WESTERN SLOPE ENVIRONMENTAL RESOURCE COUNCIL

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Note: these comments were also submitted via e-mail

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RE: Comments on the *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Draft Programmatic EIS (DEIS)* and the *Vegetation Treatments Using Herbicides Programmatic EIS on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Report (PER)*

Introduction and Setting

Please accept the following comments on the above-referenced Draft Programmatic EIS (DEIS) and PER on behalf of the members of the Western Slope Environmental Resource Council (WSERC). We appreciate the opportunity to provide these written comments.

WSERC is a grassroots non-profit conservation organization based in Paonia, CO. Our organization promotes "Healthy Lands, Healthy Lives", and is dedicated to protecting and enhancing the environment and quality of life in Delta County and Colorado's Western Slope. WSERC was organized in 1977 and now has approximately 450 members. We are one of the oldest grassroots environmental groups in the state, and one of the very few based entirely in a rural, non-resort community.

WSERC has a long-standing interest in the management of public lands administered by the BLM, since approximately 28% of lands in Delta County are under BLM administration. The majority of lands in Delta County are located in the Uncompahgre Basin Field Office (UBFO) Field Area, which includes the Adobe Badlands Wilderness Study Area. A smaller portion of BLM lands in Delta County are administered by the Grand Junction Field Office (GJFO), and include a portion of the Dominquez Canyons Wilderness Study Area.

In addition to the BLM lands in our County, a bit less than 1% of our lands are administered by the State, and the US Forest Service administers approximately 26% of our lands. Thus, over *half* of the land ownership in Delta County is in public lands. As such, our organization accepts responsibility as local land stewards to participate in public lands management decision-making processes. WSERC has an active Public Lands Committee. The Committee meets regularly in association with the Western Colorado Congress Public Lands Committee, as well as on its own, to plan and implement citizen involvement and education on public lands issues.

Our members are primarily concerned with assuring that environmental and ecosystem health is maintained on our public lands, and that cumulative impacts from activities associated with reducing fire risks, slowing the spread of invasive weeds, and energy and mineral resource development do not degrade our local clean air, water resources, wildlife, vegetation, or the environmental quality in the communities we live in.

Vegetation Management Alternatives

WSERC is greatly concerned about vegetation management proposals that involve the use of herbicides on BLM lands. The BLM preferred alternative ("Alternative B") will more than triple the area of current annual herbicide use, covering over 932,000 acres across 17 Western states with herbicides that include several persistent, mobile and toxic chemicals, including known developmental and reproductive toxicants. As an example, here in Delta County, the BLM proposes the use of herbicides for fire suppression and control of cheatgrass on BLM lands adjacent to residences in rural subdivisions north of the town of Paonia. Discussions with personnel in our local UBFO BLM office indicated a desire on the part of the project manager to use both imazapic and triclopyr applications in the fuels reduction project, which is of great concern to our organization.

The known (and unknown) risks associated with the use of the proposed herbicides, as well as the unknown risks associated with the use of any "new chemicals that may be developed in the future" (which would be allowed by the proposal) have not been properly placed in context in the Draft PEIS. The PEIS as presented is only one component of what should be a much broader approach to the issue of unwanted vegetation on BLM lands. Vegetation management needs to take into account the conditions that have led to the vegetation problems, and present methods for *preventing* those problems, as well as methods for *restoring ecological integrity* to sites where vegetation problems exist. The PEIS as it is presently configured addresses only the some of the issues associated with short-term treatments. Prevention and restoration are not addressed.

Effective management and treatment of unwanted vegetation can be performed using non-herbicide techniques, including fire, mechanical, manual, cultural and biological control methods. These types of methods have been used traditionally, and in many cases offer the most appropriate options for management that will protect and preserve our

local resource lands, as well as our local populations. *These non-chemical methods should be considered and integrated into the discussion and analysis presented in the PEIS.*

Any consideration of options at a site-specific level should be based in science, and should also consider whether the approach is a short-term "fix" or part of a long-term management plan that is expected to improve habitat and resource conditions. It does no good to wipe out an entire area (including non-target species) to attempt eradication of an invasive species, and by so doing create conditions that allow recolonization by the same or another offensive invasive.

