



This is a declaration for the Alliance for the Wild Rockies's objection to the Skyline Healthy Forest Restoration Act Project. I am President of Utah Physicians for a Healthy Environment (UPHE), and Board Chair of Doctors and Scientists Against Wood Smoke Pollution (DSAWSP). UPHE is one of the largest civic organizations of healthcare professionals in the Western US, and specializes in the medical research on air pollution's harm to public health. DSAWSP is an international coalition of experts on the public health, environmental, and climate consequences of wood combustion.

1. The project is forest management malpractice

The narrative that our forests are tinderboxes because they are massively “overgrown and unhealthy” due to decades of fire suppression, and “fuel reduction treatments,” i.e. logging, are the cure, is largely a myth promoted by the timber industry, politicians, and their allies in the US Forest Service (USFS). The myth has been debunked by numerous independent experts, both in this country and abroad.

USFS research used to justify the narrative that our forests need thinning is clouded by conflict of interest. The USFS operates under the umbrella of the US Dept. of Agriculture, which treats forests as a commodity resource. Consider this parallel. If the FDA heavily promoted Prozac, received revenue from Prozac sales, and published research showing its efficacy, the conflict of interest would be obvious. It is similar with the USFS. USFS's mandate includes acting as a facilitator for the logging industry, and historically it has consistently played that role. It promotes lumber and wood products with videos like [this](#), that encourage burning wood for heat, the most polluting way possible to heat a home ([and more carbon intensive than using coal](#)), while simultaneously claiming thinning creates healthier forests. The agency receives some of its funding selling trees to the timber industry. This obvious conflict of interest is institutionalized, and warrants suspicion towards USFS research that finds commercializing forests makes them healthier. If USFS sponsored research is untainted and scientifically valid, it should at least generally agree with independent research. That is not the case.

USFS studies claiming that fire suppression has left current forests much more dense than historical forests have been [heavily criticized](#) by independent researchers. While there may be an overall a comparative increase in the number of small trees, there are fewer large trees, and [less](#)

[total biomass](#) due to decades of logging, and therefore less carbon stored in most of our forests than they would otherwise naturally have.

The USFS [claims](#) that thinning to mimic historic density allows remaining trees to survive drought better because they have less competition for sunlight, moisture, and soil nutrients. Other research shows it's far from that simple. Canadian researchers found that the benefits of thinning were [limited to "a few insects and pathogens,"](#) and there were negative effects on "root rot severity," and that "thinning should not be promoted as a tool that will universally increase the resistance and resilience of forests." [Another study](#) showed that the death of a tree can enhance or suppress the growth trajectory of a neighboring tree depending on the size of the neighbor and the species. In other parts of the world thinning forests [decreases tree species diversity](#), and decades later thinned forests still have [decreased stem density and basal area](#).

[Emerging research](#) shows logging damages remaining trees, and does not "restore" forest health. Through underground mazes of roots, fungi, and bacteria called "mycorrhizal networks," trees share resources like water and nutrients, helping each other survive stresses. Forest thinning may reduce competition for water and sunlight and initially allow more growth, but it also heats up and dries out the forest floor, and disrupts these mycorrhizal networks leaving remaining trees more vulnerable to disease, pest attack, wind, and drought, [shortening their life span](#). In particular when the largest, oldest trees are cut down, it diminishes the survival rate of younger trees.

The extent and interconnectedness of root systems was illustrated by the largest, most destructive wildfire in New Mexico's history, the April, 2022 Calf Canyon fire that burned 341,471 acres and lasted five months. It started when slash piles burned in January of that year by the USFS had not been fully extinguished, and months later, in a dry spring, strong winds reignited them. Fire had [spread underground along tree roots](#) eventually reaching the surface and ignited when winds fanned the flames.

A [USFS review](#) of the Calf Canyon disaster drew these conclusions:

1. "Execution of the mechanical thinning prescription resulted in an open canopy that increased the amount of solar radiation and in-turn increased the rate of snowpack sublimation and snowmelt. In addition, the open canopy may have increased post-thinning windthrow that increased surface fuel loading significantly between thinning and pile burning treatments.
2. Climate changes have narrowed the window for "safe" prescribed and slash pile burning, meaning there is a high likelihood of those piles not being burned in time.
3. Converting live trees to dead trees by cutting them down increases their ignition risk.

