

Fire Workshop #1 Video Transcript

December 18, 2014

Part 1

Barnie Gyant

Because we most certainly are dealing with some issues that affect all of us. I think we're starting really just to hone in and realize what those are when you look at you know, sanitation issues, burning a habitat for species, on a restoration, will it be valued? The answer to that question is yet. So I said it twice. I'm hoping you got it. So I think I've been around most of you in a lot of different settings and venues. I think you guys know me to be pretty blunt and pretty honest and a hard working person, really trying to work at some of these [] issues that we have.

So let me just tell you briefly for me what's on our mind as we deal with Rim. So here's a small list. Salvage is on the list, and that's typically as an agency where we focus, but it's got to be larger than that. So for me, Barnie Gyant, biologist at heart, I think about how do we set the stage where as we may prevent other Rims from occurring in that same footprint? We got to be thinking out. How do we make that landscape more resilient in the future? That's one for me.

Another one I got a huge concern as a fisheries biologist is I'm just really concerned about that sediment and where it moves and what kind of effect that's going to have on aquatic systems. That's another one. Third for me is if we plant back—if we plant back—but that's depending on whether or not you got a seed source or not, and for a couple vantage places that I saw I didn't see a seed source. So that means that we plan to have a forest in the future that we might need to reforest, but what do you plant back? How do we incorporate climate change into those decisions? Do we plant back the way we used to whereas we were primarily looking at trying to grow a lot of trees fast for economic reasons? But that's another one that's on my mind.

It's going to be awhile before there's large wood back. What do we do in a way to help make sure that there's enough large wood—large wood debris on the ground system? What are we doing with riparian areas? Those are questions for me that I'm asking and so what I'm hoping is that particularly with this workshop—so we've had a field trip and so this workshop are so around those major issues. How do—write this word down. We designed it. I didn't see y'all write. This is where you actually take a pen down and write. Most of you have got pads. It's we. I want us today to see about designing how we move forward. So again I appreciate your time. Let's really have some open dialogue. You got several Forest Service folks that are here today. Kind of my instructions are I really don't want us to talk a lot. I want us to listen. Now if somebody asks you a question, yes. We're good to engage, but this is primarily our opportunity to listen to you guys as our constituents as we move forward. Again, I want to say thank you again for the day. This is going to be value for us on how we help design and how we move

forward. I'm going to probably float today in and around because I also want to listen. The Rim Fire and the Restoration Piece—just so you guys know—is my personal priority for 2014. I'm going to be engaged. I'm going to be committed. I'm going to continue to listen to people, and I'm also help provide direction as the forest moves forward with this project. Thanks for just letting me—allowing me to open this morning and look forward to a lot of meaningful engagement. Again, thanks for your time.

[00:04:04]

Dorian Fougères

I'm going to start here. Good morning. My name is Dorian Fougères. I'm a mediator with Center for Collaborative Policy. We're part of California State University Sacramento and work with federal, state and local California. How many of people have been in a meeting with me before? Okay, half of you. Okay, most of you. Great. So like Bernie said, we are thrilled. We have a robust steering committee. We have a planning committee. We have a technical committee. We've got lots of committees that are all coordinated to get you here today, probably about 20 people involved. We planned this at the strategic level as well, all the actual material that you'll have today. Why don't you go ahead if you want to grab—you have a little workbook that's going to be kind of a touch point today. If you grab one of the workbooks from the center table, there should be enough on your table.

[00:05:15]

Malcolm North

I tend to put people to sleep so you'd better keep some lights on. No actually, I'm going to try to keep this very brief because I'd rather listen to what other folks have to say so there's only four slides here. What I was kind of tasked or assigned with is talking about general ideas about vegetation and how that might inform what might happen in the Rim Fire. I think the main thing to keep in mind which Bernie already mentioned this morning is that within the context of the Rim Fire the two big actions that are going to go on in that footprint are going to be the salvage logging and the planting. The context in which I'm going to make a lot of my comments are to think about those as opportunities to implement some of these ideas about what we want vegetation to be like. Let me first start with kind of current and desired conditions. Hopefully these are things we would all generally agree on so mostly I'm going to be stating the obvious. But I think it's worth just seeing if we're all on the same page.

Some of the things that seem to be very clear from the context of the Rim Fire itself is that if the current conditions are left alone, seeding and successful regeneration of the trees is going to be rare or spotty within the very large high severity patches. The second thing is that anybody's who's been out there knows that there's potential for a tremendous amount of shrub growth. You see a lot of burned shrubs. There's probably a huge amount of seed in the soil. We know that not only necessarily from the Rim, but in many places in the Sierras. To re-establish the forest,

there's going to have to be a focus on tree seedlings, and I put pine in parentheses there because we know that the pine's likely to be more resistant, resilient to both climate change and future fires so we need to kind of favor plant and protect those particular assets. What do I mean by protection here? Protection is really reducing fire extent and severity until regenerating trees are sufficiently large enough to have greater fire resistance. I just threw a ballpark number up there. Joe could probably—Joe Sherlock could probably refine that a little bit better. I would think given productivity, you're looking at somewhere between 40-65 years to get enough crown recession and thick enough bark to be able to deal with at least moderate fire.

Then finally after that period, managed wildfire and prescribed fire might be most effective for increasing tree fire resistance into the future. Again, that more has to do with what the literature and a lot of the research is suggesting, not necessarily making a comment one way or another about whether we can do this mechanically or not, but I think the literature is pretty solid on fire resistance in trees. It's kind of a learned behavior that experienced a fire is better at producing than almost anything else.

So what would be kind of the general concepts that might inform some of this? One of the concepts certainly in ecological theory that's come along in the last 10-15 years is a focus on paying attention to the disturbance regime that was inherent in the particular system you're looking at. Some folks are saying mimic or emulate it. I think a lot of literature now is shifting to maybe not strictly adhering to the disturbance regime, but figuring out what lessons in particular you can get from it, particularly those focus on three things, which is how do management actions, how similar are they or where do they differ in terms of their spatial, temporal, and biological legacies? What do I mean by that? Temporal just means how frequently does the disturbance come along and how frequently is your management replicating or in line with that time period? The second is the spatial extent. This is pretty obvious in terms of the Rim Fires. We had these really large, high severity patches which don't appear to be consistent with what the historical fire regime produced out there. Temporal—I should jump back and say—one of the effects of the fire of course is a long time without fire or in some places without fire within the Rim Fire leading to a fuels accumulation problem as well as the weather conditions that were prevalent for driving at high speed.

But the final one I'm going to focus a little bit more on is this concept of biological legacies. What does that mean? Well, it's kind of a concept that's come out of a lot of ecological research, particularly one of the places was Mount St. Helens in which they were trying to look at how the ecosystem responded after a major disturbance. There was a lot of consensus that what was left on the site had an impact on how the system recovered. Particularly a lot of that terminology has been focused on the wood, the dead wood, both in terms of standing dead wood and downed dead wood. In the case of Mount St. Helens, there was a real difference in terms of what

happened in the areas that were salvaged on the Weyerhaeuser land versus the areas that were not salvaged. For those of you who are aware of this particular debate, there's been a lot of contention within science about the role of salvage. Generally—I'm not going to get into much of the details of that—but what I wanted to do is say traditionally the focus has been on the coarse woody debris, the logs, and the snags, and their role.

I would suggest that actually we have a lot of reasons to think that the body of the salvage literature doesn't strictly apply to the Sierras. In a frequent fire system, I would think that coarse woody debris did not persist very long in the system. For a lot of ecological connectivity for a lot of the process to be interlinked, something has to be existing in the ecosystem long enough for those processes to kind of develop. Unfortunately as far as I'm aware, there's only one particular paper that really looked into this question of salvage logging versus non-salvage logging. Martin Ritchie and Carl Skinner and Eric Knapp did work up at Cone Mountain or in the Cone Fire and basically found that the coarse woody debris was very ephemeral in that context. I was suggesting that its residency time is maybe not as long as many of the other places where salvage has been better studied.

Finally what I want to say is that at least for me when I've looked at the Rim Fire, been out there and both looked at the maps and the context of what's going on—to me the thing which really jumps out is the important biological legacy are the green trees. There's very few of them left. Keeping or focusing on those green trees is probably one of the best things we can do in terms of this ecological concept of bringing along the biological legacies that are going to be important for the landscape to recover. To my mind, it begs the question, how best to retain and minimize impact to both individuals and patches of live trees?

Final two slides. One of the things that jumps out at you in this map—the large map here—is just the severity map and Carlos has got some very nice maps which give a lot more detail of this as to where exactly the green trees are left. Certainly it would suggest that these places with green on this map are fairly rare within this landscape and so trying to work with a general concept of both protecting those places so that they're behind the lower right-hand map, the area that are fuels treated, so you break—you've broken the fire's ability to get to those places and really potentially incinerate or change those trees. That's one consideration. The other that the ecological literature would be fairly consistent on is that you would not necessarily go in and do fuels treatments within those green patches because there's a lot of processes which are going on from that legacy effect that need to be left intact. So the two things I would say that ecological literature really suggests out of this is the real importance of fuels treatments in the right place in the landscape but generally that those fuels treatments probably should not be dropped right into where the few green trees are that are left on the landscape.

Then finally this planting question. I think the restoration team—Vegetation Resilience Project report that came out was just really excellent that the folks did on the Stanislaus. I just pulled a sentence that came out of that which said, “When considering reforestation, topography and fire severity patterns are crucial.” You can see on the left the projection for possible fire severity in the future and the right kind of shows this idea of building the landscape into areas called LMUs or landscape management areas. The take-home message here is that the green areas are basically places that are likely to be in cool air drainages, cold air sinks which logically would be the place that you’d probably have a better chance for regeneration where it’s planted to survive the next fire that would occur in the landscape.

Finally, I’d say in terms of that reforestation, there seems like there’s two kind of concepts that you might want to bring in here. For those who’ve looked at ecology and probably studied it much more recently, I’m probably going to show my ancient learning, but the old idea about reproductive strategy was called R versus K strategies. One was you threw a whole bunch of progeny out there and most of them died, but you just kind of overwhelmed the system enough so that something eventually took hold kind of like throwing pasta against the wall until something sticks. The other one—the K—is actually much more that you intensively invest in your progeny to make sure that they have a better chance of survival. I would suggest both of these would come into play in terms of the regeneration within the forest. One is trying to establish as broadly as you can across the landscape, a foundational forest and that probably means a lot of plantings, very small, widely distributed. A lot of those are going to die but at least you have a chance that some of them out there, particularly if they’re put in these wetter micro sites might actually take. Some of them might stick to the wall and in effect be able to provide seed.

The other thing is that—this is something that I think lately we haven’t done much of—is to really invest in a few places, i.e. go back in and reenter them, take care of the competing shrubs, or thin the site, or whatever is necessary to be able to really accelerate the growth and establish trees in some of these key nucleation places, sites, the places that can establish a forest, and then the forest can spread out from there. I think we’ve learned from a lot of the recent analyses of spatial patterns in these forests that planting—the way we planted in the past a more plantation focus—is something that we want to revisit because there’s a lot to suggest that frequent fire forests have kind of a groupie, gappy type of structure. How we produce that from planting to get to there, I have no freaking idea. Most of the people I’ve contacted have no idea either so this is going to be an experiment and a work in process but to me that would be particularly something useful to consider in these nucleation sites where you want to invest a lot in there is a different planting strategy. Thanks.

[00:17:22]

Maria Benech [ph]

Good morning. I'm actually Maria Benech [ph]. Unfortunately Shelly Crook is sick today and couldn't make it, which is really unfortunate because this is the first time I've seen these slides, but I'll do my best. I hope a lot of you got to see the presentation that they did last week for the webinar which—

We'll have more on that webinar December 10th.

Excellent. Good because it was supposedly really well done. I actually missed it myself. What I want to cover today though is just going over the really the goals and objectives that we came up with. One, the Rim Fire—well before the Rim Fire was out—we started talking about the restoration strategy out there. We asked the team to come together—fire ecologists, fire and fuel managers, research—folks to come together and really look at this landscape because many of us have been on the Stanislaus for a long time and helped reforest the 1987 burns. We wanted to figure out how we can get this area, these locations, to a forest. We got many of those places to 25 years, but that wasn't quite where we wanted to get to. We wanted to get to long term, 100-year-old forests so we asked this team to get together, look at this area, and help us understand what we can do out here to make this something that can be a forest into the future. That was their task, and I think they did an outstanding job.

The goals that they came up with and objectives that they talked about is really looking at a lot of stuff that Malcolm just talked about too so you can see in this area high burn severity, not many green trees left so some of the things they really talked about is when we come in and reforest these areas is we need to maintain our treatments once we get back in, which we all know. We know we reforest. We've done a lot of good reforestation long term. We need to get in there and do our thinnings and that follow-up work, and that's something we'll definitely focus on. That was one of the things they suggested. Looking at the homogeneous forest, we had a lot of really beautiful plantations out there so again kind of what Malcolm talked about. Let's—groups and gaps and not that continuity through these forests so that we can maintain—when a fire comes in and we have lower severity fires, we have areas where we can put them out at. That was another thing they talked about.

Areas that are already overstocked. We have green that have survived adjacent to these areas so where that is we want to basically get in and treat those areas and help reduce the fire severity when fire comes through those areas into the future. We talked about again the heterogeneity was huge for fires as well as restoration ecology down the road. We want to look at the reintroduction of fire as an ecosystem process. It's something traditionally we've really put all of our fires out, and we want to do in the future is have a landscape where we can maintain fire through it. It's a part of the system. It's not something we automatically put out, but we can utilize that as part of

our fuels reduction, part of our ecological future landscape out there so that's really a key process that we want to think about now in developing our forests into the future and how they'll be long term. Thank you.

Again, that comes back to the reducing the negative effects of fires so we know fires are going to be on this landscape so it's really about the severity of the fires long term is what we're trying to focus on with this. Managing wildfires again, again historically when we have wildfires we put them out except maybe when they're in wilderness or some of those areas—Yosemite National Park—some of these other areas. We want to really look at utilizing fire as a process through the system in the long term, not just putting everything out but being able to have these fires move through these stands and not have—this picture that we have here—a stand that has that mosaic of burn severities. One of the things we talked about too is myself, the manager, a forester, and I've talked about how much can we live with as far as when we have a fire in these systems, how much mortality is okay? Historically we've been a little, not real comfortable with some mortality out there. I think we're going to be at a lot more comfortable with more mortality in the future. Another thing we talked about what was utilizing those wildfires over time, like in prescribed fire. They really want to expand those opportunities of applicational fire across the landscapes. Those are all those things they were really working on for that long term restoration of fire out there. The report is much better written than I'm speaking it so I hope you've seen it and actually again saw the webinar. I don't want to take a lot of time because I think you've probably had—most of you saw the webinar and you know what they're talking about so I hope that will cover it for today. Thank you.

[00:21:42]

Ryan Burnett

I was asked to talk about wildlife, but really I don't know anything about wildlife. I just know about birds so—but we say birds are indicators for everything so there we go. Okay, so I'm going to try to get three ideas across here, and again we're talking the land, trying to focus more on the landscape stuff which of course we all know less about than we do our little patch that we all study. But I'm going to really try to bring in the idea of for a lot of wildlife, high severity has value, and so that's an important thing to consider and maybe think about how we think about that and approach it. The idea of managing for mosaics, these fires certainly present opportunities to—some of the ideas Malcolm was talking about—to enhance mosaics, to bring back heterogeneity on the landscape, and then as part of my contract under a new name, I must talk about being climate smart.

Okay, so value high severity. High severity fire is really unique habitat on the landscape. What we found—I worked in the Sierras for about 12 years, and I always looked over in the fires and

go, “That looks interesting over there. I should go study something over there,” then finally started doing that about six years ago, and it really is. It’s really exciting all the stuff you never see in the green forest is in those high severity areas. It’s not just about snag wildlife. It’s about the whole range of wildlife. There’s a Rufous hummingbird here. We’re out in the moonlight about five years ago in the fall. Rufous hummingbirds is one of the fastest declining birds according to breeding birds survey. They breed in the Northwest and migrate through the Sierra Nevada. We ran into thousands of Rufous hummingbirds two years after that fire in these amazing wild flower fields. We came back and thought, “You could have hit them out of the air. If you had a tennis racket, you could have been whacking them out of the air.”

Anyway, there really are unique resources in these fires for high severity, whether they be within the natural range of variability of what happened out there, they have value on the landscape. I think when we start thinking of natural range of variability, we’re so far from that now. How we’ve managed and where we’re headed so I think it’s important just to consider that. It is really valuable. There’s a lot of resources out there that we spend a lot of time working on, restoring hard wood communities, restoring the aspen in the Sierra Nevada, thinning log poles out of meadows. The fire did some of that for us. Those are important resources to kind of continue to promote those going forward to recover those systems. We really think that—this is again some of what Malcolm was talking about—being strategic about and measured in assisting the natural processes. Where can we—this is such a huge landscape to talk about in the Rim Fire. Where can we be strategic to maybe make the biggest difference, to achieve some of these objectives? I think that’s an important strategy.

Something I coined a couple days ago, really be thinking about these high severity areas, not just for their snag resources but from the fungus and flowers, to the shrubs and snags because they’re all unique and important components of the system and drivers of biological diversity. I think the idea here is we often—my perception from the outside working with the Forest Services—we go—the salvage stuff has to happen so fast. We go identify the ground where we might be able to do this. It tends to line up with the black-backed woodpecker so we get really focused on that species of the habitat. What ends up happening is we find the places where we can go where it’s flat enough, there’s no archeological resources. There’s no botanical resources, and we salvage in those places. What we leave over, we say, “Well, now we have—we still have another 10,000 acres of high severity. That’s fine for all that wildlife,” as opposed to that’s not how we manage the green forest. We really ought to be thinking about where are those resources that are really important in high severity fire and try to line those up first and say—through whether it be habitat suitability models or whatever and really focus upfront on what are those high severity resources we want on the landscape and pick those out versus kind of leaving the leftovers after we’ve decided where we can go and do things. I think what we find is where we end up can go

and do things just happens to be where some important resources happen, whether it be spotted owls or black-backed peckers.

