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Brian Amme,
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Dear Brian,

1 Our center is located in the central Sierra Nevada, less than 20 miles from Yosemite National Park, and downwind from the Central Valley of California - one of the most productive agricultural regions in the world. Sadly, we are currently witnessing first-hand an ecological disaster caused, in part, by agricultural herbicides that *drift* into the Sierras from the Central Valley. According to recent research by University of California, US Forest Service, and National Park Service scientists, mountain yellow legged frogs and Yosemite toads have been exterminated from entire mountain basins that once teemed with them. Even wilderness areas of Yosemite National Park and the adjacent Stanislaus National Forest are affected by pesticide drift. Scientific studies show that agricultural herbicides are partly to blame for the demise of amphibians, by weakening their immune systems and making them more susceptible to disease. We can only hope that these herbicides and pesticides are not already having a similar effect on other at-risk plant and wildlife species, or sensitive humans. However, common sense suggests that past and present herbicide use is affecting organisms and ecosystems in ways that we have yet to fathom. Only time will tell what the long-term consequences will be. Regardless, we have already seen the harmful cumulative effects of herbicide use first hand.

2 Because herbicides are so harmful, we urge that their use only be allowed as a last resort on BLM lands, and only when other means of vegetation management are highly likely to fail. Herbicide treatments should be considered the "nuclear option". If and when herbicides are used, they need to be used with the greatest care, carefully avoiding

sensitive species, aquatic habitats, and at-risk humans. To avoid contaminating these non-target resources, herbicides should never be applied aerially.

Furthermore, we propose that herbicide treatments should only be allowed when success of the specific project and avoidance of negative impacts can truly be guaranteed by the BLM. For this purpose, project success should be defined as "the rehabilitation to a self-perpetuating native plant and animal community free of exotic-invasive species".

CSERC agrees that exotic-invasive species need to be aggressively managed for the good of ecosystem health on BLM and other lands. However, the BLM has a responsibility not only to maintain the ecological health of the lands it manages, but also to do no harm to the greater global ecosystem in the process. For this reason **the order in which we prefer the alternatives is:**

1. **Alternative C - no use of herbicides**
2. **Alternative D - no aerial application**
3. **Alternative E - no use of acetolactate synthase inhibiting herbicides**
4. **Alternative B - expand herbicide use and allow for use of new herbicides in 17 western states (BLM preferred alternative)**
5. **Alternative A - continue present herbicide use (no action)**

To be clear, we strongly endorse the selection of Alternative C. If the BLM ignores this input and chooses an herbicide alternative, then, and only then, we would endorse Alternative D. Our position is detailed in the following arguments:

Herbicides are harmful to plants, wildlife, their habitats, and ecosystems. This is repeatedly affirmed by statements made in the Herbicide PEIS. For example, the PEIS points out that herbicides are harmful to plants and animals. "Herbicides pose risks to terrestrial and aquatic vegetation" (p. ES-4), and "Effects to animals could include death, damage to vital organs, decrease in growth, decrease in reproductive output and condition of offspring, and increased susceptibility to predation" (p. ES-5). Even worse, as the PEIS states: "Threatened, endangered, and sensitive (TES) aquatic organisms and wildlife would be at slightly greater risk from herbicides than non-TES species..." (p. ES-5).

Not only would individual plant and animal populations potentially be harmed by herbicide treatments, negative effects would extend to soil and water quality and ecosystem and watershed function. "Treatments would lead to cumulative loss of soil from removal of vegetation and erosion..." (p. ES-5,6), and "Several herbicides used, or proposed for use by the BLM, are known groundwater contaminants" (p. ES-4). Herbicide treatments with these serious consequences should not be allowed. "Treatments

could result in short-term irreversible loss of some resources, including soil, vegetation, wildlife, and livestock forage opportunities" (p. ES-6). CSERC asks, how can losses be both short-term and irreversible?

Herbicides are harmful to human health. The PEIS states, "Treatments could harm the health of workers and the public" (p. ES-6), and "At typical application rates, workers would ...[be at risk]...when using diquat, 2,4-D, 2,4-DP, atrazine, bromacil, diuron, fosamine, hexazinone, mefluidide, simazine, or tebuthiron. At maximum application rates, there are also risks associated with the use of chlorsulfuron, fluridone, and triclopyr" (p. ES-5).

