Data Submitted (UTC 11): 1/8/2020 5:17:00 PM
First name: Honor
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Organization:
Title:
Comments: Thanks for the opportunity to comment. I am responding as a human being who tends toward wanting to inhabit the wild landscape rather than a "user" of the resource. As I cannot possibly get through this vast document, my comments are relatively limited, though I wish I could respond more broadly and with further education as to how to form a cogent and productive response. That said, I feel a moral obligation to respond.

I was at the Forest Service meeting at Kingwood hoping to be informed about how the Foothills project would be impacting our local and regional communities. And by communities, I mean human, plant, animal and aquatic communities affected by this uncommonly large project area. Instead, we were in a crowded room, patiently waiting through patronizing explanations as to why and how the forest service wants to speed up projects and shown how the budget for fire so far eclipse the other forest management budgets and expected to believe that this was because our forest depends on fire.

We were not allowed to ask questions and learn from each other as a collective, rather we were dispersed into a crowded, noisy chaotic search for information around the room. This was anything but informative and productive. And I listened as the person in charge denied so many requests for additional time to digest and respond to the huge document for the foothills project, given the poorly timed comment period over the holidays. If my comments reflect that I haven't been able to fully scan and digest this document, I apologize in advance for any oversight in my comments.

First, let me just state some of my concerns, as no doubt this letter may spark emotions before long:
The project leaves out the opportunity for public comment after specific site locations are identified for actions.
I oppose the generous use of herbicide as a management tool and don't see any alternatives explored in your document
Has there been any exploration of effects on archaeological sites in these areas?
I don't see that this proposal considers the great number of acreage that is changing due to SPB and HWA infestations or factors these in to the desired number of openings and early and mixed successional habitats.
Much of the project area is in temperate rainforest and an area where fire has not been part of our ecosystem in the way that you are proposing. I object to your plan to transform our landscape to require an ongoing fire regime
Because of the deleterious health effects to residents - smoke from wood, accuserants, herbicides burning
Because of the health effects to wildlife
Because of likely soil degradation
6) I am opposed to the construction of additional roads on the forest and approve of road closures where Indicated

My experience of the CONF only goes back 50 years. Before and after so called "fire suppression" era, I don't recall more than a very few fires on the forest and likely mostly only arson related. I can think of a few fires that started by lightning and didn't get terribly far. So many areas that are considered problematic and in need of management have become this way due to mis-management in the past.

This plan appears to be designed to transform our landscape into "fire dependent" foothills. At a time when too much of the planet is trending toward fire and our local forests are NOT, why on earth would we want to transform our public lands to perpetual burn units?

Starting in a forest that does not normally burn, the first prescribed burn creates a new fuel load and risk. The second prescribed burn creates MORE fuel load and higher risk to the forest, and ensuing years require

perpetual burning. When you decide to ADD 55,000 acres of burn units, this is not a one time burn in these units, it's perpetual ad infinitum. There will be no turning back in what has historically been a temperate rainforest.

Our historical average rainfall in Rabun County has been around 70-90+ inches per year. 2019 brought 91 inches. 2018 brought 120 inches to our area. Changing our landscape with perpetual fire will bring undesirable change to our local climate.

Say nothing of the carcinogenic effect on all of us in a nearby radius, how does this affect our carbon load? How does this affect our rapidly changing climate, both local and global?

Further, at a time when Australia is burning wild, the Amazon is being blazed by corporate interests and our own west coast is blazing a bit more than usual, WHY create a fire regime that at the present moment does NOT exist? Out of laziness and greed = because it's cheaper and easier? Because your budget driven plans begin with Fire and Herbicides?

In recent years, I have been smoked out of my neighborhood and sickened on many occasions, due to prescribed burns on the national forests both in GA and SC. How are the wildlife affected by all this fire and poison?

It concerns me doubly that not only am I inhaling carcinogenic particulates of burning trees, burning kerosene and other accelerants, but I am inhaling burning herbicides imbedded in the stands that have been sprayed. Where is the research that says it is safe to inhale any of this?

I was exposed, in 2007, to freshly applied Arsenal AC (53.1% Isopropylamine salt of Imazapyr) on our national forest in Rabun County. A late friend and I were walking through an area that unbeknownst to us had been sprayed probably an hour earlier by a contractor. This area was not marked in any way to alert us to the misfortune we stepped into. We had walked across probably 50 yards of logged over stump sprout that had been sprayed when I realized we were both covered with blue-green liquid.

