The Fire Restoration Group

California Air Resources Board—Clerks Office **June 13, 2022**
1001 I Street
Sacramento, California 95814

Electronic submittal: http://www.arb.ca.gov/lispub/comm/bclist.php

Attn: Rebekka.Fine@arb.ca.gov Air Pollution Specialist, Central Valley Air Quality Planning Section

Comments on California's Regional Haze Rule--State Implementation Plan:

General Comments

We are generally very supportive of efforts to maintain visibility protection in Class I Pristine airsheds under the Clean Air Act. Remedies for restoring degraded visibility and preventing future visibility degradation in the 29 Class I airsheds in California is a noble effort as is the effort to restore visibility "to natural conditions by 2064" in these areas.

We are glad to hear about the reduced visibility impairment from Best Available Retrofit Technology at point sources and the "significant decline in NOx and Sox emissions due to the statewide mobile source control measures."

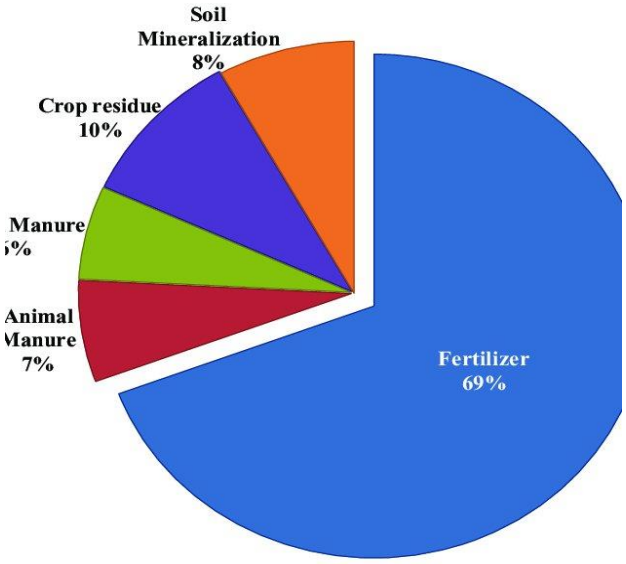
Scientific studies underscore the fact that historically, in the era of natural fire regimes, frequent, low to mixed-intensity fires burned widely each year — not only across California, but across extensive areas of the continent. Fire in these ecosystems produced a level of resilience and stability in our natural environments that is rapidly vanishing as we cross a tipping point for resilience in today's forests. Air regulations will achieve the greatest public benefit if regulatory plans recognize the pivotal importance of managed fire across America's wild lands and the fact that fuels will eventually burn, one way or another — either under management constraints or as out of control wildfires. Federal EPA and California have a wide range of responsibilities for maintaining human and ecological well-being including protecting our clean water, clean air, and endangered species and their habitats, many of which have evolved with, and benefit from, fire at appropriate scale, frequency, and intensity. Balancing appropriate ecological fire use with regulating anthropogenic air pollution to protect health and visibility can be achieved with an active smoke management program, federal agency collaboration on fire use and aggressive regulation of other major anthropogenic air and climate pollutants.

Adjusting 2064 glidepath to account for prescribed fire (comments from USFS) and expansion of wildfires managed for resource benefits should increase the attention on fire restoration in the California Strategic Plan for Expanding Beneficial Fire. In other words, the Regional Haze Rule visibility requirements should not limit FLMs ability to use fire for ecological objectives as defined by the FLMs in the management of our national parks and wilderness areas in the 29 Class I areas due to the uncertainties of climate change.

In a different section of the draft SIP, you state that, "ammonium nitrate remains an important component of haze" and that ammonium sulfate is attributable to natural and international anthropogenic sources." We offer that supporting and expanding organic agriculture is reasonable bast available control measure for limiting synthetic ammonium pollutants in the atmosphere from industrial agriculture and needs to be considered in this SIP.

Specific Comments

1. **Agriculture**--Ammonium Nitrate and Ammonium Sulfate in Agriculture



Page 44 of the Main Document states that farming operations were the largest area-wide source categories of ammonia emissions:

a. "The areawide source sector accounts for 83 percent of statewide ammonia emissions. Farming operations and solvent evaporation from pesticides and fertilizers were the largest areawide source categories of ammonia emissions. Ammonia emissions are forecast to remain stable through 2028." (pg. 44)

What does "remain stable" mean? That there are no proposed source reduction efforts asked of the agricultural community? Industrial farming practices have evolved into a heavily chemical dependent sector, yet commercial organic agriculture is expanding significantly in California.