A no-herbicide alternative is included in the Vegetation Treatment proposals as "Alternative C". While we are very concerned about the impacts of herbicides on our ecosystems, and are supportive of the spirit of Alternative C, we recognize that there are specific and isolated instances where a controlled judicious application may be warranted. In such cases, follow-up on the efficacy of a treatment and the ecological effects of that treatment on all affected organisms should be performed. Based on the application options presented in the DEIS, we are requesting that that **no applications using aerial deposition methods (from an airplane or helicopter) or large-area applications (greater than five contiguous acres) using boom/broadcast methods be allowed at any time**. In those instances where Alternative C is not feasible and all other non-chemical options have been explored, we allow that **spot applications delivered by boat, horse or human application vehicles may permitted. We request that the outcomes of such spot applications be monitored and analyzed for at least three years to assess the impacts on diversity of native species, attainment of ecologically effective densities by interactive species, and resilience of sensitive species and any impacted organisms.**

We are also concerned regarding the management context in which vegetation treatment decisions are made. As is emphasized in the Restore Native Ecosystems Alliance Alternative (Draft PEIS, Volume 2, Appendix G), **we request that there be written into the DEIS an explicit incorporation of an emphasis on diversity of native species, attainment of ecologically effective densities by interactive species, and resilience of sensitive species and any impacted organisms as an overall management goal in managing vegetation for fire suppression or invasive species control.**

Undesired Impacts of Herbicide Use

Pesticide drift is a serious health consideration for all organisms, and has been shown to be associated with decline in California amphibian species (1). Pesticide drift was implicated in incidents that caused more that 700 people to be sickened in the California Central Valley between 1999 and 2003 (2). In mountainous terrain in Utah, aerially sprayed insecticides were shown to move off site by several kilometers, with significant impacts to non-target lepidopterans (3). In another mountain valley study in Utah's Wasatch Mountains (4), actual spray trials were compared to modeling results for purposes of model calibration, and down-valley distances of pesticide deposition were

measured at distances over 5,000 meters (over 3 miles) from origin. The dangers of pesticide drift are real and documented across all types of terrain. *We do not want to be exposed to pesticide drift in our mountains and valleys.*

In addition to concerns about drift, we have significant concerns about volatilization by evaporation of pesticide residues. Volatilization from soil and surface water can cause loss of as much as 80-90% of certain compounds within a few days of application, and the ultimate fate of those volatilized particles can impact air, water, and organisms. As noted above, pesticide residues can be transported miles on dust particles, impacting non-target organisms at great distances from their application sites.

Under the vegetation management programs proposed by the BLM, the area of public lands that will be treated with herbicides in the 17 Western States could cover over 932,000 acres. Proposed methods of herbicide application across the BLM land programs include aerial-, ground-, or boat-based applications. Proposed application vehicles include airplane, helicopter, all-terrain vehicle, boat, horse or humans. Application methods include aerial deposition, boom/broadcast, and spot applications. While all of these components of application are of concern to WSERC, we are especially concerned with the potentials for spray drift from aerial and boom/broadcast applications, with the volatilization of pesticides in the days following applications, with the potential transport of chemicals on particulate matter, and with exposure of workers and citizens to the chemicals during and following applications.

The ENSR Exposure Assessment that is part of the PER identifies the components of an exposure pathway that results in human exposures at points of contact, following release of chemicals to the environment and transport via an environmental medium (e.g. air, water, soil). While the focus is on human "receptors", there exist in our county both plant and other animal "receptors" that are also at risk of exposures due to chemical applications. Pesticides have been shown to be harmful to a multitude of animals, including fish, turtles, amphibians, birds, butterflies and moths, mammals, reptiles, and beneficial insects. Animals can be exposed by eating other contaminated plants, insects or animals, by inhalation, absorption through skin, or drinking or bathing in contaminated water.

Similarly, humans are exposed to toxics via inhalation, ingestion, and dermal contact. The ENSR identifies and categorizes public receptors with potential for exposures as: Hiker/Hunters, Berry Pickers,Anglers, child and Adult Swimmers, Child and Adult Nearby Residents, and Child and Adult Native Americans. Since children are especially susceptible to the toxic effects of chemicals, it is appropriate that they be considered separately for analysis purposes, along with other at-risk populations including the elderly, pregnant and nursing mothers, the chronically ill, the chemically sensitive, and the immunocompromised. However, any human is at risk to the effects of pesticides, and the most risk-averse approach to preventing exposures would be to avoid any and all use of the herbicides listed in the proposal.

To take a broader perspective, we then see potential "receptors" of pesticide exposures as: our food sources, our local farms (we have an active Valley Organic Growers Association), our water sources for agriculture, our wildlife, non-target plant species, our domestic water supplies, our homes, public spaces and schoolyards. The Hiker/Hunter receptor category includes the many hunters who use our public lands, as well as birders, tourists, families, photographers, and other recreationists who come to our public lands to enjoy a more intimate experience with nature. Safe air, water and soil are expected to be a part of that experience.