Okay, so black-backed woodpeckers. We knew close to nothing about black-backed woodpeckers in the Sierra Nevada until about five years ago. Thanks to the good work by Rodney Siegel, who's here in the room, and some of our work in the northern Sierra, we've learned a lot more in the last five years. We have some information about black-backed woodpeckers. It's never enough. We're scientists—we never think we have enough. Really the areas they're using—we found from our data in the northern Sierra—they're nesting in stands. They have 328 snags per acre on average. That's insane, right? That's really high density snag patches. But they're nesting in really small trees. They're actually nesting almost in trees smaller than are available. I think in this study—our study with 328 snags per acre—the average—the random location had 125 snags per acre. That's what this graph here shows you. They're highly selecting for high snag areas around their nests. They have pretty variable—this is from Rodney's data. They have pretty variable territory sizes in these fires, from pretty small up to over 500 acres. Some of these territories including large patches of unburned deforest, but around—I think the average is around 240 acres per territory. This is—these are pretty big territories for a fairly small bird. There's definitely landscape considerations.

I think—yeah—so I'm going to talk a little more about black-backed woodpeckers, but I think one of the things that's missing for black-backed woodpeckers right now that I think we have the data for is to build something like this is the habitat suitability model we build for pileated woodpecker in the northern Sierra, just looking at probability of occurrence. I think something like this could be very valuable for the Rim Fire landscape. I think we have enough data between Rodney's occupancy data and our nest data that you could build a multiple scale habitat suitability model for the species to really pick at the places that are—the species would be using or preferring in the Rim Fire footprint to help guide where you might want to set those places aside because that's—as far as we know so far, that's the best management practice for black-backed woodpeckers is to find those stands with pretty high snag density and leave them alone. There may be ways to go in there. We just don't know it yet. Basically the strategy has been leave some pretty large tracts of land, 200, 300, 400 acre patches intact. They don't have to all be high severity burn. I think all of our data shows that, but just going in there and salvaging their occupancy drops pretty fast at least from other places in the Sierra.

So until we have a habitat suitability model for black-backeds, we have some ideas about what they might use. Rodney's got some stuff recently on looking at their territory sizes from telemetry work [1]. I had a hard time trying to figure out how much is 100 square feet of snag basal area per acre? How many snags is that? It's a hard thing. It doesn't seem like that much, but again these species are often nesting in places with small trees. Those small trees—that's a

lot of small trees. That's a lot of 14 inch trees per acre, but then again, within that landscape, we think they need pockets of over 250 snags per acre, again, as much as nine inch or larger. You can see the picture in the background here. That's just a classic black-backed woodpecker stand. That was about 10 acres of high severity surrounded by a lot of green forest and there's a couple more patches like this but there's your 300 snags per acre. We're also finding elevation seems to be important for them. It's less so in the burned forest, but there's still a pretty good elevation signal so we say about 5,000 feet, over 5,000 feet. Again, high stand density is really important so there are four, five, and six size classes. Even down into some of the larger threes are important, but really the dense and moderately dense stands and then habitat types.

This fire—looking at the habitat types available—a huge portion of this fire is really mixed conifer down into pine hard wood. It's really pushing the lower limits. That pine, mixed conifer, pine dominated forest is really pushing their lower elevation limits. They really prefer those higher areas so fortunately some of that's in the—for the species fortunately some of that is in Yosemite. That would probably be some of their more important habitat but so we say lodgepole, fir—red and white, Jeffrey pine, and then mixed conifer. Mixed conifer fir dominated, and then mixed conifer/pine, and then once you start getting into that pine hard wood, rarely occur in that stuff.

So I think—this is one of the recommendations in the black-backed woodpecker conservation strategy was retaining some of these snag areas for black-backs adjacent to unburned areas. We think historically they occurred in the system. We're all told by everybody that these huge patches never occurred. But they probably occurred in these smaller patches surrounded by green forests with moderate effects and delayed mortality. We know after four or five years beetles start declining in these trees. They start moving out in the periphery and so do black-backed woodpeckers. I think—some of those mixed severity patches may be just as valuable to them going forward. This is hard to do in a one year salvage and if there's silvacultures—I'm sorry Joe for saying this—but retaining in areas with high beetle activity. That's what they're after. They don't like snags because they're beautiful. They're going after the wood-boring beetles. That's—I'm never going to get in the silvaculture club saying don't cut trees down where there's lots of beetles. Okay, so enough about black-backed woodpecker for now.

The other principle I really want to get across was managing for mosaics. We know in the Sierra Nevada that habitat mosaics are really important and that we think we've lost quite a bit of that. We've homogenized the landscape into kind of your standard white fir encroached size class four M stands. We have some ideas we have for where to go with this stuff. This is  in the top here which is relationship with hard edges. The amount of hard edge within is 500 meters is just—as it gets larger and larger the species does better. Retaining high severity patches adjacent to green

forests, that's both good we think for black-backed woodpeckers but also for creating those hard edges and that mosaic.

Then to echo Malcolm's statement, I think one of the priority places for me on that landscape to go out and work is in ensuring that green forested patches that are still there stay on the landscape for the next 50 years because you can't—we can mourn the loss of that old-growth forest. You're not getting it back in our lifetimes by planting trees. You can only get it back by making sure you don't lose more of it in the periphery surrounding the fire and those patches within the fire so I think that should be a huge priority. Yeah and so—like Malcolm was saying—limit replanting in those mixed severity patches which are close enough to what we think might have happened that we wanted to let those natural processes happen. I think it's really important when we're thinking about where to go and where to do this is that we want to be able to put fire back on that landscape soon. If we wait 50 years until Malcolm says these trees are ready, 50 years of fire suppression and we've missed two more fire cycles so we think that's really important. I've often found in the northern Sierra where we go out and invest and plant a bunch of acres, like we're going to let a wildfire go through there now, but we know what's going to happen in the first 10 years so be thinking about where we can manage part of this landscape for just those things and we don't hem ourselves into not being able to use those tools. Some of this other stuff is getting a little more local but founder stands, poking holes—I think Malcolm said that already—reforesting in variable density clumping—I think we're all kind of in agreement with that—and then reinforce that heterogeneity with fire.

The last point I want to bring up is being climate smart. This is a map we have from one of the GCM models showing vegetation changes in the basic Rim Fire. I pointed out—I don't know if you can see it—Cherry Lake. You can kind of see the Tuolumne Canyon going up there. That blue according to these vegetation models is blue oak woodland. It goes almost up to Cherry Lake and by 2070, whether that's totally accurate or not. There's got to be some foothill chaparral mixed in that too, but we just need—I think that's a first cut thing is to use some of these—this data to decide where we want to do some of the things. There's definitely cold air drainages and things like that that do not get represented in these kind of maps. You've got to squint a little bit but really got to think about where are we going to put these resources in and a lot of this fire was pretty low elevation. In 70 years maybe we can get ponderosa pine to grow in those places, but in a lot of places it's going to want to be foothill chaparral and blue oak woodland creeping up that mountain. This fire may be the trigger that starts to make those changes. It's just something that we consider when we're putting our investments in this huge landscape is to take that climate smart thing. Okay, I'll leave it there.

[00:34:56]

Jonathan Long

Alright, well, I drew the short straw and got the pleasure of covering the vast array of issues around riparian areas. I'm going to try to move through pretty quickly and start from kind of the more accepted general stuff and then get into things that are maybe a little bit more uncertain and where we need more experimentation. I got some photos from Corral Creek after the Rim Fire from some of the field trips that we've done, which I think is a pretty good example for talking about a lot of the issues that come up with riparian. I do want to keep everyone aware that we're talking about a very diverse landscape so there's a lot of different kind of riparian areas out there. This is just some that I think exemplifies some of the issues that we want to deal with.

In general, riparian areas are very resilient to wildfire but there are special concerns and there's a very long list of things that could go on here, but I focused on first the hydrologic effects particularly of high soil burn severity and all the downstream aquatic impacts associated with that. Then the long term productivity and resiliency of the riparian habitats and some of the reasons we can grow large trees, provide sources of large woody debris into the streams as well as on the ground, the importance as wildlife habitat and corridors and also as Ryan was pointing out climate change refugia in these riparian systems. Those are important reasons to think about why we may want to target the riparian communities in particular for treatments.

On the hydrology concerns, we want to—general principles here—minimize undesirable hydrologic conductivity while restoring the natural hydrologic conductivity. There's some interesting debates about whether you would treat high on the slopes or low on the slopes and I think we can generally agree that you may want to really target a lot of your treatments on the road systems both to protect those road systems because you're going to need them and because those can be a source of a lot of your problems. Focusing on the roads, culverts, good trails, undisturbed areas, and there's other folks in the room that could talk more about that, the variety of EMPs, but general principles of operating as much as possible on the contours, avoiding flow concentrations, and reestablishing cover in those disturbed areas.

A lot of the maps, people are focusing on is the vegetation burn severity, but I think for the waters impact we want to really key in on the soil burn severity conditions and this is just a quick look at kind of an eyeball analysis of watersheds that have high percentages of high soil burn severity and/or moderate but ones that really jump out Reed Creek, Bear Creek, Jawbone Corral, and Granite Creek, and the Forest Service is already looking at values at risk. I think we want a pretty broad definition of some of those values when we're doing these analyses and then also look at the ability channel erosion especially incision processes. I think that's going to be a really important issue. From the perspective of riparian habitat, one of the general principles that I know people are very interested in is avoiding disruption of the natural recovery of the riparian communities especially the deciduous communities that may have a better chance now that we've opened up the canopy, reduced the conifers. Very important issue is to address grazing

management and to be tying that to the recovery of the stream riparian functions. Then the idea that you'd want to aid recovery of mature riparian forests including the conifers within parts of the high severity patches so making sure that we're—this may be some of our best opportunities to get back conifer forest in some of these riparian stands. That's one of the considerations.

A general point that I think is important to make is that a lot of the guidelines from the wet Pacific northwest forest do not translate well to the drier more fire dominated systems. Malcolm was making that point. In particular, three attributes [type your text here] that people talk about when it comes to riparian, in the stream woody debris, down logs for amphibians and other wildlife, and having shade to moderate stream temperatures. There's one study Ruediger and Ward in '96 looked at streams on the Stanislaus National Forest and one of their conclusions was that large woody debris played a relatively minor role in the geomorphology of these systems. So I think it's just a contrast with a lot of what's coming out of the—or what has come out of the Pacific Northwest and the real coastal streams, the real importance of those larger woody debris in those systems we need to be somewhat circumspect about how we translate any of those ideas for this landscape.

As a broader point, we want to really understand that functions vary within the landscape, gradient channel type, stream order, elevation, flow regime aspect, all these different parameters as an example that Ruediger and Ward study found in most of the woody debris interactions with the channel were a third and fourth order streams. That's something—you don't want to have kind of general descriptions that you would just apply across the landscape. You want to really think carefully about where in the landscape you're trying to address these processes. Tom Lyle, who's a retired researcher with the station, had a nice quote. "Do not expect simple effective standardized prescriptions, formulas, or procedures in addressing the question of how much wood is enough—dead wood is enough in the stream channels." I just put in Med Map is a tool that's developed by Earth Systems Institute with a lot of input from the Pacific Northwest station, and that may be useful for analyzing hot spots and deficiencies.

Okay, here I'm transitioning into more of the controversial and uncertain areas. In general, there's little research on long term effects of post fire riparian treatments and because of that we want to deliberately experiment to promote social learning as well as promote landscape heterogeneity. I think we have an opportunity here. We need to learn from it, and we can get some good heterogeneity out of this approach. A quote from one of the few papers that you'll actually find on the issue of post fire logging in riparian areas, "Without a commitment to monitor management experiments, the effects of post fire riparian logging will remain unknown and highly contentious." Next few slides kind of get in to that. Experimental salvage treatments, I think, certainly consider the opportunity to think riparian areas where there's a high density of dead trees and some of the objectives there would be reduced future fuels, increased light,

moderate near term woody debris loading and one way to do that might be to target the over abundant sizes while trying to encourage a steadier long term input of woody debris perhaps by trying to retain more of the larger, more stable snags. That's important because the woody debris is an important process but if you get a system where you get a big flush of woody debris and then it's rotting out and we don't have any for decades after that, that's going to lead to very unstable stream systems so trying to maintain a smoother input as best we can may be one of the targets.

I just noticed in the scoping meeting notes there was talk about actively putting some logs down into some of the stream channels. I think we really need to talk about the role of woody debris and how much we want to step in at this stage of the game to try to recruit wood because we may be getting a lot of wood in these systems pretty quickly and so I think that may be a bigger concern is how we're going to manage all that coming in.

On the planting treatments, there was some discussion out on the field trip about whether how much replanting you would do in these riparian areas and I think a general principle to consider would be to replant conifers where they were dominant historically in the riparian areas. As high productivity areas where it could speed that recovery of large trees to have for wildlife habitat corridors, but you may want to target any of those plantings towards high terraces, lower slopes, not getting out in the low flood plains or the really wet areas. I think some of the past plans people talked about planting really close to the stream banks and so that's probably something you'd want to avoid altering some of those natural current processes.

The last slide here—some other considerations from a channel erosion and management perspective. Rock is a really valuable resource and so collecting any of the rock materials that are coming off the rock slides that are going to be happening this winter and stashing that so you can use it for treatments. We've done a lot of work after the [redacted] Fire dealing with channel erosion. I've been going out to streams for the last 10 years seeing how those systems have responded. That one slide off to the right there shows a meadow that basically came apart after that fire. I chose some of the dynamics with the large word. We've got a tree that's fallen over and accelerated the stream bank erosion just due to that failure, really large wood debris jam on this particular reach that was not promoting a lot of benefit. These are important habitat features in general they can be in systems, but in certain places they can create a lot of problems. Here the woody debris is not providing any stability on this meadow. I think the basic principle here is adapt with the advantage to monitor and evaluate opportunities to treat incising channels, road and stream banks, and large debris jams where there are values at risk so you really want to both be thinking ahead to where you might have problems and then be actively monitoring to try to get in on these systems before they start to unravel too much. That's it.

[00:45:03]

Sue Britting

Capture our four goals, our sort of high level goals. One was establish frequent fires disturbance regime from the get-go. That's not 50 years out. That's now. Another one was to manage for mosaics of vegetation in space and time so trying to think about the continuum again for the fire as well as for mosaics. Let's see. Retention of green and adjacent burned forests, so not just the green forests, but the intermixed with adjacent burned areas and that complexity and then the last goal was a road network maintains high water quality so focus of the water quality topic on roads. Then we had conversation that drifted not in so much landscape—into ecological goals on the landscape but they are probably embedded in things that we would want to see happen so I'm just going to mention them briefly. One was that whatever we do out there we need to be linking that to the local community and the broader community because our implementation is tied to support from people to actually do those things. That's a little bit of telling the story and including people actively in the story, either the good parts of the Rim Fire or the parts we want to see restoration action. Then we spent a little time talking about since there are some areas where we have information gaps and our focus was on riparian areas and large woody debris, using the Rim landscape as an opportunity to explore that so evaluating really for the Sierra Nevada what is the wood dynamic and what is beneficial to riparian systems that might involve different kinds of treatments.

Anything else anybody wants to add to that too? Angela White?

[00:47:04]

We're monitoring, but we're doing isn't like a recovery goal but if we can't learn from this it's not really going to help us in the future. That was just the other thing we discussed, not necessarily as a recovery goal. That is important to me □ the future.

Let me ask—I missed the very last thing you said, Sue, after the community support before the monitoring. It was the very last point you guys made. Do you remember what it was?

Sue Britting

Road network. No, excuse me. Riparian area and coarse woody debris, specific to the Sierra Nevadans since that seems to be the information gap.

Okay thank you to table three, especially for volunteering to go first. Thank you.

[00:47:46]

Ryan Burnett

So maybe I'll start jumping from there. We definitely talked about—I think it is a recovery goal to learn from this, huge opportunity here. There's a lot of interest. We've got Bernie in the room. Obviously [] to really learn some stuff from this fire. I think that's really important because we don't know everything.

One of the things that came up was the talk of using these treatments as—or any sort of entry as also achieving fuel reduction, being strategic about where you place those. So often we think about salvage, often we're shooting for the four and five classes on the fairly flat ground. Just making sure that those line up with reducing fuels because this would probably be your only time to really go in there and do that. I think maybe adding in to that, reducing fuels in a way that will allow fire to come back in to some of that system. We talked then also about aligning the featured edge with—aligning the featured edge with climate change. [] show us later. That really led the conversation then about do we give up our already? That's the climate change quandary, right? Are we ready to say we will never grow the ponderosa pine again? Maybe there's transition so we can help aid the future adaptation of some sites by considering planting and then we also talked a little bit about the importance of those micro sites and providing the habitat. That was—I'm supposed to be talking about goals. So aligning the future climate was important and aiding adaptation. I said that was a goal.

This was JoAnne's statement. I turned it into a goal here really quickly. It's just I think more along fuel reduction, considering we talked about the brush and retaining that green tree component and how you would do that. So I think that goes into our goal of fuel reductions to maintain green forest [] and allow fire to act on the landscape in kind of a system that is functioning well in the future. I think we talked the most about green tree retentions. Do anything with them or do we leave them alone to naturally regenerate? JoAnne suggested—

[00:50:31]

Ryan Burnett

Maybe we have some—we want to protect those resources, the landscape, not just saying leave them alone. We know what happens when you leave dead [] landscape usually. I think we kind of came to the goal being that fire soon would be a good idea in a lot of these stands if the fuels allow. There was still some debate about that whether we could actually achieve that. Some of the stands may still need to go up and certainly the chance of the fire spreading out of them is highly reduced.

One of our goals was definitely, I think—well, I said, “This is our most important one.” Create a landscape that's compatible with the frequent use of fire in that landscape whether it's prescribed fire, managed fire, or a wildfire. That's the reality of—meanwhile I'm sitting here 25 years from now where our kids saying, “Man, planted all those plantations that never made it. Now we're

starting over.” Fuel reduction again—Barnie brought up one of the goals is to—understanding where you leave it and how you leave it. We’re going to talk about that probably more this afternoon but the importance of snags, downed wood, really important in how we manage our areas. What we actually do in those places is a very important goal, that goes into the monitoring, better understanding better how—how the system responds, how we experiment on it. So one of the goals was having—creating complexity in a homogeneous high severity fire area.

