Cal-IPC Policy on the Use of Herbicides for Controlling Invasive Plants

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Policy Statement:

Cal-IPC supports the responsible use of herbicide as a critical tool for land stewards working to protect biodiversity and natural lands from the harmful impacts of invasive plants.

Summary:

- Invasive plants are a top stressor for biodiversity and controlling invasive plants is a key element in land restoration and stewardship.
- Integrated pest management - IPM - is the multi-pronged approach that seeks to use the safest, most effective, most feasible combination of tools and techniques for a given invasive plant management situation.
- Herbicide is one of the tools within IPM, and in many cases including herbicide as part of an overall IPM approach is essential for successfully controlling invasive plants.
- The complexities of herbicide use for stewardship have resulted in a range of perspectives in the public, scientific, and legal realms, and it is important for land stewards to engage with stakeholders.

Background:

Addressing the global biodiversity crisis requires addressing invasive species, as made clear by the Global Biodiversity Framework whose Target 6 urges action to stop the spread of invasive species. Many plans in California, such as the State Wildlife Action Plan and the Natural and Working Lands Climate Smart Strategy, include the need to address invasive species. The land stewardship community in California works toward the goals set out in these plans.

In working to address invasive plants, land stewards use an integrated pest management (IPM) approach. IPM includes a spectrum of programmatic responses, including: prevention; early detection and rapid response; containment; and suppression. Controlling invasive plants in the field requires the use of a wide range of tools and techniques, such as mechanical removal, biological control, grazing, prescribed burning, and herbicides, that are used in combination. (See Cal-IPC's Policy on IWM.)

Pesticides—chemicals formulated to target and control unwanted organisms—include rodenticides, fungicides, insecticides, and herbicides. Pesticides provide many useful services but can also be a source of harm to humans and other organisms. As an environmental group, Cal-IPC works toward least harmful ways of addressing pest problems. This includes reducing the use of pesticides and using less harmful pesticides.

Herbicides, which are pesticides designed to control plants, are used in many settings for many purposes including agriculture, landscaping, ecological restoration, and more. When natural lands stewards use herbicides, they do so to protect native vegetation, wildlife, and ecosystems from the damaging effects of invasive plants. Sometimes this is driven by the need to protect endangered species, which are often threatened by invasive plants.

All approaches to controlling invasive plants have side effects. Like physicians weighing potential side effects against potential benefits when prescribing antibiotics or recommending surgery, responsible land stewards weigh many factors in determining their approach to a particular situation.

Those who apply herbicides for land stewardship in California are legally required to be trained in their safe use and must work under the direction of professionals accredited by the state via testing and continuing education. The emphasis is on safety through a range of best practices in the field and wearing protective equipment appropriate to the herbicide being used.

Most work controlling invasive plants in natural areas happens where there is little risk of public exposure to herbicides. In areas where public access is present, such as near trails or developed areas, appropriate measures should be implemented to prevent accidental public exposure during and immediately after application.

Natural lands stewards use herbicides as part of an integrated approach that combines multiple methods to maximize effectiveness. For example, manual removal of plant species might be preceded by herbicide treatment to reduce populations to a manageable level, with additional effort put into implementing prevention measures to stop new invasive species from entering an area. When applying herbicides, land stewards take measures to reduce the potential for off-target impacts (see Cal-IPC's BMP manual on protecting wildlife when using herbicides in natural areas).

When planning an integrated approach to a given invasive plant control effort, land stewards carefully consider all options, seeking to optimize safety and effectiveness. They may choose to use herbicides as one of the tools for a number of reasons, including:

- **Their effectiveness.** Many plants are difficult to control due to the way they grow and reproduce, and herbicides can greatly increase our ability to control these plants. Manual removal and cutting can actually encourage growth of some plants, or worsen an infestation by stimulating resprouting, spreading seeds, or spreading plant fragments that grow into new plants. Some plants, like tree-of-heaven and Japanese knotweed, can only be eliminated at scale through chemical means.
- **Their light impact on the landscape**. Manual and mechanical control methods can physically disturb and/or compact soil, disrupt soil microbiota and fungal networks, cause erosion, and damage wildlife habitat and cultural resources (such as Tribal artifacts). Targeted use of herbicides, such as spot spraying individual plants, often means a smaller human impact on the land because tools that disturb soil are not being used and fewer people are needed to complete the work. The herbicides used by land managers are almost always assessed by regulatory agencies as being of low toxicity to organisms other than

plants when used as intended. Land stewards must consider the mobility of an herbicide, via air, water, and soil, as well as their degradation and environmental fate.