Heavy equipment often damages trees that are left after a "thinning." [Trees within 10.5 m](#), are at particular risk for collateral damage and mortality.

The most widely cited forest ecologist in the world, [Dr. David Lindenmayer](#), author of 48 books on forests, says, “[logged forests always burn at greater severity than intact forests.](#)” The climate crisis has become [the main driver](#) of Western forests’ new fire vulnerability. Fire frequency, intensity, speed, and ultimate scale of destruction are directly related to persistent drought, abnormally high temperatures, wind penetration, and human activity, not tree density or “[excessive fuels.](#)” Two of those factors are primarily [climate related](#), and forest thinning increases all four on a local level.

Beyond that, [daily fire weather](#) (therefore climate) is the most important predictor of fire severity, followed by the age of the forest (older forests were less vulnerable). Industrial plantation forestry, with spatially homogenized trees is also associated with increased fire severity, but pre-fire forest biomass is not an important predictor. Furthermore, dead trees left standing can actually [reduce wildfire severity](#).

Forest management like prescribed burns and thinning, usually require road building and skid trails leaving lasting ecosystem damage: soil compaction, surface erosion, increased stream sedimentation, degraded water quality and aquatic habitat, reduced biodiversity, spread of invasive vegetation, and suppression of forest regeneration. [Over 89%](#) of forest fires are human caused, and roads invariably increase human presence in the forest, meaning ultimately more fires. Furthermore, it is usually human-ignited fires that start in or near populated areas. Of human caused wildfires, [95% occur within half a mile of a road](#). Only 3% start in wilderness, backcountry areas. [Over 53%](#) more wildfires occur within 200-meters of a road than would be predicted by a random distribution. Nor do roads serve as effective fire breaks.

The most destructive fires are those that spread [abnormally rapidly](#). Thinning and prescribed burns further open the door for invasive grasses, like [cheat grass](#), which is highly flammable but also [fire tolerant](#). The authors of a [recent study stated](#):

“It is also known that invasive grasses can drive increases in size, occurrence, and frequency. Because grass-fueled fires are some of the fastest, it may follow that fire speed may have also increased where vegetation transitions have occurred, for example, from forest or shrubland to invasive grassland.”

In the US, six different invasive grasses have been tied to a [150% increase in fire frequency](#) compared to uninvaded areas. One invasive grass now spreading in Oregon, *Ventennata*, has created fuel loads [50 times greater](#) than in areas free of the species

A long list of other research that found “fuels treatments” like thinning and prescribed burns do not decrease wildfire severity and risks can be found [here](#).

Forest trees provide the same benefits as urban trees, such as stabilizing local climate by [transferring heat](#) from land surfaces to higher in the atmosphere and buffering temperature

extremes. On a global scale, forests reduce earth's temperature about [0.5 degrees C](#). Trees release water vapor and biogenic volatile organic compounds (BVOCs) which [promotes cloud formation](#), and [contributes further](#) to cooling and formation of condensation nuclei, more cloud formation, and ultimately precipitation. Thinning forests in Northern California to feed these pellet plants would have a damaging effect on the water cycle.

2. The project is climate malpractice.

The climate crisis was called the greatest threat to global public health by [more than 200 medical journals](#) in 2021. It is also well understood that if there is still a window for averting an accelerating climate disaster in future decades, triggered by multiple irreversible tipping points, that [window is very short](#), now only [about five years](#) at the most.

The science and empirical evidence behind the global warming/climate crisis is indisputable. Last year was globally [the third hottest year ever](#) despite the cooling effect of La Nina which typically causes temperatures to drop. The year before, 2023, was the hottest year in recorded history, and the past ten year span has been [the hottest decade ever](#). Warnings from climate scientists are [increasingly dire](#). The World Meteorological Organization's [State of the Climate 2024 Update](#), released in Nov. 2024, once again issues a Red Alert:

...at the sheer pace of climate change in a single generation, turbo-charged by ever-increasing greenhouse gas levels in the atmosphere. 2015-2024 will be the warmest ten years on record; the loss of ice from glaciers, sea-level rise and ocean heating are accelerating; and extreme weather is wreaking havoc on communities and economies across the world."

