Southern Willamette Forest Collaborative
Rigdon Collaboration Committee
Wednesday, Nov. 30th, 8:30 – 4:30
Rigdon Field Trip #3

Participants: Chandra L, Cindy N, Sarah D, Fergus M, Guen P, Kris E, Laurie P, Lon O, Mike B, Jim C, Brian W, Audrey S, Leslie D, Leslie L, James J, Tim B, Alan D, Thalia L, Melanie K-M, Loren H Jane K, Molly J, Allen H, Duane B, Stephen Todd J, Sequoia G, Wendy P

Facilitators: Sarah A.

Rigdon Landscape and Fire Learning Session *Jane Kertis – Willamette NF Fire Ecologist*
(see Fire Ecology PowerPoint)

Rigdon landscape ecosystem – interactions and components of the non-ecosystem play a role in the distribution of the living organisms.

Setting the stage – obvious drivers – climate, rain, snow, etc and how distributed across the seasons.

Climate
Most constrained season – summer – squint your eye maps to see a pattern.

- Average summer precipitation and average summer temps - in the Rigdon area the landscape has a lot less precipitation and is a lot warmer than areas to the north.
- This is a transition zone from the dryer warmer to wetter cooler landscapes.
- The lower elevation, where there is mixed conifer, is a lot hotter and dryer than the Rigdon uplands.

Geology
Another key driver is base geology and landforms and soils that form from it.

- Two different landform types 1) long slopes, but more common are 2) short, heavily dissected slopes.
- There is a lot of aspect differentiation
- Because of interaction of climate, landform and topography inform the capacity of the biophysical landscape and what can grow where

Most interesting about the landscape is the interaction of climate topography of western hemlock zone interplaying with the warmer dryer habitats of douglas fir and grand fir series.

- Although the plant association series is named by the dominant tree that thrives without disturbance we know there is a disturbance that drives the mixed conifer species we see there today.

Physical processes

Another important driver of vegetation. Fire is the most dominate in the Rigdon area. Fire interacts with topography and plants that live or die on a site. Fire controls the types of patches on a landscape and how they are arranged in a landscape pattern.

Individual plant relationships with fire –

- Moistest and coolest: True fir – silver fir, western hemlock, Mt Hemlock
    - None or very bad relationship with fire very thin bark that makes them susceptible to fire. Mt. hemlock – shallow roots susceptible to fire
- Ceanothus– seeds stored in soil and need heat to scarify the seeds
- Knobcone pine – It has cones in crown that have a lot of resin and needs heat from fire to drop cones

- Resisters – able to survive a lot of fire types – Doug fir, incense cedar, sugar pine, ponderosa pine develop thick bark at an early age and can resist fire.
- Endurers -adapted by not dying and sprouting after fire – Oregon grape, poison oak, California fescue, Oregon white oak

Fire – Varies in Space

Fire affects the structure of patches of vegetation on the landscape – largely because of the types of fire in the system. The types of plants that grown and the response to fire will impact the types of patches on the landscape

- Ground fire – moves along ground surface results in low mortality
- Surface fire – moves along surface of the lower forests – can kill shrubs and lower canopy - results in low or mixed mortality condition
- Canopy fire – moves from surface to canopy and can either torch individual trees or move along canopy creating a large fire on the landscape

Fire Through Time

Wiesburg and Swanson fire history studies and graphic – see slides

- Periods on time in 1400s and 1900s with lots of fire – associated with warming periods
- During colder periods less fire
- Knowing something about the plants that live in an area, the kinds of fires historically, and overall landscape pattern or effect allows us to determine what fire regime was.

Historical Fire Regimes

- The northwest forest plan synthesis – online – historical fire regime (before management)
- 3 major fire regimes –
    - blue- infrequent high severity - very severe fire effects (coast range and high elevation west side forests)
    - yellow – variable frequency – mixed severity, variable extent. Elements of low severity and high severity fire. Mid to lower elevation forests on West side. Rigdon is in the transition zone.

