

Southern Willamette Forest Collaborative
Rigdon Learning Session: Fire History & Special Habitats
Thursday, May 2nd, 9:00 – 12:00

Participants: Maya, Kris, James, Tim, Trish, Mike, Spencer, Fergus, Leslie, Jean, Thalia, Susan

James – Fire Ecologists – ¼-1/3 way done with study

Very preliminary results of the research

Find old fire scar trees, what interested in is basal scars left by a fire
Ponderosa pine, Doug fir, other western trees hydro climatic sensitive. Wide and narrow rings based on amount water. Use computer software to cross date. Know dates of fires exactly

Info: fire return interval – average time between fires

Have a bunch of these studies on east side, first one on west Cascades and now working on Umpqua

Research area – grid in Rigdon area including YRR

99 samples and have processed 72

Fire years in 115 years between 1918 and 1593

Visually cross date and measure each ring to 100mm and compare to a master chronology

Results from 4 different sites that are representative of variability of forest types in the watershed

First 1KM uphill from river, dry pine site, dry creek?

- Dry pine site with oak
- 250 M radius between sites – want close enough so that can capture similar sites

Mesic Douglas fir, western hemlock plantation, moist, wet old growth rain forest

Dry pine site – old remnant ponderosa pine

A lot of sites we call oak savanna have old growth Doug fir and serve as a seed source for new growth since fire suppression

Oak groves are almost extinct – new growth of Doug fir has taken over

Almost all oak or dead or dying

Very frequent fire wherever there are oaks

Could the fires be caused by human?

- It is hard to say what is
- Biophysical controls that are not human
- Given the frequency of fire, anthropogenic fire had to play a role, but how much can ascribe to environment to fire or to humans is a hard to say

The real cause of fire in a system with fire that is this frequent, is fuel. It is a fuel limited system that burns whenever there is fuel to carry it.

Oak leaves vast fuel source, fall off every year, ideal fuel for frequent fire
Feedback between vegetation and fire disturbance

Now can say there is extremely frequent fire on landscape
Believe the difference is the ground fuel – difference between grasses and pine oak

Dry site #2: sugar pine almost all dead, Doug fir, incense cedar, no pine
South facing aspect
90% of basil site Doug fir

Dendrochronologists use a lot of pine species, do not think of coastal Douglas fir being a fire core, but good example of really frequent fire

Q: Why aren't there pine in stand?

- Dead – blister rust and the pine beetles come in. Fungus major culprit, secondary culprit is stress of overcrowding of stands

Really remarkably frequent fire

Big Doug fir don't record fire very well externally, so have to cut into dead logs to see fire scars

Q: No fires for 300 years – pre-colonial?

- PP are known for having fire scars generally triangle shaped cavity, duff and litter accumulates

Last site

When fire scar w/ cat face can know they are recording the fire but surface fire growing around Doug first may not leave scarring so strongly suspect there was fire, because trees recording within 100 M, Tree getting so big that fires aren't damaging the cambium as they burn around it

4 fires recorded in quick succession and then not more

Fire return intervals reconstructed in diverse forest types is between 5 and 50 years

Do not think we will be doing restoration treatments in the old growth stands – Owl habitat – but we can't neglect role of disturbance – should think about facilitating low and moderate fire in those old growth stands

Treat dry stand that are in that matrix, facilitate fire, and hope to a certain extent to get fire in these stands.

Q: Rarely see stand anywhere that doesn't have signs of fire in it

Alan Templey – Smithsonian most extensive reconstruction of historical fire
He did not use fire scar evidence, cored thousands of trees, study area HG Andrews in McKenzie drainage and Fall Creek. Estimated 10% of forests went more than 115 years without fire. The rest had relatively frequent, non-stand replacing fire. Down here dryer forests so can extrapolate more fire down here.

Q: Did you look at veg type and plant associations?

- Yes – plant association is overstory Doug fir and understory species, currents, ocean spray,

Any correlation w/ fire?

- Yes, there is a fire frequency gradient that corresponds with availability of water

Q: Sites are all Rigdon are you going to do more Coal Creek

- Yes, going to do all of the area but don't have data for Staley Creek and upper part of watershed.

Q: size of rings

- Growth is creating biomass and adding area to the circle so width will be smaller for same area even if adding biomass. Can do fancy math with growth trend and can make robust inferences w/ climate.

Also have to consider competition around it. Works good with old growth stand that it competitive.

- Competition is relevant but hydroclimatic signal is still there and is amplified by competition. Rings more sensitive in competitive stand.

You will see slowdown in trees next to roads – damages to road system

Q: Sense from other sites how you would classify those?

- Yes:
 - 3 Mesic Doug fir sites:
 - 2 are weird stands: dry Douglas fir and mesic very little PP
 - One site to bracket far end of spectrum – silver fir site, overstory Doug fir, late seral species is silver fir – true fir site. Think there may not be much fire up there – snowpack.