So I’m going to cut to the chase here. [redacted]. I didn’t say that could end. We summed up with [redacted]. We thought we need to be more [redacted] when we approach the fire and post fire recovery, and this landscape is going to necessitate that just by its size. I think that’s what we’re leaning towards. Okay, I’ll stop.

It was a commitment portion.

The commitment?

[00:53:24]

Ryan Burnett

Yeah, whatever we do out there we have to realize what are the long term implications of funding that to make sure it’s [redacted], maintaining it for 40 years and keeping fire [redacted].

[00:54:00]

Peter Stine

Our overarching goal was to maintain the historic resiliency of the landscape. We spent a lot of time talking about a landscape perspective to enable all of the goals that are underneath it. One of the principle ones we discussed is retain and enhance the remaining green tree stands, focusing on size, class, and density classes that are in rare supply, the larger ones, and the geographic distribution of the remaining green tree stands as seed sources and focal areas for reforestation. Give priority to retain I said the limited green forest conditions. Another goal was reestablishing the landscape mosaic using what we’ve got left. We have a certain set of cards we’re dealt with and that’s what we have to work with, but we want to use those to rebuild the tunnel mosaic on the landscape that we think is resilient and provides for all the sort of services that we’re concerned with, working with the vegetation, looking at the soil, nutrient and water cycles, the wildlife habitat requirements, refugia, the movement, corridors, etc. We discussed the possibility of some sort of decision tree approach where we could prioritize goals because many of these goals will bump into each other. So we have to figure out in sort of sequential order which of these goals we’re going to work with first, and we started as I said earlier discussing, focusing on the remaining green tree stands but especially the ones with the remaining large trees.

We applauded the Stanislaus report and suggested that be used to guide prioritization of goals as at least one of the sources for that. A couple of last thoughts. We dealt with the social context of this. We thought it was important to develop the social support from the local communities for the various sorts of fire force management activities that will be required. In particular we talked about using prescribed fire and the need to work with local communities to accept a certain amount of smoke which is always a challenge. That's going to require some extra effort to build that sort of local community support for those sorts of restoration activities. We also discussed the promotion of economic resilience of local communities, looking at this sort of in the long term. There's going to be certain things that are happening in the near term for resilience of the local community. We've also got long term view of that. Clearly forest products are part of that equation and so we see perhaps a way to characterize it is the forest products, the salvage and whatever else that comes off of these treatments is a byproduct of the restoration and so within that sort of decision tree process if you have ecological restoration and all that comes with that. Then as a byproduct of that there would be a certain amount of material that will be coming off this landscape and that will certainly have a role in the local economic resilience. Anything else from table 14?

Thank you, Peter.

[00:58:38]

John Buckley

We were table one and four, wherever took two that came in and joined with us. Rather than going through a vote and whatever, we just went through and pretty much captured whatever people shared. It's just a diversity of perspectives that have been captured in this particular list. So the first was that it wasn't totally clear as what's supposed to be considered here today. Is it just the fire area or is it the overall broader ecosystem landscape that's around it? Because in some cases if there's managing outside the burn area, it may influence to some degree what is happening inside the burn area and vice versa.

What are the actions that we can take to help recovering the burn area? Part of that is the big picture is looking beyond just the specific treatment units to what all would be desired within all of the landscape. There was discussion at the recovery EIS is out that it has roughly 30,000 acres of salvage logging and hazard tree removal and a variety of other treatments, but there was also an awareness that there has been millions of dollars spent on the bigger treatments, a lot of watershed protection work has already been done and there will be additional reforestation and potential other action documents that will be coming out after the hazard tree and the recover EIS documents are completed so what are some of those featured actions that will be most appropriate?

There was concern over how any of the new proposed temporary or permanent new roads will or won't further stress the burned watershed, how more roads or construction activities will or won't detract from true restoration, especially given the state of that overall watershed. We had someone who was just out in a fire yesterday who was seeing that there are many areas with brown needles on the conifers that potentially some of those could flush in the spring and have some amount of recovery so there was broad agreement that especially for the EIS timing that may not be completed until August that it is very essential that there be retention and protection for all of the trees that are showing any marginal survival because not only do they provide for a green tree that could survive but even for the short term they may be able to produce seeds and also leaf litter and other values that are out there.

There was discussion as salvage logging has one possible path to recovery, but it needs to be based on the desired future conditions, the resiliency of wildlife habitat, how do you keep the forest values that survived in the residual areas, and how do we get the overall forest health back after such a nasty fire? There was discussion of black-backed woodpecker and the need to not only be protecting the core areas that are the concentrated dense thickets that have burned but also the green areas around them as Ryan and others have already pointed out. Also though there was a reminder that much of the burn area is below the white fir 5,000 foot and up elevation so the mixed conifer on the lower elevation, the black-backed woodpecker may not be the issue but retaining enough snags and downed logs for other species is important.

At the lower elevations there was a resilience of the conifer forest may be low simply because of warming, drying climate and those may be areas where it could be more aggressive in trends of fuel treatments or in terms of management especially reintroducing fire and recognizing that there may be difficulties. In terms of the long terms goals which was kind of the initial question that we began talking about, the first priority **[1]** to protect soils and watershed values as the long term foremost priority. The second would be to retain enough snags and logs for all of the values, not just for wildlife or for the soil and other ecological values so you're retaining those at levels that are consistent with the natural values that would have been there at least prior to forest management that has changed them. Then the third—

Sorry to interrupt. Can you just repeat your first? I'm sorry.

[01:03:13]

John Buckley

Okay. The first one was to protect—the foremost priority was to protect soil and watershed values for the long term as the basis. The second was to retain enough snags and logs for the wildlife as well as the soil and other ecological values. The third was to reforest the incinerated stands with a drought tolerant species, examples just included the ponderosa pine, **[1]** cedar,

whatever reforestation is done in a heterogeneous pattern that can mimic the ecosystem that we want to have. A number of those at the table in different ways talked about mimicking the forest that we want to achieve by the actions and the treatments there. Then the last one was that we had actions that may be determined to be appropriate now have to be couched in consideration for the limits of all the actions that are in competition for the attention and Forest Service management. Then the last was is every action in the area has to consider the changing climate and the forest management has to be steered by adapting to the changing climate in order for this to be successful. There may be others that I missed, but we had a lot.

Thank you, John.

[01:05:14]

Hugh Safford

We just—we wanted to protect green patches, etc., etc., same stuff other people said. There was a lot of discussion about retaining burned habitat. I think the point really was that we thought it was important that the burned habitat be maintained not as an afterthought but rather that it was a part of the decision process made for salvage logging and other types of treatment of the burned area.

We echoed a lot of other people in our concern for highway access when we reintroduce fire in this landscape. A lot of times we talk, I think we talk easily about how burned areas provide us large areas that have been denuded of fuel. They might be relatively blank slates, easier places to think about reintroducing fire, but we never do it. It never gets done. We can't blame anyone because the mechanics of how you actually make that happen are not obvious to anybody. This fire—one of the unique opportunities we have is this is the first big fire restoration effort that we have engaged on since the region wholeheartedly embraced ecological restoration. I think we really need to put our lack of money where our mouth is and think about how we're going to make these things happen.

We all think that the Rim Fire at the very least can serve the very important purpose of providing us an experimental landscape if you will to think about and talk about how we actually engage some of the processes and how we actually carry out some of the things that we've been talking about for a lot of years. Someone noted earlier that the lack of funds and resources to do this is a big issue. It is.

Okay, yeah, the other thing we talked about was that, I guess this is linked to that, is just the experimental opportunity that the fire offers us. We don't mean just in terms of literal experimentation necessarily but in terms of observation. We talked about a lot about how we—I think this was in the last two groups talked about the structure pattern in forests and how we get

there. There are relatively tried and true silvacultural methodologies for doing that kind of stuff usually based on hard density plantings, different types of entries, those kinds of things. We know that where those things can actually be accomplished, they tend to do a pretty good job. The question is can we continue to do that sort of stuff. Our track record recently hasn't been great. Nonetheless, it probably makes sense to take some of the fire area and do that kind of stuff to see whether we can make it happen. We should also think about how we might comp plant for example instead. How do we do that? I don't know. We've talked about it a lot, don't think we really have the mechanisms worked out yet.

We think that as a goal it would be very important for the Forest Service to commit—I don't know how we'd do this but hand up a document somewhere [redacted]—that the fire and fuels report is worked on by the Forest which is a living document and is not the end-all or be-all. Let it be considered and used throughout all the other planning that's going on. We also thought that it was really, really important that documents like the very famous GTR2 [redacted] hand up and down on that—the guidance that that document gives us to think about the physical habitat and how it ought to modulate the way that we treat the landscape. That has to be taken to heart. We've got to find a way to make sure that that happens in the Rim Fire.

Yeah, monitor, study, learn. I was just going to say I was in a meeting the other day where I was actually amazed to hear someone tell me that they thought we were doing too much monitoring. We don't do any monitoring. We need to take climate change into account. Again, it can't be an aftereffect. I'm trying to remember who was showing the—was that you, Malcolm? It was someone, maybe it was Ryan or someone—you were showing a fanciful projection of what things might look like in the future. We just know they're going to change a lot. Those have to be taken into account. It's likely that lower elevations and [redacted] investments are trying to restore elevation habitats will be for naught. Again, I don't think we've got it worked out how we take that stuff into account. We can talk about it a lot but in terms of what that actually means in the landscape, a place like the Rim Fire provides a pretty good landscape to try some of those ideas.

Then two things we added at the end. We thought it was important to consider local economies and all these considerations. Finally, this is my addition—I hope this is okay with the group, but I think that—my group thinks. Does my group think this? I should say it first, huh? I think it's really important that we focus on generating a long term restoration strategy for that landscape because thus far, again, I'm not blaming the agencies. This is the way humans work. We have a lot of work to do and a lot of things happen and things just start happening. People start going in different directions and then 10 years down the road you're trying to box it all up. It's like, “Wow. We can't get this in a box. It's not possible.” In the fires that we have gotten settlement money for we started the process of requiring the forest actually to develop restoration strategies. It's turning out to be pretty cumbersome and we're going to have to figure out a happy medium

for the forest and for what we think we're going to need, but it's really important that the agency start to think about longer term considerations because right now for us long term is three, five, six, seven, maybe 10 years.

There are places where we can go for guidance on this. In Europe, when they have a big fire, they do a BAER report, and then they send it in a team and they develop a long term look at what's likely to happen on the landscape in terms of the economies, vegetation, all that kind of stuff. Again, I think this provides a really good opportunity for us to develop those kinds of processes. Did I miss anything? If any—

Part 2

[00:00:00]

Dorian Fougères

The piece around climate change came up several times and then the piece around green tree components. I mean those were four big pieces that came up repeatedly a lot. Some other things that came up maybe that second tier. The roads were mentioned a couple times and then the community support, community economic resilience, came up a couple times. Other things, I'm not saying they were diminished. I mean they were obviously important for particular groups, but they came up a little less frequently. Some that—well—yeah. Or they're a bit more about the treatment level, so there are some other pieces there that came up. The one thing I'll flag that came up I guess in two groups was partly summarized in last one this idea of experimental landscape. Can you do something different in terms of reintroducing fire, getting that mosaic back on, and also climb those lower elevations? So, it's just meant to be a very high level summary. The repeating thing that I heard across the groups. What we're going to do now, Manny's going to help me with mics and is Chris going to help me with mics. So, let's go ahead—let me see just a raise—show people hands if you comments. We'll have Craig number one. John will be two. Greg will be three. And then we'll build another queue. Go ahead, Craig? Did you have a comment earlier?

[00:01:10]

Craig Thomas, [] :

I just want to appreciate your synthesis there because the people are wondering, "So, what are we going to do with all this at the end of the day?" And the idea is to never let go of it. To keep these conversations and ideas and honing going to where we can—practice heterogeneity on this list. Clump it into maybe topic areas and people who have interest there. And you keep going

deeper in it until we get to a really clear synthesis of ideas that—fleshed out more over time, a short amount of time. So, it's—thanks.

[00:01:41]

Dorian Fougères

And I will say, I'll leave it to you guys in the afternoon where you want to go, but that may help you also with things. Either because you're like, "Gosh. No other group spoke about it. I really want to look at that on a map and think about these treatments," or, "Yeah. This was really a big issues for us across the group. We want to dive there." So, it will give you some discretion whether you want to go on a common topic or something that's less common, but equally important.

[00:02:17]

John Buckley, the Central Sierra Environmental Research Center.

So, for those that did make it on Friday that they may have missed some of the science presentations that Scott, Malcolm, and others, [], about the need for large burn treatments rather than very small piece treatments. I just want to go back to the issues that's—the very first one, frequent fire disturbance regime and the goal—it can fire back on the ecosystem here. If we're just looking at the 150,000 acres of forest service lands, we're trying to return every ten years or so to treat. We would need to treat 15,000 acres a year within this burn landscape and that's not counting all the other burning that needs to be done just on the Stanislaus Forest plus in Yosemite Park where there's also an aggressive burn program. I'm just asking those of us here to be realistic and if that's not possible to consider how we can strategically, either do splats or some other landscape approach that will allow fire to strategically be able to break up fires like the Rim Fire more aggressively. Or if truly we need to get fire back in the ecosystem to be able to get where Malcolm was talking in 40 or 45 years where we really will have the ability to fire burn from the fires that burn through more frequently. How can we move beyond 200 acre projects to 5,000 or 10,000 acre burn projects during the windows of opportunity that are available?

Thank you, John. Go ahead, Greg.

[00:03:58]

Greg Aplet, Wilderness Society

And I just wanted to draw attention to a theme that I thought emerged that didn't quite get captured. I think—actually, I think it is really a well-captured in what Ryan called his personal prep preferred principle. I'm not sure where it ended up in here. But—

Number eight.

[00:04:28]

Greg Aplet

Number eight? Yeah. That this creates a landscape in a manner that we're not afraid of the consequences of future wild fire. I think that was a theme that we talked about some in our group of we have an opportunity here to look into the future as Hugh was suggesting. We have a—that we create a long term restoration strategy. We have the tools to anticipate what kind of vegetation we're likely to get under known conditions. We have the tools that can tell us perhaps a little bit about what future climate might be like. We have the intellect to begin to fuse those two things and start to think about what kind of a landscape we're likely to have in the future. And then what kind—what are the—and then begin to shape current conditions into the kind of future condition we want. And I think we have the—we—[inaudible] with that. That if we—we need to—anyway, we need to start thinking about what kind of a future that is that we want. We need to think about what is the infrastructure—what are the management activities that we are—need to—that we're going to need to engage in in order to maintain that future? What's the infrastructure—what are the infrastructure elements that we need to maintain in order to engage in those management activities? What's the infrastructure that we don't need that's causing us problems that we not want to get rid of over time? And then last, only last, what are the treatments that we need—what are the things we need to do now in order to set us up for that of a management approach in the future.

Thanks, Greg. Who else wants to get in the queue so we'll have— [crosstalk]. So, we'll go Jonathan and then Sue. And then who was back over there? Brandon. Okay. Go ahead, Jonathan.

[00:06:32]

Jonathan Long

Yeah. Well, [inaudible] came out of Harvard, but I don't think they had all the flip charts. Both Arnie and Steve did homage to the important of considering impacts to [inaudible] systems and I think it's really important to recognize that in severely burned watersheds that the long term effects on streams are very consistent to—we want to be thinking about those things. And also Steve pointed out that in some cases interventions may leave the system better off. I think there's sometimes an assumption that avoidance of management activities is the best course from the stream's perspective. And I think that's an assumption we need to question.

Thanks Jonathan. Go ahead, Sue, and then we'll go back over to Brandon and then Peter.

[00:07:14]

Sue Britting [ph]

One of the things we talked about related to this future fire requirement here in to what Greg mentions as well is this—the notion that we probably need to rethink how we’ve accepted risk and mortality. And that we may—in this future, we may need to accommodate more mortality than people have been comfortable in the past. And that we may need to press on some of those prescriptions about managed fire to allow that to shape the environment. And then the other thing is that point about the long term plan. It is so easy to get sucked into this, “We got to do something now. We go to do,”—the urgency because it’s dying. The timber—we’re losing our economic value and then everybody gets focused on that when it really is about a long term plan and taking advantage of the space because this—because it’s such a huge environment—a huge space. There’s lots of flexibility out there. So, I think that’s something that we have to keep in mind and that if we not lose the momentum, the interest, because really this is a 100 year project. This isn’t a 20 year project. This is a long term project.

[00:08:38]

Brandon Collins, Forest Service PSW and also U.C. Berkeley.

I just wanted to comment on the first point here on the example, recovery [inaudible]. And everyone tacitly agreed, “Yes. We want to protect the remaining green trees.” But I want to follow up on the point that Ryan brought up is that this notion of protecting it is what are we protecting it from? Right. I think that we actually have any opportunity provided in these green stands and they’ve basically been treated for us. And some of the hardest thing to get into which are long term fire excluded stands. So, rather than protect it, let’s make them the focal point of our management and let’s go in and capitalize on that. Protect that investment by retreating those actually as a priority rather than let’s fence them off and work around them. That’s all.

Dorian Fougères

So, Brandon, let me just ask on this and then we’ll come to whoever it was because I heard this come up in another conversation. We got a little bit of a point out—a report out that tension between what you do in the green tree stands for biological components and legacy and fuel resiliency. They’re both in the same geographic area. Did you guys talk about that because you raised this piece? I mean how do you do both?

[00:09:46]

Brandon Collins

I guess the protect thing—I mean if I’m—maybe I’m not sure I’m understanding exactly what you’re asking me, but protecting is probably more of related to the potential for salvage in them and—whereas I’m talking about it from a fuel standpoint and enabling for future fire and desired effects. Is that what you’re asking?

[00:10:06]

Dorian Fougères

John's asking. Can you just maybe a bit more about the idea? So, you're—what I heard you say was you're not so concerned with protection of the green tree patches from salvage. You're more concerned about how you treat them for the purpose of fire?