- red – frequent low severity -. very low mortality, common fire, Middle variable frequency of fire

- West slopes of warner Mt. study – 1990s – surveyed stumps in Warner Mt. area of recently harvested units of Dug fir and Ponderosa pine stands.
  - Looking for evidence of fires.
  - Able to find 8 fires that occurred 1654-1879.
  - Calculating mean fire frequency = 27 years. Fairly frequent.
  - Also point out that ground fire often doesn't scar trees, so could be conservative estimate of frequency.
  - No evidence easily available for ground fire.
  - Q: Types of evidence used: older fires were largely age class fires (more severe) and could have "reset" the stand. Each site had variable fire evidence which leads to the fact that mixed fire severity occurred.
  - So why no fire from 1879 – now? People?

Evidence of historical fires

- Fire scars – formed when surface fire burns the bark or base of tree so it moves through furrows of bark and kills live tissue. Cambium live tissue when killed the tree puts on quick growth to close the wound and seals area. If tree hasn't totally grown over the wound you can get another scar in the same area (bark thinner and more vulnerable).
- Age class data – after fire kills a patch or stand get shade tolerant species that move in (doug fir), can give info that fire occurred before that age class trees.
- Another place to look for evidence is old survey records. During Jim's creek project. In Rigdon there in mid1800's - probably close of a picture of pre-settlement landscape. In Jim's Creek – 5K acres of open savannah doug fir and ponderosa pine with lots of shrubs.

Current Fire on the landscape

LANDFIRE program – for fire management. Goal is to produce special information, looking at historical patterns and creating a process to evaluate current conditions against historical conditions. A way to get a handle on historical patterns of fire.

Part of the process was to develope Models of dominant vegetation types (such as mixed conifer) 5 states of transition: pretty simple seral

1. Post disturbance early seral
2. mid serial closed canopy
3. mid seral open canopy
4. late seral open canopy
5. late seral closed canopy

Use information about growth and succession to model how these states moved with growth from one state to the next, and how quickly. Added disturbance information to model the frequency that disturbance would occur and how often it would move to another state. Ran the model multiple times to get a "steady state" for reference conditions. Every dominant vegetation

type has a reference for what the seral conditions mean is for each vegetation types and % area each seral state occupies in watershed.
When binned in condition class:
I – very little departure, within range of historical conditions - up to 33% departure
II – departed landscape - 33-66% departure
III – heavily departed 66<% departure

- Mixed conifer results – dominate by open canopy forest and late successional forests – most of which are open canopy.
- Every single seral stage has some occurrence in a watershed. Looking at a watershed basis
- Comparing historical reference conditions to current condition provides a "sense" of departure.
- In the Rigdon area there is a lot of closed forests -- which indicates it is departed.
    - In Rigdon landscape there is lots of type II, departed landscape. As well as ares w/ white oak model were heavily departed.

Note: this is a simple way to get a grasp on departure. There are issues with the model, such as there is only 1 value for each seral stage. Need to note there is variability within space and time within a vegetation type. Expect that there is more variability and range within the vegetation type. For now, the model is a good first step and there is work being done to develop more sophisticated models.

People on the landscape:

- We know Native people shave been on the landscape for centuries. Evidence: camps, culturally modified trees, settlements. We can postulate that natives may have used fire as a tool.
- Post settlement: grazing, logging, etc that also has effect on vegetation.
- Key role of people: suppressing fires
    - Early policy to suppress all fires – most effective in 30's – 40's CCC suppressing fires and building fire deterrents. Changed role of fire.
    - Compared to ignition map 1970 – 2015 there were 1000 fire ignitions in the Rigdon area. Most were actively suppressed.
- Think about if only a very small portion of 1000 ignitions was not suppressed what would be the impact on the landscape today?

Fire in the Future
Climate change vulnerability assessment
By 2100 – Eugene will feel like Sacramento CA
Generally across the west cascades of OR: by 2100 increase of summer temps 7% and decrease in summer precip 30%
The landscape will become a lot warmer and dryer
Ray Davis research – fire and fire effects research – map of probability of large wildfires occurring. Drivers of large wildfire – summer temps, summer precip, topography elevation and slope. Tested model looking at recent fires – and it proved true. If we look at the chart at our

current condition, Rigdon subwatersheds, in 2060 w/ climate projection data, landscapes have really high probability of large wildfires.

We can't control physical aspects (slope, climate) but can control the vegetation. All the more reason to think about creating resilient landscapes today knowing what we will be up against in the future.