- Suspect might be site that see 100 years or more without fire – though lack of evidence doesn't mean no fire. Huge Douglas fir, some will burn 9" at stump height so tree won't necessarily have evidence

Thin and burn dry sites, mesic sites – to reintroduce fire would be high risk it would need to be very dry, there was a time when the mission was to regenerate stands as Douglas fir, hope now that the goal is to restore and reintroduce disturbance.

Believe much of the habitat owls and voles needed is because of non-stand replacement fir. Mechanical thinning does not do it, but if opportunity to thin in south and facing drainages and reintroduce fire. Maybe the goal could be to use treated areas as anchors and let fire move across landscape.

Q: Month or so ago collaborative met w/ interdisciplinary team – a whole sentence about high elevation mesic forests are modified by fire suppression: What do you think?

- Yes, absolutely. Historically this whole watershed burned constantly. Even now, every 4-5 years an incident but those are smaller

Tens of thousands of acres

1849 entire watershed burned, yet there is this old forest structure, inevitable that most historical fire was non-stand replacing

There is an abrupt transition between the McKenzie watershed and the middle fork salt creek – not latitudinal but has to do with landforms and orientation to Pacific Ocean.

Fire history w/ aerial photos, up NF there are whole drainages that are 150-year-old from stand replacing. 20-30K acres burned at same time. Every 60 years.

Crude age structure data for the Willamette – 60-year period certainly related to long term oscillations of Pacific Ocean that creates dryer conditions.

Have found 500-year-old trees, but not stands much older, Yes- average old growth Doug fir is 450-550 years old. 4/5 basal area of this forest was regenerated about that time. Get up in the silver zone find older trees.

Q: How long will study take?

- Will finish something within a year b/c want to but won't stop this research

Walama Restoration – Maya Stewardship Coordinator

30 classrooms environmental education, field trips

Stewardship generally focused on work parties around native plants

Mt. Hood – pollinator garden – collect seeds for volunteers

Here doing milkweed and monarch

Dry pine and Oak habitat

All surveys have been in Rigdon area

Extends down to Calapooya and want to start surveys in Umpqua

Monarchs lay eggs

Narrow leaf milk weed or showey common

Purple milk weed in Rigdon – more common in Southern OR and CA

Forest openings w/ harsh shallow soils

Lives in dry mixed conifer habitat w/ oak

Areas dominated by ponderosa pine and sugar pine with open meadows – historically they were much larger but growing in

This is on the northern range on the west coast – can help provide refuge to shift range with arming temperatures and climate change

Only knew 1

36 meadows surveyed – 500 acres area and 80 acres

Recorded 18 populations and 15 are monarch egg sites

Growth season starts now and goes until end of July

2017 Tanya Harvey and Joe Doerr started to look for them, used aerial surveys and FS data to look for sites. Got baseline counts of milkweed in these areas.

Measure how management actions and restoration effects these sites.

Reconnaissance surveys: canopy, trees and shrubs, qualitative data that are collecting

Wide range of stems per acre (7-500)

Always on ridgeline or south facing slopes

Grows in meadows w/ 5-55% tree cover

2017-2018 monarch migration mid-June to end of July – observed about 10 butterflies'

Don't tag or net so not sure if repeats

Interested in how monarchs are using this area – though they were seeing the same male in two meadows. Long time to be here.

52 eggs and 17 caterpillars

Going out with volunteers. Since migration and breeding season so short starting citizen surveys June 17-23rd

Camp trip, taking out small groups and looking for monarchs, will be lots of flowers out

Protocol:

Use Avenza – with basemap

Navigate and collect data

50-90-degree temp, low wind

Transect grid 50' apart

Nectar species for pollinators – observations are really important to know what species they are using

Milkweed June is the flowering period starting to come up – easy to see, pretty tall, Survey by looking at leaves for eggs and

Seedling survivorship and recruitment

Eventually will start looking at fitness: plant size

This year want to set up plots – touring with Dorina genetic center –

Planting seeds in site

Working w/ FS to come up with a list of questions

Flowering season how does it coincide with breeding

Monarchs and a lot of pollinators nectar

Hordes of grasshoppers were feeding on them too

Not sure how fire affects species but in southern Oregon it sprouts right up after fire

Think that fire is good for species, takes out competitors

June – what is capacity? Unlimited – wouldn't expect 100. Will have FS staff and have at least 10 people from Walama can help lead

Share are monarchs coming from?

Browers Burst year – 4 generations and 4th generation goes to Mexico

Southern Oregon

This year large wintering population that they will go everywhere so there is hope more

Western ones generally overwinter in California

Folks used to think rocky mts was a barrier but genetics

Wintering populations in CA and Baja and many other places

This year lowest year on record for CA sites. Mexico population was at 129% (usually goes east US) but on big year they are hoping some will come west

Speculation that this is when the crossover happens

Monarchs travel

Caterpillars eat milk weed and then butterflies eat nectar

Preventing fire is not allowing areas to regenerate wildflowers

Planting? Have to do NEPA to plant, interested in trying to seed