WORTHY GARDEN CLUB

Worthy Garden Club connects people to the natural world and cultivates a community of environmental stewards working together to build a greener and healthier planet through advocacy, action, and education.

November 14, 2022

On October 5, 2022, Dr. Dominick DellaSala (Wild Heritage) and Dr. Rick Martinson (Worthy Garden Club) drafted a three page summary of some of the primary issues associated with the value mature and old-growth forests have as natural climate solutions. The paper was distributed to a number of representatives and candidates running in the recent mid-term elections.

County Commissioner Phil Chang was one local representatives that received a copy of the three page document. He took the time to draft a thoughtful response that summarized his thoughts about the various elements discussed in the paper. The original three page document can be found at https://www.worthygardenclub.com/lorax. Below are Phil's feedback and Dominick's responses.

Phil Chang:
Thank you for sharing the document that you wrote up on forests, wildfire and climate. There are objectives which I share in your document, such as preserving old growth trees and emphasizing home hardening to improve wildfire resiliency. But I think that many of the forest management concepts that you and Dominick DellaSala are promoting are:

(a) Not rooted in an understanding of the historic structure, process, and composition of our dry, pine-dominated forests which were once highly resilient to fire and drought and stored quite a lot of carbon sustainably in much fewer, more widely spaced trees;

(b) Not rooted in an understanding of our current forest conditions and the way that fire behaves in them; and

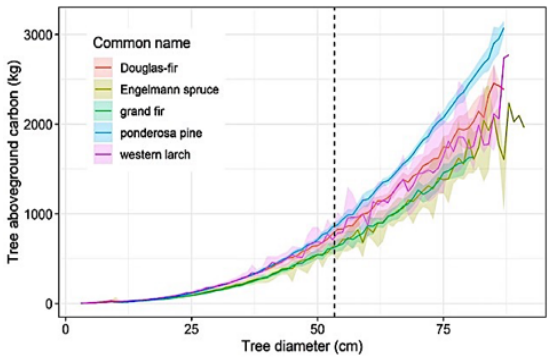
(c) More relevant to wetter forest types found in western and south western Oregon.

Dominick DellaSala:
I did my postdoctoral research in mixed conifer forests near Bear Valley/K falls- the largest bald eagle overwintering communal roost site in the lower 48 states. At the time, I published in peer-reviewed journals and advised USFWS on treating the old-growth forest eagle roost for fire risk reduction. My analysis favored prescribed fire only. But USFWS decided to make it into a timber sale and it got out of control as large trees were being taken. Fortunately, they pulled back and went with the original plan to do some light understory (ladder) fuel reduction pretreatments and then prescribed fire. The point being, in nearly every single case I've worked on, while the science shows SOME benefit from light touch thinning under certain very limited conditions (see below), the agencies nearly always sweeten the commercial logging pot by taking both large fire resistant and large shade intolerant conifers to pay for the cost of the sale. Even USFWS which is supposed to be in charge of endangered species management could not resist putting in commercial logging prescriptions even though my published research indicated otherwise. In addition, I have published other studies directly related to the dry pine and mixed conifer forests in the region - some are attached to this email.

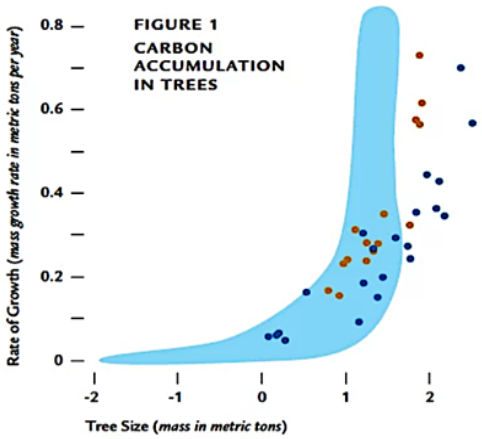
Over my 30 plus years of working on forests globally and regionally, I strive to understand to the best of my abilities the inner workings of forest ecosystems. My objective is to see the forest the way I think nature does. After over 300 publications and books, I still consider myself a novice at understanding forest ecosystems. They surprise me all the time. I'm humbled by their complexity, beauty, and what they give to us for free every single day. To claim that anyone completely understands forests is an overstatement. We do the best we can but we all approach the issue with personal biases. My bias is nature based - biodiversity, ecosystem integrity, natural climate solutions. I have problems when commercial logging is mixed into what is otherwise a science question and matter of conservation urgency, which almost always takes place around the issue of fire risk reduction as noted below. Being humbled in the presence of forest giants is what has taught me a powerful lesson about ecosystems - they are more complex than we can no (I'm not the first to say this by any means). And this has come about from decades of doing research in forests from Oregon to the tropics. So I'm pretty sure that despite my ignorance of the workings of any forest, I know enough about what may and may not work best going forward.

