LANE COUNTY AUDUBON SOCIETY
AN OREGON CHAPTER OF THE NATIONAL AUDUBON SOCIETY
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January 4, 2009

TO: orvegtreatments@blm.gov
Subject: Comments on Oregon BLM's Vegetation Treatments EIS

Dear BLM,

Please accept the following comments submitted on behalf of the Lane County Audubon Society, Rogue Valley Audubon Society, Kalmiopsis Audubon Society, Cape Arago Audubon Society and Audubon Society of Portland concerning the Vegetation Treatment Using Herbicides on BLM Lands in Oregon DEIS. Our members, numbering well over 12,000, frequently recreate on publicly owned land and are dedicated to protecting birds, other wildlife, and their habitats.

We share apprehensions about the spread of invasive plants and a desire to limit the negative ecological consequences of invasive plants. However, we believe that the best approach is to emphasize prevention and address the root causes of the spread of noxious weeds. We are concerned that the proposed massive use of herbicide will negatively impact non-target organisms and will exacerbate the problem by reducing the cover of desired native vegetation which will, in turn, create more opportunities for weedy plants to invade treated areas. A more selective targeting of exclusively invasive plants will leave more of the native plants in place to reoccupy the site and prevent future establishment of noxious weeds. We believe that herbicides should be used in a limited way on targeted populations of invasive plants only, that treatment should take the form of spot applications to avoid impacting non-target organisms, that greater buffer zones should be in effect around waterways and in habitats that contain sensitive species, and that only those herbicides in the least risk category should be permitted.

We believe that the DEIS is fundamentally flawed because it is based on the projected spread of invasive plants without addressing prevention. The estimated annual rate of spread of invasive plants leads to a considerable increase in the use of herbicides. Yet it is based on calculations that do not address avoiding activities that would significantly slow the spread of invasive plants in the first place. The consequences of activities that increase soil disturbance and decrease cover of native vegetation such as roads, logging, grazing, off road vehicles, fire suppression, altered fire regimes, and mining must be addressed. This would provide the dual benefit of both decreasing the spread of invasive plants and reducing the necessity for treatments with adverse ecological impact.

One of the stated Purposes for increasing the number of herbicides in use by the BLM in Oregon is the benefit of the use of "newer, less toxic herbicides." (DEIS p.9) We agree that this is a sound goal given the problems with the four older herbicides currently in use. However, in all of the action alternatives (3 through 5) proposed, the use of at least one of the four *older, more toxic* herbicides already in use would increase (DEIS p. 322). Under the BLM "preferred action" alternative 4, the use of herbicides "would more than double the use of moderate risk herbicides (when compared to Alternative 3)." Alternative 3 is designated as having "higher risk" than the no action alternative 2. It would seem that the action alternatives do not, in fact, meet the stated Purpose of "minimizing the effects to non-target plants and other species" and leading "to lower human and ecosystem risk." (DEIS p.9)

Risks to Wildlife

According to a recent literature review, "A plethora of papers have been published that address the effects of chemicals on wildlife vertebrates… In birds, there is ample evidence for EDC effects on the reproductive system. In some bird species, effects can be linked to population declines… Evidence shows that selected species from all vertebrate classes were negatively affected by certain anthropogenic chemicals." (Bernanke and Kohler, 2008) We believe that sound management decisions are based on scientific evidence and request that an up to date search of the scientific literature be undertaken to better inform BLM policy on the use of pesticides.

Even a cursory search in the scientific literature reveals cause for concern and suggests the most judicious approach to the use of chemicals. Although risk assessment is considered in the DEIS, there is a lack of references addressing this issue in the otherwise extensive References section. A few examples follow. Please note that some of these studies were conducted on herbicides that have been in use for some time suggesting that a careful analysis must be undertaken before any newer herbicides are adopted. In addition, some of the studies suggest that the "inert" ingredients in herbicide formulations may pose risks. This hazard should be more fully explored in the DEIS.

