Felice K <felice.kelly@gmail.com>

Written testimony in support of HB 2656, the Oregon Safe Waters Act

Committee Chair Helm,

Thank you for your consideration of my testimony. I write today as a concerned citizen with a background in science to make sure that you are considering the potential effects of herbicide exposure on the residents of coastal communities. I hold a PhD in molecular biology and genetics from Rockefeller University, I completed post-doctoral work at Stanford University School of Medicine, and I currently work as a research microbiologist at Oregon Health Sciences University. The views I express here are informed by my education, but are my own conclusions, and do not come from my work at OHSU or represent the views of OHSU.

The three herbicides that I will briefly discuss—glyphosate, atrazine, and 2,4-D—are commonly included in the aerially sprayed chemical mixtures used on recent clear cuts, and water run-off from these clear-cuts and drifting spray from aerial spraying leads to community exposure primarily through drinking water. It's difficult to find up-to-date measurements of pesticides in drinking water, especially those—like glyphosate—that may show spikes in concentration after spraying and then degrade quickly in the water system, but data collected by the state shows atrazine and its breakdown products, which persist longer in water systems than other herbicides, in 32% of the 22 school water systems tested in 2012. (https://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/DRINKINGWATER/SOURCEWATER/Pages/pdp-schools.aspx#table1). In addition, atrazine has been detected in the urine of residents who live downstream from clear-cut logging, and many rural coastal residents seasonally draw their water directly from downstream rivers, so their exposure to these chemicals may be much higher than those measured in schools or municipal water treatment plants. (https://olis.leg.state.or.us/liz/2013I1/Downloads/CommitteeMeetingDocument/37225).

Glyphosate, which is one of the most commonly sprayed chemicals, has been credibly linked to increased cancer risk, particularly Non-Hodgkin lymphoma. A recent analysis of all the relevant population studies found an association between glyphosate and increased risk of lymphoma. (https://www.sciencedirect.com/science/article/pii/S1383574218300887). You may have seen that a jury recently found that repeated glyphosate exposure was a significant factor in a California man's development of cancer. (https://www.npr.org/2019/03/19/704978021/california-jury-finds-roundup-caused-mans-cancer). Some animal studies have shown dose-response relationships between glyphosate and the development of malignant lymphoma, though the mechanism is unknown. As with most pesticides there is controversy surrounding the real-world health effects of exposure, as outlined in the following link with regards to glyphosate, but I wanted to be sure that you were aware of some of the more concerning data that have been published. (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5515989/)

Atrazine persists in the environment and also acts as an endocrine disruptor. Very low environmental levels of atrazine induce deformities in the sexual organs of frogs and can result in genetically male frogs developing as females, which may be contributing to amphibian declines around the world. (https://www.pnas.org/content/pnas/107/10/4612.full.pdf). These endocrine-disrupting effects have also been observed in mammals, with testicular atrophy observed in male rats exposed to atrazine. (https://www.ncbi.nlm.nih.gov/pubmed/20045047). In humans causation is always more difficult to prove, particularly when agricultural communities may be exposed to multiple pesticides, but there are

data that show a significant correlation between atrazine exposure through drinking water and low birth weight. (https://www.ncbi.nlm.nih.gov/pubmed/30200320). In addition, low semen quality (defects in sperm motility and morphology) was correlated with high urine levels of atrazine metabolites in a study of men from agricultural regions of Missouri and Minnesota. (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1241650/). Due to the unavoidable contamination of water with atrazine and its effects on human health the European Union phased out atrazine, beginning in 2003, and environmental groups have suggested that the US should follow suit. (https://www.biologicaldiversity.org/campaigns/pesticides_reduction/atrazine/). The bill considered here does not come near to banning atrazine, but would take significant steps towards reducing the drift and run-off from atrazine into communities downstream from clear-cuts.

Finally, 2,4-dichlorophenoxyacetic acid, commonly known as 2,4-D, may act as an endocrine disruptor, and studies have shown an association between exposure and an increased risk of non-Hodgkin lymphoma. (https://www.ncbi.nlm.nih.gov/pubmed/28476329). On the whole I found fewer compelling studies of the effects of 2,4-D on human health, but many questions remain about its effects, so reasonable care to minimize the contamination in drinking water would be appropriate.

The Oregon Safe Waters Act would reduce the exposure of citizens to the chemicals I discussed here by eliminating aerial spraying of these herbicides on recent clear-cuts in watersheds. Cancer is often slow to develop, and the levels of use of these chemicals have been increasing, and so we may not fully realize the public health impacts of what we are spraying into drinking water today for another decade or even two. But it seems prudent to regulate the use of these chemicals within watersheds to minimize exposure rather than using these communities as unknowing experimental subjects.

Thank you for your time and consideration. Please let me know if you would like any more information on the herbicides I discussed above or would like PDF copies of any of the articles that I linked to in this text.

Sincerely,
Felice Kelly, Ph.D.
Portland, OR