Phil Chang:
Large old pine trees are indeed less susceptible to fire than smaller, younger pine trees with lower branches and thinner bark. However, trees do not exist in isolation. A large old pine tree that is crowded with small trees and tall bitterbrush and manzanita all around it is far less resilient than a large old pine tree with lots of spacing and a grassy understory. In the small number of places where we have genuine old growth trees with historic understory conditions there are no proposals to log the old growth trees. I agree that the 30” diameter trees in Euro unit 5 should not have been marked or cut, but this error represents about 5 acres within 17,000 acres of commercial thinning in the West Bend project area (and the DCFP is working on monitoring processes to prevent Euro 5 from happening again). Also, a young 65 year old 28” grand fir that should not even have grown up in a site except for 100 years of fire exclusion is nowhere near as resilient as a 300 year old 28” ponderosa pine tree. Altered species composition is a major consideration in resiliency and ecological value.

Dominick DellaSala:
This is a good point. Thanks for recognizing the importance of large trees and how they develop fire resistance as they age and grow in height. I think most researchers agree that we have a deficit of large trees and in E. OR/WA this is the direct result of high-grade logging on fed lands that removed most of the large sugar pines plus large D. fir, and large pondies. What has come back are many large firs and they have provided critically important structure and carbon accumulation and storage. Here's an interesting graph from Mildrexler et al. showing how carbon takes off around 21 in dbh across conifer species especially the firs!



Here's an interesting graph from Stephenson et al showing how C accumulation goes exponential as tree size increases



Aboveground mass growth rates for 58 species (shaded area) juxtaposed with two of the most massive tree species on earth: Swamp Gum (*Eucalyptus regnans*—brown dots) and Coast Redwood (*Sequoia sempervirens*—blue dots). Mass growth rate equals the total mass accumulated each year after accounting for respiration. The mass of a tree is primarily carbon, so the figure shows that annual carbon accumulation increases with the size of the tree. (Adapted from Stephenson et al. 2014.)

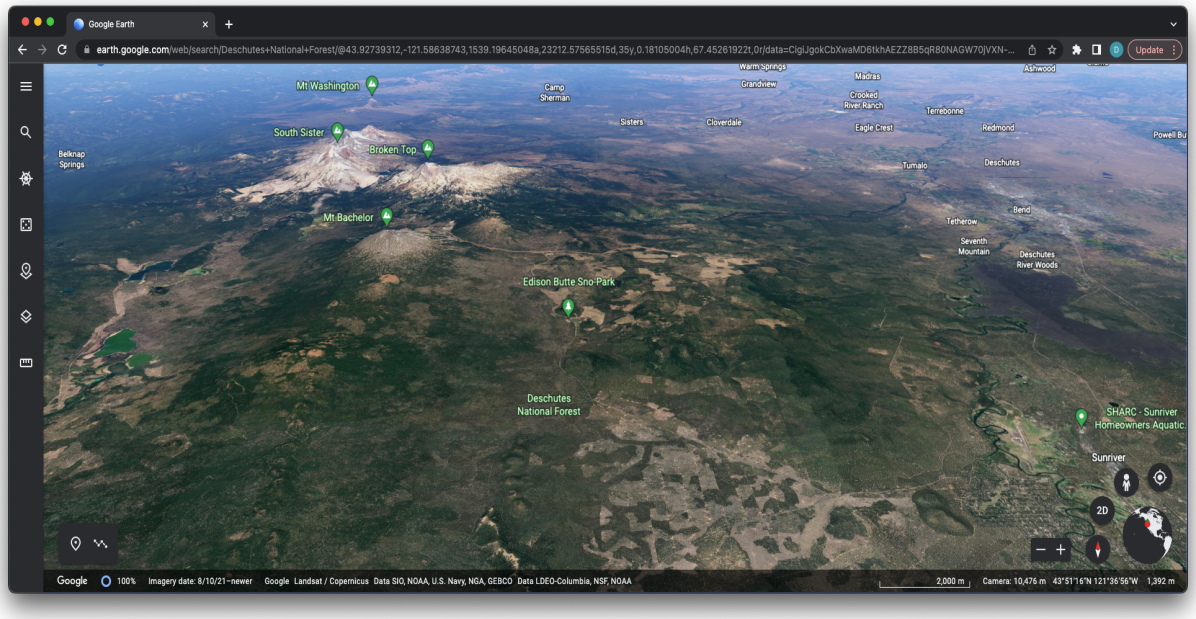
The point here is as trees increase in height, dbh, they develop old forest structural and functional features regardless of composition. Wildlife don't care if it's a fir or pine when the tree has a certain older look to it - my own research has shown this to be the case including in E. Oregon. The atmosphere doesn't care if it's a large fir or large pine when it is cut down - only that most of the carbon is transferred from the forest to the atmosphere when large trees of any species are removed. We still have a large tree deficit in the dry forests and some of that gap is closing due to fire suppression and the eastside screens. To take out the structure now comes with major collateral damages to older forest features and carbon. However, there may be a better way than commercial logging of firs. In dry fire suppressed forests, the large firs could be girdled to create snags, killed and tipped into streams for fish habitat etc. That would take care of the concern about ingrowth and because of the carbon value of any large tree, I'm not a big fan of commercial removal of trees >21 in dbh as they are just starting to ramp up their carbon storage capacity as noted above. And I have to disagree strongly with removals in moist mixed conifer - no excuse for those given they are on longer fire rotation intervals then dry forests and fire suppression is not as big a concern.

