Regional Forest Climate Conversation
Meeting Notes

Thursday, May 28, 2020
9:00 a.m. – 12:00 p.m. PST

AMERICAN FORESTS
- SINCE 1875 -

Overarching Meeting Goals:

- **Purpose:** Connect stakeholders working on conservation and natural resource management to set the context for, and begin to inform the development of, a climate-informed vegetation management plan for the San Bernardino mountains.

American Forests

Brittany Dyer, CA State Director
Austen Rempel, Senior Forest Conservation Manager

The purpose of this Regional Forest Climate Conversation is to find out what is useful to you - how does climate adaptive planning apply to your work specifically, and what is the ideal outcome?

- AF in an effort to grow this region and strengthen RCD and AF relationship, in partnership with CalFire, was successful in acquiring NFWF (National Fish and Wildlife Foundation) grant.
    - 2-year timeline (already a year in) in grant to get 80K seedlings in the ground.
    - Currently doing reforestation using CCC crew (while practicing social distancing).
    - Reforestation on public and private lands, including a YMCA camp.
- Create a regional climate-smart document for all participants and land managers.
    - Goal of this meeting is to inform the development of this document by listening to you, the participants.

TIMELINE: Climate Plan due Fall 2021

1. Host another workshop in the fall based on today's discussions and inputs.
2. Goal of this conversation is to lay the foundation for a workshop in the fall to develop draft plans for our climate-smart document for the region.

Geography of the San Bernardino Range

- Desire for work to encompass the entire range of the San Bernardino mountains.
- A great model for our approach is the work being done in San Gabriel Mountains to inform our own processes and strategy.
- Cross-jurisdictional work: public and private lands.
- NIACS has partnered with AF to assist with assessment of regional climate trends, projections, and more.

Northern Institute of Applied Climate Science (NIACS)

Kirsten Schmitt, Climate Change Outreach Specialist

What is NIACS and what do we do?

- Northern Institute of Applied Climate Science.
- Goal – get science-based climate-adaptation information into the hands of land managers to apply to their own regional decision-making.
- **Fundamental approach to adaptation** -> there is no single right way to adapt to climate change.
    - Dependent upon respective landscapes, values within those landscapes, and project goals of landscapes.

Using this fundamental approach, how do we move forward with the San Bernardino Mountains?

- Forest Adaption Resources: *Climate Change Tools and Approaches for Land Managers* (2nd Edition).
    - A tool to assist land managers with developing their own climate-adapted response framework for a specific project they are working on.
- Adaptation workbook: vulnerability assessments, scientific literature, and other resources.
- NIACS has a desire to gain context on what climate change means for the work being done within the San Bernardino mountains.
    - How can we structure a plan that will be useful for "you?"

Group Introductions

Cheryl Nagy, Project Coordinator, Mojave Desert RCD

- Project Coordinator – Mountain Communities Wildfire ReLeaf.
- ReLeaf has planted over 500,000 seedlings across the San Bernardino Mountains.
- Has received funding with American Forests for ReLeaf projects: https://www.americanforests.org/magazine/article/project-showcase-out-of-the-ashes/
- Partners/collaborates with CALFIRE on a regular basis.
- Place-based partner with American Forests in the San Bernardino Mountains.

Dana Raponi, District Manager, Mojave Desert RCD

- Interested in everything happening in the San Bernardino Mountains.
- Working on reforestation following bark beetle infestation/tree mortality.
- Works closely with Cheryl to identify programmatic needs with a close eye on seedlings for the ReLeaf Program.

Chuck Bell, President, Mojave Desert RCD

- President of the Board of Directors for Mojave Desert RCD.

Luis Cortes, Conservation Technician, Mojave Desert RCD

- Desire to learn more about what is happening in the mountains, offers to help where he can.
- Wants to be more informed on what actions are being taken to help with climate change.

Tony Walters, Conservation Specialist, Mojave Desert RCD

- Here to assist, learn, and engage.

Elizabeth Bickham, USDA-NRCS

- Partners with Mojave Desert RCD.
- Focused on fuels reduction work.

Lauren Blake, Forest Fuels Prevention Officer, USFS

- San Bernardino Headquarters, Forest Service.
- Interested in this conversation because of forest level discussions include a strong desire to return to forest health & watershed level projects/treatments in the area.
- "What do we need to do to start treating the forest as a whole rather than focusing primarily on reactionary efforts toward wildfire/community protection?"
- On a recent call with local fire ecologist, there is a general technical review project being done by the Bren Institute (UCSB) on historic boundaries/locations of montane forests.