Rigdon Field Trip

Stop 1: Mixed Conifer forest example (near Mutton Meadows) *Jane Kertis & Tim Bailey*

What do people notice about the forest?

- 300 year old ponderosa pines,
- 75-100 year old douglas fir
- Larger diameter trees – gives a snapshot, evidence that the area was once more open –
- Distance between trees, size, larger branches that once existed on lower boles of pines
- Oregon white Oak
- Still some native grasses in small bunches

Participant Q: Is it too late for thinning treatment?

- Maybe or maybe not, need to see how stressed the trees are
- Older doug fir trees in the stand may live longer.
- Recruitment of more ponderosa pine can't happen without out creating a more open forest
- If douglas fir in the stand are thinned it will allow for more nutrition, water, sun for remaining trees
- Can see the trajectory of tree mortality for the larger trees that are being crowded out.

What would fire do in this stand?

- Creep around, burn through thick duff layer
- Amount of needle cast at the base of large trees could kill them
- Variation could depend on the topography
    - This area flat, but slopes would carry fire
- If condition right, fire could reach the canopy

<u>Group Discussion:</u>
What has led to these conditions? Fire suppression? Less cultural fire?
If fire were reintroduced, what would be the effect?

- It depends on the prescribed fire plan – can plan fire intensity but it would be impossible to kill the smaller douglas fir while protecting the larger old growth Ponderosa and Doug Fir
- 100 years of fire suppression has created a condition that prevents using only fire to restore the forests
- If the forest continues on this path, the dougs will kill the pines

- If mechanically thinned, then fire can be reintroduced and a fire regime established that allows frequent fire. Every 10 years? Possibly
- Thinning will allow for more structural diversity of trees, grasses, shrubs

This stand is pretty representative of mixed conifer in the area. If we think ahead to 2060, when this area is more susceptible to large fires, what fire will do the landscape?

- Need to think through the consequences – If this area is restored to what it looked like 100 years ago then we would want to leave Pine's to seed replacement trees for the ones crowded out.
- We talk about looking back – but we also need to look forward. P-pines, Sugar, incense Cedar – If the area is warmer and dryer landscape need propagates to propagate these forests to expand into the future. Urgent – need to think of species that are blinking out and that we want to keep on the landscape.
- Leads back to bigger conservation – thinning is a tool in the tool box. Part of this project to have this conversation. The Douglas fir trees that are in this stand have enough value that they can pay for the restoration work. This is a telling stand, pretty representative, of current condition in dense south facing stands, more open, geology, climate dry. The North facing stands may look different.

Stop 2: Mutton Meadows *Jane Kertis, Molly Juillerat, Sequoia Gjerde*

Mutton meadows is actually an Oak savannah

- Historically it was heavily used for grazing sheep.
- The meadows have been maintained with fire.
- Illustrates what the open condition looks like
- The meadow has been maintained by prescribed fire and has been used to experiment with fall and spring burning to measure impact on native annuals and perennials and non-native weeds
    - St. Johns ward, oxide daisy, etc. See handout.
    - Fall burning has the best native vegetation response, but spring (late winter) wasn't significantly worse.
    - Spring burns easier to control, advantages especially when first time burning an area.
    - Monitor burns to see if getting desired results and look for ways to adapt and modify to get best results.
    - Burning starts at the top of the meadow, creating burned area fuel breaks and lighting strips all the way down.
- Fire in all transects either did nothing or had a positive effect – effects two fold – basically increased the spots that some of the natives could move too and increased cover. Overall fire is good, with fall fire being a little better.
- Native grasses – fescue, oak grass, elymus, lots of spring wildflowers
- This meadow is somewhat representative of meadows in the area. Really dry skeletal soil meadows mixed in with seasonally seepy areas with camus species that you see in and wetter areas. And really dry species as well.

Group Discussion:
Comment: This area illustrates what more of the forest looked like 150 years ago. Including shrubby oaks – little clumps of oak that get burned down and probably never grow to a tree. These bushes have been shaded out, and don't leave evidence that they existed but it was likely there were many more and an important component on this landscape.

Oak adaptations in sprouting – Oregon white oak – the shrubby oaks in Mutton Meadows were able to make it but there were likely many more that didn't.

This summer Molly and her crew will be looking for openings similar to mutton meadows, or evidence that there was openings.