Phil Chang:
Within the pine and mixed conifer forests on the Deschutes NF, almost all of the acres are previously logged. On the Sisters and Crescent Ranger Districts most of that logging was selective, leaving old growth trees sprinkled across the landscape in previously managed stands. This stands in stark contrast to the way that logging has been practiced in the Douglas Fir forests of western Oregon. So when you say that fuels management should be focused on areas with small trees and previously logged areas that would describe most of the mid and lower elevation Deschutes National Forest. There are many stands that are both previously logged and include unhistoric high densities of small trees and also some large old growth pine. In these stands we should be (and are) preserving the large trees but we should be actively restoring the density, composition, and processes all around them.

Dominick DellaSala:
Good points but most definitely not the case for private lands. Just take a look at Google Earth as an example - lots of clearcuts on private lands, lodgepole dog-haired stands all along Hwy 97 are type

converted to depauperate commercially managed plantations - true not on fed lands - but that's even more the reason why fed lands are an oasis in a sea of clearcuts and industrial logging.

So this is what "active management" really looks like!



As to restoration, I've also published on that for many different dry forest regions (some examples attached) - it depends on what you mean by "restoration," "resilience," "resistance," etc. All of these terms are in the eye of the beholder. IMO they need to be based on ecosystem integrity which is much more complex than "fuels reduction." Restoring integrity means - returning fire to its natural role in ecosystems (prescribed fire, wildland fire use, cultural burning), leaving large trees alone, maybe some light below canopy treatments for reasons other than "fuels" (see below), cultural burning practices for cultural values, decommissioning roads, bringing back beavers, restoring stream and landscape connectivity, getting cows out of streams, protecting climate refugia etc (conservation biology). That is a holistic approach not tied solely to fuel limited concepts of restoration, resilience, etc. that are increasingly unlikely to work in a rapidly changing climate superimposed by unprecedented logging footprints whether from the past or more recent - cumulative effects mean the system is less adaptive to climate change in the long run. See the Google Earth image.

Phil Chang:
Your paper says that the East Side Screens protected large trees on national forests without specifying which parts of which National Forests. The East Side Screens did not apply on much of the Deschutes National Forest where trees over 21" are found. Frankly, there are better ways of protecting large trees – and the appropriate large trees - than this policy.

Dominick DellaSala:
I'm curious about what better ways are meant by this comment? The screens are certainly not perfect but then again what's being put in place is far more risky to recovering the large tree component IMO because it involves commercial logging of large trees.

Phil Chang:
Modernization of forest products infrastructure to accommodate the flow of smaller and mid size material coming from forest restoration is already well underway in Central Oregon. Facilities like the Quicksilver integrated small log yard in La Pine process hundreds of thousands of tons of small log by product from fuels reduction and restoration into clean chips, posts and poles (including hop poles), and firewood each year. The sawmill in Gilchrist is able to process a 16 foot log with a 6" top. Because pine is not milled into construction lumber like 2x4s but rather into shop lumber for secondary processing into moulding, trim, etc, it is not economically feasible to operate a pine sawmill on small diameter logs. But all the hardware and labor are there to process very small logs.