Organic production has increased 44 percent from 1,796,080.49 acres in 2014 to 2,590,328.41 acres in 2019. In 2019, sales of organic products in California totaled more than $10.4 billion, which represents an increase of 3.5 percent from 2018. See the CDFA link below:

https://www.cdfa.ca.gov/is/organicprogram/pdfs/2019_2020_California_Agricultural_Organic_Report.pdf

The organic farming sector reliance on composted organic material and extensive cover crops for nitrogen soil amendments supporting soil health and vigor is a reasonable best available control measure that should be strongly represented in this 2022 RHR SIP.

Please explain in more detail how, "Farming operations and solvent evaporation from pesticides and fertilizers were the largest areawide source categories of ammonia emissions. Ammonia emissions are forecast to remain stable through 2028." Is this due to increases in organic agriculture (promoted by the SIP) that starts to limit the amount of synthetic ammonium nitrate applied in industrial agriculture as a Reasonable Best Available Control Measure? This shift should be promoted in the 2022 SIP.

2. **Fire Restoration**--Fire's historic ecological role in California needs a deeper examination of fire and climate and the relationship of fire and California's diverse vegetation classes.

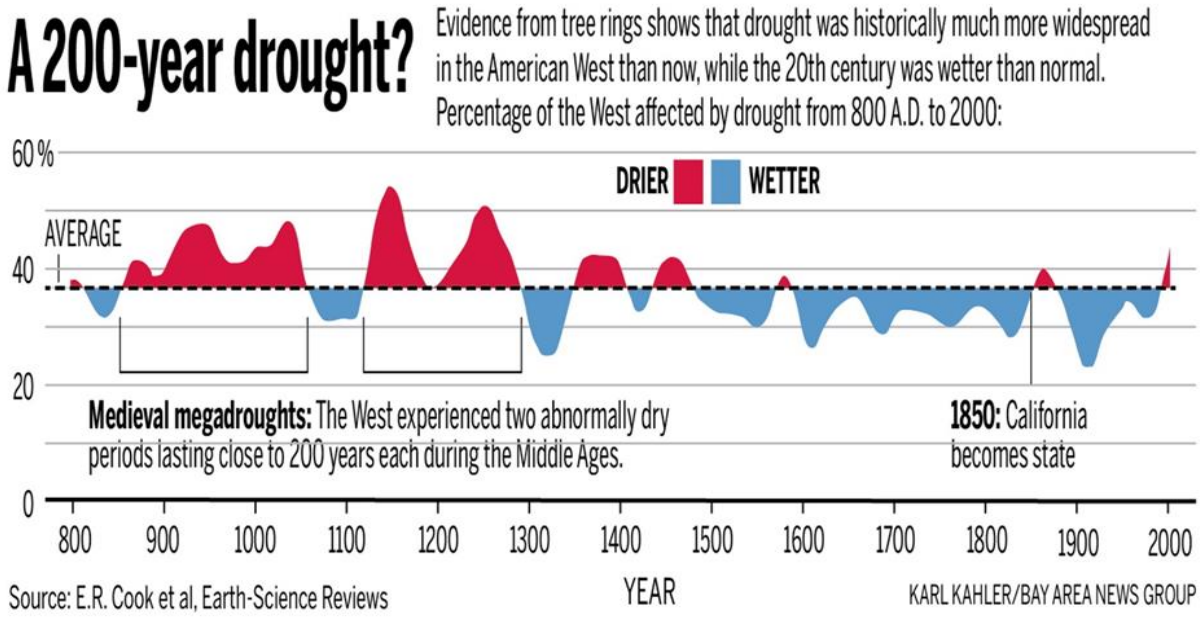
a. Natural Conditions by 2064 as it relates to human impairment such as mobile sources (vehicles and other transportation systems) and stational sources (power plants, OHV recreation and fugitive dust, fertilizer chemicals noted above) and the focus on NOx emission are disclosed in detail and proposed reductions are strongly supported.

b. Fire as an ecological process and fire restoration as an acknowledged ecological need is more complicated and needs a deeper explanation so the public, policymakers and regulators understand the history of fire suppression and fire exclusion in California and the rigorous 30+ years of fire and vegetation ecology pointing to the significant need for expanded fire restoration.

3. **2064 Natural Visibility standard needs further discussion**. Since Congress amended the Clean Air Act in 1977 to remedy the impairment of visibility in the 29 Class I airsheds in California and directed the improvement of visibility to "natural conditions" by 2064 there have been significant improvements in mobile source and some stationary source emissions.