[00:10:18]

Brandon Collins

Right. If you think about the potential for fire on this landscape, it's great. The landscape—if anyone's seen the maps of what the past fire history was like in this fire footprint, it's—there's a ton of fire. And the likelihood of seeing fire again is very high. So, if we have a few of these "rare elements on the landscape of large green trees," then let's focus on them to do treatments. And then because the likelihood of getting fire in them is great. They've already had the initial step of getting under burned, if you will, and some sort of [inaudible] fuel treatment. So, let's capitalize on that and work forward in those stands not just fence them off knowing that's where the owls. That's where the goshawks are. Let's don't touch them. No. Let's work with those. Work hard. That's all.

Dorian Fougères

Okay. So, let me let Malcolm thread on this because I think if you wanted to frame the question that came up and then we'll go to Peter. Is it on the same point as Brandon, that [inaudible] mountain?

[00:11:18]

Malcolm North

I'm Malcolm [inaudible], PSW. I think Brandon raises a really key point. We've talked a little bit about the idea of nucleation in terms of planting and establishing trees on the landscape. But the flip side of the switch I think is really important is these green tree places provide an opportunity to nucleate fire on the landscape and build up from there. And we had some discussion at the table about whether you could put a fire back in these stands or whether you might not be able to because of either shrub resprouting or not. But certainly I think we probably agree that right now it'd be fairly safe to burn and at some point if you follow them in the near future they're still going to be relatively safe to burn if we get in there at the right time. But I think this idea of nucleating fire out from these places would be something worth considering.

Dorian Fougères

So, I can tell this is probably going to be one of the themes in the afternoon where you do that and how would you tactically do that. Thanks, Peter, for being patient. Go ahead, Peter. Let's give the mic to you. And then we go you and Craig. Thanks Peter.

[00:12:20]

Peter Stine [ph], PSW.

I just want to return to a point that John Buckley raised about the realistic nature of returning fire to these systems. I'll say that certainly is a lot of scientific evidence that supports that notion, that restoration of these landscapes requires that we return fire to the system. But I think when you use the term realistic expectation, I think that really elevates that issue way beyond this room. And I think it's a topic that needs to be discussed at many levels. And I think there's certainly room for doing more with the current climate that we're in. I think there's room for that. But I think to expect us to be able—especially the Stanislaus National Forest to make the quantum leaps in doing that, I think that is unrealistic given the current social, socioeconomic, climate that we're operating in. So, I guess I have a two point, I guess, recommendation. And one is that that be a discussion that gets elevated to the right places so that we can really delve into that in an effective way. For example, the smoke issue. And I think we should try to increase it where we can currently on this forest and other forests. But it's not—when you talk about realistic, it's not realistic to expect that we can suddenly do that now.

[00:14:21]

Dorian Fougères

So, a couple things hearing now and I'll come to you and Craig. So, I see more themes emerging. We've heard this in a couple things not just in the fuels but also the green trees, this idea of being strategic. Now 2,000 or 3,000 acres, 29,000 acres, where specifically are you go to get your greatest advantage on the goal. The other thing I'll say is the long term pieces come up a lot. Do I do long term restoration strategy, a long term burn plan? How do you get that landscape scale over time? It's the flip side of John's piece. What can we do now? What can we do over longer term? So, just connecting some dots. Let's go to you and then Craig and then we'll go to—we'll come to Matt and Angela. So, you, Craig, Matt, Angela. What what?

[00:14:53]

Craig Thomas

I said this is a hot mic. The—I just wanted to clarify a couple of points that have come up. One is John brought up the concept of what scale we need to be thinking at when we're thinking about disturbance regimes. John, I just did a real quick calculation based on fire rotations and probably in the fire area you could away with 2,000 to 6,000 acres. And that's not undoable. That's definitely not undoable. And the other thing is that I would submit that it doesn't necessarily all have to be burned either. I mean none of us would like that. But as long as you're doing [inaudible] that reasonably reduces fine and small fuels on the site then you're doing a lot of the work that we hope that the fire does as well. A lot of our past treatment

methodologies didn't do that. Most of our current ones do that. So, anyway, I'm just trying to make it clear to people that I don't think this is a task that—I don't think we can—I think we can reach that. It's possible. I'm not saying we're going to reach it, but it's certainly possible. Those numbers are not [inaudible].

Dorian Fougères

The second point was to also find the compatibilities between the treatments.

[00:15:58]

Craig Thomas

Yeah. Yeah. I mean I think in the ideal world all of that would just be simply broad cast burn, but I think all of us understand that that's going to be really difficult to pull off. The other thing that I wanted to note about that is in terms of reintroducing fire to the system. You're—if you're going to burning green tree stands, large stands, you still have some big trees in them. A couple of things to think about is a lot of those may be reasonable places to get this [inaudible] fire in very, very soon. Really in the next four or five years. Remember that the fire return interval in a lot of these forest types is somewhere between 7 and maybe 15 years. That's hard for us to figure, but that—it's a lot of fire. And that's an average. It could have been a lot more often sometimes, a lot less often. But the shrub issue is a big one and it's one of the reasons that when people do treatments in forest they tend to stay away from fire because he's terrified the seasons was down saying all of this. And manzaneas [ph] they come back like gangbusters. But what you got to remember is after second entry and third entry that sequel is exhausted and we're done. So, again it really militates for a longer term thinking. We can't just think we're going to be in there one time. You got to commit to getting in there a couple times and it has to be a couple times over a 10 to 15 year period, right? So, anyway, some things to think about.

[00:17:19] And then finally—actually, probably not finally. You know me. But any rate, I think it's finally. The other thing that I want to note in the Stanislaus is that a lot of that landscape under most prevailing weather conditions is really a pretty safe place to do this work because it burns up into Yosemite and they don't care what fire does. It could burn everything [crosstalk]. [laughter] So, in fact they welcome it. They're just going to sit and watch it anyway. They're not going to do anything. But—so, I think that one of the problems that we got is that we're so concerned about catastrophic fire that all we ever do is talk about the 97 percentile conditions. And now people are in this position where since that's the only time fire occurs because we put everything else out, that that is the way that fire works. It is not the way that fire works. 97 percentile means only 3% of the days are that hot. We put everything else out. So, 97% of the days are going to be more moderate. So, under typical conditions in the summer and I'm not suggesting it's not getting warmer and it's not getting windier. It is. I know that. And everything's a lot harder than we all would suggest. But on your average summer day

you got a moderate to heavy wind and where's it blowing? It's all blowing up toward Yosemite. So, not too many things to worry about. I think that's its own.

Dorian Fougères

So, just connect that. It's a little bit of a different piece, but there was a comment earlier from Sue about the—thinking about our assumptions about risk and our assumptions about—yeah. Those components. Craig, go ahead.

[00:18:51]

Craig Thomas

Two things. One I want to thread on what Peter said about smoke and how realistic it would be about expectations. I guess I would argue for a more aggressive approach. We are in deep conversations with air regulators all the time and work with many of you including Scott Stevens, for example, who've been very helpful in helping to air regulators understand fire was a process. And it's inevitability in our system, so we're going to choose our smoke. We're not going to deny smoke. And we have to keep that message in front of everything that we say because—the air regulator community is moving along and they are grappling with very tough issues in their regulatory framework that runs contradictory to how our natural processes operate in this mountain range. So, we are making progress. And we've got two 10,000 acre burn projects in the Sierra Nevada right now with two courageous managers that are willing to take those things on inside of the agency right now. And hallelujah for that and we need a lot more of it. Second point is this gentleman over here to my right has spent a lot of his career recently with his ecology staff defining the natural range of variation within these systems, vegetation required, et cetera. So, in the—in this fire and other fires when we see the effects of part of the overall effects in the low and moderate severity within that burn, are we going to go in there and do things? Are we looking at that as, "Hey, we just got a treatment?" Or are we looking at it as a problem? Can we accept low and particular moderate severity fire effects as part of the natural range of what we're striving for and not as a problem?

Dorian Fougères

Thanks, Craig. Next we got Matt.

[00:20:45]

Matt Brooks

My comments actually follow nicely to the last two and they were linked to this [inaudible], [] couldn't be here but he would want me to remind everybody that all fires aren't the same. All fires [inaudible] the same. And this landscape spans Montane Chaparral, [inaudible], lodgepole, and the long term goals for fire regime characteristics need to take that into consideration. Now that said a lot of the fields and landscape now are transitory fuel types. They're in—where there

was initial reentry burns and you've got potential for shrub lands filled with candlesticks. And so, in terms of the intermediate strategy for the type of fire that you might want, it seems to me there should be an intermediate strategy much like what Hugh's talking about of not just treating and walking away, but continuing to do what you think needs to be done at that site to get to the point where that natural—that potential regime can take over. And I say potential based on fire projections over [inaudible] may be. So, it seems like there should be an initial plan and then a final target. That's play space.

Dorian Fougères

Thanks, Matt. Angela.

[00:22:03]

Angela White, Pacific Southwest Research Station

And I have two points. One that does follow on the discussion we're having and the second is to make a plug for shrubs. Everyone keeps talking about shrubs as this thing we must fight against. And although I completely agree we don't want a homogenous shrub line anymore than we want homogenous stands, we still want to think of that as part of our heterogeneity we're creating. So, think about all the landscape what might naturally have been shrub habitat and also work on promoting that. So, that's my plug. And the second thing is only on the whole idea of resiliency. Again, our crew started discussing ecologically resiliency and what we think we want to do as researchers and as managers and how a lot of times we can't do that because we haven't considered essential context. And again, this isn't just our group that said this. Several groups said this. And this is not where I ever want to go is ecologist. I don't like having to continue this social aspect of things because it's that more complicated. But I feel like what is possible is really determined by how much public buy-in we have and I think it's—we're going to miss a huge opportunity if that isn't part of our strategy to find ways to engage the public as an opportunity to say, "This is what this fire did that was good. This is what we don't want to see with this fire in the future." And I think there's going to be a lot of tourists going into the area because they're excited about it. And you should be jumping on that and promoting that with the communities surrounding the Rim Fire. I mean we need to take this opportunity to do that as well as part of our strategy and ecological resiliency.

[00:23:54]

Dorian Fougères

Thanks, Angela. We got about five minutes left. Couple pieces. Who's next, Manny? Okay. We'll go Pat and Jonathan. And then I want to ask if anyone, maybe Sue or Craig since I work with you in other contexts, and habitat now, habitat of the future. This idea of intermediate strategies. If you guys want to say anything on that. Pat and then Jonathan. Go ahead, Pat.

[00:24:14]

Pat Manley, USFS

So, Pat Manley. US Forest Service. And just to maybe book end this argument a little bit about what to do with existing green forests. So, from maybe a complimentary perspective is that especially the low to moderate burned forests, to consider the possibility that they are—that in essence what happened as I think as Ryan said a lot of that hard work has been done. You couldn't choose to have this fire in those places and do those things, but it did occur. And perhaps they're in a condition one would expect or hope you would have a burn—a more frequently occurring fire regime. And I think as Sue mentioned this higher level of mortality that we might have observed in the moderate burned forests, maybe that's all part of what you would expect across a heterogeneous fire landscape. And that's if we look at them from that window, how would you move forward? And I think that this might clarify a little bit about this perspective of protecting. Protecting—I think what the philosophy behind that was that they are in a good condition now. So, how do you promote that and even improve upon that over time in the context of resiliency? And I—if that's the perspective of the protecting it then I think I wholeheartedly agree with Brandon. If we are—if it's well we—protecting it doesn't necessarily mean putting a fence around it so much as it's in great condition. It's been kick started in a direction we'd like to go and how do we enable and facilitate continuing those forests to move in a positive direction. I think that's—I'm not—I didn't really hear us thinking or talking about those low to moderate burn forests in that context, but I wanted to throw that in.

Dorian Fougères

Thanks, Pat. Jonathan. And then we'll start back up here. Go ahead, Jonathan.

[00:26:19]

Jonathan Long

Yeah. Just a really quick point. On this example, recovery goals number six and eight. Minimize sedimentation and maintain water quality are unrealistic. We've had a giant fire, so you don't want to box yourself in. Sedimentation and deposition are desirable processes that help reform stream habitat, so you want to have a much more sophisticated goals for your water quality and riparian system to take into account the processes.

Do you have any strong [inaudible], Jonathan? I mean [crosstalk]. Just go ahead.

[00:26:49]

Jonathan Long

I think more is trying [inaudible] is things long term channel incision. That may be something you'd want to target much more heavily. Things that are going to be persistent effects over the

land—on the landscape that we're going to be living with decades. Those I think would put us as higher priorities rather than the short term stuff. The fire is going to have some big impacts on water quality and then you could also bring in the values at risk if you really have reservoirs or sedimentations you really have a big impact. Figure out strategically how you would address those things. But you don't want to set up a blanket goal of trying to minimize these things because you can't afford it—to do that.

[00:27:28]

Dorian Fougères

I think what's always interesting in these conversations is the refrains that happen during the day. People suggest rethinking something that's viewed one way. Let me check with Sue. She wants to see if have that now, have that intermediate strategies on that thread. Or Craig. And then we'll come to Steve.

[00:27:43]

Sue Britting

I think only—we use—words are commonly used like protect that have—that convey a certain—convey what the action is going to be. I think this venue will be helpful for us to develop objectives, be clear about what those are. If they exist, identify practices that may be adverse and that those are the tools then that achieve protection or conservation or—but they advance your—the trajectory. So, it was just one. We tend to have an adverse reaction to—some of us to the terms protect or conserve because they've been interpreted as limiting. That gets at the habitat now, habitat in the future. And then just one. We think about that a lot in our framing in terms of habitat. What you've done today to alter something for a species that may occupy the space today. You want to bring them along with you in the future. I think we have probably plenty of examples of places we want to think carefully in this landscape about what we want to do to make sure that we've supported those processes and species that bring them along to an environment that's clearly going to be different in 50 years. So, I think that's all, but it's a big space. And that we can find those places on the landscape that provide for now and in shift things also for their future.

[00:29:12]

Dorian Fougères

And I ask because you guys—that was your group that had the mosaics in space and time, right? Okay. Let me let Steve have the last word and then we're going to break for lunch. I mean, actually we're going to go to Carlos for about ten minutes and then we're going to break for lunch. And then we'll come back and continue conversations in different ways.

[00:29:26]

Steve Brink

Okay. Thank you. Steve [inaudible], Association. Three quick things. One—well, not exactly associated with the objectives of this forum. I think sometime somewhere we have to be very cognizant about the no action alternative because I would suggest within the Stanislaus particularly there's probably going to be 100,000 acres or so of the burn that's going to be no action. And what does that mean in terms of an influence on the other areas that we are going to do something on? That's number one. Number two, I would predict that ten months from now this same group will be in another forum talking about the low and moderate severity burn map areas because there's going to be a substantial amount of additional dead in those this coming year. And whether or not they still then fit within the variability that Craig talked about a little earlier.

[00:30:24]

Steve Brink

And then third, I think there's an 800 pound gorilla that the Forest Service has to deal with and I'm not talking about Sierra Pacific Industries. [laughter] I'm talking about the paradox we face with spotted owls and goshawks and how we manage for it. There are green areas left out there that some of them are tracts that were either still intact or only partially burned. There's still a lot of green retention out there. And we all know that in—so far today the way we've treated those is you simply put a fence around them. In part because the fire crews will not go put a drip torch to them. There's too much ladder fuels and stuff on the ground and there's no money to go in and clean up the mess before you can put a drip torch to the ground. So, to me there's a paradox that we still have to face here on what to do about managing for the green tree patches that are still out there that are occupied by goshawks or spotted owls particularly.

Dorian Fougères

So, you guys have a lot of material for the afternoon. I'm not going to summarize things again. I think we've got a good set of it. So, let me turn over to Carlos. Actually, let me just give a round of applause for all of you who have reported. Thank you everybody. [crosstalk] in terms of maps, in terms of ideas and treatments throughout the afternoon. For right now, I'm going to turn it over to Carlos on high fidelity [inaudible] imaging update for about ten minutes or so and then we're going to break for lunch.

[00:32:05]

Carlos Ramirez

So, one of the common things we've heard over and over is we need the capacity to be able to evaluate the landscape at multiple temporal and spatial scales. And really have a good opportunity with the Rim Fire with some of the data that's already been acquired and will be acquired to be able to do these types of assessments both for the management—land

management perspective as well as the scientific community perspective. Let me just provide a quick background. Bernie came to my director about two weeks before the end of the fiscal year and the looming government shut down and wanting to do a LIDAR acquisition which at the time seemed like a near impossible—it was a monumental task. Fortunately with an existing agreement with UC Davis, we were able to get [inaudible] funding rolled into that agreement to be able to do a baseline LIDAR survey for the entire Rim Fire cluster two kilometer and buffer outside the fire perimeter. That was made possible by Suzan Youssef and Alice Colton up at UC Davis. There are a lot of different parties involved from the sense of community they're interested in helping to assess the landscape not only for this initial baseline, the assessment, but also longer term. And we've been working closely with the Jet Propulsion Laboratory, in particular Dave Schimel, closely with UC Davis. UC Davis has already put resources in place to help with that initial data product generation for these types of variable scale analyses.

[00:33:41] As has Van Kane from the University of Washington up at Jerry Franklin's lab. And fortunately, Malcolm is heading up a project that ties in set full of these individuals listed here that will help facilitate the acceleration of some of the metrics and tools necessary for working with these high resolution data sets.

[00:34:04]

So, what is been acquired to date is hyper spectral imagery for those that aren't familiar with it what—as opposed to something like land sat where we're only measuring six spectral bands with hyper spectral imaging or imaging spectroscopy, we're able to measure hundreds of bands. So, in terms of characterization of the landscape both from biophysical and biochemical composition, it provides an unprecedented amount of information to be able to evaluate forced regeneration, ecosystem function, looking at different bioindicators. In conjunction with that average collection—let me back up just a minute there.