Christina Barba, District Fuels Planner, San Bernardino NF

- Santa Anna watershed project.
- Climate change does have impact on how we manage the forest.
- Specific interests on improperly functioning dry mixed conifer forests - need their functionality restored.
- Rx fire has been active on the district in past 30 years.

Susie Kirschner, IERCD

- Both districts cover SB mountains above the 110 highway.
- RFFCP grant recipient: Capacity Building Grant from Department of Conservation
    - Looking to build capacity through both pre-planning & implementation projects.
    - Working to help FSC build capacity.
    - Development of a regional priority plan.
- Would like to expand views beyond fire prevention in order to integrate climate science into future planning efforts.

Arnaldo Ferreira, Geneticist for PSW Region 5, USFS

- Works with all NF in R5.
- Ensures that all seeds needed are available to help with restoration/reforestation projects that are happening.
- Seed bank located in Placerville.
- Many gaps for major species that are needed to be planted.
- Collects samples of species of concern.
- Project focus areas with a lot of emphasis: White Pine Blister Rust.
- Many selections already done over the past 15 years in finding resistance in certain trees; process takes over 3 years to determine if a tree is resistant to a pathogen or not.
- So far, we have 58 resistant samples that we will be surveying in the field.
- Works with forest liaisons to assist with approach, funding, partnerships as they relate to planning.

David Haas, Unit Forester, CALFIRE

- Been with unit for about a year, working on reforestation and regeneration.
- First planting in San Bernardino mountains with CALFIRE.
- Referenced the Natural Range of Variation GTRs' for various forest types. "One has been done for Ponderosa Pine in the Sierra Nevada and Cascades, and another for Red Fir and Sub alpine forests. I don't know the specific scope of what is in the works for your region but these are being led by the Region 5 Ecology program."
    - https://www.fs.fed.us/psw/publications/documents/psw_gtr256/psw_gtr256.pdf

Laura Dyberg, Mountain Rim FSC
- First "activity" was a replanting in following Mill Fire in the 1990's.
- Involved in Mountain Communities Wildfire ReLeaf (works closely with Cheryl Nagy).
- Role of FSC and Fire Safe Alliance: communicating to others what our healthy forests should, could, would look like – in addition to work such has fire prevention and fuels/veg management, slash removal, etc.

Karla Kellems, San Bernardino Mountains Land Trust
- Preserve all the way from "Crestline to Big Bear area".
- Land trust has a couple unique concerns regarding mission statement goals in protecting biodiversity, sensitive habitat, sensitive/endangered/protected species.
    - However, challenges faced include dealing with infrastructure surrounding preserves – how do we have a "good neighbor policy" with those infrastructure owners who are fearful of catastrophic fire while still fulfilling our land trust mission?
    - Lack of biodiversity is one of the direct effects of climate change.

Presentations

Brittany Dyer
AF background
- Oldest conservation organization in US, helped found USFS and CCC's.
- Work on both Public and Private lands.
- Two main program areas: American ReLeaf (forested lands) and Urban ReLeaf (forestry in urban communities).
- Mange for: Climate, People, Water, and Wildlife.

Austen Rempel
- Species potential habitat tool: https://specieshabitattool.org/spht/.

Steven Ostoja, USDA CA Climate Hub (statewide)
- Need to be very cognizant of how impactful climate change is affecting and will continue to affect our landscapes.
- CA forests are changing and will continue to change drastically – already witnessing/experiencing the effects of a changing climate to resources and forest management.
- "Must" read: *Climate change vulnerability assessment of forests in the Southwest USA*, Thorne et al, https://link.springer.com/content/pdf/10.1007/s10584-017-2010-4.pdf
    - Jim Thorne - jhthorne@ucdavis.edu

Climate: "Bending the Curve"
1. Atmospheric CO2 has been steadily increasing since the industrial revolution with, sadly, no change in site.
    a. Unlikely we will achieve that 2-degree warming target.
    b. We are outside the highest emissions scenario.
    c. Whole suite of emissions released into the atmosphere, not just CO2: our planet has been warming increasingly since ~1900.

