Tree Mortality Task Force
Forest Health and Resilience Working Group Minutes

December 7, 2016

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

I. FHRWG Member Roll Call: Stewart McMorrow (CAL FIRE), Chris Keithley (CAL FIRE-FRAP), Paul Mason (PFT), Cedric Twight (SPI), Margarita Gordus (DFW), John Amodio (YSS), Sherry Hazelhurst (USFS), Brian Nowicki (CBD), Gabe Schultz (CAL FIRE), Rick Carr (CAL FIRE), and Pete Cafferata (CAL FIRE).

FHRWG Participants: Mark Rosenberg (CAL FIRE-FRAP), Emily Meriam (CAL FIRE-FRAP), James Savage (BLM), Coreen Francis (BLM), Tadashi Moody (CAL FIRE-FRAP), Kelly Larvie (CAL FIRE-FRAP), Patricia Maloney (UCD-TERC), Eric Huff (CAL FIRE), Jodi Axelson (UCCE), Carlos Ramirez (USFS), and Liz van Wagtendonk (SNC).

II. Approval of November 2016 Meeting Minutes: All concurred to approve the November meeting minutes. Minutes from past FHRWG meetings will be posted on the TMTF website (June 2016-November 2016). http://www.fire.ca.gov/treetaskforce/workinggroups

III. Update on Sub-Working Group Addressing Emerging Remote Sensing Technologies
Kelly Larvie stated that she will be scheduling a sub-working group meeting in December. Susie Kocher and Larry Camp are the FHRWG participants. Kelly and Liz van Wagtendonk reported that the USFS is continuing to work on an agreement with NASA/JPL for hyperspectral imaging that can map tree mortality and assets at risk from falling trees (data for hazard tree abatement). Work is currently funded for the Plumas National Forest; additional funding is needed for the remainder of the Sierra Nevada.

IV. Presentation on a Contract for a Second Conifer Moisture Stress Flight and Data Analysis
Carlos Ramirez, Head of the U.S. Forest Service Region 5 Remote Sensing Laboratory (RSL) at McClellan, provided a PowerPoint presentation titled “Existing Program for Assessing Water Stress Across Forest Types in California” (co-authored by Dr. Greg Asner, Stanford University). He described the joint project being funded by the USFS and CAL FIRE to expand on the moisture stress research published last fall by Dr. Asner. This study includes state-of-the-art airborne observance using a dual-laser waveform LiDAR scanner and a high resolution visible to near infrared imaging spectrometer. These instruments provide the ability to assess canopy moisture stress.

Flight data were collected in the summer of 2016 over a 10 day period from 4.4 million acres in the Sierra Nevada, spanning most major vegetation types. Three focal areas for intense ground truthing have been identified: Sagehen Creek Field Station, Sequoia-Kings Canyon National Parks, and the Dinkey Creek CLFR Project. The goals of the project include improved estimates of canopy water content (CWC) and measurements of progressive water stress. This effort is expected to yield major improvements in modeling techniques and more reliable results. The work will determine which areas are more vulnerable to mortality by developing reasonable thresholds for

high/moderate/low vulnerability classes. It will also identify "hot spots" for canopy water loss summarized by vegetation type.

Planned deliverables include annual canopy water content data products and progressive water stress data (both statewide), and LiDAR derived metrics of forest structure, liquid water expressed in foliage, and radiance images for the three focal areas. A technical report will be available by June 30, 2017. Currently, prior to full execution of the CAL FIRE contract, the USFS RSL and Stanford CAO (Carnegie Airborne Observatory) teams are evaluating forest structure data to determine which are most suitable for statewide analysis, as well as beginning to process LiDAR and infrared imaging spectrometer data. This work will support planning needs for forest restoration efforts, examine forest carbon dynamics in the Sierra Nevada, and provide validation data for other remote sensing projects being undertaken in this region.

V. Presentation on GIS Data Summarizing the Number of Acres in Forest Type/Seed Zone/Elevation Bands

Emily Meriam, CAL FIRE-FRAP, presented the Tree Seed Zones Tree Mortality Map and Excel spreadsheet she has developed for the FHRWG. This work consisted of overlaying GIS data for tree seed zones, 500-foot elevation bands, and forest type vegetation maps in the 10 county high hazard area. Tree mortality data spans 2012-2016 and are from the USFS Aerial Detection Survey (ADS). The detailed Excel spreadsheet provides tree mortality data for each 500 foot elevation band by seed zone, with separate tabs for conifers, hardwoods, and conifers and hardwoods combined. For example, for the 500 series seed zones (west slope of the Sierra Nevada), 41.8% of the conifer and hardwood life forms within these seed zones have had mortality. Considering all the seed zones analyzed in the 10 county area, 89% of the total mortality is found within the 500 series. **Comments on the seed zone map should be sent to Emily Meriam and Stewart McMorrow prior to the next FHRWG meeting (January 4, 2017).**

This work will allow Stewart McMorrow, CAL FIRE Stewardship Forester, to place a seed sowing order based on seed zone mortality expressed as a percentage of total tree mortality. He is ordering 150,000 seedlings, to be available in 2018 for non-industrial landowners. It will also help prioritize seed collection efforts for both CAL FIRE and the USFS. Additionally, there was considerable discussion regarding how this data can be best used by the public. Stewart and others expressed the concept that tree mortality does not equate to replanting needs, since that depends on landowner objectives, which vary considerably. Further discussion will occur during the January meeting regarding how to best disseminate this information to the public. Jodi Axelson suggested that a web-based interactive tool would be appropriate.

VI. Update on the FHRWG Document titled "Achieving Long-Term Forest Health and Resilience in California"

Pete Cafferata reported that the final version of this document was sent to the FHRWG on November 22nd. It is posted on the TMTF webpage under the FHRWG tab and it will be provided to the full TMTF in their handout package at the meeting scheduled for December 12th. Brian Nowicki stated that the final version did not adequately address all of his comments and he asked why it was labeled as a FHRWG project without full group consensus. Gabe Schultz explained why the document went through CAL FIRE internal "green sheet" review, stating that working group documents with concepts that bridge TMTF policy or provide a position that would represent the

Governor's office must include this level of review. He stated that disagreements with this policy must be expressed to the TMTF leadership, either by phone call or email.

VII. Update on the FHRWG Draft Document titled "Sierra Nevada Forest Health Report"
John Amodio stated that he appreciated the comments he received on the October draft and that he attempted to incorporate the comments into the draft emailed to the FHRWG on December 2nd. In particular, the document was shortened, with an entire section eliminated. Suggestions from Jim Branham, SNC, have been incorporated, but Board of Forestry and Fire Protection input is still required for two sections. Additionally, the executive summary, concluding summary paragraph, and reference citations within the main text remain to be completed.

Cedric Twight noted that the edited versions of the last draft were not distributed to the entire FHRWG group, preventing participants from reviewing the feedback provided to John and Larry Camp. Stewart McMorrow, Mark Rosenberg, and Pete Cafferata will discuss the best method for providing past comments to the FHRWG and send them to the group in a timely manner. **John asked that comments on the current draft be provided by December 16th, allowing a new draft to be completed for the January FHRWG meeting.** Comments should be sent to Pete Cafferata for distribution to the entire FHRWG.

VIII. Next FHRWG Meeting: The next meeting will be held on January 4th at 2:00 p.m. at the CAL FIRE FRAP office.