Fish and Amphibians: There has been a great deal of concern over plummeting amphibian populations. Most scientists believe that toxins in the water are among the factors contributing to the decline. A review article by Bernanke and Köhler (2008) overviews some of the evidence for this including a study that showed that embryos and tadpoles of the northern leopard frog (*Rana pipiens*), green frogs (*Rana clamitans*) and North American bullfrogs (*Rana catesbeiana*) that "were exposed to the herbicides triclopyr and hexazinone, under laboratory conditions were sensitive to these pesticides; exposures resulted in either death or paralysis." The review noted that the tadpole stage of *Litoria moorei,* an Australian frog, was particularly sensitive to Roundup Biactive. Roundup also reduced tadpole survival and biomass directly in leopard frogs by 40% (Relyea et al., 2005). Furthermore in the presence of a predator, newts (which reflects a more realistic scenario), the leopard frog tadpoles suffered greater mortality from the combined effects of herbicide and predators. An examination in an aquatic community showed that Roundup completely eliminated two species of tadpoles and nearly exterminated a third species, resulting in a 70% decline in the species richness of tadpoles and a 22% decrease overall in species richness (Relyea 2005). The effects of several pesticides including diuron was examined on *Xenopus* (frog) eggs and showed inhibition of ovulation in vitro, accompanied by decreased testosterone production. (Orton et al., 2009)

A 2002 investigation showed adverse effects of glyphosate on the gills, liver, and kidney in fish (Jiraungkoorskula, 2002). In a study by Xie et al. (2005), herbicides and a binary mixture of surfactants with the herbicides were evaluated using an in vivo rainbow trout vitellogenin assay, a biomarker of estrogen exposure. Juvenile rainbow trout exposed to 2,4-D for seven days showed a 93-fold increase in plasma vitellogenin levels compared with untreated fish. Their results further demonstrated that a mixture of surfactants with triclopyr and 2,4-D possessed greater than additive estrogenic responses in these fish both under laboratory conditions and in a field setting. A recent study (Baldwin et al. 2009) examined the effects of exposure to sub-lethal amounts of various pesticides (including herbicides) on salmon. "Major efforts are currently underway to restore Pacific salmon habitats in an effort to recover depressed populations. However, not much research has been done to determine the importance of pollution as a limiting factor of ESA-listed species," explained the lead author Baldwin. "The model showed that a pesticide exposure lasting only four days can change the freshwater growth and, by extension, the subsequent survival of subyearling animals." (quotes from *ScienceDaily Dec. 17, 2009.)*

Some studies have looked at other aquatic organisms. Martin et al. (2004) conducted sediment toxicity tests to show sensitivity to herbicide in such organisms as an amphipod, *H. azteca*. This was recommended by organizations such as the World Health Organization (WHO 1994) and Environment Canada because glyphosate has a relatively long half-life in sediment. Of note is the fact that different formulations of the herbicide Round-up had different toxicities indicating that different "inert" ingredients such as surfactant components may themselves be toxic.

Birds and other Wildlife: Birds and grazing or insectivorous mammals will be exposed to toxic spray either directly when herbicide mixtures contact fur, feathers, and skin, through inhaled mist or through ingesting contaminated food and water. In birds, anthropogenic chemicals have been associated with skin and eye irritation, respiratory distress, organ malfunction, suppressed immune response, and reproductive problems such as eggshell thinning, deformed embryos, and decreased growth rates of nestlings. Behavioral alterations that have been observed in birds after exposure to these chemicals include decreased parental attentiveness, reduced territorial defense, greater vulnerability to predators, disorientation during migration, and reduced amounts of foraging. Wildlife is not protected by "do not enter" regulations; those animals that stay in one area are particularly vulnerable to chronic exposure. The two following studies provide evidence of direct and indirect impacts to birds. Deleterious estrogenic effects of Roundup were found in the duck *Anas platyrhynchos* (Oliveira et al. 2007). Exposure to this herbicide resulted in alterations in the structure of the testis and epididymal region as well as in the serum levels of testosterone and estradiol. Taylor et al. (2006) examined the indirect impacts of herbicide use on food webs. The study focused on insects eaten by ring-necked pheasant and gray partridge chicks and demonstrated that herbicides do reduce arthropods that serve as avian food resources and as beneficial predators.

Analyses prepared by federal agencies note the likelihood of exposure to wildlife. They address both the potential dangers of the surfactants found in herbicide formulations: "The use of NPE-based surfactants in any of the 10 herbicides considered in this EIS could result in toxic effects to mammals and birds that eat contaminated vegetation or insects at typical and high application rates" and identify animals that are most vulnerable to herbicide application: "Small insectivorous birds that defend territories may feed in the same area and are subject to chronic

exposures… Other land birds may forage lower and could be subjected to higher levels of exposure…Grouse may return to the same areas to feed on a regular basis, especially if the food supply is close to a breeding display area. As a result, chronic exposures may occur… Deer and elk would occasionally feed in the same area for multiple days leading to chronic exposures." From APPENDIX X: Effects of Herbicides on Wildlife Species **(***Appendix prepared by Alan Dyck, Forest Wildlife Biologist, December 2006.* www.fs.fed.us/r6/invasiveplant-eis/site-specific/.../App-**X-Wildlife**.pdf*)*