- Looking for areas with thinner soils, different soils, and conditions that would support these types of meadows.
- Explore areas that support the different plant associations.
- Have to be sleuths – work with the land and look for evidence of what types of vegetation likes to grow in an area.
- Don't want to engineer something that isn't natural to an area – want to work with the land to be successful.
- That is one way to determine where certain treatments will be successful.
- Will be looking for potential projects points throughout the area

Comment: This is an example of good wintering areas. Meadow forbs and grasses are good feed for elk, other places don't have the food sources. This area also attracts golden eagles – open forage in understory is important to the whole wildlife food chain.

Question: Is there concern with amphibians and burning in spring?

- Depending on when it happens, it is possible to loose some amphibians but for the most part burning doesn't have a huge impact on the population.
- Historically, have changed fuel bed completely, so burning in summer problematic. Particularly in this south slope area get a 2 week spring window.
- Maybe spring burning not natural, but many of the plants are dormant and it won't kill them.
- Burning at the end of the summer can be problematic.
- Spring burns tend to be more mosaic anyways, wetter so leaves more green patches

The FS has been trying to think about burning impacts on pollinators. Butterfly Association – recommended that they not burn a whole meadow in 1 season. Have done surveys for butterflies and bumblebees and have found many unique species.

Another consideration is the more open environment, soil crusts, places where want to burn in the fall where there are lots of exposed soil there can be more damage on the burn site than if you can burn other times. Have to think about when planning a prescribed burn.

- Human activity – trampling, grazing etc, damages the soils.

- If there hasn't been a lot of human impacts then the soil crusts are not impacted and the grasses are more intact.
- Vegetation will hold the soils in place and will not come off the site after burning.
- Have to be more careful for erosion in steep slopes. Soils ability to hold water.
- Solar radiation – soils more dry – easily to dislodge

Oak habitat – less than 0.5% of this habitat left in the Cascades

- Rigdon located at the eastern edge of Oregon white oak territory – even more important when thinking about expansion.
- We are at the transition zone of black oak (to the south) and white oak.
- Q: is this an area black oak can expand too? Not sure about the difference of the physiology of the two species.
- Calapooya divide seems to be the dividing line. This is also true for a lot of different plants. Very interesting zone for botany.

Stop 3: Fire Management Policy and Tumblebug fire scar *Duane Bishop*

Changes to fire policy over time:

- the way fire is managed on the landscape has changed a huge amount in the last 20 years. Not long ago there was a 10:00 rule, every fire out by 10:00 am no matter what.
- As we continued to learn more about fire ecology the conversation between researchers and leaders about the benefit of fire and the risk of firefighting have changed.

Fire on the landscape:

- Prescribed fire – NEPA process – identify where want fire, how, when. Decide environmental parameters, risks, and write prescriptions based on models. Implement once the prescription is met.
    - When things are going as planned then area burned, if the fire is burned outside of prescription then a prescribed fire converts to a wildfire. Fire is not an exact science. It is broad brush but it is a course tool. Can't exactly decide where it is.
- Planning for wildfires
    - Preseason – identify values at risk so when fires happen these values are identified. As fire season gets closer the agency administrator works with fire commanders who are delegated to manage fires.
    - Firefighters are given direction from the Chief of the Forest Service and the District Ranger.
        - There is lots of training that firefighters do to prepare for a season.
    - Participant Q: things change?
        - Yes, every year there are updates to how suppression is approached. The Chief of the FS now is very focused on firefighter and public safety as a primary concern, and then resources.
    - The technical experts that manage fires use an incident command system (ICS), led by an incident commander that works for the agency administrator.
    - Under the ICS system people can be added to the command structure to grow to match the size of the incident.

- Tumblebug was a Type I incident with a large overhead organization that managed many resources that are working on the fire.
- A type I fire at this size was probably costing $1M a day to fight. It is very complex system.

Different firefighting tactics can be used to suppress fires.