Within a couple of days, I was struggling with esophageal reflux for the first time in my life (and off and on since that time), followed by a terrible bout of bronchitis such as I had never experienced before. My friend called 5 years later to let me know he had advanced esophageal cancer. You can perhaps imagine, considering the reflux the herbicide had caused in me, my shock and dismay at my friends ill-fortune. I'm sad to say he is no longer with us or he'd be submitting comments along with the rest of us, and you can be assured that he'd object just as heartily to the egregious use of pesticides on our precious resource.

I have suggested in the past to a ranger on our district that goats might be a viable alternative to the application of poisons to our landscape and my comment went unanswered. Maybe it sounds silly, but think about it, not only would the understory be cut down, but it would be Fertilized in the process rather than degraded by the persistent accumulation of pernicious chemicals (a large percentage of which we don't even have a right to identify in the form of surfactants). And it seems the idea has taken off in the last few years, both in rural areas and on some public lands. In any case, I would like to see some viable alternatives to herbicide use.

We are already overloaded with an exponentially increasing amount of pesticides all around us - DOT spraying all roadsides and medians, UTILITY companies spraying all rights of way, residential and rural, RAILROADS spraying all railway corridors, local urban and rural municipalities spraying government and recreation resources, corporate and industrial interests, and private citizens. I cannot (nor do I want to) fathom how many thousands (millions?) of tons or pesticides are accumulating all around and INSIDE of us.

Personally, I retreat to the forest and the river to restore my balance, my health, thinking I am walking barefoot on clean soil, breathing clean, fresh air and swimming in pure, clean free flowing waters. Of course this was once

the case, but no longer. This project ensures that it will NEVER be true. I will NEVER breathe clean air, walk on clean ground free of poisons nor swim in water free of pernicious chemicals. Shame on. you.

The fact that we are, as a species and especially as a culture in the USA, greedy and lazy is hardly a reason to poison the land we have inherited by sheer luck of birth. The fact that because it is "cheaper and easier" than manual treatments is no reason to implement pesticides on our watershed, especially without researching the effects - and cumulative effects - across the landscape an on the vast array of species affected by them, plants, animals and humans alike.

The forest is a living breathing community and this project has stepped to a new level - excluding public input going forward for such a wide swath of implementation.

Decision matrices appear to have been built from the bottom up.

It appears to me that some areas of the project are intended to achieve opposite results to others, as if what's happening naturally in some areas is being curtailed only to be an objective in another area.

Following are some excerpts of research into the effects of herbicide use and sources cited, just a smattering of information that simply shows that these chemicals are not simply "harmless" as the FS would have us believe.

For myself, I only need look as far as my own personal experience with the effects of these pernicious chemicals - and these from only limited exposure. My health has been directly adversely affected by exposure to smoke and herbicide on our national forest, and additionally from herbicide use in utility rights of way and along our roadways.

The management of our forest resources should be motivated by what keeps our forests strong and healthy and vibrant rather than by what is driving the budget or the market. Our forests were designated by the Weeks act primarily to protect the health of our watershed first and foremost. This comes before corporate or private interests or user groups.

A forest if is a complex living organism and we should learn to inhabit such a place and learn from it what it needs before trying to form it to our will and wants and uses and budgets and projects. It is not something to be "used" but something to be inhabited.

What you choose to do will affect your grand children and theirs in ways they will never be able to escape.

Some info on health effect of fire/smoke:

https://www.wired.com/story/the-health-effects-of-wildfire-smoke-may-last-a-lifetime/

https://www.health.ny.gov/environmental/outdoors/air/smoke_from_fire.htm
"There is also the potential for chronic health effects from exposure to the components of smoke. Long term exposure to ambient air containing fine particles has been associated with increases in cardiovascular disease and mortality in populations living in areas with higher fine particulate air pollution. Frequent exposure to smoke for brief periods may also cause long-term health effects. Firefighters, who are exposed frequently to smoke, have been examined for long-term health effects (for example, cancer, lung disease, and cardiovascular disease) of repeated smoke exposures. The findings from these studies are not consistent or conclusive. Some studies show an increased frequency of these diseases among firefighters compared to similar male reference populations (e.g., male policemen, white males in the general population), while others do not."

https://www.accuweather.com/en/weather-news/how-inhaling-wildfire-smoke-can-wreak-havoc-on-your-health-

2/432523

""If you're close to the fire, you'll be exposed to carbon monoxide, which poisons your red blood cells and interferes with oxygen uptake, [as well as] nitrogen dioxide, which dissolves in the airway lining fluid to generate a powerful acid that hurts small airways," said Dr. Brian Christman, a volunteer spokesperson for the American Lung Association.

