Using Herbicides on Forestlands in Oregon

A Position of the Oregon Society of American Foresters

The Oregon Society of American Foresters (OSAF) supports allowing forest owners and managers the choice of using herbicides prudently under applicable U.S. Environmental Protection Agency (EPA) and state regulations. To protect water quality and nontarget areas, these requirements include no-spray buffer zones near streams and weather-based restrictions that minimize drift with aerial spray operations. Herbicides are an important tool for protecting the productivity and health of Oregon's forests by reducing competing vegetation during reforestation and by controlling noxious weeds and other undesirable plant species. Herbicides are used relatively infrequently in a given forest area and in lesser amounts than with other land uses.

When used as part of an integrated management plan developed by forestry professionals, herbicides have been proven highly effective in controlling unwanted vegetation through many years of field monitoring and research. Similarly, when applied by trained personnel following all applicable state and federal laws, herbicide use on forestlands has been shown safe for people, fish, wildlife, and desired vegetative species. OSAF supports ongoing efforts in training, law enforcement, research and monitoring to ensure and further refine the efficient and safe use of herbicides on forest and all other lands in Oregon.

Issue Herbicides are synthetic chemicals and natural compounds that are used in forests to control unwanted plants to enhance and protect native forest productivity and health. Herbicide applications, particularly aerial spraying from aircraft on agricultural and forest lands, has been an issue of concern and controversy for decades in Oregon. Some people and advocacy groups believe that herbicides should be further regulated or even prohibited, largely due to their fears of possible human health impacts because these chemicals are toxic to plants. Some well-publicized violations of applicable aerial spraying regulations have helped fuel these fears. However, credible evidence for human health impacts remains lacking and instead a substantial body of research, monitoring and professional experience have shown that the carefully planned and well-regulated use of herbicides is a safe, effective and targeted method of managing unwanted vegetation in forests. Maintaining this cost-effective management tool as an option also helps Oregon's forest owners remain a leading and competitive source of forest products in the U.S. and world.

Background

Herbicides as a Forest Management Tool

Competing vegetation can have significant impacts on tree vigor and forest productivity, particularly the establishment and growth of newly planted tree seedlings as they compete for space, sunlight, water and nutrients. Such competition can result in delays and failures in reforestation after timber harvest or natural events (wildfires, windstorms, etc.), as well as violations of Oregon Forest Practices Act (FPA). The control of noxious weeds and other undesirable invasive plants is also an important concern as the variety and extent of these aggressive plants have increased in Oregon's forests, thereby threatening native biodiversity. Herbicides are often the best option for controlling weeds and invasive species, as other methods are less effective, cost prohibitive, or not as long lasting. Controlling unwanted vegetation also helps achieve a broad range of other benefits, such as enhancement of carbon storage, wildlife habitat, livestock forage, and wildfire resiliency.

Because much of Oregon's forestland is found in relatively remote and rugged terrain, aerial spraying is a common and cost-effective method of applying herbicides after timber harvest. Historically, cutover areas were often broadcast burned to help control competing vegetation prior to tree planting but this practice has

been reduced due to air quality and safety concerns. The total amount of herbicides applied with both aerial and ground spraying on Oregon's forestlands is relatively small compared to urban and residential, agricultural, and right-of-way lands. Typically, only one to three herbicide applications will be made during a forest rotation of forty or more years. Although an aerial spray operation and the affected vegetation may be visible soon after treatment, extensive green-up occurs shortly thereafter. Newer, safer and more effective herbicides and application methods are continually being developed. Herbicides in use today are more selective, targeting the undesirable species better than those used in the past. In addition, advances in spray nozzle technology and aircraft global positioning systems (GPS) have greatly improved the accuracy, efficiency, and safety of aerial applications.