- Direct attack is engaging the fire directly, putting people right on fires edge.
- Indirect attack is fighting fire from a distance.
- Minimum Impact Suppression Tactics (MIST) is to fight a fire with minimum impacts such as ground disturbance, sound, etc.
- Monitoring – certain times of year when there is not enough resources to fight fire, or when fire is in a remote area, they can decide to monitor a fire.
- Need to have many conversations about using all the tools available to fight fire. Fire management is changing to active suppression as the only option to use a variety tools. Considering safety, what are the options, values and risks.
    - When we let fires burn its not for resource benefit – it is for firefighter safety.
    - For general forest health, letting fire burn is an important conversation to have and that time is coming.

See 2014 Middle Fork 2014 fire handout: there were 105 fires on the District.

- Deception fire in 2014 - started out with 500-600 people and eventually brought in a Type I team.
- The fire perimeter was 7000 ac with parts over 100% slope.
- Early on decided to not put firefighters in the area because it was steep, instead used indirect firefighting strategy. Used the road system around the fire, thinning trees, improving roads, and prepping the road to burn out a perimeter contingency line that could hold the fire if it blew up.
- The fire burned brush and small trees benefiting the landscape.
- The fire did have a few days of fire runs but the contingency lines held.
- Back-burned using a helicopter to light ridge tops within the fire to remove much of the fuel interior of the contingency line.
- Now the area is recovering well and sprouting new growth.
- After a fire the Burned Area Emergency Response (BEAR) team comes in and assess areas that need to be treated
- Infrared soil survey for burned severity (high, med, low) Most of the deception fire burned low. Only 11% was medium or high severity. Usually fires of this size have 50-60% burn severity.
- On the Deception fire it was interesting aligning multiple players on the approach to let fire burn. Talking about tactics and strategies have to consider time of year and resources. For Deception there was lots of firefighting resources available but for other fires, there may not be.
- 2014 fire season for the District cost 38 Million being thrifty as possible while providing for life and safety.

A common question is when you get a fire, why not let it burn? The District can't because they haven't gone through a specific NEPA process and the full public disclosure of how they will manage fires. There are places like Colorado Rocky's where it is remote it is acceptable to have 5K acre fires in the backcountry. Here in the West it is not remote enough to let-burn.

Group Discussion:
Comment: When considering the complexity of wildland firefighting as a tool – Tumblebug is a good example of good and bad. Where we are standing is an example of fire doing good. In the distance, where the fire burned through the Tumblebug drainage, it eliminated the habitat for 9 pair of spotted owls.

- When trying to decide if fire is good it depends on how you look at it and from what perspective (owl or elk). Tumblebug burned severity was more like 60% high severity and burned hotter across more of the fire area. There was also vegetation differences.
- The Deception fire was at a lower elevation in a western hemlock zone with lots of Douglas fir. The Tumblebug fire was in a silver fir zone, or Mountain hemlock where you would expect to have high mortality.
- It is complicated because you have to consider the individual landscape, values at risk and safety.
- In this location – looking at fire effects – the Tumblebug fire was 2009, mid Sept lightning fire. There were a lot of small fires, but 3 burned together to form the larger area. The fire did burn down to the area standing in, and it did some good. It thinned through mixed conifer area. It is a place where more good can be done. Where it did good was a clear cut that was replanted with pine and had a grassy understory and fire burned as an understory fire.

Q: Prescribed fire policy considerations, especially with climate change, will there be an emphasis to do prescribed fire and funding to implement? You would think so, but with changing politics, changing administration there is no way to know. There has been more of an emphasis on using fire on the landscape on the east side of Oregon but west side doesn't get the same focus.

Moving to the other side of the ridge. . .

Tumblebug fire scar on north facing slope *James Johnston, Jane Kertis*

What do people see?

- Mixed conifer forests – diversity of over story Madrone, Incense cedar, doug fir.
- More northerly moist aspect, rhododendron

Mixed conifer forests stands experience a real mixed severity fire. In the patch we are standing, most of the over story was killed, whereas right next door, seemingly at random, there was an understory fire with very little over story fire.

- Magnificent variation of fire effects, differing fire effects strongly associated with highly variable of diverse regeneration.
- What do people see regenerating? Manzanita, incense cedar, doug fir, ponderosa pine.

Diverse forests – diverse fire effects – diverse response to fire in terms of regeneration.