Of particular concern is the inhalation of tiny particles about 2.5 micrometers in diameter and about 1/20th the width of a human hair, Christman said.
"These are small enough to be carried into the alveoli, the tiny air sacs of the lung," he said.
This can significantly increase the risk of stroke and heart attack.
Health impacts
Wildfire smoke can cause or worsen a number of health problems, including reduced lung function, infectious bronchitis, asthma and heart failure, according to the Environmental Protection Agency (EPA).
"When you're breathing things in, before they get to the lungs, you're affecting all of your upper airways - your nasal cavity, oral cavity, throat and vocal cords," Ordon said.
Sinus trouble and increased cough can also occur. Children, the elderly and people with certain pre-existing conditions, including congestive heart failure, cystic fibrosis and allergic rhinitis, are particularly at risk.
"If somebody has underlying respiratory problems, like asthma, emphysema, COPD and if you're a smoker, these people get into trouble quickly because they already have a compromised respiratory and pulmonary function," Ordon said."

Some information on Herbicides:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4756530/

https://content.sierraclub.org/grassrootsnetwork/sites/content.sierraclub.org.activistnetwork/files/teams/documents/The_Unintended_Consequences_of_Using_Glyphosate_Jan-2016.pdf

"The widespread and massive application of glyphosate herbicides has resulted in extensive contamination of the environment. A comprehensive 2014 study by US Geological Survey (USGS) scientists on US water systems (including rivers, lakes, streams, lakes ponds, wetlands, precipitation, soil and sediment, soil water, ditches, drains, and groundwater) over 9 years and across 38 states found Glyphosate in 39.4%
of samples and its principle metabolite AMPA (aminomethylphosphonic acid) in 55% of samples.4 5 70% of rain samples tested positive for Glyphosate.

2. Glyphosate's Activity and Mobility in Water:
Glyphosate is being detected in surface waters and groundwater wherever it is used. Glyphosate residues have been detected in surface waters across the European Union. The European Glyphosate Environmental Information Sources (EGEIS) summarized surface water monitoring from 1993-2009 for thirteen European countries. Over 50,000 samples were included. Glyphosate was found in 29% of these samples and Glyphosate's breakdown product, AMPA, was found in 50% of the samples.20

1. Review Of How Glyphosate Kills Plants:
As mentioned before, besides being a broad-spectrum systemic patented herbicide, Glyphosate is also a patented mineral chelator, antibiotic, and desiccant. It disrupts plants' metabolic shikimate pathway, which starves plants of essential nutrients and weakens their immune systems. Moreover, Glyphosate's desiccating effects reduce a plant's ability to uptake water. It essentially gives the plants a condition similar to "Aids".
As a powerful antibiotic, Glyphosate also kills beneficial bacteria and other microorganisms in the soil. Beneficial organisms fix atmospheric nitrogen for plants' consumption and are necessary for healthy plant growth.38

Without these beneficial microorganisms in the soil to compete with and suppress harmful plant soil-borne pathogens, the lethal soil-borne pathogens, such as Fusarium (**see below), take over and ultimately kill the weakened plants.39 40

2. How Glyphosate Kills Non-Target Plants:
Glyphosate doesn't just kill the targeted weeds but kills adjacent beneficial vegetation too. Glyphosate can readily desorb from soil particles in some soil types and can be highly mobile in the soil environment. Glyphosate travels from the root system of the targeted weed into the soil where it is picked up by adjacent roots of desirable plants and trees, ultimately killing them.
Don Huber PhD and Joe Holland authored an article on glyphosate and plant diseases in the European Journal of Agronomy (2009). The article demonstrates that Glyphosate predisposes plants and trees to disease and toxins. The article shows that glyphosate can increase the spread of Phytophthora (Sudden Oak Death) in oak trees (non-target species) among other plants.
Glyphosate is also a threat to non-target plants as a result of spray drift from target areas. In the US, sub-lethal doses of herbicides have been blamed for reducing winter hardiness and resistance to fungal diseases in trees.42