Some of this information is represented in the Risk Category tables in the DEIS (p. 75-84). BLM and Forest Service Risk Assessments distinguish No Risk, Low Risk, Moderate Risk, and High Risk herbicides on various classes of plants, animals, and people. In BLM evaluations, diquat, diuron, fluridone, bromacil and tebuthiuron are noted to be of moderate or high risk to fish streams and ponds, pollinating insects, and aquatic invertebrates. Bromacil, dicamba, diquat, diuron, and Overdrive are rated as moderate or high risk to mammalian herbivores, avian herbivores, and/or insectivores. In multiple cases, the herbicides in the FS-evaluated assessments are also rated in the moderate to high risk categories (see table). There is no attempt in the DEIS to offer an alternative that excludes those herbicides that have been shown to present the greatest risks.

Human health risks

Several of the proposed herbicides pose health risks to people. The DEIS discusses some of the risk scenarios (p. 314-317). A few of these are quoted below.

Bromacil: "there would be a risk to workers associated with several exposure scenarios involving typical bromacil application practices... a risk for systemic, reproductive, and cancer effects from typical and maximum exposures to bromacil. Risks for systemic, reproductive, and cancer effects to workers and the public are associated with accidental scenarios …"
Diuron: "there are risks to workers and the public associated with both routine and accidental exposures to diuron… Diuron is a suspected carcinogen, and possible endocrine disruptor"
Tebuthiuron: "tebuthiuron poses health risks to workers under various application scenarios… Several accidental scenarios also pose a risk for systemic and reproductive effects to workers and the public."

Glyphosate: The DEIS states that no health risks are associated with the use of glyphosate. However, recent evidence shows the potential for harmful effects. For example, a *Scientific American* headline from 2009 reads "Weed-Whacking Herbicide Proves Deadly to Human Cells" and reports the results of a study that demonstrates that glyphosate formulations stimulate cell death in human umbilical, embryonic, and placental cells (Benachour and Gilles-Eric, 2009) .

As stated above for fish and wildlife, although the DEIS discloses some of the potential risks of the various herbicides to people, there is no proposed alternative that offers the use of only those herbicides that have been found to provide the least risk to human health.

The proposal to increase herbicide use from about 17,000 to 45,000 acres will result in more exposure risks to both wildlife and people. The increased use of herbicide will amplify the

chance of spills and other accidental scenarios. The BLM analysis should assume that human error occurs and that some workers may not be able to read or understand regulations written on the labels of the herbicides that they are applying. The preferred alternative 4 will expand the use of herbicides such that they are used in areas where they are much more likely to impact the public. Rather than targeting herbicides for control of invasives only, this option would allow the use of herbicides on native plants as well and expand application to administrative sites, recreation sites, and rights-of-way. These include roads, campgrounds, picnic areas, trails, boat facilities and leased areas such as parks and schools. (DEIS p. 19). All of these are public gathering places where larger numbers of people would be subject to exposure including children whose bodies are much more vulnerable to the adverse effects of chemicals. Another source of increased exposure risk is the use of toxic chemicals at popular berry-picking areas, commercial and recreational mushroom gathering areas, and Native cultural plant gathering areas. In addition, the extended use of herbicides along roads will increase the amount of herbicide that runs off into streams and other waterways. The DEIS acknowledges that contaminated water from roadside ditches is quickly directed to nearby streams (p. 27).

The use of herbicides over a much wider area presents a further health hazard in that there is an increased likelihood that they may eventually end up in people's drinking water. There are hundreds of domestic water supplies on or adjacent to BLM lands yet this hazard is not adequately addressed in the DEIS. The USGS report "Pesticides in the Nation's Streams and Ground Water, 1992–2001" confirmed that commonly used pesticides (including herbicides) show up in domestic water supplies.

We believe that the proposed action alternatives present too great a risk of contaminating drinking water, and adversely affecting non-target native plants, wildlife, and people. Targeted use of the least harmful herbicides should be used only on invasive plants. Prevention of the spread of invasive plants and non-chemical methods of weed control should be explored more fully in the DEIS. We would like to see an alternate proposal that makes concrete use of the risk assessments and includes only those herbicides that have been shown to be in the no-risk or at the very least, low-risk categories. This would meet The Need and Purposes for which this DEIS was prepared.

Thank you for the opportunity to comment.
Sincerely,

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