- It is up to the collaborative, working with the forest service, to decide what the goals and objectives of this project are, but a goal and objective that is strongly suggested by the ecological literature is biodiversity and introducing very diverse fire effects to the landscape - on the theory that when you have diverse fire effects and diverse fire responses you have a more resilient landscape projecting forward into the future when there will be a more variable climate and variable disturbance.
- Another way of saying it "don't put all you eggs in the same basket".
- There is a reason there is a mixed conifer forest here.
    - If we were standing in the same topographic position and same elevation north of us in the old Lowell district , or south in Steamboat creek it would be a different forest.
    - The reason this landscape is here is really deep valleys, a lot of elevation change, the unique landform of the Staley ridge and Callapooya Divide that is blocking winter and spring precipitation that would normally come from the south west.
    - You can drive up and over the ridge in the spring and it will be pouring to the south while dry on the north side of the ridge.
    - Unfortunately we don't have good data that shows 30 years of weather in these valleys but anecdotally we know that there is a very strong influence on temperature and precipitation by these ridges.
    - It's a really unique landform and is why we have the incense cedar, the ponderosa pine and the white oak.

Looking forward into the future when it gets dryer, more wildfire, and thinking about maintaining structurally and compositionally diverse forests, it is probably really important to landscape scale resilience.

- In this area in 100 years there will be a dense stand of Doug fir here.
- This is what mixed severity fire historically looked like.
    - Not like on the east side where a tree here or there dies. Instead it can look like a patch of high mortality right next to a patch of low mortality.
    - That is mixed severity story here.
    - In some ways it makes it more resilient to large fires in how the new forest will be a different age and height than its neighbor.
    - If a crown fire is running through here it would hit this patch of new growth and drop to the ground.
- In essence, its creating variable types of fire and diverse fire behavior, that leads to diverse post fire landscape patterns. Maintaining variability will be important from a resiliency perspective.

<u>Group Discussion:</u>

Comment: At this there are neat things going on here with disturbance response, succession trajectory and options for the future.

Comment: With harvest is it important to continue to do small clear cut harvests with a variety of heights?

- That is one technique to consider. Then the question is, at what scale do you want to variability to express its self at – 10, 50, 100 acre scale?
- If you create the variability, heterogeneity everywhere then in essence you are creating homogeneousness. Keeping that scale in mind when talking about that.
- We also need to keep in mind the aspect differences. In my mind, that is where diversity in fire effects is going to express itself as well.

Fire is an imprecise tool and when have wildfire its even more imprecise. Say this is an area we want to protect for spotted owl, but in a wildfire situation there is no way we could have herded this fire.

- The operational considerations of wildfire fighting are important with respect to future landscape scale to disturbance.
- When you use silviculture as a tool to create more open forest structure, and you are generating more grasses and flashy fuels that keep flame lengths low, there is more options for fire management and options for fire management s to build line in different places and achieve more objectives.
- Probably more options in letting fire burn when there is diverse stand structure. Because you are creating a variety of fire behavior which gives you more flexibility in how you choose to fight the fire.

One of the agency tools that can be helpful is the Wildland Fire Decision Support System (WFDSS). The system assists fire managers and analysts in making strategic and tactical decisions for fire incidents.

- Long term fire analysis – fire ecology models and costs. Original intent for risk assessments, resources needed to fight fire, and determine costs.
- Can compare direct indirect and point protection. You can modify over time.
- The nice thing is it helps get thoughts together on how to respond to a fire and can consider costs. It does invite a lot of outside scrutiny but the methodology's are there and invite discussion.
- Values at risk – humans, values, land – like a quick NEPA – what are the values at risk. Helps make little decisions like using roads vs. going direct through a meadow. Won't cause a risk, help save important values and save money.

Stops like this helpful to start thinking about what types of treatments are good for different sites.

- There is a huge range of treatment options from passive management, essentially doing nothing, to over story removal - suspect won't happen at large scale like a clear cut - and everything in-between
- Heavy or light thinning, different spatial variability in thinning, thinning that leaves clumps and gaps.
- There are areas like this that is appropriate to introduce heterogeneity by removing patches of trees and leaving other patches untreated.
- There are a huge variety of treatments available for different topographical settings and different vegetation types and one helpful frame to view those options in is how are future disturbance regimes going to interact with those treatments? This gets at the resilience issue.