But the climate crisis is also the dominant threat to our forests, and will grow even more so in the future. Any policy however well-intended or otherwise meritorious, is irrational unless it prioritizes above all else, its impact on climate, especially the short-term impact.

Any public policy that accelerates this trend is irrational and a betrayal of humanity across the globe. That means, for example, even policies intended to improve certain wildlife or vegetative habitat, but require forest thinning, must be suspended if they also worsen the short-term atmospheric carbon equation. For virtually any public policy that impacts our climate, those climate consequences must be given priority, especially those with immediate impact on atmospheric carbon.

Thinning and prescribed burns under the premise of wildfire reduction or control are not just misguided but are counterproductive. Fuel reduction forest management is associated with [high forest carbon storage losses](#). Forest thinning and prescribed burns exacerbate the climate crisis directly and immediately in two ways. One, the carbon absorption by trees and vegetation is

immediately ended when they are cut down. Two, burning, as with prescribed burning or pile burning, immediately releases that carbon into the atmosphere. These projects result in a [net tree mortality](#)—i.e., they kill more trees and carbon storage vegetation than they prevent from being killed, and therefore they only add to the climate crisis, and at the worst possible time. Any argument that forest thinning is so effective in reducing wildfire carbon emissions that it more than offsets the two factors mentioned above is [completely lacking in supportive evidence](#).

Even [USFS researchers acknowledge](#) that “wildfire reduction strategies reduce carbon sequestration potential in the near term, but provide long term benefit.” But as we pointed out above, policies that negatively affect climate on the short term, must be suspended, even if they have the potential for benefit decades later. Replacement trees obviously cannot grow fast enough in any meaningful time frame for their carbon absorption to offset the carbon released from burning them.

3. The project is public health malpractice.

For multiple reasons wood smoke from any source is the [most toxic type](#) of air pollution the average person ever inhales, whether it comes from a fireplace, wood or pellet stove, wildfire, or a prescribed burn. Beyond greenhouse gases, burning biomass emits pollution gases like sulfur dioxide (SO₂) and ammonia (NH₃), ozone precursors nitrogen oxides (NO_x), volatile organic compounds (VOCs), and both filterable and condensable particulate matter, primarily smaller than 2.5 µm, and an array of many of the most toxic chemicals known, including dioxins, furans, and dioxin-like polychlorinated biphenyls, benzene, polycyclic aromatic hydrocarbons (PAHs), formaldehyde, and acrolein.

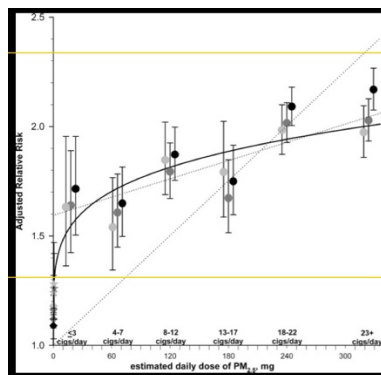
In total, on a national scale, emissions from prescribed burns are just as damaging to human health as those from wildfires. A [recent study](#) concluded that annually, nationwide, wildfire smoke and prescribed burns combined to cause the deaths of 20,000 Americans a year, and slightly more than half of those deaths were caused by prescribed burns. If that is the case, it challenges the assumption that human health is being protected by prescribed burns.

[A review article](#) of research on characteristics of biomass burning emissions establishes several important factors on the issue of whether or not the more intense wildfires that prescribed burns are supposed to prevent, are in fact more harmful to human health. It is not just the amount of particulate pollution being emitted, many factors influence toxicity of biomass burning emissions: the size and shape of the particles, their chemical composition, the age of the particles in the atmosphere, and the type and species of biomass being burned. In turn many factors influence those characteristics, such as the intensity or temperature of the burn, the amount of oxygen in the flame, combustion efficiency, and the progression phase of the burn, i.e. flame or smoldering.