What we are concerned about is the less than clear description of what the "natural conditions" are and when they existed in the 29 Class I areas. In additions, we ask that this SIP address specifically the following questions:

a. How do you factor natural climate variation in our historic past (records of years 800 to 2000), not attributed to fossil fuel use? There have been many decades to centuries of warming and cooling trends in our California climate history prior to the burning of fossil fuel. See graph below E.R. Cook et al. (2007) Earth Science Reviews. We have spent the last 500-years in a wet, cooling cycle and could be entering a serous warming cycle, even if we weren't making matters much worse by 120+ years of burning fossil fuels. What is the "natural condition" sought for in 2064? And does the natural condition vision in the late 1970's line up at all with the natural fire regimes and frequency in the 29 Class I areas—a time of extreme fire suppression and the mistaken idea that because we designate these areas wilderness areas the visibility is always clear and pristine.



b. Increased fire cycles would naturally follow warming trends over the centuries and would be considered the natural result of slight changes in the Earth's axis, changes in lightning occurrence, and expanding Native American cultural burning.

c. Climate/fire science suggests the remaining century will see increased wildfire emissions. (Hurteau et al. 2015) in Environmental Science and Technology.

ABSTRACT: Changing climatic conditions are influencing large wildfire frequency, a globally widespread disturbance that affects both human and natural systems. Understanding how climate change, population growth, and development patterns will affect the area burned by and emissions from wildfires and how populations will in turn be exposed to emissions is critical for climate change adaptation and mitigation planning. We quantified the effects of a range of population growth and development patterns in California on emission projections from large wildfires under six future climate scenarios. Here we show that end-of-century wildfire emissions are projected to increase by 19−101% (median increase 56%) above the baseline period (1961−1990) in California for a medium-high temperature scenario, with the largest emissions increases concentrated in northern California. In contrast to other measures of wildfire impacts previously studied (e.g., structural loss), projected population growth and development patterns are unlikely to substantially influence the amount of projected statewide wildfire emissions. However, increases in wildfire emissions due to climate change may have detrimental impacts on air quality and combined with a growing population, may result in increased population exposure to unhealthy air pollutants.

d. Please explain (on page 44) where you suggest that with the "unprecedented increase in wildfire activity in California" and increases in PM 2.5 and PM10, how these sources are "expected to remain stable through 2028"? They will not remain stable but are driven by our human-created unstable conditions due to a century plus of fire suppression and fire exclusion leading to uncharacteristic fuel loading and stand densities and possible increases in lightning ignitions.

   Lightning ignitions may be on the increase as annual warming trends expand fire seasons. These trends certainly are a significant driver of fire in California where a key study cites over 1,000,000 lightning ignitions between 1985-2000 (van Wagtendonk and Canyan 2008). While not all the lightning strikes lead to wildfires they are a significant part of the fire regime—ignition origin and emission component.

e. If we finally come to understand the naturally fire-prone nature of California, one of the most naturally fire-prone, Mediterranean climates on planet Earth (Moreira et al. 2020), then we will have to come to terms with what fire scientists and vegetation ecologists have been saying for over 30 years – we must embrace the natural relationship with fire and California's vegetation. This means we will need to take in account the fire regime and fire frequency in the various vegetation types where fire restoration is possible and necessary AND the smoke emissions associated with those treatments.

f. Based upon the recent collaborative work that generated the California Strategic Plan for Expanding Beneficial Fire (March 2022) https://wildfiretoday.com/documents/californias-plan-for-expanding-the-use-of-beneficial-fire.pdf we will be seeing much more fire restoration in the years to come, from prescribed fire, Native American cultural burning and wildfires managed for resource objectives.

The "natural condition" trajectory must consider the need for expanded fire restoration in these Class I areas of California. Viewing a wilderness vista absent summer smoke is anything but "natural" when considering the need to expand restorative burning under the science-based fire regimes that have functioned here for thousands of yours. The fire regime (including the mean fire return interval and its variation) is a known entity for most of the state. Emissions calculations can be factored based on these fire regimes to give a rough metric for "natural conditions" and the impact of visibility. The impact on visibility is a social construct formulated during a time of highly unnatural fire suppression in these Class I areas. Extensive uncharacteristic wildfires in our current era are not the natural condition (due to fire intensity and scale of burned areas) BUT the total acreage of 2 million acres/year in California is a natural condition that needs to be called out based on best available science. The California Strategic Plan for Expanding Beneficial and its 400,000 ac/yr. annual commitment is a step in the right direction.

Sincerely,

Craig Thomas

Craig Thomas, Director

The Fire Restoration Group
P.O. Box 244
Garden Valley, CA 94633

(916) 708-9409
craigthomas068@gmail.com