



## Tree Mortality Task Force Forest Health and Resilience Working Group Minutes

May 3, 2017

CAL FIRE FRAP Office, 1300 U Street, Sacramento, CA

- I. **FHRWG Member Roll Call:** Stewart McMorrow (CAL FIRE), Dr. Chris Keithley (CAL FIRE-FRAP), Dr. Jodi Axelson (UC Berkeley), James Savage (BLM), Rich Wade (BOF), Larry Camp (FLOC), Margarita Gordus (DFW), Susie Kocher (UCCE), Gabe Schultz (CAL FIRE), Staci Heaton (RCRC), Kevin Conway (CAL FIRE), Liz Forsburg (TNC), Kelly Larvie (CAL FIRE-FRAP), Chris Fischer (USFS), Heather Williams (CAL FIRE), and Pete Cafferata (CAL FIRE).

**FHRWG Participants:** Dr. Russ Henly (CNRA), Patrick Nevis (Office of the Governor), John Dingman (CARB), Emily Meriam (CAL FIRE-FRAP), Liz van Wagendonk (SNC), Kristen Merrill (CAL FIRE), Dr. Van Kane (UW), Coreen Francis (BLM), and Dave Passovoy (CAL FIRE-FRAP).

- II. **Approval of April 2017 Meeting Minutes:** The April meeting minutes were approved. Minutes from past FHRWG meetings are posted on the TMTF website:  
<http://www.fire.ca.gov/treetaskforce/workinggroups>

- III. **Update on the FHRWG White Paper titled "Recommendations for Comprehensive Sierra Nevada Ecological Restoration"**

The FHRWG decided to consider the possibility of revising the white paper titled "Recommendations for Comprehensive Sierra Nevada Ecological Restoration." During April, detailed comments were received from Mr. Randy Hanvelt, Supervisor, Tuolumne County, as well as input from Jim Branham, SNC, to which CAL FIRE Deputy Director Helge Eng proposed a draft response. The group agreed that we would solicit input after the FHRWG has had a chance to review these comments for 5 working days, at which time participants will inform the FHRWG co-chairs if they think the document should be revised. If we do decide to revise the document, it will go back through the CAL FIRE Executive staff review process a second time. **Input is to be provided by Thursday, May 11<sup>th</sup>, COB.** The current version of the white paper is posted at:

[http://www.fire.ca.gov/treetaskforce/downloads/TMTFMaterials/TMTF\\_Comprehensive\\_Sierra\\_Ecological\\_Restoration\\_FINAL\\_4-5-17.pdf](http://www.fire.ca.gov/treetaskforce/downloads/TMTFMaterials/TMTF_Comprehensive_Sierra_Ecological_Restoration_FINAL_4-5-17.pdf)

- IV. **Update on the FHRWG Tree Mortality Seed Zone Map**

Emily Meriam, CAL FIRE-FRAP, informed the group that she will begin making additional changes to the simplified tree mortality seed zone map during the week of May 8<sup>th</sup>. These changes will include: (1) revising the color scheme so that the counties with greater



mortality will be shown in tan or orange colors, rather than darker shades of green, (2) revising/adding text, (3) making the map ADA compliant, and (4) possibly adding data on the percent of each seed zone with mortality. Heather Williams, CAL FIRE, stated that she anticipates having a rough draft of the reforestation Story Map available for the June FHRWG meeting, with a goal of completing it by mid-June. The Story Map will likely have 10-15 images, including both the simple and more complex versions of the seed zone map, and possible video footage from a recent reforestation workshop. The completed Story Map will be posted on the CAL FIRE website.

#### V. **Stand Dynamics and Regeneration After Disturbance Presentation**

Dr. Jodi Axelson, Cooperative Extension Specialist, UC Berkeley, provided a PowerPoint presentation titled “Life after Beetle: Stand Dynamics Post-Outbreak(s).” Disturbance categories were first described: type (fire, insect outbreak); severity (low, moderate, high); spatial and temporal characteristics (stand level vs landscape level, short-time vs long-term, return interval vs natural range of variability); and disturbance interactions (drought setting up insect outbreak). Historical bark beetle attacks were illustrated with the Black Hills outbreak in the 1890’s. Currently, we are possibly entering an era of “mega-disturbances,” sudden mortality events greater than have been recorded in recent human history via drivers such as hotter droughts. The Forest Drought Severity Index (FDSI) was shown to be well correlated to the Normalized Difference Vegetation Index (NDVI), bark beetle area, wildfire area, and percent dead for several conifer species in the SW. From 1984 to 2012, tree mortality in California was greater from fire than from bark beetles, in contrast to Colorado and some other western states, due to our lower elevations and drier forests.

Different types of bark beetle outbreaks were described next. They were characterized as being host specific, size specific, and acting as a natural thinning agent. This results in stands where only some of the trees are killed in a bark beetle outbreak. Tree preferences were provided for western pine beetle (ponderosa and Coulter), mountain pine beetle (many species, larger trees), and ips (lodgepole, sugar, Jeffrey, and smaller trees).