1 Monsanto. "Glyphosate and Roundup Brand Herbicides." Monsanto. Available at: http://www.monsanto.com/glyphosate/pages/default.aspx
2 Battaglin WA, Meyer MT, Kuivila KM, and Dietze JE. "Glyphosate and Its Degradation Product AMPA Occur Frequently and Widely in U.S. Soils, Surface Water, Groundwater, and Precipitation." Journal of the American Water Resources Association (JAWRA) 2014: 50, 275- 290, DOI:10.111/jawr.12159 Available at: http://onlinelibrary.wiley.com/doi/10.1111/jawr.12159/abstract
3 Sirinathsinghji E. "Widespread Glyphosate Contamination in USA." Institute of Science in Society. 2014. Available at: http://www.i- sis.org.uk/Widespread_Glyphosate_Contamination_in_US.php

https://www.centerforfoodsafety.org/files/2019-09-03-cfs-glyphosate-comments_23907.pdf

The EPA singles out one class of surfactants used in many glyphosate formulations as being of particular concern due to their known toxicity: polyethoxylated tallow amines (POEAs). In the Preliminary Ecological Risk Assessment, EPA assumes that POEAs are essentially the only surfactants that are toxic to aquatic organisms, and builds its entire exposure and risk assessment strategies on this overly simplistic foundational assumption (EPA 9/8/15, pp. 19, 62). Yet at the start of the registration review process, EPA revealed much less certainty, stating: Formulations with POEA "tend to be" the most toxic to aquatic organisms; but that "[o]nly a few" toxicology studies have been conducted with formulations containing surfactants other than POEA; "[f]or most formulations, we have no data"; "there are some non-POEA formulations that appear to be quite a bit more toxic than" glyphosate alone (EPA 6/5/09, p. 19). EPA also

conceded "uncertainty" about whether or not some aquatic use formulations "contain POEA-type surfactants" or others more toxic than glyphosate alone, resulting in "considerable uncertainty about the risk to aquatic organisms" (Ibid, pp. 19, 31). In light of the data gaps and uncertainty, it is entirely possible that some non-POEA glyphosate formulations are even more environmentally toxic than those with POEA. This is also true with respect to human health.
Experimental studies suggest that the toxicity of the surfactant, polyoxyethyleneamine (POEA), is greater than the toxicity of glyphosate alone and commercial formulations alone. There is insufficient evidence to conclude that glyphosate preparations containing POEA are more toxic than those containing alternative surfactants" (Bradberry et al. 2004).
While Bradberry et al. dealt specifically with acute exposure to glyphosate formulations, the same is true of

chronic exposure.
EPA admitted that it had not even identified the surfactants in many glyphosate formulations: "There are many formulated products for glyphosate and the surfactants used in these products that [sic] must first be identified" (EPA 6/5/09, p. 31). EPA was still scrambling to gather this basic formulation information seven years later (Gillam 2017). In 2016, EPA Chemical Review Manager Khue Nguyen emailed Monsanto executives with a "time sensitive" information request (EPA 4/6/16). In the notes attached to that email, regarding a meeting held the previous day between EPA and Monsanto, she stated:

Several peer-reviewed animal studies on glyphosate and glyphosate formulations support its association with adverse effects on the liver and kidney, including metabolomic and proteomic markers of non-alcoholic fatty liver disease (Mesnage et al. 2015, Mesnage et al. 2017, Milic et al. 2018, Ren et al. 2019). Another study found glyphosate excretion is significantly higher in patients with nonalcoholic steatohepatitis, and a significant dose-dependent increase of glyphosate exposure with increase in fibrosis stages (Mills et al. 2019). Several studies suggest these effects may be mediated by the effects of xenobiotics, including glyphosate, on the gut microbiome (Bonvallot et al. 2018, Caussy et al. 2018). EPA concedes it does not collect guideline toxicity studies on the effects of pesticides on the gut microbiome (EPA 4/23/18, p. 9), so effects of this sort go unexamined. More study of glyphosate's impact on the gut microbiome is needed (Mao et al. 2018).