Herbicides and other pesticides are associated with several public health risks from acute poisonings to chronic effects like cancer and asthma. For instance, there are about 110,000 non-fatal human pesticide poisonings each year in the United States. In addition, use of certain pesticides has been linked with rising rates of specific human diseases, such as breast cancer. Extensive exposure to some herbicides and other pesticides has also been shown to have adverse respiratory and reproductive effects, ranging from asthma to sterility. The adverse health effects of herbicides include: cancers (diuron, oxadiazon, simazine, norflurazon, oryzalin, isoxaben, bromacil); reproductive and development disorders (diuron, oxadiazon, norflurazon, bromacil); liver toxicity (diuron, glyphosate, oxadiazon, simazine, norflurazon, oryzalin, isoxaben); kidney toxicity (glyphosate, oxadiazon, simazine, oryzalin); blood disorders (diuron, simazine, norflurazon, oryzalin) and other adverse health effects.

The PEIS states that there is a need for the approval of new herbicides because they are purportedly safer than old ones. "Many of the herbicides currently available for use by BLM pose risks to fish and wildlife"(p. ES-4). Yet diquat, one of the new chemicals proposed for use, is known to be "fairly toxic to livestock, wild horses and burros as well as workers" (p. ES-5). Furthermore, World War II era herbicides that are known to pose heath and ecosystem risks are still proposed for continued use by the BLM.

Herbicides are harmful to wilderness and other recreational resources. Once again, the PEIS, itself, supports this argument. "Herbicide treatments could affect visual, wilderness and recreation resources. Treatment would remove and discolor vegetation, making it less visually appealing" (p. ES-5), "Treatments in wilderness and other special areas would detract from the 'naturalness' of the area" (p. ES-5), and "Recreationists could be exposed to herbicides, experience less visually-appealing landscapes, or find fish and game less plentiful as a result of treatments" (p. ES-5). None of these is an acceptable consequence of vegetation management.

Herbicides treatments harm Native peoples. The PEIS states, "While herbicide treatments could affect cultural or paleontological resources near or on the surface, they would be more likely to affect traditional cultural practices of gathering plants and the health of Native peoples" (p. ES-5), and, "Native peoples would be exposed to risk when picking berries in areas treated with diquat. They could also face risk when consuming fish contaminated with 2,4-D, hexazinone, or picloram. Native peoples face risk from diquat or fluridone when they are accidentally spilled or used at maximum application rates" (p. ES-5).

Herbicide treatments raise environmental justice concerns. Again from the PEIS, "There are potential environmental justice concerns because a large number of Native peoples and other minority groups live in the West and work in industries (e.g. forest products, herbicide applicator) or conduct activities (e.g. gathering of plants for traditional uses, recreation) that could potentially expose these groups" (p. ES-5).

Herbicides treatments harm cultural and paleontological resorces. "Treatments could add to the cumulative loss of paleontological and cultural resources" (p. ES-6).

Not surprisingly, the PEIS states "**In general, potential direct and indirect adverse impacts...would be greatest under the Preferred Alternative**" (p. ES-4). CSERC agrees with this statement and proposes that it is more than sufficient a reason not to select Alternative B.

Because herbicide use poses so many dangers and is potentially so harmful, the BLM should exhaust all available alternative weed management strategies prior to considering herbicide treatments.

There are safe, effective, alternatives to herbicides for weed control. **Manual removal** (hand pulling) is the most effective and selective method of weed control and poses the least potential collateral impacts. Because it is labor intensive, the BLM should consider using inmate labor where feasible. Inmate work teams are used successfully for fuels reduction treatments and fire suppression, and it seems obvious that inmate labor could be used effectively to remove weeds as well.

When properly planned and managed, **prescribed fire** can be used to control many exotic invasive weeds, while providing multiple collateral ecological benefits. Among these are reduction of non-fire adapted invasive exotic species, reduction of wildfire risk, and return to a natural fire regime - all goals of the BLM in land management. The utility of prescribed fire should not be underestimated, and it should be used more frequently than at present.

In some situations, **selective grazing** by various livestock species can be an effective method of weed control. The introduction of a particular livestock animal, such as geese, goats, cattle, and sheep, can reduce pest weeds and make the pasture and/or range land more productive. As a technique it also has the added benefit of involving "charismatic attributes" that may be useful in engaging the public on noxious weed management.