The review found that very intense fires, as opposed to lower-intensity burns like prescribed burns, had higher concentrations of incomplete combustion, and created larger particles. Particle size is extremely important in assessing toxicity of the particles. Smaller particles are more easily inhaled, more difficult to exhale, more easily picked up by the blood stream in the lungs, and then more easily penetrate organs, tissues, and individual cell membranes once those particles are distributed systemically in the blood stream. Moreover, the smaller the particle the greater the surface area for an equal amount of particle mass. The greater surface area allows more toxic chemicals and heavy particles to be adsorbed on to the particle and greater chemical surface reactivity with body molecules. The smallest particles [trigger the most oxidative stress, inflammation, tissue injury, and DNA damage.](#)

Although inhaled particulate matter of any size can cause health problems, in general, the smaller the particles the more damage they can do compared to an equal amount of particle mass consisting of larger particles. **On that basis alone, the larger particles of more intense wildfires are less toxic than smaller particles typical of prescribed burns.** Other [studies](#) have shown that per ton of biomass burned, low intensity burns [produce more smoke emissions](#) than higher intensity burns.

It is well known by every relevant medical organization and governmental regulatory agency in the world, there is [no safe level of air pollution](#), it is harmful at even very low concentrations. Furthermore, it is also well known that the dose response curve between air pollution concentration and adverse health outcomes is not linear, but hyperbolic, i.e. steepest at the lowest concentrations. Every critical organ system can be harmed by air pollution, [including every cell in the body.](#)



Hyperbolic, air pollution dose response curve. This graph demonstrates there is no safe level of particulate pollution, and that the relationship between dose exposure and disease is the strongest at the lowest doses.

This means that even small increases in exposure to communities in rural areas is harmful to their health, and that includes from prescribed burns and slash pile burning from forest thinning.

A [recent study](#) is cited inappropriately as justification for prescribed burns in the Western United States. Kelp et al. (2025) found no significant reduction in wildfire severity from thinning, but did find a significant reduction in fire severity from prescribed fire conducted less than two years prior to wildfire. The study also reported substantial reductions in particulate emissions from prescribed fire. However, on page 10 of that study, the authors base their results regarding particulate emissions reduction on the assumption that "on average 75% of the land treated by Rx [prescribed] fire burns in a wildfire within the next 8 years", which the authors say "agrees well with encounter rates for Northern California (Beidler et al., 2024)." However, only a small portion of one western U.S. state (California) had an encounter rate (prescribed fire area later burned in wildfire) anywhere near this high, and that tiny portion of the western U.S. was a profound outlier. [Beidler et al.](#) (2024) reported, in Table S8 (Supplemental Information Table S8), that even over the course of 10 years the encounter rate in western US states ranged from 7% to 17%, not 75%. Therefore, the particulate emissions reduction results reported by Kelp are not applicable to the vast majority of areas in the western U.S., either because wildfires mostly do not encounter previous prescribed burn units within a given decade, or because prescribed fire would have to be conducted far more often--unrealistically often--to achieve a higher encounter rate.

4. Fuels reduction projects are often paired with massive herbicide use, another public health hazard

Forest managers often use massive amounts of herbicides as part of their "fuels reduction" projects, even extolling it as an ["integral part"](#) of modern forestry practice because they claim it [increases forest wood volume](#) and even biodiversity. This particular project is also paired with widespread herbicide use.

But ten years after their use, herbicides (typically glyphosate, i.e. Roundup) can still be shown to [reduce plant species diversity](#) in the understory. But the human health impacts are far more alarming, and are usually dismissed or [completely misunderstood](#) by those who make decisions on their use in forestry.

As biologic poisons, pesticides (herbicides and insecticides) have always been recognized as a hazard to human health, and their use has been controversial since at least 1962 with the publishing of Rachel Carson's *Silent Spring*. The idea that widely distributing biological poisons would leave beneficial plants, animals, and humans unharmed never made scientific sense, and in recent decades, a growing body of research confirms they do damage to far more of the biological world than just pests. But now the danger of the use of pesticides is likely exponentially greater.