C. Glyphosate persists in bone and bone marrow
EPA's cancer assessment of glyphosate included a brief discussion of glyphosate's absorption, distribution, metabolism and excretion (ADME), data that "may provide valuable insights into the likelihood of human cancer risk from exposure" to glyphosate (EPA 12/12/17, p. 93). ADME studies are conducted in experimental animals to assess a xenobiotic's distribution within the body, its potential metabolism into breakdown products, and the rates at which it is absorbed into the bloodstream and excreted. EPA's conclusions from the mostly uncited studies it reviews were that "the amounts of glyphosate detected in tissues were negligible indicating low tissue retention following dosing," that most glyphosate was excreted unchanged in feces and urine, and that "elimination was essentially complete by 24 hours indicating that glyphosate does not bioaccumulate."
The cancer most associated with glyphosate exposure in human epidemiology studies is non-Hodgkin lymphoma (NHL), a cancer that begins in lymphocytes, which are infection- fighting white blood cells produced by lymph tissue. NHL can originate anywhere lymph tissue is found - including lymph nodes, spleen, thymus and bone marrow - and spread to other parts of the lymph system (ACS undated). Thus, it might be of interest to learn whether glyphosate is distributed to organs with lymphatic tissue, where it could potentially affect the development of lymphocytes. Below, we discuss several ADME studies in which radiolabeled glyphosate was measured in various tissues, such as bone and bone marrow, of experimental animals dosed with the herbicide.
Monsanto scientists Brewster et al. (1991) found 4.7% of the glyphosate they fed to rats was in their bones 6.3 hours later, with 1.1% still present after seven days. Elimination followed a two-phase pattern, with a very short period of rapid elimination followed by a second phase in which glyphosate levels in bone declined much more slowly. Glyphosate levels were not reported in bone marrow specifically.
Several other studies arrived at more or less similar results (see JMPR 2004, pp. 96-103 for the following discussion and references). Ridley (1983) measured glyphosate in blood plasma and bone marrow of rats at several timepoints up to 10 hours after an intraperitoneal

injection, and found rapid elimination of glyphosate from plasma, but slower elimination from bone marrow (JMPR 2004, pp. 96-97).
Powles (1992a) administered glyphosate orally to rats and measured its presence in various tissues 4, 10 and 24 hours later. At both 10 and 24 hours, bone and bone marrow were among the tissues with the highest levels of glyphosate (JMPR 2004, p. 99). Powles (1992b) had similar results in experiments involving oral administration of single or repeated doses, and intravenous admintration, of glyphosate to different groups of rats. After 7 days, "[t]he highest concentration of glyphosate was found in bone, with lower concentrations in bone marrow, kidney, liver, lungs and the residual carcass" (JMPR 2004, pp. 99-101, Table 7).
Davies (1996a, 1996b, 1996c) conducted similar studies, only the rats were sacrificed and tissues measured for

glyphosate after only 72 hours. These studies also found by far the highest levels of glyphosate remaining in the rats were in bone tissue, whether the glyphosate was administered orally in one or repeated doses. Bone marrow was apparently not tested separately from bone (JMPR 2004, pp. 100-102).
While most glyphosate administrered to test animals is rapidly eliminated via feces and urine, multiple studies show that a significant amount is retained in bone tissue, including bone marrow, even 7 days after administration (none of the studies discussed above went beyond 7 days). The mineral portion of bone is composed of hydroxyapatite (aka hydroxylapatite). The calcium is present as a divalent cation (ion with 2 positive charges). Glyphosate is known to chelate (bind to) divalent cations, including Ca2+, for instance in plant tissues (Cakmak et al. 2009). This represents a possible mechanism for glyphosate's relative persistence in bone tissue.
There is strong evidence that glyphosate and its formulations have genotoxicity both in vivo and in vitro (IARC 2015, Benbrook 2019). This evidence includes a number of positive results for glyphosate's genotoxicity in bone marrow and lymphocytes. Bolognesi et al (2009) found increased micronucleus formation in the peripheral blood lymphocytes of people living in areas of Columbia with aerial spraying of glyphosate formulations, with increases also observed in individuals tested after spraying operations took place vs. baseline levels measured prior to spraying (Bolognesi et al. 2009). Glyphosate and its formulations have proven to be genotoxic to human lymphocytes in a number of in vitro tests as well (IARC 2015, Table 4.2, pp. 49-50). In vivo tests in non-human mammals have demonstrated that glyphosate induces micronucleus formation or chromosomal aberrations in bone marrow (IARC 2015, Table 4.3, pp. 52-53), while in vitro genotoxicity assays in non-human mammalian cell cultures have also shown that glyphosate, its formulations, and AMPA can cause chromosomal damage (IARC 2015, Table 4.4, p. 55).

