USDA Northwest Climate Hub
U.S. DEPARTMENT OF AGRICULTURE

28 & 30 July 2020

Forestry adaptation

- Video on how drought damages trees and therefore how it shows up symptomatically and why trees can die sometimes years after droughts.
- Dry forests are generally suited to dry conditions however volcanic ash cap soils can be more susceptible to drought than the drier forests.
- Observation: Grand fir has been facilitated on some site, and they are very susceptible to drought.
- Need to look at water-holding capacity and NDVI (normalized difference vegetation index) to decide what species to use for reforestation.
- Dry forests are highly vulnerable to drought if forests are at high density and with the wrong species.
    - Forest stand density may need to be reduced more than it was in the past.
    - There may be a lot of variability across sites – can't use just one number across the board.
    - Challenge: Private landowners do not want to see their forests change so are resistant to intensive thinning on their property.
- Forest thinning in coastal Willamette and SW OR, problems with forest thinning on private lands- timing, restrictions with crews who can't get in because of fire restrictions limiting chainsaw use).
    - Private landowners (non-industrial forest lands) and tribes, without federal assistance, have not been able to manage properties, so timber lots are overstocked.
    - Pre-commercial thinning gives chance to modify species composition of forest.
    - Tribes have a hard time finding the crews to do the work
    - Not many crews do thinning and window keeps getting shorter and shorter to thin.
- Challenge with private-land owners with small acreage, usually don't get high-quality timber so then it isn't economical to do forest treatments. Anything a landowner does is against their taxes, so they can't incur any expenses.
    - Neighbors are working together to make it more economical.
    - Idea: Commercial firewood sale to reduce biomass and bring in funds.
    - Idea: Generate biochar to remove fuels from forests.
- Consider planting densities and consider forest diseases and pests.
    - Targets may be out of date
- Take care with assistant migration as most disease found is on offsite trees. So aim for more diversity the better with unknown future.
- Soil data are limited in forests, which make identifying drought vulnerabilities difficult.
- After a fire, we need to know where we shouldn't be planting considering current and future conditions as just because there were trees there before doesn't mean that they should be planted there again.

- FUTURE NEEDED ACTION: Forest Service works with NRCS via the National Cooperative Soil Survey to get more soils data on forested lands.
- Currently a lot of emphasis on planting trees (Trillion Trees Campaign). The Forest Service's priority is planting disease-resistant western white pine and Port Orford cedar.
    - Fewer trees per acre are better, along with promoting species tolerant of drought and climate variability.
- Forest Service has shifted to more fall planting.
    - Mortality of planted seedlings has been very high in drought years.
- Increase, tree species diversity to increase resilience. Current in the Pacific Northwest tree species diversity is very low on a lot of sites.
- Focus on no-regrets tactics.
- Trees have to survive today's climate, but also tolerate future conditions.
- Working with State Forestry Department on Oak restorations and forestry restorations to determine what species may be best with climate change.
- Forestry groups are adjusting to lack of precipitation by changing thinning practices and they are able complete stand entries later into winter.
- Observations:
    - In some places, cold-tolerant species are nested at lower elevations and die-offs are occurring in some of those places. Some landowners are having trouble getting regeneration on those sites. Are those high-elevation species a lost cause on those sites?
    - Lodge pole pine survives in pretty dry places, and larch has high drought tolerance.
    - Subalpine fir is dying in a lot of places.
    - Land-use legacies can affect forest's ability to deal with drought.
    - Currently seeing a lot of mortality in western hemlock, and some in western red cedar. Mortality is scattered but widespread.
    - Trees dying across all age and size classes. Mortality in historically wet areas with limited rooting depth. Roots are intact but not deeply rooted. Have not been able to attribute a pattern yet. Cannot see these trees from aerial observations, so it's all been from ground observations.
    - With drought, we see an increase in disease.
- Challenge: With reduced planting / reforestation, it is hard to balance productive land - weeds outcompeting species you want to dominate the site.
- Challenges on continued maintenance of forests.
    - How do we have these drought adaptation strategies?
    - How do we use fire as a tool?
    - How do we do thinning and use fire? This is the long-term vision, but areas are so overstocked that fire is not an option right now.
- We need to learn about ways to live within the situational limitations; local agreements through grassroots -local cross boundary/ownership agreements are a good approach.