In some cases, the use of **biological control agents**, such as insects, can selectively remove one weed species from a pasture, range, and/or natural ecosystem with minimal ecological effects. The effectiveness of this technology has been demonstrated for more than a century. For instance, an introduced biological-control insect proved highly effective against the serious Klamath weed infestation in California. Biological pest control using natural enemies in the United States provides an estimated $12 billion/year in benefits. Not only is the use of biological controls economical, but once established, these insect species provide permanent, effective control of the weed or other pest.

Where chemical use appears to be the sole alternative, there are several **herbicides made from natural ingredients**. Those that contain clove oil (eugenol) control young broadleaf weeds. Products containing acetic acid, often in combination with citric acid, are effective on young grasses. Some products contain both clove oil and acetic acid, so they are useful for a broad variety of weeds. Soap-based herbicides dehydrate leaves by cutting through their protective layer of cutin. All of these types of organic herbicides work best on young weeds and pose only a temporary setback to well-rooted perennial natives.

The safe, effective management and control of established exotic-weeds requires input from and the joint effort of scientists from several distinct disciplines, including biological control specialists, chemical control specialists, wildlife ecologists, animal science specialists, economists, and the public. When properly employed, this **integrated pest management** (IPM) can produce major benefits. The basic premise of IPM centers on employing first biological and other non-chemical pest controls - with the use of chemical pesticides only as a last resort. IPM has the potential to limit the adverse public health and environmental effects of chemical pesticide use. Since pesticide effects on public health and the environment cost the United States a conservatively estimated $9 billion per year, this should be a much welcome change.

The continued spread of exotic-invasive weeds should be prevented prior to allowing any use of herbicide treatments. This can be accomplished through quarantine of colonized sites and exclusion of seeds and other propagules from non-invaded areas. The BLM should establish inspection stations or close all presently accessible routes through all invaded areas. Furthermore, the BLM needs to scrutinize its own activities and those

of other BLM land users to identify routes by which invasive weeds are transported. These may include road building, vegetation management activities (especially mowing), OHV trail use and livestock transport and grazing.

For the rare cases where herbicides may be determined to be necessary, project plans should include realistic exit strategy. Any chosen alternative should require that when herbicide treatments are used, follow-up monitoring, analysis, and rehabilitation are carried out until the desired stable native plant and animal communities are established. If herbicide treatments are not followed up by monitoring and mop-up, they can cause weed populations to increase, making the problem worse. What will stop the same or other invasive exotic species from invading after herbicide treatments? These species are, after all, adept at colonizing disturbed sites, such as those that will be created by massive herbicide treatments. If anything, herbicide treatments would favor invasive exotic species rather than native species, many of which are not able to colonize disturbed areas. The PEIS supports this: "Weeds colonize highly disturbed ground and invade plant communities that have been degraded..." (p. 2-15). Herbicide treatments disturb the existing plant and animal communities. Therefore it is obvious that herbicide treatments will only result in re-establishment of the same or some other species of exotic invasive if not followed up by monitoring and appropriate treatments.

In order to obtain the greatest success rate, herbicide treatments must be used as part of an integrated control program, with implementation of management practices that kill or remove weeds, and then prevent subsequent recruitment and seedling survival.

Page 2-15 of the PEIS states, "Disturbed areas *may be* re-seeded or planted with desirable vegetation when the native plant community cannot recover and occupy the site sufficiently". Repeated seeding or planting of native vegetation and animals should be required until self-sustaining native vegetation and wildlife communities, free of exotic invasive weeds, become established. This should be a requirement for any project, not an option.

Herbicide treatments don't provide beneficial results unless they are followed up closely until the desired native vegetation community is well established. Even after this, annual surveys should be conducted to catch re-growth from the seed bank or re-introduction of the same species or other invasive species. If exotic invasive plants do reappear, then it will be mush easier to catch them with manual removal when their populations are small. It should be a requirement of any herbicide plan to guarantee that follow-up observation and rehabilitation is planned and success is achieved.

The selected programmatic alternative should require that prior to herbicide treatments, a specific, feasible plan be in place to prevent re-introduction of the same species or introduction of other invasive exotic species into the project area. This could be as simple as excluding all anthropogenic vectors for invasive exotic species (people, vehicles, OHVs, livestock, etc.) from treated sites until stable native plant and animal communities are re-established. It should also include containment of other known exotic invasive plant populations in the area.

The BLM needs to develop and implement innovative policies focused on reducing and preventing invasions of new weed species. Dollars invested in prevention would be well spent if such expenditures can curtail a potential loss of billions of dollars to agricultural and environmental weed problems in the future.