California

1. **Increased warming in the last 3-4 decades to currently in 2020**
   - Approximately 0.5 degree per decade in CA alone.
   - Max temperature for state is warming even faster – 0.7 degrees per decade.
     - Just because this is happening in CA doesn't necessarily mean this is happening on a local level, however:
   - Historic precipitation patterns have higher variability, but there been relatively stable.
     - However, DROUGHT severity index has increased – in both frequency and magnitude, and in some cases duration.
       i. Notably 2012-2016 drought, which was thought to be the worst drought in CA for ~1,200 years.
          - Historic drought has been happening in CA for millennia, this is well documented.
2. **Climate Modeling and Greenhouse Gas Emissions**
   a. Emissions scenario
      i. 2070-2099 scenario projects very high warming.
   b. San Bernardino Mountains projections
      i. Expect to see ~5 degree warming in future max temperature within the next few decades.
      ii. 2070-2080: projection for max temp to increase by 8 degrees in lower elevations.
   c. Remember – warmer future means less moisture available
      i. Even though we still might get as much moisture, moisture and temperature are integrated. In a warmer future, there will be less moisture available.
      ii. Climatic water deficit – tool available for all of California, predicts the deficit of water of what a plant needs and is available.
          - More info on climatic water deficit and models: https://pubs.usgs.gov/fs/2014/3098/pdf/fs2014-3098.pdf
      iii. Shows similar trajectory that temperature does.
   d. Extreme heat events will increase!
      i. Extreme heat in CA is context specific to location, but in SB mountains, expect to see a marked increase in the 4-day consecutive heat waves of 104-105-degree temps.
      ii. With higher future temperatures, increases in climatic water deficits may be likely.
   e. Shifts from snow to rain (*data from presentation is for Sierra Nevada*)
      i. Already decreased occurrence of snow in lower elevations.
          - Transition to rain.
   f. Wildfire activity
      i. Most sharp increase in fire activity occurring in shrubland ecosystems.
      ii. Close 2nd for conifer ecosystems.
      iii. Increased larger, catastrophic wildfires.
          - Trajectory expected to persist.

- Some data suggested that with a 1.8-degree increase -> 300% increase in area burned for wildfires.

Climate Change and Extremes Demand Will Force Climate Adaptation

- This affects what we choose to plant in the future.
  - We are talking about trees that will be "here" for centuries or longer that will be experiencing these trends.
- Important to conceptualize and integrate the projections in how we approach climate adaptive strategies.
- Species distribution has, is, and will change.
  - RCP8.5 model
    - "Squeezing" species out of their ranges because they will be unable to survive the bioclimatic implications of climate change.
    - James Thorn et all, 2017 Climate Change, consequential paper for California ecology.
    - https://link.springer.com/content/pdf/10.1007/s10584-017-2010-4.pdf

Terms to know:

1. Sensitivity: how likely your forest is to be affected/changed by environmental disturbance.
2. Exposure: Based on the projections, how will your landscapes be exposed by the climate change?
3. Adaptive Capacity: How resilient your forest is to these changed conditions.

Responding to Climate Change:

- Accepted actions that result in 1) mitigation are highly desirable but that 2) adaptation is necessary.

Seedlot Selection Tool: shared by Steven Ostoja.
https://www.fs.usda.gov/ccrc/tools/seedlot-selection-tool

Species Potential Habitat Tool: shared by Austin Rempel.
https://specieshabitattool.org/spht/

Group Discussion Exercise

Kristen Schmitt, NIACS

"What new or altered considerations does climate change bring to your work?"
Menti Responses below (additional info from those who spoke on their responses).

- Fire frequency and severity and how to respond to that increased threat.
- Wildland fire risk, WUI expanded development, successful reforestation.
- As we assist with reforestation, picking species that will withstand the changing conditions. (Elizabeth)
  - Stems from idea that when we're looking at what prime habitat should be in an area, we're looking at old sources as we're trying to match what species we should be planting.
- Tree seed sources/adaptability. (Austin)
  - Incense cedar (sometimes treated as a weedy tree species), but after a fire in San Gabriel forests was the only species to survive in a fire. Appears to be a climate-smart species.

    - Equal concern is coulter pine, and also big cone Doug fir, which limited in geographic scope in certain areas of the state.
- 30% of the remaining yellow pine mixed conifer forest in SoCal is on my district. What we lose to severe fire probably won't be forests again due to climate. (Christina)
    - We have 10 times the amount of trees we used to have. For me as a fuels person, I'm focused on maintaining what we have on our forests. I'm looking at how do we alter the structure in our forests to be resilient to large wildfires so that it will remain being a forest.
- Educating neighboring property owners on how to protect their homes – fire insurance, sprinkler systems, 100' defensible species.
- Increased fire threat and assistance/funding to be able to meet the need.
- Climate change brings an additional facet to our fuel's reduction work. How we approach it and documenting results. We want to include climate change in our messages to participants in our community grant program. (Laura)
    - our projects are focuses on fuel reduction on the community level and on private property (home, neighborhood and community basis). We have recently been more conscientious on how to document fuels in board feet removed and converting those figures into green tons to be used in grant programs by Cal fire or other organizations. Green tons can be used to estimate how small community efforts are impacting figures and community-based impact to numbers.
    - We provide replanting information (using our brochure) but we are hoping that we can find more messages that we can share to our community on how the small things that we do as community impact the larger picture fuel reduction efforts.