EPA underestimates exposure of aquatic organisms to glyphosate and associated surfactants in several ways. First, EPA assumes surfactants in terrestrial formulations degrade rapidly in the soil and do not runoff into bodies of water. This is not the case. POEAs in particular persist for months in the soil and ARE available for runoff (Tush and Meyer 2016). In its response to comments, EPA concedes that POEA may persist and enter aquatic environments, but does not change its risk assessment accordingly (EPA 11/21/18, p. 3). Second, EPA assumes that terrestrial applications of glyphosate formulations never involve direct oversprays of aquatic habitats (but rather only drift from a nearby field). This is not the case. Direct oversprays are a common occurrence, as we documented. They certainly occur in forestry applications, and vernal pools in forests are important amphibian habitat. For glyphosate formulations labeled for both aquatic and terrestrial uses, EPA proposes to exempt aerial applications over the forest canopy from the general terrestrial use prohibiton against direct application to bodies of water (EPA 2019, p. 39). Third, EPA's modeling of glyphosate (and hence surfactant) concentrations in water from runoff and drift are based on relatively large bodies of water that will underestimate concentrations in smaller bodies, such as vernal pools, where concentrations of glyphosate up to 0.328 mg/liter have been recorded (Battaglin et al 2009).

D. Glyphosate and Risks to Pollinators
It is urgent that pesticides be evaluated for impacts on pollinators and other beneficial insects. Populations of many insect species are in decline (e.g. Wepprich et al. 2019, introduction at 1-2: "...a global analysis of long-term population trends across 452 species estimated that insect abundance had declined 45% over 40 years [1]. Recently, more extreme declines in insect biomass have been observed upon resampling after 2-4 decades [4,5]), and several pesticides including glyphosate are implicated (Wepprich et al. 2019, summary at 15-16). However, EPA has not fully evaluated effects of glyphosate use on pollinators and other beneficial insects, but instead has put off this requirement and may ask for more studies (EPA 2019, pp. 14, 28).
EPA's evaluation of the effects of glyphosate use on pollinators and other beneficial insects must take into account the particular life histories and characteristics of different kinds of insects, not just honeybees. Given the great diversity of species, EPA must use the best available science, including studies done by independent researchers using a variety of toxicity endpoints: acute and chronic toxicity of glyphosate to the insects, sublethal impacts such as increased susceptibility to pathogens and parasites, changes in foraging behavior (Balbuena et al. 2015), and other aberrant changes (Faita et al. 2018) that are likely to result in lowered fitness. For
the authors state: "The [POEA] surfactant in Roundup is present at 15% (Hoogheem 1987, Sawada et al. 1988),

or 150 g/L assuming that the 15% value refers to the level in terms of weight per unit volume."

example, recent studies show that glyphosate is toxic to bee's gut microflora (Motta et al. 2018 a and b, Blot et al. 2019), which could have significant health effects.

Many of these insects depend on habitat near agricultural fields that is vulnerable to off- site movement of glyphosate in drift and run-off (Botías et al. 2019, Boutin et al. 2019). Glyphosate thus indirectly impacts pollinators and other beneficial insects via habitat degradation and destruction, including changes to species composition in affected environments since some plant species are more sensitive to glyphosate than others (Boutin et al. 2019, Cederlund 2017 a and b, Olszyk et al. 2017, Saunders and Pezeshki 2014, 2015; Saunders et al. 2013). Research shows that glyphosate use can result in changes in plant reproduction that affect which species are abundant or rare in later generations as well (Boutin et al. 2019, Olszyk et al. 2017), and thus what resources are available for particular insects.

E. Glyphosate Toxicity to Birds

Based on EPA's preliminary ecological assessment, glyphosate clearly poses chronic risks of concern in at least six glyphosate application scenarios (EPA 2019, pp. 26-27). This is true even though EPA does not have a valid NOAEC for harm to avian species. The lowest dose tested in the mallard reproduction study (501 mg ae/kg) was found to have adverse effects; both the LOAEC and the NOAEC are less than 501 mg ae/kg. Risk quotients exceeded the agency's level of concern in six glyphosate application scenarios even with illegitimate use of the non- definitive NOAEC from the less sensitive study in bobwhite quail. These risk quotients cannot be dismissed on the grounds they are conservative, because EPA has not established a legitimate NOAEC for birds, which may be far below 501 mg ae/kg.