Table 1 below lists selected herbicides proposed for use in the Vegetation Treatment DEIS, and contains a summary of some of the undesirable effects on human and animal health due to exposure to those pesticides. While our purpose here is not to provide a comprehensive literature review of all the proposed chemicals and their effects, this information is presented as representative of our concerns regarding these chemicals.

For example, the growing of grapes, including organic grapes for wine, is a growing agricultural pursuit in our area. Damage to grape vineyards and other crops by 2,4-D has been reported since the herbicide was first introduced in 1947 (23). We are especially concerned about the proposed use of sulfometuron methyl, one of a group of sulfonylurea (SU) compounds that are excessively persistent in the environment and cannot be detected at low levels in environmental samples (28), presenting potential long-term dangers to any human, animal or plant receptors. Sulfometuron methyl sprayed by the BLM in Idaho in 2001 to control non-native grasses and noxious weeds on public rangeland is alleged in a lawsuit to have damaged over 100,000 acres in 11 counties and resulted in hundreds of millions of dollars lost in farm revenue (29). Local tests and expert discussion leads us to question the proposed use of imazapic (trade name Plateau), since it can kill species that should be encouraged; as well as of tebuthiuron (Spike), since it has led to substantial cheatgrass expansion in certain trials (30).

Also indicated in Table 1 are the herbicides that are reported in the most recent "US Forest Service Regional Report of Pesticide Use on National Forest System Lands" (5) as having been used on our local Grand Mesa-Uncompahgre-Gunnison National Forest (GMUG under Notes). An indication that five of the pesticides in Table 1 are on the Pesticide Action Network's list of "Bad Actor" pesticides (6) is also included in the Table (PAN-BA under Notes). The "Bad Actor" list was created to identify "most toxic" pesticides. A chemical found on the list is at least one of the following: a carcinogen, a reproductive or developmental toxicant, a cholinesterase inhibitor, a groundwater contaminant, or a pesticide with high acute toxicity (7).

TABLE 1. Health Effects of DEIS Herbicides

Herbicide	Health Effects	References	Notes/Mobility
2,4-D	**Nervous system effects:** myotonia, behavioral changes, delays brain development in lab animals; associated with ADHD and autism in farm children;	7,8,5,9,10, 11, 22, 23, 40, 41, 42, 43	GMUG†; exposures occur due to air drift,

	increased risk of ALS (Lou Gehrig's disease) found; interferes with myelination in brain as result of lactational exposure **Circulatory system effects:** reduces blood's oxygen carrying ability and clotting ability **Genetic damage:** increased abnormal chromosomes, and breaks in human DNA; genetic damage in barley, wheat, rice and onions **Reproductive effects:** increased birth defects in children of farmer-applicators, lowered sperm quality in farmers; increased cell death in the earliest stages of embryonic development in mice at concentrations found in the environment **Cancer risks:** increased risks of non-Hodgkin's lymphoma in farmers, workers, applicators, gardeners, dogs exposed to lawns **Hormonal effects:** disruptive to blood concentrations of thyroxine and estradiol; suppresses thyroid, estrogen, testosterone, progesterone and prolactin **Familial effects:** use by farmers increases exposure in their children **Ecological effects:** reduces successful hatching of bird eggs; toxic to fish, earthworms and beneficial insects; damage to grape vineyards and other crops *Contaminants and inert ingredients include carcinogens, reproductive and immune toxins.*		migration of contaminated soil, residential track-in, take-home exposures from agricultural uses.
Bromacil	**Cancer risk:** classified as possible human carcinogen by EPA	6,12,13	PAN-BA[††]; mobility from target areas shown to affect or destroy xerophytic native species
Chlorsulfuron	**Environmental effects:** may cause severe reduction in the yields of some nontarget crops if they are subjected to exposure at critical stages of	5,6,14, 23, 27	GMUG; PAN-BA; persistent in soil--measured in