Dominick DellaSala:
That's a good point but it does come down to what is the purpose and need here. Is it fuels reduction? If so, see my reply below. Is it a kindlier/gentler logging on fed lands - ok - I get that - but let's at least be clear. FYI - I worked to transition the Tongass rainforest in AK out of OG logging and into second growth. When I took that project on in 2015, the timber industry and The Nature Conservancy (same thing!) were both claiming it would take 40 yrs of more OG logging before young forests were ready to transition the industry. We should through field plots in young forests and changes to milling infrastructure that it could be accomplished in 5 years on a much smaller logging footprint.

That transition is now underway on the Tongass and it mirrors what took place during the spotted owl wars with the Siuslaw NF transitioning when all other national forests in the owl's range were fighting the transition. They led by example.

Why can't the Deschutes just say no to commercial logging of large trees then? I asked this of the Region 6 supervisor and his response was economics. Well, economics can change if the industry is willing to retool.

Phil Chang:
We starved our fire adapted forest of fire for a century which is a big part of the reason we have overly dense forests and unnaturally high fuel loads now. This is one of the reasons why the DCFP and many other organizations that care about our forests have worked so hard to enable more prescribed fire on the Deschutes National Forest. Instead of prescribed burning a few hundred acres per year in West Bend we need to be burning a few thousand per year for a decade. Activists who care about our forests could be contributing to these efforts to expand prescribed burning.

Fires in our dry forest ecosystem are more severe than they were historically because of the unnatural fuels conditions we have created through historic logging and fire exclusion. I can connect you with area-specific research demonstrating that high severity fires did not cover thousands or tens of thousands of acres over the last 500 years the way they now do. I can connect you with fire modeling that demonstrates that the fuels reduction treatments that are being implemented on the Deschutes NF will lead to reduced flame heights/lengths and reduced crown fire spread even in severe weather conditions. (This does not mean that fuels reduction treatments can allow fire fighters to put fires out or make them 100% containable in severe conditions, but that fuels reduction does help reduce severity and extent). Climate change is contributing to longer, more severe wildfire seasons, but it is not an either/or situation. Unnatural fuel conditions make fires more severe and that can be changed by trying to restore forest structure, process, and composition. I can also bring you to specific spots on several recent fire (Pole Creek, Milli, Rosland Road) where previous treatments created the conditions to bring crown fire to the ground, hold fires, and prevent them from burning into subdivisions.

Dominick DellaSala:
I'm going to have to disagree here. The attached published studies show no increase in the proportion, amount, or patch size of high-severity fires in large fire complexes in this and 11 other western states for the most part. This includes a study by Hessburg et al. 2007 - he is one of the biggest champions of logging for fire risk reduction but noted the importance of mixed severity fires on the Deschutes that included high severity components. Studies by Perry et al. 2011 also show large high severity patches occurred historically esp during drought cycles. Others (e.g., Odion et al, Baker) have demonstrated no increase in high severity and historical large high severity patches in these dry forests.

As to whether thinning brings down severity - that's is questionable to say the least. Under low-moderate fire weather if you do everything right and fire happens to hit the spot on the ground that was "thinned" then yes, intensity and spread rates can be reduced. But this is the exception and not the rule esp in a rapidly changing climate as large fires are mainly top down climate driven factors that blow right through thinned areas. See attached.

Phil Chang:
I believe deeply in home hardening and working from the home outward. That is why I testified so many times to get wildfire resilient building material requirements and defensible space requirements passed in Oregon Senate Bill 762 back in 2021. But it is not an either/or question for me. We need to contain the WUI and harden homes AND we need to address unnatural fuel conditions in our forest that increase the probability of high severity fire raining embers down on our homes.

Dominick DellaSala:
What happens in the WUI and the back country has absolutely nothing to do with home ignition probability - retired forest service researcher Jack Cohen has published extensively on this and so have others. See you-tube videos of Jack's work for details. In addition, most fires impacting towns actually spill over from private lands, not federal lands. That study came out from Oregon State University recently.

Phil Chang:
These practices (clearcutting and plantations) are almost never used on the Deschutes NF. The West Bend project area is an exception and this area was mostly clear cut and plantationed back in the day that it was still private railroad grant land before it was traded to the federal government. These are practices that people need to worry about in western Oregon but are not really a thing here. Focus concerns about these kinds of "industrial logging" practices in Western Oregon and restore the structure, process and composition that will make our forests and the carbon within large trees more resilient in an era of climate change. In extreme weather conditions fires do not burn less intensely in wilderness and roadless areas here than they do in previously managed national forest lands in the dry forest systems here on the east side of the Cascades.

Dominick DellaSala:
True - but somebody must be doing those practices - see the Google Earth imagery above

Also - in the largest study ever done on this question - industrially logged forests burned most intensely and wilderness/roadless/parks burned in lower intensities - same thing was observed in fires near Roseburg.