- Climate change changes the approach when entering a new project like a restoration project. We have to educate ourselves on what species can handle different exposures, such as climate and predators.(Luis)
    - It's important to consider the education aspect. You have to take the ecology as a whole and go from there to see/test the resilience of trees.
- Fuels treatments based on the 90th percentile conditions from 20 years ago have limited efficacy now and in the future.
- Need for assessing current stand structure and conditions to be able to compare where we are on the variation and where we might be headed. This will help us understand the impacts other resources.
- Reducing loss of biodiversity. (Karla)
    - Concern of mastication and how it affects pioneer species such as ceanothus and manzanita – which provide nutrients to the soils post-burn, as well as habitat for wildlife.
    - One of our mission statements and goals is to protect the loss of biodiversity. Thus, we always walk a fine line when implementing forest health projects. What we do is using science to determine whether the loss of a species habitat work the benefits of a forest health project. We are concerned mostly about pioneer species, manzanita, ceanothus, and others they are important for habitat. We think they prepare the soil and provide habitat to some species.
- The need to establish climate plots to gather species adaptation information to design guidelines.
- Protecting species that are already adapted to their environment. (Karla)
    - We should be protecting species that fair well against poor air quality, ozone, and other factors as they relate to climate change.

    - Ponderosa pine has developed adaptability to poor air quality/conditions. So, I think the focus should be to protect a species that has developed protections to changes versus of bringing ponderosas from elsewhere.
- Affects reforestation or ecological restoration success. Increased tree mortality by abiotic and biotic stressors.
- Increased man-made fires near developed areas surrounded by forest.
- Using science of fire ecology to build models and collect data.
- Soil Health.
- Species migration to higher elevations/NE.
- Type conversion, especially chaparral to invasive grasslands. (Susie)
    - For our district we have a whole department focused on habitat restoration and we are noticing a lot of type conversion taking place and how it increases fire potential and severity. Also it leads to loss of biodiversity as these areas are converted to fire-prone grasslands.
- Mojave River watershed (Chuck)
    - if we have extensive burning/dies off, it will cause an influx in sedimentation and mud to the Mojave river as well as the volume of water. This is the main water source in our area. We are very concerned about this and floods that can result if the upper watershed burned up.

"As we think about how to structure a climate-informed vegetation management plan, what themes do you think are important to include?" (answers listed with responses noted below answer from those who shared)

- Fire ecology.
- Lauren Blake, USFS - Stand structure/forest and chaparral adaptations.
    - Our old stand structure documentation was burned in a 2003 wildfire, and we are in the process of acquiring new data – but it is costly.
    - LIDAR to find out "what we have out there" because we do not have a workforce to survey.
    - FS-GTR coming out with NRV.
    - Need for better education/understanding on chaparral ecosystems and compositions; we can't create monocultures.
    - In order to manage, we first need to understand our stand structures.
- Biodiversity, fuel reduction, local habitat and their relation to the different species of vegetation.
- strategic ways to protect bio diversity.
- Christina Barba, Fuels, USFS - "I think the NRV assessment Safford & Stevens put together for the Sierra Nevada that included a future range of variation has been helpful to my work. Looking forward to what Molinari's group comes up with for SoCal."
    - NRV is being used to inform projects on the San Bernardino Mountains.
        - Goal to restore to historic conditions in our forests.
    - Referencing a project in Mexico.
    - Restoring fire regimes using 1930s data.
- Invasive species.
- Preventing man made fires, increasing multi class forest(s).
- Arnaldo Ferraira – one thing that is lacking is data on performance of species that were established in some plots. Several species from different populations/elevations/seed zones were tested at this plot, and monitoring this plot would provide valuable information on how they are performing.

- It is difficult to convey to people who do not understand the data that it is not beneficial to keep our forests in their current states because they're composition is not historically what they were.

WRAP UP

Brittany Dyer

Next Steps

1. follow up email with resources mentioned and notes, etc.
2. Post-conversation survey.

    a. Need initial feedback and thoughts about how the meeting went; utilize this information for additional follow up steps: https://forms.office.com/Pages/ResponsePage.aspx?id=DQSIkWdsW0yxEjajBLZtrQAAAAAAAAAAAMAANMZqvRUMFBCOUU4UEdENkdFVkszOTU5VkJTNFJXOS4u

3. Use post-conversation survey data to create a NEW survey, which will help frame & develop fall workshop.