Participant Q: Is the stand a natural regeneration stand – yes. We have learned on the district that there is very little issue with getting stands to regenerate naturally after fires. Planting is unnecessary and naturally seeded trees fare better than planted seedlings.

Stop 4: 1996 fire scar *Jane Kertis, James Johnston*

This fire scar is one of a number of fires that occurred in this area in 1996. It was late Aug, hot dry, lots of other fires. High fire danger. The fire wasn't suppressed for 3 days because there were no resources. These are not conditions that we could ever replicate for prescribed burning. What do you notice?

- Fire effects were low intensity, blackening of trees on uphill side,
- Surface fire that punked around and then popped up in small opening.
- Fire was an understory burn.
- There was a small patch that was a blowup that has now regenerated with young douglas fir regrowth.

<u>Group Discussion:</u>
Comment: This site illustrates that after suppressing fire for 100-120 years - reducing fire back into the ecosystem will not return the forest back to the way it was.

- This fire is a good example of how not the case. The only spot that the fire got hot enough to punch a hole in the canopy and cause a patch of mortality resulted in an even denser stand of Doug fir.

Comment: But we don't know what this area looked like 150 years ago?
Yes we do, these big Incense cedar were here but much of the dougs weren't here.

- There is probably some incense cedar in the reproduction trees.
- A lot of these smaller trees aren't going to make it. In my mind, this is not accomplished restoration of a more open forests.
- Takeaway – sometimes we can't use the same process to restore forests after they have been altered. Its not going to give us necessarily the same fire effects that we would have seen in the past.
    - The reason is the fuel bed has changed completely. You can't use prescribed fire to remove all that fuel, safely.
- Q: Whats wrong with regrowth patch? Has diversity?
    - There is no right answer here, if we want to have a dense stand of Doug fir on this slope we could, and it wouldn't be a catastrophe but it wouldn't have cedar and pine.
- This is just a small patch, if you look at this hillside its not all dense.
    - That's because it's the patch is the only place that the trees were killed and there was enough sunlight for the regrowth
    - The whole point is that the 1996 Fire burned all throughout here but it didn't create any mortality.

- If we look around it is obvious that Douglas fir grows really well here if we don't have the process of fire to maintain the more open condition.
- When you take fire out you are creating different types of stands, and by putting the process back in now, we aren't necessarily getting the effects me may want. If we want to recreate an open stand, by putting fire in this system alone we are not going to get it. We are either going to get something like this – a surface fire that creeps around and may pop a few holes in the canopy – or – we are going to get a crown fire that basically kills everything. These are the things we need to wrestle with when we are thinking about what we want these landscapes to look like.

Patches of both of those are good – we want both – and we also want little patches where there is no mortality and a bunch of mortality is fine. We are not going to be the deciders on that for the most part when fire is in play.

- We are the deciders if we want to let fire come into play here – that is one big decision – and again we also want to talk about the scale we want that diversity to express itself. Right now we are looking at one little hillside but say its several hundred to 1000 acres on this hillside. Do we want that whole area to look like this?

The question is, is this resilient? Is this what we want a resilient forest to look like?

- If we were here 100 years ago and it was a little less dense, with a grassy understory, it would tend to just underburn. If that patch of dense douglas fir continues to grow and gets to be 30 or 40 feet tall this is no longer a resilient stand. It could easily create a crown fire that, with wind, would kill the whole hillside.
- If that is what we want then we can make forests like that - we know how to do it well. But that's not what was here and is not what is resilient on this slope.

Question: If we asked the FS to burn this and kill 50% of the evenly spaced trees could you do it?

- No, don't think we could kill 10% in here, not with the fuel loadings we have today
- The lesson is that this area burned in late August – if we want to use fire to reduce density in this stand we would have to burn it in even later or dryer conditions.
    - FS – we can't even have that conversation because the fire would run to the top into more favorable fuel beds and then be off to the races. Even if we wanted to just treat this it would take so much to hold this fire that we just couldn't.
    - The thing about what we did on the other side of the hill, in the Jims Cr project, we created the conditions so that it could be more resilient in a wildfire, even a severe one. The trees are more widely spaced and less fuel on the ground.

Comment: Even though this is a north slope its still part of the mixed conifer forests – we are still seeing incense cedar and pine. Not quite as frequent as the south slopes but its still here.