	development.		unaltered condition after 2 years
Dicamba (Banvel)	**Nervous system effects:** inhibition of enzyme acetylcholinesterase in humans **Circulatory system effects:** genetic damage to human blood cells **Cancer risks:** increases frequency of non-Hodgkin's lymphoma **Ecological effects:** toxic to fish and other aquatic organisms, toxicity varies widely by species **Reproductive effects:** increased cell death in the earliest stages of embryonic development in mice at concentrations found in the environment *Contaminants and inert ingredients include carcinogens and a dioxin shown to cause birth defects in laboratory animals*	5,6,15, 22	GMUG; PAN-BA; volatilizes easily, known to drift several miles; mobile in soil and water
Diflufenzopyr	**Ecological effects:** demonstrated synergistic effects in the field occur when used in combination with dicamba	38, 47	Metabolite (M9) persistent in water and soil
Diquat	**Reproductive effects:** increased cell death in the earliest stages of embryonic development in mice at concentrations found in the environment; concentrations used to treat weeds in ditches could adversely affect survival and development of mallard embryos, potentially other avian species nesting in such habitats; reduces growth in neuroblastoma cells in culture **Neurological effects:** researchers in Italy observed acute and persistent Parkinsonism after use of diquat, which is also used in commercial fish agriculture.	16, 22, 25, 33, 35	Mobility in soil leads to high potential for leaching in groundwater and runoff into surface water; considered hazardous for combination of long persistence in soil, high water solubility, and low vapor pressure
Diuron (Karmex, Direx)	**Circulatory system effects:** exposure causes formation of methemoglobin, an abnormal form of hemoglobin **Genetic damage:** found in laboratory animals in developing embryos and bone marrow cells	6,17	PAN-BA; widespread water contaminant in US rivers and streams

	Cancer risks: classified by EPA as "known/likely" carcinogen **Ecological effects:** reduces photosynthesis by aquatic plants at 0.1 ppb		
Fluridone	**Ecological effects:** Losses of floating-leaved aquatic nontarget plants occur during large-scale pond applications	26	
Hexazinone	**Reproductive effects:** detrimental effects in animal studies including chromosomal aberrations **Ecological effects:** half life of up to 19 weeks poses hazard to livestock and wildlife grazers; can be persistent up to six months	12, 24, 25, 31, 46	Mobility from target areas shown to affect or destroy xerophytic native species; mobility in soil leads to high potential for leaching in groundwater and runoff into surface water; half life in plants up to 19 weeks
Imazapic (Plateau)	**Reproductive effects:** Found to reduce the ability of birds and other aquatic animals to reproduce **Ecological effects:** Toxic at low concentrations to aquatic plants, non-target plants susceptible at doses less than 1% of recommended application rate; ongoing development of genetically modified tolerance to this and other imidazoline herbicides raises issues of gene flow to weeds and creation of herbicide-resistant weeds. *Contains crystalline silica as an inert ingredient, associated with a variety of health hazards and classified as a carcinogen.*	18, 32	"High" potential to be leached by water below plant root zones; potential for runoff high for several months following application
Picloram	**Reproductive effects:** Embryo loss in laboratory rabbits, testicular atrophy in male rats **Ecological effects:** Toxic to juvenile fish at less than 1 ppm; extremely phytotoxic causing hazards to nontarget	5,6,19	GMUG; PAN-BA; persistent and highly mobile in soil

	plants due to drift and runoff *Hexachlorobenzene (HCB) contaminates picloram during manufacture; HCB is a probable human carcinogen.*		
Sulfometuron Methyl (Oust)	**Reproductive effects:** Caused testicular lesions and atrophy and increased the incidence of fetal loss in laboratory tests; minute amounts disrupt plant reproduction in peas, canola, and soybeans **Environmental effects:** difficult to assess in some situations since many sulfonylureas have biological effects below levels that can be detected by standard analytical methods	20, 23	Persistent in soil for a year in quantities to kill desirable vegetation; Crop damage totaling millions of dollars due to drift
Tebuthiuron (Spike)	**Ecological effects:** Use to control sagebrush can decrease sage-grouse habitat and nesting and foraging activities; phytotoxic to algae; represents risk to native freshwater plant species of phytoplankton and floating macrophytes	36, 25, 37	
Triclopyr	**Cancer risks:** Increase in breast cancer in laboratory tests **Neurological effects:** Major metabolite shown to be disruptive to nervous system development in laboratory animals **Ecological effects:** Highly toxic to fish; inhibits the growth of mycorrhizal fungi; interferes with nitrogen fixation; decreases survival of nestlings in birds	5,21	GMUG
† GMUG -- reported use on GMUG National Forest (See Reference 4) †† PAN-BA -- listed on the Pesticide Action Network's "Bad Actor's" list			

Herbicides and Our Towns

While our organization is concerned with detrimental effects of herbicide exposures on all organisms and ecosystems, we are especially concerned with the potential for exposures to citizens of our towns were herbicides to be applied on BLM lands adjacent or nearby towns. Using Geographic Information Systems (GIS) analysis, we created one- and three-mile buffers around the Delta County towns of Paonia, Hotchkiss, Cedaredge, Delta, Orchard City, and Crawford. Then we intersected those buffer zones with a map layer of BLM lands in the County.