Impacts to forest stands in different parts of Canada from mountain pine beetle attacks were described based on results from several published papers. In central BC, mortality of 70-80% caused the overstory to shift to uneven-aged lodgepole pine forest, while the understory returned to lodgepole and increased aspen. In southern BC, lodgepole pine forest plots revealed a shift in the size structure of stands and a shift in regenerating species. Lower intensity mountain pine beetle attack here did not result in significant increases in light reaching the forest floor, favoring regeneration of shade tolerant species (Douglas-fir and spruce). In the southern Alberta Rocky Mountains after mountain pine beetle attack ranging across sites from 10% to 93% overstory mortality, the overstory shifted from lodgepole pine to a mixed species canopy, and the understory became dominated by shade tolerant species (e.g., subalpine fir, balsam poplar) with no pine



regeneration. This resulted in the production of stands with greater heterogeneity, higher components of non-pine species, and reduced probability of beetle outbreaks in the future due to species shifts. In the northern Rockies, post beetle attack seedling density did not increase significantly until the “grey” tree mortality phase, when the canopy became sufficiently open.

Dr. Axelson stated that following severe drought in the early 2000’s in southern California, western pine beetle attacks killed ~12.7% of conifers, mainly ponderosa and Coulter pines. Mortality was greater than 80% in some areas. Despite continuing drought and availability of suitable host trees, western pine beetle populations rapidly declined in 2004. In the most heavily impacted areas, some type conversions have been reported. For the central Sierra Nevada, data were presented showing that fire exclusion has caused pine seedling density to significantly decrease, with large increases for shade tolerant species such as incense cedar and white fir. Historical photos were shown illustrating that Sierra Nevada mixed conifer forests were highly clustered with gaps (low stand density).

In conclusion, it was stated that there are many unknowns regarding Sierra Nevada forest recovery from the current beetle epidemic, including: (1) will there be conversions to other forest types or shrubs?, (2) will ponderosa pine be lost at lower elevations?, (3) will pine species across heavily affected areas regenerate?, (4) how long will it take for the canopy to open up?, and (5) will fuel accumulations change fire behavior and/or impede forest regeneration? Unfortunately, past studies in other parts of the western hemisphere do not help us answer these questions well.

**Dr. Axelson’s PowerPoint presentation is posted at:**

**[http://www.fire.ca.gov/treetaskforce/downloads/TMTFMaterials/FHRWG\\_Axelson\\_presentation\\_05-03-17.pdf](http://www.fire.ca.gov/treetaskforce/downloads/TMTFMaterials/FHRWG_Axelson_presentation_05-03-17.pdf). Her published papers and the other papers cited in this presentation will be made available to the FHRWG with either a Google Docs site or an ftp site.**

VI. **Update on FHRWG White Paper Synthesis on the Long-Term Sierra Outlook**

Pete Cafferata briefly stated that a short draft outline for the white paper synthesis on the long-term outlook for the Sierra Nevada has been produced. The presentation by Dr. Axelson and the papers used in her presentation will assist with this effort. Margarita Gordus, DFW, volunteered to assist with writing the paper, and limited assistance from CAL FIRE-FRAP staff may be available. **Clarification on the audience for the paper and approximate paper length are required.**

VII. **Discussion on Development of a Reforestation Strategy for Non-Federal Lands**

Stewart McMorrow briefly reviewed steps being undertaken to develop a reforestation strategy for non-federal forestlands in California. The FHRWG co-leaders, Dr. Tom Smith, and Kevin Conway met with Dr. Steve Ostoja, Director, USDA California Climate Hub, to



begin a dialogue on reforestation strategies. Dr. Ostoja is working with the USFS on co-hosting a workshop on reforestation that will address the science known and expected to interface with future California forests. Also, while no firm reforestation strategy has been written yet, Stewart stated that several things are occurring that will assist with this effort, including: (1) CAL FIRE seedling production is anticipated to begin again at the LA Moran Reforestation Center in 2018, (2) a Forestland Steward Newsletter addressing reforestation has been produced, (3) reforestation workshops continue to be offered (the next one is May 31<sup>st</sup> in Sutter Creek), (4) CAL FIRE continues to assist small landowners with seedling purchases, and (5) the revised California reforestation manual is expected to be completed this year.

VIII. **Update on Sierra Forest Science Coordination Sub-Working Group**

Pete Cafferata briefly stated that 13 people have volunteered to participate in the newly formed Sierra Forest Science Coordination Sub-Working Group. This group will (1) identify existing interests/needs for science and management information related to tree mortality, (2) identify ongoing research and monitoring projects that address these interests, and (3) determine where gaps exist, funneling existing funding to appropriate projects. A Doodle poll has been sent out to hold the initial conference call to begin work later in May.

IX. **Next FHRWG Meeting**

The next meeting will be held on June 7<sup>th</sup>, 2:00 p.m., at the CAL FIRE FRAP office in Sacramento.