[00:34:46]

There was already a NASA campaign which flew part of the Rim Fire area as part of the launch of the new generation of space born instruments. So, we do have pre fire hyper spectral imagery for part of the Rim Fire. Fortunately, for Matt and some of their other folks from Yosemite there is full coverage of that area. And it's about the eastern half of the actual burn that was covered. We also have thermal—hyper spectral thermal data that was acquired and then as I mentioned the baseline LIDAR data set immediately post fire. Fortunately, Thomas Painter, one of the JPL PIs who's been looking at snow deposition through time—rumor has it he has wall to wall or near wall to wall pre fire LIDAR data for that area.

[00:35:40]

Numerous benefits to being able to leverage these data sets. This is just the short list for being able to—rather than looking at—and certainly there are valuable forestry metrics to be had from

the LIDAR data, but then we can also look at the physiological response of the landscapes through time both in different spatial resolutions as well as temporal resolutions. In fusion of the imaging spectroscopy data with the LIDAR data will further help us to understand what's going on with the recovery processes.

[00:36:19]

Just a map of the area that was acquired as I mentioned pre fire. There was about half that area covered, but this is the actual flight from November where both Averson Master [ph] were flown and it does span the entire area of interest and the entire LIDAR project area which we'll see in just a moment. Just to give you an idea of the dimensionality of the data set we're dealing with. This is—this area should look familiar to most of you and it shows the high dimensionality in spectral resolution where we can look at things like plant pigments, moisture, stress, and numerous other attributes that can be derived from the data set. While this sounds researchy in nature, a lot of the methods are already very mature. Between Greg Asner at Stanford, Dar Roberts at UC Santa Barbara, and Suzan Youssef at UC Davis and numerous other PIs, we can readily implement some of these already developed methods.

[00:37:25]

The high resolution LIDAR data sets again like the hyper spectral imagery, there's an almost infinite amount of directly derivable output data products that we can generate from the data. Here's some work from Van Kane with the Yosemite data that was flown on 2010 whereas looking at the distribution of patches and gaps within different forest types. And then something that I know is probably of interest to Craig and Sue is the preliminary analysis in the treatment areas of the [] CFLRP. And that's something that we're hoping to pull together for presenting here pretty soon.

[00:38:03]

As I mentioned the LIDAR data extends outside the burn perimeter. We would have liked to have gotten whole watersheds, but unfortunately it wasn't in the budget. But we do have full coverage again of the fire itself and the 2010 LIDAR flat lines that do extend into the park. And we'll be examining the pre and post fire effects within those areas. Field data collection. As soon as the agreement was in place for the post fire acquisitions, UC Davis has—was out to—within the burn perimeter collecting both spectrometer measurements as well as field plot data. The Jet Propulsion Laboratory in conjunction with UC Davis was out there collecting plot data as well.

[00:38:52]

I won't spend a lot of time on the plan analyses. That's really for another discussion, but we've been generating a long list of products that are of immediate use and—as well as longer term

data products. And this is just the short list of some of the outputs that are being generated to support the initial recovery efforts. As I mentioned Van Kane has been instrumental in working with the LIDAR data both for the park and the—and more recently the Forest Service. He's already been hard at work brainstorming with Malcolm and others on some of the questions we'd like to address with these multi temporal data sets.

[00:39:40]

So, where do we go from here? First and foremost, we're still identifying and consolidating pre and post fire data sets. Right now we have authorization from NASA headquarters to fly the burn perimeter three times per year for the next three years and Dave Schimel is already looking for funding to extend that out even further. In addition to that, we'd like to have the LIDAR acquisitions not only airborne terrestrial LIDAR, but then couple that with terrestrial LIDAR or ground based LIDAR in addition to bathymetric LIDAR so we can start to look at sediment transport and have some idea of the uncertainty inherent in the data as we scale up to these larger landscape levels.

[00:40:25]

As of right now, we're looking to hold—or Dave Schimel from JPL is working on this to have a NSF funded workshop most likely at the park. So, if he hasn't contacted you yet Matt, then you'll probably hearing that—about that soon as well as with Gus Smith. But the idea is to solicit input from the scientific community on what the initial data—what initial—data products are needed for longer term analyses and these—this longer term look on—of the landscape that he mentioned as well as, again, focusing on what the immediate needs are. And that's really the key point of this presentation is just to minds turning on what is needed for this effort. And with that, I'll take any questions.

Dorian Fougères

Did you—let me ask. Did you want to ask people specifically question or just if they have ideas on data input to come sit down with you at lunch and [crosstalk]?

[00:41:30]

Carlos Ramirez

Yeah. I would say let's have that discussion at lunch or shoot me an email. I meant to put my contact information up here. And we'll compile a list and get that to you, the PIs involved from JPL and UC Davis and other institutions.

Dorian Fougères

So, any immediate questions for Carlos just on the pieces he presented? Okay. So, we're going to break.

Part 3

Dorian Fougères

So terrific. So I'm just going to give a quick recap of the pieces that came up from the report from the morning group sessions. There were a couple of pieces that were high level themes that came up again and again and in different groups. We have this piece around restoring or returning to a frequent fire disturbance regime that came up across several groups. Another piece, substantively, was this idea; what do you do with the green tree component that came up in a lot of places? There's a habitat issue and a fuels issue there. Another landscape level view is this idea of how do you restore a landscape level matrix? So really a heterogeneous landscape with a variety of habitat and vegetation and values. A couple concepts that were a bit at kind of at a second level, it may be of importance, it came up again, but not every time, was this idea; roads. We had a couple of conversations about the road network and water quality. The monitoring piece came up a couple of different times. And a couple of pieces here around the landscape resiliency, the whole issue of community support, community economics resilience also came up across two different groups. So those were the kind of second order themes. And then we had a couple of things which were obviously important to individual groups, but they didn't come up repeatedly. There was a little bit around some of the course wood degree. Some of the pieces around the soil and watershed values. Obviously those are important components; they just didn't come up repeatedly across the groups. But for individual groups those were important. So those were the pieces. And then there was a bunch of stuff that was more of procedural and tactical; what would you look at, or how would you would you do this? So we had the piece on, again, a little bit of a monitoring emphasis, the adaptive learning, adaptive management component. We had the funding commitment, decision support tools for prioritization, and also how do you kind of balance competing interests and then also reference for other planning documents that are already out there that need to be kept for that purpose. So that was the summary of report outs from the small group work.

[00:03:40]

Sue Britting

Three roles and it was establish frequent fires to service your team, manage for mosaics space and time, retention of green tree patches for the adjacent areas. So we played off two maps and

this map on the left is the one that indent—that the resiliency team identified some areas for strategic management of fire, so there's fuel breaks and areas to manage. So because several of our objectives or goals had to do with wanting to introduce fire, we wanted to talk about those places that maybe need to have some resiliency built into them, or managed, so that they would be, they would help us manage the fire we wanted to introduce on the landscape. So that's why that first map, this left side map is up. And we kind of talked about two areas, and their examples of different approaches for managing. The specific areas they can frankly be moved around. But the two types we focused on were ...

[00:05:02]

Sue Britting

Placed on the landscape where we had more of a mosaic, so the green view represents retainer; trees. Potentially there's a limit to this sometime in the future. So this is a different pattern today and it was one that we talked about wanting to, you know, continue on this trajectory of variable landscape. And so this would be an area where we could be immediately thinking about the mosaic of green tree versus adjacent burned areas and how we can use it to facilitate that progression into the future. The other generalized area we talked about in where the more severe fire occurred in where there was higher mortality. So then a different strategy we're looking at in that area was how are we going to introduce some variability in here in a way that have that landscape not become a uniform, either a shrub, or a uniform in its tree planting, whatever actions that's going on up here. So we talked about, you know, when to introduce fire here. Would you plan this, or manage this in a way, that you might be able to have some assets that you planned out, but then there are other areas that we actually do want to get some fire in there early on to help manage the shrub loads. Some of this you see in the canyon area is not very accessible, even if mechanical treatment was an option. So we really started moving into, these are very different areas in terms of management and strategy, to even achieve a single objective of mosaic, or reintroduce fire. We're going to have to take different approaches in different areas. And then we talked a bit, we didn't get very far on some of the, what looked to be like riparian and green and [].

Dorian Fougères

Thank you, Sue. [Applause] Table three always gets to go first. Who wants to go second? I see []. He's got a map.

[00:07:09]

Hugh Safford

So we didn't end up [] anything and in fact, most of us, we were friendly, in the beginning it got very acrimonious for not talking to anyone, so I volunteered to talk about it. So the map, the severity map is the one that I want to – you guys can help me out maybe, but we had some sort of half-baked ideas. It's a good term for burned area. One of the things, was variable, that was put up at the very end, can you put that up again? I think we, I think it's very difficult to do this kind of work in 40 minutes. We were very lucky, though. We had two people at our table who actually live in that landscape. And even they were willing to put lines on that. And, you know, this kind of work doesn't get done in 40 minutes, and often times it doesn't get done in 40 weeks either. But a few of the things that we wanted to move on the landscape, well, Carol's going to bring up, she's going to bring up the actual sizes of the trees on the pre-fire landscape. Because we have a lot of interest in knowing kind of what big trees – I mean, whatever, right? Where the big trees were and where the small trees were, so when that comes up I'll refer to that. But it's basically all of it here. This is where most of your canopy can be dominated by trees bigger than about two foot DBHR. It actually really didn't burn all that hot. And so we had an earlier debate today about what do you do. Well, that's the focus area probably for that debate about how you treat large tree stands that have had fire in them for a long time, a lot of them – they just happened to get a lucky a lot of this because they burned on moderate days, probably is what happened. But this is going to be the central point for that debate. The other thing we talked about was that if you look at the strategic fire management areas – well, that's kind of interesting. There's another map that we got, what was it? The burn probability map, I think that's what it was, and it kind of dealing with this area, and my guess is you'd think they just left this on it because it's just mostly like untreatable landscape and that's why it's not in here as a fire management area?

[00:09:22]

Marty Gmelin

I think a lot of that was actually two different, that map was two different distances. So the fire management [] and the fuel [] thought about things differently in the fire material out there. And that area wasn't high on the list of [] so much as on the [] side [] on one point.

[00:09:39]

Hugh Safford

So to the extent that really what you got is a network of treated material. The problem is you're dealing with the exists, and so this canyon landscape, which is chaparral, it has a lot of sand in it, there's some oak in it, it's a pretty scary landscape, they're not going to be able to walk people in here to put a fire out when it starts and so it becomes a real hazard. Another novel idea which I'll admit was Larry's and mine, people start rolling their eyes when I talk about it, this kind of whole area here, there's a whole of tree in here that's maybe 3,000 or 4,000 feet. This was largely plantation land, right? Originally when a fire came through here. And when you look at that elevation, and you look at what the future climate model suggests will occupy that landscape is not conifer forest. You know, that's kind of right in the middle, hey that's going to be a lot of oak woodland kind of habitat. If you wanted to get crazy there might be a landscape where you can think about just giving up on planting conifers. I'm not saying you should, there are probably places wherever you want to, but it was noted to me that there are places along the streams and on some of the canyons where there are some big Doug fir for example, a residual little stand. But just given what we know about the inability of a lot of these conifer seedings making it through the hot summers anymore, on gravily soils at those elevations, maybe try pushing it towards oak instead. And there are a whole lot of different oak species that would look great under current climate. They would sprout after fire, they leader doesn't burn nearly as hot, it provides a pretty good habitat. And I suggested maybe we should plant cherry out there too because then you have something to log and make some money as well. [Laughter] So we need a little more precipitation. There's a lot of insight going on in our group. And then this area down here we were really focused on this fire management stuff. This is Highland Ridge. And a lot of this is kind of small stuff, was [] the conifers that burned last time. And this area is really nice, it essentially protects this area from fires coming from the south and from the [] canyon. So this was an area where you would have to, I don't know how you could do it, but it just looks like there's a big road network in there, but you'd have to find some way of treating that landscape and it's probably not going to involve a whole lot of fire, it's going to require probably mechanical entry. What else? There's something I'm forgetting.

[00:11:50]

Hugh Safford

What is it? Oh, yeah, let me explain this map real quick. Carol just brought this up. So this is pre-fire, obviously. And the red areas of the canopy trees are dominated by trees that are two foot deviation up. And then sort of that tan color is 11 to 24 inches, and the yellow is 6 inches, et cetera, and the white is essentially non-site. The other thing that we, a conifer site, the other thing that we really wanted to have was we wanted to have a solar productivity map, or some

kind of site index map, obviously in terms of future management, that's hugely important. We don't have access to that. So we thought that in the NDDI, but the NDDI we have is a post fire. So anyway those are some of the things we talked about it. Am I forgetting anything?

[00:12:40]

Marty Gmelin

Yeah, I think deer kind of plays into this, a lot of it. This country is probably deer herd, a littering range, [] tree out there, what they're doing and how they're moving, coming out of the fire through here. So we got a bunch of treatments in there to help make sure that we remove the sticks so that way they don't have a lot of movement when all the snags start coming down. So what's happening now is the [] is so thick, there's only few corridors for the deer to move, and the cougars hang out and just have a little buffet walk by them. So we want to make sure we're thinking about it, that this would be for the future, you know, make sure we continually manage that for deer movement. You know, we've had the Fisher corridors, identified some of those key areas for [] Fisher areas, so how we manage those kinds of things. [].

[00:13:43]

Dorian Fougères

Thank you, Marty.

[00:13:46]

John Buckley

We're talking about this area here, this is the [] River Canyon for many, many years. The reason this has so many large trees is one of the largest areas conservation groups have fought to protect for many years. There was an area here of 10,000 acres, 15 square miles, it was called the donut hole. There was the fire, the [] went all the way around, it burned. But it was backing down into this, and whether it was right or wrong the incident managing decided to light that off with ping pong balls in helicopters. And they created this huge 1,500 acre, 2,000 area block of burn here, and these two here, they actually are bigger than this now, I just saw recently on this side here. But if this was all lit on purpose by the Forest Service to try to even out the burn within the perimeter because of all the [] throughout this area, but this was intentionally lit off [] later on, []

packing into it, because it was old forest habitat, whether it was bad or good, the fire was not running through it, it was backing down into it. So it's just [].

[00:15:07]

Matt Brooks

Okay. So the first thing we have was, since we like fire, we're looking for evidence for places where maybe there was an understory burn, that sort of thing, that might be especially in areas that were mapped previously as high grid in terms of lack of fire. And up here we noticed, if you believe the grid maps, was that this area, this one area here was high departure in terms of lack of fire. And in this area down here, as well, these two areas, a lot of was high departure, but these two areas were where they were a fair amount of green in the NDDI. And we thought that some of the green might disappear within, you know, 6 to 12 months because of delayed mortality. But we thought that it might be useful, if you wanted to identify areas for high priorities, where an initial re-entry fire, maybe an accomplished by the Rim Fire, to maybe redo, maybe reanalyze this after a period of time. We need to think most of the mortality has occurred. And then if you're still getting some degree of retention of live trees, that might be a good place to focus on using it as an opportunity. Also I thought it was interesting that this was where a lot of the large areas of trees we're worried about. I also thought it was interesting that were only a moderate density of low plain trees down here because of the extremely high []. So I kind of worry about the different [].

[00:16:42]

Matt Brooks

So that was one point, the opportunity for, you know, identifying areas for managed fire. Some other comments on retaining the snag forest for wildlife values, as a general objective, in using Justin Heade's[] map for the black-backed woodpecker habitat, that might be a place to start since some of that's already been sort of established frequent fire. Areas that were rehabbed, or areas where there were like dozer lines, that sort of thing, where sort of being done to re contour the roads, or the dozer lines, those dozer lines would be an effective fuel breaks for a while. So you utilize those when you're trying to reintroduce fire to those areas. So identifying areas where you already have some anchor reports for fire line is established, that might be there for a while. There was some comments about where the re-forestation should occur. Areas where [] the present, plan on lighting fire slopes and sites were scattered, seedlings and manage every few years with fire, I'm assuming are being made after those seedlings are established enough, right?

And then also the idea of looking for replanting riparian hardwoods where it was shaded out by conifers, [] corridor, one of those areas. And then we talked about tribal considerations, and it kind of occurred at the very end that perhaps areas where fire was used for various cultural purposes by tribes, they may be telling us areas that where whatever the purpose is for, like [] for acorn production, those are areas that are now don't have a [] in them, or a forest. Those might actually be a glimpse into the past of the landscape potential for where those areas can be reestablished. So I don't know. Perhaps there is a little bit of opportunity to look back into the tribal records of where there were historical areas of that sort. It might be an information source. Anything else?

[00:19:16]

Peter Stine

Okay, we're not shy about drawing on the map and, you know, take it for what it's worth. But the first thing we did we started to identify some of what appeared to be the clumps of green tree retentions in the seat [] of the [] fire. So you can't see it from where you're seeing, probably, in gold are outlining a few of these areas that appear to be key areas for this objective of using, or retaining those remaining green tree patches and enhancing them, and enabling them to reforest around the edges. We also looked at some areas for potential places to put up a stand against a moving fire and you can't see this, it's marked in silver here, but there's some places along ridgetops and at the top of south facing slopes where we might be able to put a fight against a fire, and manage the land appropriately for that. Then we looked at this area up in the north, as others have mentioned, this is where some of the larger trees are. And there's also a nice distribution of new severity conditions. Actually the joining of some bigger [] of high severity, and this could be an area to focus on in terms of habitat conditions and those mosaic conditions that we talked about that include the habitat for woodpecker species and others. So you have this good mixed [] area. And we further looked at this area, including potentially the SBI land right at the joining[], which I assume has been all savaged. And looking at potentially using this wide block of land as a study area for looking at different loads of treatments in some sort of randomized fashion where we have this array of severity types. So this one area could be, it could serve that purpose. An alternative that we discussed is looking at Spotted Owl packs that are distributed throughout this area. I assume there are 46 owl packs involved in this fire. So potentially we could use the owl packs, or some area around the owl packs as sample units for different levels of treatment to look at the response of Spotted Owls to controls and different levels of salvage. And embedded within those sample units could be the other sorts of studies that are being contemplated looking at the woodpecker response, looking at replanting strategies, especially given that owl packs covers much of this area that we could also develop some sort of

an elevation gradient as well as some of the other factors that we want to include in this. So we were kind of jumping up ahead in some ways of trying to incorporate on this landscape of the experimental design that would be necessary to follow up on a lot of the issues that we think are important, so relatively uncertain. Anything else from the?