Indeed, preventing new invaders from taking root in ecosystems is especially important, because once invading weeds are well established in natural and managed ecosystems, they are often impossible to exterminate completely.

Buffer distances between herbicide treatments and all aquatic habitats and sensitive species should be a minimum 50 feet. In an attempt to minimize potential impacts, the PEIS proposes that "Buffer zones would be used to reduce the risks to vegetation from herbicide treatments" p. ES-4). Yet in table C-16 (p. C-89)"buffer distances" to aquatic areas and non-target plants for some herbicides are zero (Chlorsulfuron, Diuron, Imazapic, Tebuthiron), and, for some, not "evaluated" (Diquat, Fluridone, and Tebuthiron). CSERC urges that a *minimum* buffer distance for any herbicide used be 50 feet from all aquatic zones and all non-target or sensitive plant and animal species. Furthermore, the buffer distances proposed in table C-16 are based on modeling, not on empirical data (Table C-16, p. C-89). "In some cases, buffer distances were extrapolated (if the largest distance modeled still resulted in risk)" (p. C-89). Considering the significant possible negative effects, the accuracy of modeling is not high enough to be sufficient for establishing buffer guidelines. CSERC strongly urges that buffer distances must be determined empirically through experimentation under controlled conditions of varying droplet size, application rate and height, and wind speed. The alternative is to be extremely conservative.

Only pesticides that identify all ingredients on the label should be allowed. Our national pesticide law only requires that certain ingredients in a pesticide (the active ingredients) be identified on the label. All the others are misleadingly called "inert ingredients" and are not identified. These same ingredients often escape from most of the

testing and evaluation required for active ingredients. They're not really inert, just untested. The public is being kept in the dark as a favor to the pesticide industry. It's time for a change. Diuron, for example, is the active ingredient of several formulations - Karmex, Karmex DF, Krovar, Krovar 1 DF, Diurex 80 DF, Diurex 4L, Diuron FL - used on California thoroughfares. The portion of diuron in these formulations ranges from 40% to 80%. The identity of the 20% to 60% of the formulations' ingredients is a secret. Chemical manufacturers conceal from the public the names of many chemicals in their formulations, and they are supported by state and federal agencies in this subterfuge. The information that is publicly available about inert ingredients, however, indicates that the majority are biologically active and toxic - often as much as are the active ingredients or in some cases, even more so.

All areas to be treated with herbicides should first be surveyed for rare and at-risk plants and animals. If rare and at-risk plants and animals are found on the site, herbicide treatments should not be allowed, or actions to mitigate impacts to rare and at-risk species should first be taken.

The environmental scope of this PEIS is too large, and it should be broken down by eco-region. There is too much environmental variation across eco-regions covered by the 17 western states. This plan should be broken down by eco-region. If nothing else, because this is a programmatic EIS, an NEPA level environmental assessment should be required for each specific site or project.

Aerial application of herbicides shold not be allowed under any circumstances. Herbicides not only destroy the target plant, but often they reduce a number of non-target plant species as well. In addition, an increase in toxic poisons in some plants - including potassium nitrate and cyanide that occur naturally in some plants - has been documented following herbicide use. These poisonous chemicals have been demonstrated to be toxic to livestock as well as wildlife, so increasingly the levels of these poisons is surely detrimental to the animals that live among these plants. Furthermore, some herbicide-tolerant plants may be physiologically affected by the herbicide. For example, several herbicides that did not kill certain non-target plants did significantly increase (up to 3-fold) the attack of pest insects on non-target plants. Similarly, plant pathogens often increase in abundance (up to 5-fold) on non-target plants exposed to herbicides. Finally, yet another disadvantage of herbicides is the often-necessary annual applications get to be very expensive.

Finally, the Federal Land Policy Act of 1976 requires that land-disturbing activities must be conducted in a manner that minimizes ecosystem degradation. CSERC argues that

large-scale use of herbicides, across 17 western states will significantly degrade native vegetation and the health of affected ecosystems and is therefore illegal. We strongly urge the BLM - at the least - to select a no-aerial herbicide treatment alternative, and we encourage the agency, ideally, to select a no-herbicide treatment alternative. Herbicides simply are not essential to land management on BLM lands, and the risks and costs associated with herbicide use do not justify the publics concern over potential chemical contamination of plants, wildlife, and water resources.

Sincerely,

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