There are over 12,000 acres of BLM lands found within the 1-mile buffer zone outside our towns, and nearly 50,000 acres of BLM lands found within a 3-mile buffer zone outside our town boundaries. Thus, any herbicide application on those lands has a real potential to impact plants, animals and humans within our town boundaries. While there are higher densities of residences within town boundaries, there are also many citizens of the county who don't live within town boundaries, who could be impacted where they live in rural areas due to off-site impacts of herbicide applications. As noted above, we are also at risk from applications of chemicals on other public lands in our county.

Cumulative and Synergistic Effects

As mentioned above, over 50% of Delta County lands are public lands. The portion of public lands that are managed by the US Forest Service is also subject to herbicide applications, as are agricultural areas on private lands. Thus, management actions by the BLM should be analyzed in a broader context that includes and considers other possible herbicide applications that could contribute to cumulative effects on receptor organisms in an area.

We are also concerned that the synergistic effects of combining herbicides is very poorly understood and not well-addressed in the analyses presented in the DEIS and PER. The EPA does not require pesticides to be studied for synergistic effects for registration of these chemicals, however they are known to occur. Often these effects are exploited in the development of herbicide products for field application (see study on the synergistic effects of diflufenzopyr with dicamba, 47). With the multitude of chemicals being used in environmental settings, the potential for unknown toxic effects on organisms resulting from synergistic mixtures of chemicals is very real. Herbicides interact cumulatively and synergistically in aquatic and terrestrial environments, and such effects are likely responsible for the decline is species abundance, as evidenced by studies on the decline of frogs and toads over the past twenty years (44, 45). By reducing vastly the amounts of herbicides used on BLM lands, risks will be lowered for all organisms. The web of life is vast--for example, pond contamination due to drift and runoff can impact microorganisms, fish and larger aquatic life, and eventually the mammals that may ingest the fish. This is another ways of noting that impacts of herbicide applications do not occur in isolation, and can magnify up the food chain.

In addition, organisms and ecosystems in today's environments are subject to a number of stressors, including the impacts of climate change, increased population pressures, threats to habitat due to fragmentation and loss of connectivity. Herbicides are only one of the potentially detrimental stressors that can cause impacts. As environmental stewards, we are committed to working to protect all organisms and ecosystems. For this reason, and supported by the comments above, we are against the use of herbicides on BLM lands, and take the position that alternative methods of vegetation control be used in all instances.

While birds are only one of the classes of nontarget species affected by herbicide applications, a quote from Carolyn Cox (editor of the Journal of Pesticide Reform) on the effects of pesticides on birds is apropos of our position:

> "Pesticides will continue to kill birds, reduce their food resources, and disrupt their normal behaviors as long as pesticides continue to be used. The only way to eliminate the effects that pesticides have on birds is to *use nonchemical resource management techniques* [emphasis added]. On farms, in forests, on lawns, and elsewhere that pesticides are used, managers are finding that these techniques work well and make economic sense. Our job is to see that they are implemented more widely.
>
> This is not a simple task, but one that is essential if we are to seriously heed the message of our miners' canaries (39)."

Summary of WSERC's Comments

1. No herbicide applications using aerial deposition methods (from an airplane or helicopter) or large-area applications (greater than five contiguous acres) using boom/broadcast methods should be allowed at any time.

2. In those instances where Alternative C is not feasible and all other non-chemical options have been explored, we allow that spot applications of herbicides delivered by boat, horse or human application vehicles may permitted.

3. We request that the outcomes of such spot applications be monitored and analyzed for at least three years to assess the impacts on diversity of native species, attainment of ecologically effective densities by interactive species, and resilience of sensitive species and any impacted organisms.

4. We request that there be written into the DEIS an explicit incorporation of an emphasis on diversity of native species, attainment of ecologically effective densities by interactive species, and resilience of sensitive species and any impacted organisms as an overall management goal in managing vegetation for fire suppression or invasive species control.

We thank you for your consideration of our comments. Please feel free to contact us using the contact information below to discuss our comments.

Sincerely,

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