[00:23:15]

Dorian Fougères

Thanks, Peter. [Applause]

[00:23:30]

Malcolm North

Okay, we also were not shy at all about dividing up the landscape in making definitive decisions, and a lot of it is just to throw out some controversy here. But we started with the beginning that, at least from the fire reports, and the fire breaks, one of the first place, of course, to be considered would be a lot of the ignitions are, and I think it's down here, this river, this recreational, a lot of this is chaparral above it. So we really viewed this as the first place in which you want to have some kind of fuels treatment above it, that you want to turn this whole area up over to fire. Right now just leave it as probably to burn it frequently, to try to produce fire ripping out of this up to the north, but to keep this probably as existing chaparral or whatever and continue to burn it. The area that we saw kind of building on what other people were saying is we took this whole northern area up here and said; go in and look at it, take out the fuels that you need to, and then turn it all over the prescribed fire. And we wondered why you would want to go in and helicopter, salvage this [] river area up here, actually that's a fuel loaded after you take out the bigger trees. So that was the question. But, of course, all of this idea of putting this in the prescribed fire is contingent on do you have opportunities outside of the Rim Fire to actually build a pretty good network to hold a lot of that fire against going into the communities in that direction. We also said, hey this is next to the [] park, let's put this over to prescribed fire as well. We were very pro fire in this. [Laughter] And Joe Sherline [ph], who worked on the Forestry is familiar with this area, so he knew about the deer area in here. And we noticed this green tree patch right up in here that butts up against the SDI land. So to us this really suggests that this is not a place you're going to be able to prescribe fire into this green tree patch because of the private right behind it. So this would be an area to really consider a fuels treatment right around the edge of it to be able to like keep fire from going out into that area. Let's see, what else do we have in here? Oh, and then this grey block in here, for the area that's in high

intensity, we looked at really trying to increase the heterogeneity in here by going in here and creating pockets of salvage and then pockets of planting, and planting intensively managed in the future, so you go back in there and look at the river [] shrubs that we're using in the competition. So that's what that area is there. Did I miss anything? Okay.

[00:26:29]

Dorian Fougères

So this is a good, we're going to 2:30, so we got about 20 minutes. Really what I'm interested in hearing from people is not me trying to summarize it, because I can't show it on the maps, but people that are seeing common area brush, for example, that north edge, the [] River area, the wilderness area. You know, one of the kind of patterns that come each you see in terms of areas that people have identified we want to ask people who have been watching the presentations what did you see? What are some of the []? Barry? I always get people that are scratching their head. Are you scratching your head because you wanted to ...

[00:27:22]

Hugh Safford

Only I do. That's including []. So the, I think that seems to me that there's at least some agreement on some of the groups here that the [] River area, that's inventory road less, we cannot, or go in there and treat anything anyway. I mean, what a perfect place, if you're thinking about trying to encapsulate a return to fire area. And obviously the devil is in the details, but I would suggest that that seemed to be a pretty general conclusion, I think. That's fantastic.

[00:28:11]

Angela White

Well, I find it interesting that most of this started with the green tree, like looking at the DDI, so I think that that's just a generality of where all our mindsets are in. But I think one thing I struggled with, our group struggled with, we morally had the discussion is looking at the fire returning, or what areas burn more frequently? Or what areas typically burn hotter? And just trying to tease out is that going to be indicative of what happens in the future, like why did those areas burn more frequently? Was it because of their typography? Or their proximity to roads?

So what we're trying to say, what we're trying to predict, part of what we're trying to strategize is whether we predict this area of the landscape, how would we predict to continue to burn? That it's hard to know how much we can make from historical patterns. Because I don't think any of us fully understand how those fire maps were built. Fine, there was eight fires that burned there. Well, why?

[00:29:18]

Dorian Fougères

Yeah, let me just make one comment, [] on Angela's remark, or the [] table, we knew this was going to be a very difficult exercise. It's a high level, very fast, very short. Some people have detailed knowledge they probably would know all the [] fires, most people don't. So the purpose really was to start with a different phase in the collaborative exercise and getting that kind of high level [], high level of that stuff. We're not expecting that people could do the [] planning that the staff has actually been working on getting. So it's a bit of both, I mean some of these questions, yeah, some people have more knowledge than people want, but that's the tighter stuff down the road with planners they wouldn't even know. So does anybody want to comment on that? I got Brandon and tell me your name again?

[00:30:06]

Brandon Collins

The Forest Service, PSW. I just want to follow on what Angela said with respect to this map, which is actually pretty interesting, but you got to know a little bit about what's going on there. I think Becky and their team put it together, but it's basically the areas that burned at higher severity, higher to moderate severity, and what that frequency of high and moderate severity is. And that's pretty darn interesting the way you see in these places, all this yellow is places that burned at high to the moderate 20s in the last, whatever, 30 years, since 1984. So that's a good point, you know, kind of relatable of what you was talking about is we're not going to change this. It's going to keep burning in high severity. So we're not going to be, you know, we shouldn't be messing around in there, we shouldn't be trying to put plantations back there. It's very prone to burn in high severity and it's probably going to do it again. And anyway I just want to say that's out there and that's a pretty neat tool to look at.

[00:31:00]

Dorian Fougères

Great, let me just – and then we'll come back to Angela – that's the Cumulative Fire severity map that you're looking at? Thanks. We'll get to the mic to Angela, and then [] if you want to respond and then I'll come back over to Scott.

[00:31:21]

Angela White

I mean it just, I guess this is more specific, so maybe it isn't appropriate for this group, but even when you have in areas, it's kind of, I think it goes by how we salvage, because fine, you have two areas that burned in high severity, maybe it burned at high severity once for some certain set of conditions. They burned at high severity the second time because that area wasn't in salvage logged. So it doesn't necessarily say in the future that area will also be a high severity area, and I guess that's the assumption of why we have to start somewhere. It would be interesting to see, to have a discussion about how we really expect it to play out.

[00:31:57]

Dorian Fougères

Thanks. Scott, do you []?

[00:31:59]

Scott Stephens

Well, I think another theme I heard from the groups is this idea of really active management of reforestation in areas that you can choose. I think that's really a key factor. It's so easy I think, pass a restoration, if we pass an idea that's going to make it desirable. But I think I've heard at least half the group say that an active philosophy, it's probably decades, maybe 30, 40 years. It's probably by square acre, by any means, it's probably picking and prioritizing like we've heard. But the idea, we all have the idea that you're going to be kind of forced to decide through really correct manipulation through many decades in the area that's chosen. There's got to be a [] idea versus just passive.

[00:32:46]

Dorian Fougères

[], I'll ask [] to comment. So when we came up with the steering committee, they had similar responses. So they said we talked about salvage, we were really having a conversation about reforestation, replanting, regeneration where that occurs. So right now, if you haven't marked your calendars, January 23rd is the day that we have on the books, to try another one of these thesis workshops to work in that conversation. It's a bit [] to say to the IDS that we have Bernie here in the room, that's coming down the road, so it's a bit of a different time. It's kind of like, I wouldn't say part two, but it's the continuation of some parts of what's coming out today. We should be a little bit more focused on it. We don't have a design, we don't have an agenda. I got lots of support from the people who helped with [], but there is, there is some recognition that there are parts of the conversation that are sequential, or at least connected. Did you want to say anything on that, Bernie? Or []?

[00:33:47]

Barnie Gyant

You asked me twice, so I better say something. [Laughter] What we talked about is as we look at just general restoration for real is green trees. And we decided kind of upfront that we would see about trying to establish a couple of days to get all people's calendars, because it's really hard to get a large group like this together. So we already, of course, we're going out there. For me, I think, uh, if you look at what we use in treatments, and then you look at some of the connected activities like over three or four [] piece, where would that be, or where would you plant. So we want to have conversations that we still need to have, we're not trying to solve it all today, but we do have another date, to try to drill down a little bit more so we can turn this information to the Forest as they're developing their alternatives around the restoration piece for [] in general.

[00:34:43]

Dorian Fougères

Thanks, Bernie. Jonathon, we now want to check if there's anyone who hasn't spoken yet. [].

[00:34:51]

Jonathan Long

Just a real quick one, Brandon, could you hold that map up one more time? Becky's map in high severity. My only point is that the questions asked produces certain information that can't be done for a basis of decision, but I think it's very important to realize that it's only answering the question that was asked. So in this case the area that's up there to the west of Cherry Lake, for those of you who are looking at the map, it's also on the screen, all that area up there. It ripped and burned completely in 1975, post 1973 in the Complex fire, and it ripped again and most of it has totally burned this area now from this Rim Fire, the fact that it shows that it's low high severity and it's important information here, it has nothing to do with the reality on the ground if you go out there. And it's burned once really hot and got replanted and has burned again, especially the Hell's Mountain area is all black. So it maps [] only are answering the question that was asked and you have to give Marty, and Maria, and the other folks from the global force who know the other information [].

[00:36:15]

Gus Smith

I was just – sorry. I was just going to respond to Angela. On the far side, on the far eastern side, where you see the green and yellow, or up on the, on the very front of the severity map, it shows just Rim Fire severity, the pattern that we did see is about the same. So what burned hot in Ackerson[] and other fires, you know, burned in high severity in the Rim fire. But the difference, if we could put up, Ackerson[] is probably our best landscape fire, [] in that part of the woods, is that, you know, what is troubling is that those high severity patches are coming together. So you got small, or smaller patches, of high severity in Ackerson, and then they bled together in the Rim fire, so they're connected [] patches []. That was the only thing I was going to say because we don't treat forest up there post fire. So no logging, [].

[00:37:13]

Dorian Fougères

Thanks, guys. Let's go ahead on to Joe.

[00:37:13]

Joe Sherlock

I couldn't help the more I look at this to kind of think that there is a binary thing going on here, where you got a lot of green up here in and down in here, you've got a matrix that you can work with. And this is an area that, again, to me, seems like, do what you got to do pending wise, salvage wise, whatever, to be able to turn it over to fire, because you've got enough to build off, you can maintain this matrix as this area of high severity in here is a flip, where you want to really build and try to hold on to these green tree areas because they're really rare on this landscape, and this is an area where you want to do the reverse. You want to try to keep the fire out of the, you know, be able to hold these green spots for a little while. So when I look at this I keep on thinking you kind of have two different end points that we're working off of that's matrix based to choose the opportunities for turning over the fire a lot more, and this area is different in which you'd want to intensively manage it and really try to be able to [] on what you go here.

[00:38:17]

Dorian Fougères

So a matrix based area and an intensively managed area. Joe?

[00:38:25]

Joe Sherlock

My name is Joe Sherlock, I'm the Regional Silviculturalist. And I have some information, and I think it started a related conversation. So, Brandon, that map that you showed us, one more time, please? So that orange area to the west, it's got a lot of attention lately, and I'd like to provide a little information. That was real live forest land. It was low elevation land, it was harvested an awful lot in the '50s and '60s. And what was left – the condition that we had before the fire of 1987 was whether a variety of plantation efforts that were made covered underneath, or maybe dominated in many other cases, by bear clover and manzana. So it's really not much of a surprise, I don't think, that it burned like it did and vaporized what it did in '87 and again in this year. And even, and so unfortunately in this year because there were plans to make sure that this type of stuff didn't happen. So I wonder how we think of, so the stuff that we're talking about today seem to be focused, we're focusing on some of these areas, and Hugh, you mentioned how difficult it is to do this in 40 minutes, or 40 days, or 40 years. A lot of the context and a lot of the

decisions that are being suggested today, you know, really, you know, of course we'd want to take a much deeper look into some of these situations. And the other thing that I'm noticing today is there hasn't been an awful lot of talk about the reestablishment of forests. A lot of us thought there would be, because, you know, yesterday, in theory, everybody's concerned about making sure that the forests are being [], but now that it's burned down we've got this whole other, we got this whole other perspective on what's going on. It's been a surprise to me. But I do want to mention it, because we're making calls about a lot of those landscape pieces that are premature. And I think that's just a function of what we have today. So I understand.

[00:40:39]

Dorian Fougères

Yeah, I'll say a little bit, I mean, that's probably something that we were aware of in design by Barney, or June, or Steve, or Craig, we recognize that there is a ton of site specific expertise on the forest, but this was also an opportunity to get people to look at it with just a different set of eyes. We're anticipating that the people here in the room are going to do the deeper analysis and take it further, but there was an effort that the forest, I'm not saying that all those are right, or could be done, but it's to get, you know, just a different set of ideas on the table, maybe even for the next forest meeting.

[00:41:09]

Joe Sherlock

Could I have the mic again for just a second? Okay, so I knew that, I understood that, but I wonder if that's really what the point of why I wanted to say something is that when we make these type of assessments of a situation, and we'll make the more serious ones later, but these type of conditions, or these types of discussions will come up again later. And I think it's important, I think it's a good idea to play through them now in public. So I understood it and I agree.

[00:41:37]

Dorian Fougères

Yeah, I think it's important about managing expectations. Go ahead, Sue.

[00:41:43]

Sue Britting

So I want to make sure that some of what we were talking about earlier was at least understood. Because the example we gave for two, you know, kind of characteristic places on the landscape was about getting forests on this landscape. In this area they exist today. And we want to manage them forward in a way that supports heterogeneity that gets fire back into this landscape. In this landscape, possibly up here although, I think there's some [] issues here and I there is a different type, I think. But I'm going to go right in here because I know this []. In this place we've got a different setting. We've got far fewer trees, maybe, you know, there could be some remnant bio trees in here, and this would be a lot of space that has the potential to become uniform. We also talked about the reality of infrastructure and money to plant. And so now here's a place on the landscape where we know a forest existed in the past. We want to see a forest in the future. And the worst thing would be to have of 20,000 acres of something uniform. Because that has the potential to ignite somewhere down in here and run right up. So in this place, in my mind, there's a challenge, a very different challenge of how you create a landscape that's not continuous. And how you reset, how you arrange this landscape so that it can basically try to set the clock in a different time in various places. But what we talked about in our group, it was almost also coming up with the planting, so I'm thinking about a comment earlier about maybe these are places where you don't have fire. But my response back is we have to get fire back in here. It's too big of an area not to have fire at some point in the next ten years. So we need to come up with a strategy to reset fire, [] down here, it doesn't compromise our investment, those little trees, we want to see them grow up, but also it figures out a way to take some of the other structure and keep it down, and keep it less of a [] issue. So I think it's a pretty, this one is pretty complicated. In fact I think this one is easier. There is, you kind of know what to do. This one we have to break up space and time. But just to emphasize, I think it is about forest and it's about reestablishing them with, you know, whatever resources we have as long as it's not complaining the thing that people are complaining about today, continuous forest cover. This is the opportunity here to have an environment that's not continuous forest cover. And it's going to be complicated.

[00:44:38]

Dorian Fougères

We have about five minutes left before we take a short break. Barnie?

[00:44:46]

Barnie Gyant

So now I'll come to the map. So this is what I've been thinking. So this is, this is green. And we know in the landscape where a lot of fire occurs, then what do we do to protect it? It's a high pass, right? You want to be in the [] to protect your house. This is our house. You're going to have to model here. So what are you protecting? And then if I look at this place, you know, I see some places, one, if there's no forest here now, the question is; do we want it? We got to answer that question first. Do we want forest back? If you answer that question with yes, the next question is; is there a seed source? That answer is going to be yes or no. If there's not a seed source then what do you do? And then other than that – and then when you do do it, do we do the same thing that we did a long time ago? Do we plant it back the same way we did before? Or do we do something different? Because the reality is, as I look at the region in its entirety, we want to focus and concentrate here, but we also got 17 other national forests that have similar problems. So now I'm thinking to myself I got to be strategic on where we send those resources as a way, as we look at time management, to what we want to be as part of the rim, as a part of this restoration. Now the reason why we're doing it in a collaborative, Dorian, this is why I wanted the mic, is because the way we manage and did things before as an agency creates a tremendous amount of controversy. So this is my fourth region. And any time you use the word salvage created a tremendous amount of uproar. So in the collaborative we're doing in a setting. We worked really hard in the last couple of years on how do we work across this entire landscape with some of the issues that we deal with is we want to talk about it. We want to get the opinions of what other people may know in and around that, so we can at least start to sketch out how we want this place to look when we're all gone. Because I don't want my great, great grandkids talking bad about why in the world did they do that? They knew that fire occurs in that area over and over again, so why did they set this problem up for us? So what I'm encouraging us to do is that as we think about where to go, how we prioritize it, let's be smart about it, let's use our resources in a smart way and see if all of us can see about trying to sketch out something. And here's the other piece, we give ourselves the latitude to know that we come at it from a good place. And that if it's quite rocky we make adjustments as we move forward. That makes sense. So that's what we want to do. That's why we're here today. It's all of us putting all of our information, values, all of that stuff, I'm going to tell you, no one's come up with something that's better than what we currently have.

[00:48:45]

Dorian Fougères

Does anybody want to add? Marty? And then we'll go to Marty and then we'll take a break.

[00:48:57]

Marty Gmelin

I know I'm not really supposed to talk, but I want to take it one step further. To me it's more about to plant, to do something, but it's really what habitats do we want 50 years from now? We burned up 46 packs of [] in one shape, form or the other. We [] habitats, shaded landscapes. Great. So now if we think about our next steps, what do we want this thing to look like in 40 to 50 years? Do we want to start thinking about working our ways towards those [] or not? And what, and how will those look like? To me that's going to guide our future, what do we want in the future, if we work our way back with what we start with now. That's the key, we start now and work our way towards the goal of the future, but this is a long haul. I don't have any kids. This is my child. I planted this once before, I've thinned this once before, so it's one more I want to keep. So the next challenge is what do we want in the future? Because that's the key.

[00:50:05]

Dorian Fougères

Thanks. Why don't you guys see if you guys can give a round of applause for these conversations? [Applause] We're not really having a conversation, but it's okay. Okay, we got a 15 minute break, I'll tell you happily what Bernie and Marty said is a great lead in to what we're going to do. So please be back in your seats at 2:45 when we talk about treatments until the end of the day. So please be back in your seats at a quarter to three. Malcolm and John and several other people who were in the conversations, again, if you can revise upon or [].