A second dimension of concern emerged in the 1990s with research that showed many pesticides (including the most commonly used herbicides containing glyphosate) [were also endocrine disruptors](#), i.e. they mimicked or antagonized critical human hormones at extremely low dose

exposure, adding an entirely new level of scientific evidence of their harm to human health. Endocrine disruptors have been identified as causing a wide spectrum of harm, especially at the earliest, most critical stages of human development; in utero, infancy, and childhood. Clinical consequences include developmental disorders, reproductive toxicity, multiple cancers, immunosuppression, and damage to the brain and nervous system. Many pesticides degrade into metabolites that have [even stronger endocrine disrupting characteristics](#).

Because of this research, in 1996, Congress mandated EPA test all pesticides for endocrine disruption potential. Twenty-nine years later that still has not happened and [EPA's regulatory process largely ignores the issue](#). Independent researchers meanwhile have strengthened the evidence of harm from endocrine disruptors. Glyphosate is still the most commonly used herbicide, despite increasing resistance developing in many plant species. It is now recognized as an [endocrine disruptor](#). A detailed case against the use of glyphosate can be found [here](#).

A third dimension of public health harm from pesticides has emerged in the last few years that almost certainly dwarfs the previous two. Scientists from throughout the world are finding [PFAS in many of the most commonly used pesticides](#). The presence of PFAS can be both intentional and inadvertent, i.e. intentionally incorporated into the active ingredient, as inactive ingredients used to enhance efficacy, or from leaching from storage containers.

Last year the CDC made an unprecedented recommendation that physicians consider testing their patients' blood for PFAS or "forever" chemicals. That they have never made any such recommendation for any other toxic chemicals speaks volumes about the unprecedented danger of these chemicals. In 2022, EPA made stunningly strict drinking water guidelines for forever chemicals; for the two main categories [.02 and .004 parts per trillion \(ppt\)](#). To give that a visual context, that is the equivalent of 1 drop of water in a lake the size of six Rose Bowl stadiums, and one drop of water in a lake the size of 30 Rose Bowl stadiums.



Then in April last year EPA made enforceable, nationwide drinking water standards for these chemicals that are so strict it means EPA essentially believes there is [no safe level](#) of PFAS exposure. They made the standard equal to the [detection capability](#) of current technology, i.e. 4 ppt (parts per trillion).

Reflecting growing worldwide alarm in the scientific community, a pollution researcher at the UK's Liverpool John Moores University, Patrick Byrne, said PFAS are [“probably the greatest chemical threat the human race is facing in the 21st century.”](#) [Twenty-nine states](#) have adopted at least some laws to protect their residents from PFAS in consumer products and more is being planned.

Global contamination with PFAS now intersects with pesticide use because the evidence is overwhelming there is wholesale contamination of pesticides with PFAS chemicals, and many pesticides break down into still toxic, [short chain PFAS](#) type chemicals. [Seventy percent of pesticides](#) introduced to the market since 2015 qualify as PFAS compounds. As a former EPA scientist, Kyla Bennett [said](#), “If the intent was to spread PFAS contamination across the globe there would be few more effective methods than lacing pesticides with PFAS.”

There is already widespread PFAS pesticide contamination of every component of the global environment, including [drinking water and the food supply](#). Nearly [100% of humans](#) carry PFAS in their blood in very disturbing amounts, including newborns, and pesticides are a major reason. Women, fetuses, infants, and children are [more susceptible](#) to the health hazards of pesticides and PFAS. European scientists said, “The extent of this [contamination is shocking](#). It is a result of political failure at many levels.”

Pesticide use in forested areas is largely unrestrained, and decisions about mass spraying are made by private contractors, lumber companies, and government agency employees who have no expertise in the health consequences of the products they are exposing the public to. This lack of oversight is irrational, and it is now wholly unacceptable. There is strong evidence that the mass use of pesticides is now a serious, global public health threat on an unprecedented level because of endocrine disruption and now PFAS contamination. Indeed these extremely hazardous chemicals are likely found in the emissions of pellet combustion.

Pesticides can drift [thousands of miles](#) from where they are applied. Typically about 25% of sprayed pesticides become airborne and capable of contaminating ecosystems hundreds and even [thousands of miles away](#).

Sincerely,

Brian Moench, MD
President, Utah Physicians for a Healthy Environment (UPHE)

Board Chair, Doctors and Scientists Against Wood Smoke Pollution (DSAWSP)