Poor habitat
- High fire risk



If goal is: to have safe, productive, resilient, and ecologically complex forests.

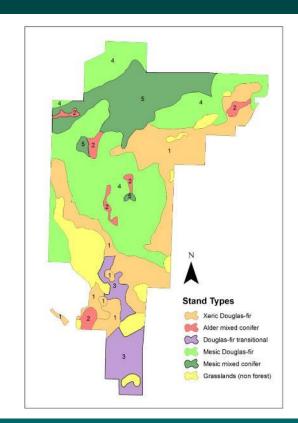
How do we get there?

Fire Safe Homes

- Assess homes and driveways
- Create a fire safety plan
- Neighborhood / community based models work best
- Talk with Fire Departments, Conservation District, Firewise planners

Fire Safe Forests: Begin with a Plan

Assess your forest, acquire a management plan

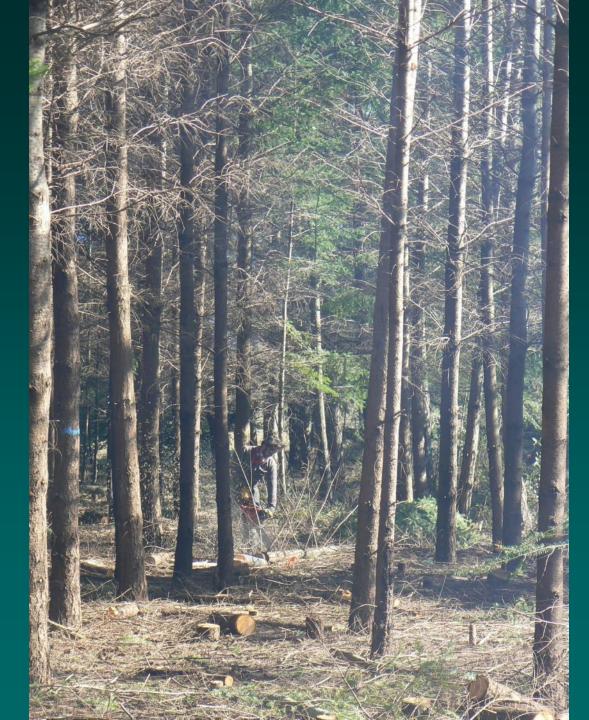




- #1 Tool For Young Stands: Thinning
 - Reduce tree density
 - Remove low vigor trees first
 - Remove drought & fire intolerant species
 - Remove small diameter, suppressed trees
 - Treat slash and down woody material

EXAMPLE....

- •Thinned from below
- •Also removed defect trees
- •Pruned lower limbs









Density Management : when to thin?

• Before overcrowding

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- Usually at 20-25 years & on a cycle of every 15 years

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- Before overcrowding
- Before trees lose more than 2/3 of their live crown
- Usually at 20-25 years & on a cycle of every 15 years
- More often & less intensively =
 - Resistance to windthrow

What to do with the biomass?





Lop-And-Scatter



Lop-And-Scatter









Rain Shadow Consulting: project examples 13-acre fuel reduction and stand improvement thinning for Waldron Community Land Trust, cost share with EQIP



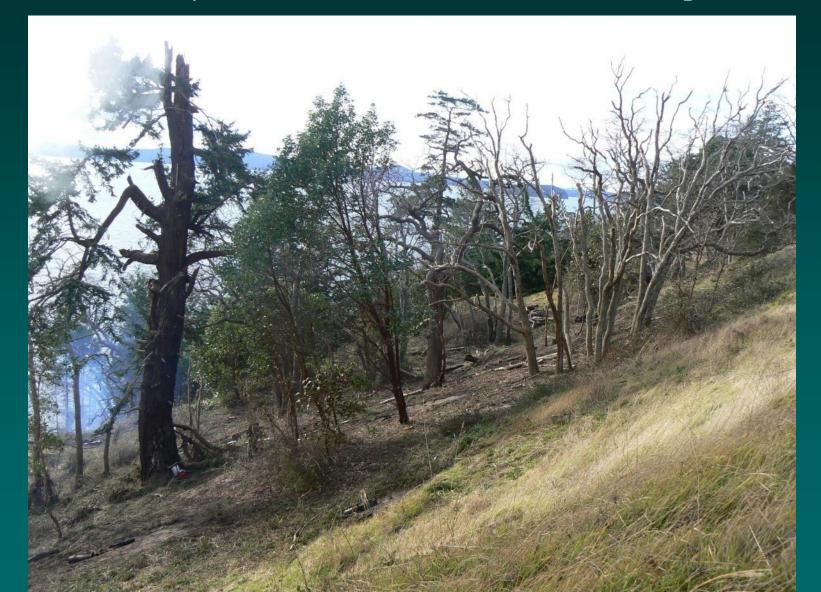
Rain Shadow Consulting: project examples



Rain Shadow Consulting: project examples 50 acre Garry oak restoration, Waldron Is., TNC Preserve



Rain Shadow Consulting: project examples 50-acre Garry oak restoration, Waldron Is., TNC preserve



Make Charcoal





Summary

- We have a wide variety of forest types
- Clearly, our forests burned
- Human history is complex but highly informative
- A 100+ year fire free period and poor management practices have lead to unhealthy forests
- Our homes and forests are at risk of catastrophic fire
- We have resources and knowledge to reverse these trends
- We need to invest in creating healthy forests

Questions?

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