[00:50:39]

Peter Stine

Okay, these are just examples, as it says, and this is part of the brainstorming. And I think there's a lot more brainstorming to do, and that's partly what we can do here today and beyond. I think we'll zoom around the right kinds of treatments as we start to get more structure to exactly what the objectives are, where and what. But some examples are, the issue of grazing we

haven't talked about much. It is one of the issues. I see smiling faces. Clearly the Forest Service are going to have some challenges on how to handle the grazing allotments that were within the footprint of the fire. Some of them weren't entirely burned, and some were partly burned. So how do we address that? And do we, for example, have closures, or exclosures, to grazing? Another issue we talked about are riparian habitats and how do we, and sedimentation and excessive sedimentation, so one of the techniques that's been discussed is using contour filling on slopes above stream channels. Is that a technique that we would want to use? And where would we want to try to use it? We talked about fire breaks on this landscape, particularly in the portions that are really prone to repeated fires and repeated high intensity fires. So do we want to identify, and some work has already been done on this, do we want to identify the places where we want to either establish and/or maintain fuel breaks such as along canyon ridges? The whole issue of what to do with streams, riparian areas, is a big concern. There are many facets to that, one of which is what do we do in terms of planting the conifers in these streams? Do we want to do that? And if so where? How much? And how? Do we want to avoid that and allow the hardware component to come back up? And that, of course, will vary depending on stream conditions and location.

[00:53:07]

One of the big issues we continue to discuss is the distribution abundance of the snag patches that will be retained on the landscape for the benefit of wildlife species, included, as I mentioned, the Spotted Owls. Does that help Spotted Owls? Will they sustain in these high severity burn areas? That's a sort of a still of an unknown question. And then the black-backed woodpeckers, which we mentioned repeatedly, and other woodpecker species, I think are also within the [] of how do we manage the snag, the snag component of this landscape? The whole planting issue I think is a real interesting one, now in 2013, soon to be 2014, our view of planting has changed I think quite dramatically from where it was the last time big fires went through this area. And so the question is how do we plant, where do we plant, what do we plant? And I would say that it's even a place where we want in the face of climate change, do we want to consider some experimental plantings with different assemblages of species.

[00:54:32]

Then the issue of using herbicides, how we use them tactically to manage the vegetation. Is that something we want to do, and if so where, and how and so forth. We mentioned a number of times the hardware component, not just along the streams, but the blue Oakwood runs at the lower end of this fire and where that is moving as time goes on. We mentioned snags already,

but we've also touched on the issue of the relationship of snags to the green stands and how we manage that. And, again, back to the planting issue, how do we, should we plant in lower elevations? And as we do, what should we plant? I think again this raises a very interesting topic of should we try novel assemblages of species in an experimental way. Because you know, throughout the country, especially in the West this topic comes up time and time again. The managers are looking for guidance from the research community on what, how to cope with climate change. And in this case in particular where you have a fire what should you do in response? I mean one option is to plant what was there before. Is that smart? Another option is to plant, as Jerry [] suggests, lodgepole pine? So, you know, there's a lot of different options that one could take, and especially from an experimental point of view, I think it would be very interesting and useful for the long haul to inform this whole issue of how we're adapting to climate change.

[00:56:38]

My final point I want to make is all of this I think could be viewed and couched in terms of setting up an experimental design to investigate many of these topics. Because there's uncertainty around all of them, and we are poised with such a large fire to be able to look at a lot of these questions in an experimental way. And we going to be talking more about that with the Forests to figure out what sort of an experimental design could be offered to investigate many more of these topic areas. And so I encourage you to incorporate that into your thinking with all of these potential treatments. Thank you.

[00:57:31]

John Buckley

Okay. So we just went through a number of topics and rather than trying to look at the maps again, we just touched on specific issues. One is the first one that Peter talked about is livestock. And the general consensus from our group was to exclude livestock grazing from burned areas for at least the first two years, or until a vegetative recovery is covering at least 60% of an area with ground covers that have regrown. And there is not just for the riparian areas, but also for the deer benefits that are already going to be suffering so much because of the loss of the acorn production where the oak experienced intensity. The second one was as Justin was going back to, again, the map that he provided related to the black-backed woodpecker and there was a general agreement that that is a good starting point if you're looking at key areas of top quality habitat. It's roughly 13,000 acres within the Stanislaus Forest conifer areas that are so severely

burned at this point. And it's just an area of consideration that can be focused on for the black-backed woodpecker understanding that at lower elevations other wildlife species also have to be given consideration of where snag redemption should be. A third point, was salvage should focus on where logging is a tool to accomplish the overall landscape strategy rather than salvage logging following an analysis or assessment where there's the best snag volume and easy access. So, again, there was a strong consensus from the group that the focus should first be on accomplishing an overall landscape strategy rather than just where there's a volume and access. The fourth, what should the infrastructure be to maintain roads and fuel breaks consisting with long term management activities. Focus on what's being left than what's being removed. In some areas we'll need to have the emphasis on keeping what's there while other areas need a fire management infrastructure that's based on excluding fire to protect those sites and that's back to what [] and Hugh were talking about at times.

[00:59:58]

John Buckley

Focused on what you leave rather than what's being taken and again that's talking about for the infrastructure a system that's adequate to provide for that. And then the next was establish fuel breaks not only on ridge lines but if possible along the road systems, and one of the issues that has come up in the hazard tree sale that now is being brought forward on the Stanislaus and the Rim Fire, the only trees that are there that are supposed to be removed in the hazard tree sale, the first EA are those trees that actually pose hazards risks and might fall on the road. So all the biomass treatment, all the fuels that could be removed while those hazard trees were being treated, knowing how they will be left, and there's not the opportunity to, then most economically and efficiently do fuel treatments simultaneously along those road areas to provide a basis for a prescribed burning to get the fire back in the ecosystem on a more appropriate basis. And the last one was just a very quick initial beginning discussion of herbicides. There was a discussion that they're a short term tool that has a limited effectiveness in terms of the big picture and trying to manage overall but that there may be strategic places where there may be specific areas that they can fill a need and there was not a strong consensus from our group that herbicides was a tool that should be high in priority.

[01:01:41]

Dorian Fougères

Thank you, John.

[01:01:58]

Malcolm North

So I think the first point that came up is that the salvage is going to be probably the first and major impact on the landscape, and to each time a salvage treatment proposed or [], what exactly is the objective? A lot of our group didn't have a problem with an economic objective, particularly you got to pour money back into the restoration of the fire, but clarify where you're doing fuels treatment and what the prescription might be to be able to achieve that fuels objective in one place versus doing something else in a different place. A second point we talked about is the black-backed woodpecker and Ryan is taking donations to give us the ultimate answer to that. He said that he could model it in about two weeks if we just open up the money offers to him. But we did have a conversation of the distribution with that kind of habitat within the landscape and that there probably is a way to, at least partially optimize or at least be very strategic about where you would salvage and where you would want to leave some places for facilitating that habitat to occur. Keeping in mind that, of course, the areas adjacent to the park. So you have a good what we call in ecology a continent effect or a source to be able to supply woodpeckers into that landscape if the habitat is present. And then the third one we had a discussion about was we noticed that on the initial map, and we realize it's initial, is the salvage is generally shown as occurring in contiguous blobs, or areas that are put down in the landscape. And there's certainly a concern after some of the discussions we've had about what you would do within those blobs if you've got live trees, or low to moderate severity, some clarification about, and I think nervousness from a lot of people, about actually going into let's say a group of six or ten live trees and still salvaging within that context. That kind of rings a bunch of ecological warning bells versus trying to achieve your fuels objective outside of that area rather than going in there. So I think, again, just clarification on within the salvage laws themselves, how the treatments and what the objective is, and how it might vary between the residual structure that you're working from.

[01:04:22]

Dorian Fougères

Let me just ask, Ryan, since you guys had some conversation, do you want to get into more specifics about what you guys talked about? The distribution of habitat?

[01:05:01]

Ryan Burnett

Yeah, so we talked a little bit about, you know, how much is enough for the black-backed woodpeckers and whether, I think mostly we talked about having the best suitability and all of that, maybe the best way to go about optimizing. So we built these acres and we don't know how suitable this really is, this is the first take at it. So yeah, I don't know if I have anything else to add, the black-backed woodpecker, you know, [] distribution we just don't know that information very well and how much high severity. And then we talked a little bit about how salvaging, you know, can they put up with some salvage? And we don't know that in the Sierra Nevada but elsewhere, they're pretty sensitive to salvage logging, up to 50% of the material removed and their occupancy goes way down.

[01:05:57]

Ryan Burnett

Yeah, so the nest stands may be more sensitive's the way we're doing the wet stands in more of a matrix, and [] it might be quite a variable.

[01:06:08]

Dorian Fougères

Thanks Ryan. Group number three.

[01:06:16]

Scott Stephens

I think we got a little bit overlap as well, we got a little list here. The first thing is about the cattle grazing, it seems to be a recurring theme. We think that the riparian areas would be very sensitive to cattle grazing up or down high severity fire areas because of the reduction of confers. We actually wondered if a few upland areas cattle grazing might be an effective way to do some shrub management, to actually reduce some shrub cover through managed cattle grazing. I think there's research that actually supports that. People actually wondered about cattle grazing leases, that possibly those are probably long standing in a lot of parts of the forest and whether or not

they can be modified because of the issues surrounding the fire. We talked about meadow ecosystems, that was interesting, that maybe with the lower [] with all the trees there that we're going to have reoccurring higher water in streams and some of these down cut areas near meadows may be some be places for restoration efforts, so meadows could be a real good place to maybe consider doing some work. Herbicides we talked about a fair amount. We thought the idea that spot herbicides targeted would maybe make some sense in the areas where we're trying to do some planning to try to reduce shrub cover and continuity and try to get the trees to grow more effectively and also to give them a chance to maybe survive some fires. It was discussed that in the '87 plantations, many of the plantations weren't planted until over five years after the fire and that aerial herbicides were used then to try to reduce the cover of the shrub to allow planting. We thought that if the discussion was if it was done a little more quickly that they probably wouldn't possibly need to do that at all, if you can get in there early and put the trees in and then you get that spot herbicide that you don't have to use the aerial resources. I got fuel breaks. How do you maintain fuel breaks? We had an open discussion about do you use herbicides to maintain the fuel breaks or reduce shrubs in other competing vegetation? Or do you use fire? Or do you use both? I think one thing that did come up with the group and also with the group today was the critical presence of fire in the ecosystem, so it probably possibly points to fire as being the tool that maybe made the greatest sense for more benefits.

[01:08:24]

We talked about pruning, so actually pruning some of the regeneration, some of the trees that are starting to grow. Just taking them up maybe, you know, three or four feet, take the live ones up, throw those limbs out to an opening, just giving a little discontinuity can really increase the potential for trees to survive a surface fire. We've seen that actually on some research at Blodgett Forest. It's a small separation. We actually don't have to torch those individual trees, but really with a lower intensity fire. So maybe some pruning might be a possibility. And we talked about the possibility of some natural regeneration in the conifer areas. Not to places with just live trees, but there looks like there's some anecdotal evidence that there's some seeds on the ground based on the opening of cones. We don't know if those seeds are viable, we don't know at all, but potentially, Hugh actually came up with an idea that maybe a regeneration survey can be put out this next year to kind of get a sense of what the regen is doing, and even some models can actually help prediction regeneration occurring in this site. But there could be possibilities of natural regen out there that we might be able to use in part of the restoration. And the last thing is encouraging oaks. Encouraging the California Black Oaks, in particular, are sprouting, and the idea of at least keep 20 feet away with any planting of early sprouting oak to give it some real space to grow and dominate the site. And that's what we had.

[01:09:45]

Dorian Fougères

Thank you, Scott.

[01:10:00]

Sue Britting

Okay, we started talking about planting strategies. And so we talked a little bit about what's feasible and how planting actually has occurred historically and then came up with the idea that probably sort of a mixture of a suite of strategies would be more appropriate to get that variability. So some of the more traditional dense planting, that might be appropriate in some areas if you are going to be actively managing them and protecting that density and you might manage them in a more traditional way. The low density planting, maybe there are some opportunities then to introduce that in a way that it serves a different kind of variability in the landscape. And then we talked a little bit about opportunities to plant in areas that are not salvaged. And how one would orchestrate those, such plantings and what kind of an investment then you would make in that after the planting. And so I think that's a ...

Part 4

[00:00:00]

Sue Britting

The area that needs to be investigate more, but there are quite a few areas in the landscape that may not have much in the way of sea source, and are going to be very remote. So we basically came up with the notion that we need a variety of strategies to approach the landscape. We then talked about retention of snags and large downed wood in that conversation seemed a very variable retention by land allocation or objective. So we were really focused more on talking about wildlife issues and locations for wildlife benefit, whether it be for carnivore corridors in the future, how those snag and retention would relate to deer and deer use of forage areas, and so again the idea there was...the notion of variability. Then we talked a little bit about grazing, and then just an additional point about areas where grazing is excluded was if not excluded from an

entire watershed we need to be thinking about then the need to develop off stream water sources. So that's not only our cattle merging into the riparian areas for the vegetation, they're also going there for water. So there's a couple thing; if we're not planning to exclude them entirely then developing water sources, maybe even for the notion of phasing into two years in, you still might want to develop off stream water sources even in year three and beyond so that you can still protect the riparian veg. Then the last bit we talked about was channel incision, and apparently there is an amount of and a degree of that in the area now from past activities. So either in meadow systems or just in stream channels themselves. So those would be priorities we think for doing something to remediate or alleviate the incision; whether it's log check, dams, rock, whatever an appropriate approach to targeting those areas that are already inside. That's it.

Dorian

Thank you, Sue. Here's Pat.

[00:02:51]

Pat Manley

Alright. Let's see we talked about a number of different tools. First of all we started out talking a bit about planting, and we didn't talk much about plantations given the constitution of our group, but of course that's come up a number of times; mix of species, looking at various elevational locations and such. But we mostly talked about non-conifer species since that hadn't come up, and the value and importance of focusing on hardwood trees and also even shrub species that may not regenerate for all the reasons we're concerned about conifer species; so lack of seed sources, either a challenging environment in which to start that process. So Black Oak and Blue Oak came up specifically, and then riparian things like Alder, Willow potentially; certainly you have to read the terrain to figure out what species would be most appropriate and in what locations. But nonetheless thinking about non-conifer species in a recovery strategy. Exotic species. Talk a bit about that and whether or not that was a major concern or not. We did...

Dorian

What species?

[00:04:13]

Pat Manley

Invasive species. So a plant species in particular. Didn't have a lot of expertise around the table in that per se, but certainly something to pay attention to and – but we did have a lot of thoughts about how to deal with that specifically, but we didn't have an eye on that, at least not to enhance it if – and better yet to have strategies to make sure that invasive species don't become problematic in that landscape. In terms of grazing we spent a fair bit of time talking about grazing and overall came to the conclusion more or less that other than their potential value in shrub control as Scott mentioned that didn't see it as a very useful tool beyond that particular strategy. So in order to be able – so since we were given the task of thinking about tools that didn't come up as a useful tool beyond that. But if we did want to engage in cattle and other species in terms of shrub control that that would be fairly challenging, but might be really useful in lower elevation sites; more of the oak environment. But as Sue mentioned and others riparian areas are real problematic to keep them out of the riparian areas, and that the risk is very high for the environmental damage that can be – that they can have on the landscape. Particularly since water and water quality are such a big issue in that landscape; so no challenges there for one of two. If you're looking at from these – the perspective of the tool is still pretty challenging to bring them in that context.

[00:06:04]

Pat Manley

We talked a little bit about the last couple of topics were going to be about expanding some of the tools one uses for expanding existing green tree islands and other connectors. So we talked about plantations and establishing trees in areas where there isn't vegetation, but there's also a real science and art to expanding these existing green tree islands across the landscape. So creating micro environments, what sort of species do you start with; there's a sequential process to it and a real strategy I think to growing out existing islands to become connectors, and therefore sort of a nuclei is a term being used for recovering forest across the life of a landscape. So it's just something that – I know there's actually a fair bit of restoration science around that we haven't talked a whole lot about, but it's certainly relevant.

[00:07:04]

Pat Manley

Then the last thing had to do with really the salvage and where – one topic was where there is a conflict between needing and wanting to maintain large densities or whatever – a greater density of snags for certain objectives. But in others there's competing objective where we'd need a lower density of snags would be more beneficial; that considering cutting high snags so essentially – or high stumps I should say. So cutting trees as high as possible, and some locations for various reasons can be actually a nice effective compromise to still provide habitat, and also because they're shorter they don't fall over as quickly, they're not as subject to environmental buffeting. So it actually might lengthen the amount of time that would be available as a log as well, because it wouldn't fall down quite so quickly. So those are some comment tools that many folks have used in the past, but nonetheless would be pretty relevant in this landscape also.

[00:08:13]

Pat Manley

I think the last thing I wanted to mention that is a little bit of an add on, but it's relative to what we were talking about this idea of snags and such is the interface between green and burned forest, and that interfaces are really valuable environment for a whole lot of reasons. For re-forestation so there's growing out of nuclei of green – of existing green forest, there are also connotes value, the snags value to the green forest, the green forest connotes value to the snags in terms of use by wildlife. So there's this whole edge effect, and so not just recognizing the value of that edge effect, but also managing for it. So that might mean that along an edge how does one define an edge is a good question. That's maybe in the eye of the value being managed toward. It's wildlife species and it's how big of an inclusion becomes a high severity burn patch versus simply a snag patch in a green forest. So that's something that we haven't talked a lot about, and the other has been along maybe a clear edge would be buffers. So you're buffering the green forest, you're buffering green forest with snags and connoting that cross pollination in terms of value in both directions. So those are some other tools in terms of looking at how to maintain the value of those edges that we talked a little bit about. Did I miss anything or any additions over there?