- **Their safety to workers.** Controlling populations of invasive plants by mechanical means can be difficult and more dangerous than doing so with herbicides, especially in steep, remote sites and along roadsides.
- **Their feasibility at larger scales.** In addition to the challenges of effectively controlling invasive plants, controlling them over large areas (as one might at the beginning of a large restoration project) is even more difficult. Herbicide use can make some large projects more feasible. This includes restoration of degraded landscapes through seeding and replanting, which often requires extensive control of invasive plants at the beginning to reduce competition.
- **Their ability to be targeted and short-term, with use diminishing over time.** Land stewards most commonly apply herbicide to individual plants one-by-one, using, for instance, a backpack spray rig with a handheld nozzle. The amount of herbicide used in natural areas is typically small compared to the amounts used in landscaping or agriculture, which more commonly use broadcast spraying, the uniform application of herbicide over a large area of land. In site restoration projects, herbicide use decreases rapidly as native plants re-establish. In ongoing stewardship efforts, herbicides may be used intermittently over a longer time frame at low levels. In "early detection rapid response" efforts to remove invasive plants new to an area before they spread, a small herbicide application may avoid a lot more work later (as well as reducing future need for herbicide).

The most useful herbicides in natural areas are herbicides that can move through the target plant—known as "systemic" herbicides—and often control it with one application. Some synthetic herbicides are "selective," meaning that they only affect some types of plants—such as grasses but not broadleaf plants, or vice versa—which can be very useful.

In contrast to systemic herbicides, there are "contact" herbicides that only damage the plant tissue they touch. Perennial plants treated with contact herbicides typically grow back and require continued treatment. (Annual plants may be controlled when treated early in their development.) This makes these herbicides of limited use in natural areas where the goal is to permanently control the plants. At this time, all herbicides made from natural substances that meet USDA National Organic Program standards—for instance, strong vinegar—are contact herbicides and therefore not used much, if at all, to control invasive plants in natural areas. (Some of these herbicides have a high level of acute toxicity, with potential for caustic burns, as well.)

Like many other chemicals in regular use, such as bleach, gasoline, and other substances listed on the Proposition 65 list, herbicides have some potential to be harmful to people. Wildlife, plants, and other organisms can be affected by exposure to them. This does not necessarily mean the substances should be banned entirely, but rather that they should be used in as safe a manner as possible and only when needed.

Herbicides have harmed California communities in the past. For instance, widespread aerial application of herbicide to timberlands of northwestern California in the 1970s has been

associated with reproductive health impacts in several rural communities. The unsafe use of pesticides is in part what has led to California developing one of the most robust pesticide-use regulatory systems in the world, one that is continuously being improved upon to advance safer and more effective pest management tools.

Regulatory structure is set up to ensure that pesticides are (1) deemed safe before being legally registered for use and (2) applied safely once they are registered. This infrastructure is not perfect, and environmental groups and others seek to hold regulatory agencies accountable through the courts when needed. Regulators and researchers face many challenges when addressing the potential impacts of pesticides such as: remaining independent from industry; studying impacts at realistic exposure levels; and teasing apart the impacts of active ingredients versus additives that can, in some cases, have more side effects than the active herbicidal ingredients themselves.

The complexity of these challenges has resulted in a range of perspectives in the public, scientific, and legal realms. Cal-IPC is committed to respectful engagement with stakeholders across a range of perspectives. In some situations, it will be important that land stewards and their organizations engage with community stakeholders and address concerns when herbicides are proposed for use.

As land stewards work to protect this renowned global biodiversity hotspot, they support prevention efforts that reduce the number of new species introduced to California each year while looking for new approaches to address those species that are a problem in our natural areas. (Some “new” approaches are not new at all, such as the revival of Indigenous practices like cultural burning.) For situations where no alternative tools presently exist with effectiveness, feasibility, and safety comparable to that of herbicides, removing the option to use herbicides will significantly diminish the ability of land stewards to protect California’s biodiversity. Though we may share a long-term vision of a world where pesticide use has been substantially reduced, the state’s community of land stewards needs access to herbicides for the foreseeable future. As leaders in the land stewardship community, Cal-IPC will continue to work with experts and stakeholders across disciplines to find the best way forward as we work to meet biodiversity protection goals.