- Similar to the first stand we saw today, really mossy understory, Oregon grape, not the same density of ponderosa pine, there is more western hemlock here - which is a good indication that it is a moister area. There is some red cedar down by the creek too. We are right at a transition.
- The point again is that the stand is altered, and even under heavy high fire conditions we may not get the result we want just by reintroducing fire.

- Also shows that the forest is not so dense that we will lose everything when a fire comes through.

Comment: Conceptual model doesn't have much empirical basis, the models are wrong. We make strong associations between vegetation, topography and disturbance. And its wrong.

- Instead you find strong correlations between available soil water that buffer certain species against climate variability. So on these aspect slopes you get douglas fir but you go over the ridge and look down the other side and its ponderosa pine.
- But, that's not determinative of the disturbance regime at all, the disturbance regime can be the same. You can have a surface fire regime in these somewhat fire intolerant species just the same as you have surface fire in the ponderosa pine.
- So this surface fire we had in here - because there wasn't someone to put it out - is probably characteristic of the system. You see quite a bit of fire scar evidence on the ridge that says this is characteristic of the system.
- Same disturbance regime, very different vegetation dynamics. This is important to keep in mind as we move forward with restoration.

Question: Does that mean its climate and not structure?

- It means its a lot of things -- Why do we have Ponderosa pine on sites?
    - Is it because its more fire tolerant? No.
    - Is it because its more drought tolerant? No.
    - Is it because its more tolerant of insects? No.
    - Its because of all those things.
- The synergistic effect of low water availability, frequent fire, and extreme variability of climate over the several hundred year lifespan of an organism is what favors ponderosa pine.
- Whereas this site here that has more water availability.
- Then why are we losing Ponderosa pines? Why are they dying?
    - Not sure that they are. Less concerned about them dying from drought stress and lack of rigor and competition of douglas fir, than I am of the simple fact that the site is not regenerating ponderosa pine.
- But if it is all because of the climate and the ability of a community to handle all the different variables then why isn't it regenerating?
    - It's the disturbance regime that changed.
    - The concern is that succession is excluding those more rare structures like old growth ponderosa pine and the oak from the system.
    - That is the rational for treatment.
    - It will eventually die, all biological organisms will die, the concern is that they will not be replaced by the structure that is there now.

Comment: Oregon white oak have a very wide ecological amplitude and they will persist where the disturbance regime favors them over their competitors.

- They obviously don't compete well with conifers but if there is a disturbance regime or moisture regime that the conifers can't handle, the Oaks can.
- The Oregon white oak is very fire and drought tolerant, much more so than the conifers.

- It is the type of structure that absolutely will be killed by conifers - absent releasing them from the competition.
    - It is largely a story about light and not water availability.
- Maintaining that oak structure on the landscape has got to be a priority. It is such an underrepresented element of biological diversity on this landscape.

Participant's closing thoughts or questions:

- It would be good for the group to go into Jim's Creek
- It was helpful to learn about how Colorado went through the NEPA process to let fire burn on the landscape and understanding the path towards that direction if that is the way we want to go
- We need to think how managing this landscape, through allowing for wildfire - in terms of inactive or active management - will effect water quality. Thinking of this as a drinking water source. It opens up another can of worms, but how will any of the management activities affect water quality - even at a large scale with catastrophic wildfire.
- Key takaway – the Callapoya divide and its influence on vegetation in this area. How it creates a rain shadow.
- I loved the oaks, pines and the mountains – it is wonderful and reminds me how varied it is. How much it looks the same, but turn a corner and its something completely different. To protect that is a goal.
- If the powerpoint slide about 2060 is correct, all bets are off.
- Thinking of ways to look at variability across the landscape, and what we want to do in this project area, is going to be a good challenge. How can we display and show this using some of the tools we have. In planning field trips we can visit spots that are accessible but there is this whole giant area - trying to look at that bigger area will be challenging.
- Appreciated the conversation about 2060 and looking at plants in that dryer, warmer environment and how to support the ecology into that. Not something I had thought about.
- Always thankful to be with different forest service specialists and be a witness to how thoughtful of how they are. Working together in this preplanning stage, I am grateful to be a part of that with the collaborative. I know the FS has a lot to offer and the rest of the collaborative too so its nice to be part of the conversation though this process.