[00:09:50]

Dorian

You guys have impressed me. You sit in on these...if you sit sometimes and you jump in you don't realize the threads in conversation that emerge. So thank you all reporters for doing that

synthetic piece. The rest of this time is your time and we're going to spend – I'm not saying we have stay here until 4:30 p.m. I know people have flights to catch– some people already told me they have leave or have to have – if you do have something at 4:00 p.m. a flight or picking up kids or something, please again don't forget to turn in your green evaluation. But the rest of this time is an opportunity for you to see again your commonalities, questions, concerns, criticisms, friendly [] suggestions you might have on something else that somebody put out there. So we're going to turn it over to you for this last piece and go as long as you have energy. We'll start with Angela, who else has a comment? Angela, then Scott, then John, thanks.

[00:10:53]

Angela White

I just have more of an add-on, maybe it's a criticism to a certain extent. But you know it's all well and good to talk about treatments and how we would do things, and as the ideas get more brain use we start realizing what cost that is and we're already starting in terms of that we have no money, and yet we haven't really even factored in the economics of the situation. I think that that is a mistake to not – I know we don't want to include that in like it's a mistake not to and I think about putting that in and maybe an experimental framework like Peter asked us to start thinking about. It looks – I don't want to say maybe it's not so fruitful if we don't consider the feasibility as maybe part of the study.

[00:11:47]

Dorian

Yeah, I'll just state that again from part of the design part of today that it's a totally valid comment. The purpose today though it wasn't to think about what we can actually do, it was a recognition of there's a lot of planning and implementation and conversation about funding and what not that certainly looms and comes down for the forest and what not. Today it really was the – recognize that's there is the reality, but who decides for the same of the conversation. Not to say it's not going to happen or it needs to happen, but at least get the ideas out there without that constraint. It's Scott and then Jonathon.

[00:12:15]

Scott Stephens

I was just going to comment that one thing about the Rim Fire is we know what's really important it's a lot of [] and a lot of attention to media, socially and politically, but I still look at it as a symptom of really the greater landscape. So it's so hard sometimes to just look right – but look at all these things and all these habitat issues, but the forest that surrounds the Rim and also that goes up and down the Sierra's basically the biggest issue. So hopefully there's a way that you can take and unify our experience, and also jump start more restoration outside. I think a perimeter this high is huge it actually offers more opportunities to do work around the fire, that probably is not going to be a priority for the first maybe five or seven years, but maybe you could begin to plan for it today for seven or ten years using that as a discontinuity and using it to move on. I'm just afraid we keep chasing these fires, we're chasing our tail. I just don't think we're ever going to go to that next step so I think the Rim is a real important event, but it can also create the conversation. I'm much more into the conversation with more restoration on forest lands.

[00:13:20]

Dorian

Let me check something just to be sure I understand; you mentioned two things. I'm not sure if I got it wrong. One was just the question that came up this morning the boundary and those [], but on the edge right outside. So it's pretty – but you also look at the adjustment of the region and across the central Sierra's and Sierra.

[00:13:33]

Scott Stephens

Yes I sure would. I would say we could use this and other fires, the Chips fire and all the other fire, the Moonlight that have worked in these landscapes as anchor points for future burning operations and treatments. But then also just to think of how this can work for another conversation to think about restoration at a much larger scale to begin to actually think and maybe part of the change the trajectory. Right now I'm afraid we're not changing the trajectory very much, I think the trajectory is pretty set. Steven Pines written about this a little lately, it's a little bit strong worded, but I still think there's plenty that can be done to change the trajectory outside of those fires [].

Dorian

We go Jonathan and we'll come to [].

[00:14:17]

Jonathan Long

What I did come up with the treatments I've heard discussed, SBIs and contour tilling and ripping treatment of a lot of their business and certainly right after the fires we obviously don't have the benefit of getting that in before the first runoffs so the benefits I think are maybe a little bit more questionable. But if there's a co-benefit for the planting perspective I think it really ought to be discussed as somebody considers [] in these water [].

Dorian

So just to make sure – so it's the [] combination of replanting?

[00:14:49]

Jonathan Long

It's not contour tilling or ripping, the contour failings is a different treatment, it's a little bit more high risk for failure. The contour tilling is still something that needs more evaluation to actually document, but having some promising results for [] using it so I think it's something people should be looking at.

Dorian

You suggested – you think about replanting.

[00:15:16]

Jonathan Long

If there's a co-benefit to replanting I think it makes it more worthwhile to think about even though we missed the first runoff season.

[00:15:28]

Greg Aplet

I just take Scott's point up another notch which is that this fire occurred in a landscape that we already identified as one of the biggest contention, and if I had a limited – if I had limited resources to invest in this landscape, I actually haven't heard compelling reason for us to invest it inside the fire as opposed to outside the fire. So I would like to hear that at some point, but I think a story could be told about opportunity presented by this fire. But I think it may be – we may be in a situation that's worse than tail chasing, it's actually not well with us.

Dorian

Okay is it James or Jim; which do you prefer?

[00:16:21]

James Munson

James is fine.

Dorian

James and then we'll go back to Pat. James.

[00:16:29]

James Munson

You're all doing great and walking through the halls during the break and I saw this one picture of a beaver and it was by the lake and it said that the beaver was swimming to safety, and that pulled my heart strings somewhat. But what I've seen today I've been encouraged by what I've heard from people in here and I just want to say thank you all for showing up and working together, and as Barnie said it's also about what's going to be left when we're not here. [] there now, and I think that I have seen personally a lot of growth and a lot of new forest trees towards

the way we conserve our forest and the way forest service does business when it comes to fuels reduction. It's just nice to see that this workshop is happening, and I see a lot of very positive bright minds, and I just encourage you to keep working together and look to the future.

Dorian

Thanks James. Pat.

[00:17:58]

Pat Manley

The small add on to the idea of value inside and outside that the activities inside and outside the fire footprint as I thought I had earlier in the day, which is the boundary of the fire is something we – it sort of keeps our focus there and if you look though that the amount of green forest that's remaining on the sort of northwest and the southeast corners of it it's really contiguous landscape. So we might challenge ourselves in moving forward to take the boundary off and have – and just look at this neighborhood in essence, and where you might direct activities and why. I think that will help us unchain our thinking a little bit. I know EIS has to have a footprint, but in thinking about this landscape and what it's all about I think it could back a little bit and take that boundary off, and we need – then our [] may be more restricted to the more highly impacted aspect of it, and maybe less on or maybe included other areas in the large landscape restoration perspective.

Dorian

I know there are other regional efforts that the forest service is leading where people that flag – a lot of people [] the kind of community involvement among the community [] community adding those components there are efforts written out. Our [] is involved, private land owners, utilities and so forth; so I'm hearing a little bit about that too that the Rim Fire neighborhood so to speak. Sue?

[00:19:39]

Sue Britting

Thinking a little about the information I've read about salvage and unsalvaged areas, and the fuel issue. So we didn't really talk about that a lot except to identify that if fuels were your objectives then being clear that you actually met the objective. So I think there's something maybe a little unexplored for the Sierra Nevada, I think much of the information either comes from the southwest or comes from the Pacific Northwest in terms of if the fuels after salvaged [], and fuel conditions that maybe more a fire hazard right after the salvage logging effort versus an unsalvaged stand. So I think some of that particularly in terms of what we look at areas on the landscape, do we want to achieve their resiliency what are the short – 10 to 20 year timeframe versus 20 years and beyond, and having a closer look at what those fuel conditions actually are in the likely to be in the salvage type areas versus unsalvaged. So part of that has to do with what actually gets removed in a salvaged area and either the unmerchantable that's left and how that's treated. So I think that's in my mind a fairly complicated element, and it in some ways leads me to Greg's comment about is it worth the – what is the investment there in my mind and what change can you make on the landscape. So I'd like to see some unpacking of that a little bit more in some next [], because there's a lot of focus in some of these areas in I'm going release the fuel, and that's just a common thing to say. But in fact they're not sure that the practice is being proposed [].

Dorian

Who else wants to jump in?

[00:21:56]

Craig Thomas

So I know that this isn't closing time, but I just want us to recognize that those of us that started talking about cooking up this idea of getting people together and trying to half way deal with the project of this size, in particular a fire of this size. The ability for us to sit down together and embrace what happened and try to understand and grapple with the changes of what led to the Rim Fire and maybe ones to come I think is a huge victory for us all. So – and I'm encouraging everyone to recognize as we all are here today that fire is a process, the conditions that we had before, the conditions that may still be out there, climate change showing up potentially the way that it has, and according to Hugh the way that it certainly will more intensely than I can even think about. The fact that we can think about these things, process and bring up all these good ideas today, and to think about changing and not be stuck in the old patterns so that we don't repeat what we did 25 years ago, faced with all this information, to me is a huge victory for us

today. No matter, whatever we synthesize all of this, if we can keep working together, refining these ideas and bring them forward that is a huge different way of doing business. I remember Mr. Bernie Gyant over here when we started working on restoration initiative, the ecological four page statement, doing business in a new way was one of the things that was highlighted. I keep going back to that document, I want to prove that out, it has a lot of good ideas. In fact that we're here today is proof of that and I think we're going to keep this energy going and keep the conversations going, and get to a place what we wouldn't have come near reaching 10 years ago, five years ago. I just want to thank you all for the energy and coming here today personally, because it's – we are definitely a new ground from what I remember in resource management for the last 30 years. I want to say I appreciate all of you and your energy.

Dorian

Thank you Craig. John?

[00:24:22]

John Buckley

There's no more email the question of whether or not to salvage [] is highly controversial beyond just those of us in this room. At one point Jerry Franklin called down and talked to me extensively at our center for a long time, and some of the points that he raised haven't actually been focused on much today. One of them was is that the incredibly high value of the large material, which is our point of focus of those who are willing to salvage logs as the greatest economic value, but the incredible ecological value especially is that structure that's going to be retained immensely over time even if it's not a standing snag it becomes down wall and all that, which is something that needs to be always a priority consideration. The second question, and one that's ties a little bit to what Sue was touching on is that in many cases salvage logging has been vilified in and some cases are [] maybe because it effects soil, because it effects other values, and because it removes trees that might be essential for [], woodpecker or some other species. On the other hand the [] from Jerry Crain and that his agreement was, and I won't go through his [] that I've [] copies of quotes today is that the quantity of dense – the quantity of wood that is now in many of these areas is so much higher than what the natural or range of [] was, and Scott talked about this Friday with Stan the [] of variety what was historically out there and what we have today, Jerry was pointing out that if the goal was to retain more or less what would have been there after a standing replacing fire historically rather than everything that's on the landscape today we were at least moving back toward a process or amount of wood that

reflects the historic range in considering climate change into the factors, his focus was you can't reduce it to the more adept tolerance and finer tolerance like Pine rather than White Fir. But if we are thinking that even when we have green it stands and they were the double the stocking or triple the stocking of what might actually be there, if we don't remove some of the dead wood now, if there's huge amounts of dead trees inter-mixed with them we may still have high risk of overly dense stocking and fueling that makes the next fire and that's more devastating. So as many wicked problems the challenge is what to do in a fashion that moves us in that direction of my goal and also sensitive species that will be so affected by whatever we do. We do think that removing fuel at some point that exceeds the amount that we want out there for the long term position has to be part of the equation.

Dorian

Thank you John. Other comments, threads? I know you guys are like no I'm ready for another six hours. So why don't we do that. I'll just ask any last comments or [] pieces? So here's what we're going to do. I'm going to look to Jim and Barnie and also [] or Craig or Steve some of the organizers if you guys want to share any kind of closing remarks on it or from my group from behind me.

[00:28:17]

Jim Branham

So anyway considering that – considering that we were approached with the idea of pulling this altogether, this is what we do so we're excited about the opportunity. We realized that we had to do a field trip before the weather, we had to do a workshop before the holidays and we got plans more on that, but it was all – and we really want to thank the folks in the Stanislaus and they're probably are having times with just leave us alone, we've had enough attention. But they did great in terms of the field trip, and when I talked – when we – the idea of this actually hatched by Greg Thomas and Steve [] pulled all this together, the first time I talked Barnie we had to be sure we could do this in a way that's actually going to work in concert with what the forest needs to be doing and Susan [] was very clear about the need to act, but also the need to have the information.

[00:29:08]

Jim Branham

I think we found the right balance and this is a great start. I think we'll continue this work. I do want to acknowledge Manny [] of our staff who has been instrumental in pulling all this together and working with...and working with the [] and the working group, planning group that includes Bernie and Craig and Steven [] and Susan [] who is on the Forest as well as engaging the scientific community. They really put together I think a really good agenda for today, but it's just a start really. I think we've got a lot of opportunities to continue this process on this effort. I want to echo what Scott said it's just we look across our [], the work we're do and we know that there are more fires out there waiting to happen. We'll continue on this path that we've been on pretty much now that's what will happen, we have meetings and talk about what we're going to do with the landscape or we try to get ahead of it and we're trying, it's hard work and as Scott has said, and I []. [] about we need really to understand that the detriment of events like this, and I think it was interesting Ed [] in San Francisco that you see today here, then [] the city and county of San Francisco is declared an emergency [] County, and it just reminds the rest of California that's needing a []. We are connected and what happens up there doesn't []; so thank you all for taking the time to be here today.

[00:30:49]

Jim Branham

We made a few references to grandchildren and great-grandchildren; the older you get you realize that the closer the [] as grandchildren and young people, oh great grandchildren huh. [], but I think the legacy we add to that is this process is taking place is one of those things we can point back to, even when we point back and say it must have been pretty thoughtful about this. The negative concept is []; so this is an opportunity and I think we were all in it because we care about the forest and the water sheds here in Sierra Nevada; I think it's a great opportunity. So thank you all for your time and I want to thank Bernie and Core Service for keeping to your word and working together and taking the path. It's easy to say that you'll help with an event [] it's like we're not going to do a collaborative process. But you were true to that and I think it's great, because it gives us an opportunity to say we did it differently, and we still end up with areas of disagreement and we probably will, but I think that it's a great process to show you right now. So thanks to you all, and we'll be meeting somewhere out – mid-January. I don't want to say something we can't honor and we'll be meeting in fact right after this, a small meeting of [] to talking about the agenda for the 23rd. January which you'll be hearing [] about soon. So thanks again.

[00:32:40]

Barnie Gyant

So again thanks for everyone coming. For me just this group coming together is success. So here's a few things that I heard, now this is not only the entire list, this is – can I shut this report. Can you hear me now? So we leave here with how to move forward with grazing, how soon can you let cattle go back home so if they're grazing, they're grazing. Snag and large wood retention is another one. Salvage, that should be based on being clear on what kind of restoration efforts it may be achieving, and also disclosing where if salvage is based on economics is to be for full of truthful and where that occurs. Also, you need to see about the development of fuels strategy on how do we deal with this footprint, this landscape for now and into the future, and then also looking at protection of green forest and the ages – just some of maybe the things that I heard. So I hope I captured just some of them, not everything, don't throw any rocks at me.

[00:33:50]

Barnie Gyant

Here's the reason why my job as a deputy of the regional forester resources have been in four regions in eight states now and the one thing that's common amongst that is people. So I'm going to challenge us, and this is the reason why I'm in this job primarily is my underlying theme, is I really want to see about how do we change our culture. For instance, I'll give you an example, how many of you have some type of retirement plan? Why is it that we have a retirement plans or something like that; we're planning for the future right? We're planning for our security in the future or maybe something that we pass down in the future generations; would that be some on the list on why we have a retirement plan?

[00:34:42]

Barnie Gyant

So here's the question; why is it that we talk about how we need to treat our landscape, we are more willing to deal with it and pay for it on the back end than what we are – than what ya'll said on your retirement plans; so why is that? Why are we willing to react to it versus trying to be proactive with treating the landscape? That's one type of change in our culture and the way we think. Also, as I look at many of the issues the last time I personally checked when there's smoke in the air the fires itself, sediment movement, insect and disease, non-negative and invasive, the last time I checked and it was just a few minutes ago when I stepped out, is that those issues to me have never known any boundaries, which means ultimately at the end of the

day if it affects all of us. So how many of us in our agencies and our organizations have plenty of money and plenty of resources where we don't rely on anyone else? Let me see a show of hands? Matter of fact you can stand up on this one. At one time I think in our society we did, and there was no need for me to talk to my neighbor or the other agency, because I had plenty of resources to do what I wanted to do when I wanted to do it. We are not in that climate today and I don't foresee it being in our future any time in the near future. So you know what that means, I'll probably have to talk to my neighbor and say you and I both have some skin in the game, how can we design it where we both or all of us get exactly what we want all the time; no let's forget about that. But are there some nuggets that we can take? I think the answer to that question is yes. I think the answer to that question is yes. We're already paying for the Rim Fire, \$127 million of suppression. Where do you think that money came from? Let me help you; how many of you guys pay taxes?

[00:37:05]

Barnie Gyant

I want to see a show of hands. San Francisco, I'm just going to throw out a number, don't throw an egg at me. About \$35 million of their investment, we spent over \$10 million trying to do emergency solar stabilization as a part of the []. So now roughly numbers on the Rim Fire, and this is wrong, this is going to be a low number, is \$172 million and we're not done yet. Guess what, it's going to be a long time; so that's the reason why I challenge us to let's start acting different. Because the way we behaved thus far hasn't got us very far. So we can sit back and say am I contributing to the no action or what do we need to do, but at the end of the day, we've got to own our behaviors. I want you to go look in the mirror and all of us is a part of it; so it is a culture shift. I am – if you guys knew how much time and effort I've spent personally trying to hold true to this process you'd really be surprised. I'm not going to go into details, but you guys know there's a lot of old stuff that's going on. I will fight for this process because I think it makes a difference, and Scott you're exactly right, if we can demonstrate how all of us work together on what this piece of the world looks like we can take that and then multiply that not just the Sierra's, but also the southern California, and also in northwest [] land footprint because you know what in my job the issues that we're dealing with Rim is across the whole state.

[00:39:06]

Barnie Gyant

So I just wanted to leave you those important thoughts. I really, really appreciate everyone coming today, I appreciate the energy because I think we're going to make a difference or go damn hard trying to make that happen.

So now I want to switch gears just a little bit so any of you folks that are traveling for the holidays be safe, keep your head on swivel, don't leave a bunch of personal expensive stuff in your vehicles. We are going through some tough economic times; you can laugh if you want to, but I'm being serious. So what we want to do is to make sure that we see you back in the New Year. So thanks again for your time, happy holidays and I just really appreciate the day today.