Environmental Effects and Regulations

Although toxic to plants, herbicides have a relatively low toxicity to people, wildlife and fish because they are formulated to disrupt plant biological functions, which are much different from those of humans and animal species. To ensure safe use, the federal government regulates the use of all herbicides under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). Under FIFRA, all herbicides and their active ingredients must be evaluated and registered by the EPA before sale and use, and herbicide labels must specify the approved methods and locations for application. In Oregon, licensing and continuing education of applicators are required and administered by the Oregon Department of Agriculture.

The Oregon Forest Practices Act further regulates the use of pesticides in forests in OAR Chapter 629, Division 620, through a number of different rules. One example of FPA pesticide regulations under Chapter 629, Division 620 includes requirements to protect water sources, to prevent contamination of waters of the state. These requirements apply to registered drinking water sources as well as fish-bearing and non-fish streams. In addition to specific no-spray zones near streams, aerial spraying can only be done when weather conditions minimize spray drift from the target area. The Oregon Department of Forestry enforces FPA rules and monitors pesticide applications, helping to assure their safe and proper use in Oregon's forests.

For decades, the environmental behavior and effects of herbicides have been the subject of studies in Oregon and beyond, and the findings have informed the evolution of effective policy and practice. The primary mechanisms for forest herbicides to enter streams and aquatic ecosystems are via drift or excess runoff during the first few storms after application (Clark and others 2009, Louch and others 2016, Tatum and others 2017). The potential for stream entry can be minimized by the use of riparian buffers, drift prediction models, and recommended application rates, droplet size, and timing (Clark and others 2009). Herbicides have limited mobility and environmental impacts because they are fixed rapidly in soil and organic matter, have low toxicity to fish, amphibians, aquatic invertebrates and wildlife, and do not bioaccumulate (Tatum 2003, Tatum 2004, Clark and others 2009). Although studies in large watersheds have been less common, a report (Kelly and others 2012) by the U.S. Geological Survey of the McKenzie basin (Eugene's domestic water source) found that "Forestry compounds were rarely detectable in the McKenzie River even though forest land predominates in the basin… Forestry pesticide use is not considered a likely threat to drinking water quality at the present time." A major international review (Rolando and others 2017) of glyphosate-based herbicides, which are among the most common types used in forestry, stated that "The weight of available scientific evidence… in this extensive scientific knowledge base leads to the conclusion that [these] herbicides as typically employed in planted forest management do not pose a significant risk to humans, the environment or [associated] wildlife species."

Evaluating the effects of herbicide treatments on terrestrial species and habitats is complex and challenging (Betts and others 2013) but newer studies, including several in the Oregon Coast Range where significant private lands and herbicide use occur, continue to expand and improve the knowledge base. For example, vegetation that remained after herbicide treatment was sufficiently diverse to conserve moth communities that reflect local ecosystem biodiversity (Root and others 2017). Herbicide use also was found to reduce but not eliminate available bird habitat and these effects are relatively short-lived (Kroll and others 2016); it was further noted that relatively small changes in herbicide use should have positive effects on bird species richness, a point that can help refine vegetation management planning to maintain important ecosystem functions. Other such studies are expected to be completed in the near future and the forestry profession will continue to monitor and apply the knowledge they provide.

Role of Forestry Professionals and Planning

Forestry professionals typically develop and use an integrated management strategy for vegetation management, i.e., an effective group of treatments to achieve the desired long-term results. Herbicides are one of many tools, and prescribed fire and mechanical and silvicultural methods, alone or in combination, are also effective vegetation management tools. However, herbicides remain a key part of many such strategies, and are especially vital when dealing with aggressive noxious weeds and non-native invasive species.

In summary, the combination of federal and state oversight, professional training of applicators, FPA monitoring and enforcement, continual improvement in chemical development, and adherence to label directions provides the public multiple safeguards to assure the safe, proper and legal use of herbicides in Oregon's forests. Given ongoing public concerns, the OSAF supports continued study of herbicide use and environmental effects.

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This position statement was adopted by the OSAF Executive Committee on January 12, 2018.
The statement will expire January 12, 2023 unless after thorough review it is renewed by the Committee.