



The Use of Pesticides in Invasive Species Management
A Position Statement of the North American Invasive Species Management
Association

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The North American Invasive Species Management Association (NAISMA) is the largest organization dedicated to protecting North America's natural heritage from the threat of invasive species. NAISMA's mission is to support, promote, and empower invasive species prevention and management in North America.

The goal of invasive species management is to preserve biodiversity, protect endangered species, and improve ecosystem health. Invasive species threaten ecosystem health by reducing biodiversity; deteriorating habitat for native species, including endangered species; fueling wildfires; reducing or changing nutrient availability; and damaging other ecological functions. Invasive species cost the United States economy in excess of \$170 billion per year in management, mitigation, and agriculture losses.¹ NAISMA seeks to support land managers in lowering these economic costs by improving invasive species management. Pesticides are one of several management tools that stop the spread of invasive species when no other solution is available or economically feasible. This position statement seeks to provide support for the use of pesticides when chemical control is required to obtain optimal control, and reduce non-target species damage to protect biodiversity.

Management Recommendations

Invasive species prevention is the most economical and desirable approach to invasive species management.

When prevention measures fail, the presence of invasive species may require management action to prevent further ecological destruction and invasive species range expansion. Such actions may also be necessary to reduce economic losses and/or human health hazards posed by some invasive species.

NAISMA supports the proper use of pesticides as part of an integrated approach to managing invasive species. An integrated pest management (IPM) approach is one that poses the least

possible risk to people, property, resources and the environment, while preventing intolerable levels of pest damage. This holistic strategy evaluates and selects the most effective, practical and low-risk methodology, which may include chemical, mechanical, and/or biological control methods. Manual control may also be considered if practical, but may not be effective in many cases due to lack of human power and inability to remove all reproducible parts of the invasive species. In cases where other options are not practical or effective, pesticide treatment may be required to effectively control the invasive species threat. With appropriate training and strict adherence to label instructions, pesticides are a useful tool where sometimes there is no other economically feasible option. In some situations, non-chemical methods may actually pose greater risks to the environment than pesticides.

NAISMA supports the following invasive species prevention, management, and policy actions to prevent and manage invasive species in North America that will help to minimize the use of pesticides over time:

1. Promote prevention tools, education, and awareness campaigns as a first line of defense against all invasive species introductions.
2. Support early detection technology and programs that can identify a species that will spread rapidly if it is not contained quickly.
3. Use integrated pest management (IPM) that uses knowledge of species' life history and strategic use of chemical, mechanical or biological controls as necessary at the most effective life stages for the type of control chosen.
4. Apply minimal amounts of pesticides when chemical control is required to achieve optimal management. Use direct application techniques to reduce damage to non-target species.
5. Monitor invasive species to inform and target future management strategies, especially those that include the key elements of early detection, rapid response, containment of spread, and eradication where possible.
6. Increase the [sharing of technical data](#) and cooperation among agencies and other partners to manage invasive species.
7. Increase funding for scientific research that involves the input of managers by public and private agencies and organizations to control, minimize, or eliminate negative impacts of invasive species.
8. Enact, expand, and enforce laws and regulations focused on prevention and control of the spread of existing invasive species.
9. Reduce or eliminate the sale, distribution and propagation of known invasive species in livestock, horticultural, and agricultural industries to prevent their accidental escape into natural areas.

Here are some of the key ways that invasive species alter the heritage of our precious natural parks, forests, grasslands, wetlands, rivers, lakes, and other areas, as well as threaten our economy and human health:

Biodiversity

Invasive species reduce biodiversity by outcompeting native species for habitat. Biodiversity loss leads to a dismantling of food webs and destabilization of ecosystem function. Japanese stiltgrass and garlic mustard are examples of plants that create monocultures where they establish in forests. Feral hogs reduce habitat for native species and predate on wildlife.

Threatened and Endangered Species

Endangered species are especially at risk from the impact of invasive species because of the reduced habitat and resources that invasive species cause to endangered species populations. The changes in habitat structure that invasive species cause can make it impossible for an already sensitive species to survive and reproduce. In Oregon, for example, Kincaid's lupine, a threatened plant, and the endangered Fender's blue butterfly that is dependent on the Kincaid's lupine, are examples of where habitat loss is exasperated by invasive species outcompeting the lupine in remnant prairie and savanna habitat.

Ecosystem Health

Invaded ecosystems rarely provide the same ecosystem services they once did prior to invasion. Invasive species are known to modify nutrient cycling, change soil dynamics critical for native plant re-establishment, and even alter fire cycle dynamics. All this results in ecosystems that we can no longer depend on to provide valuable resources such as clean water and productive soils.

Economic Threats

The economic threats from invasive species are huge. From costly agricultural quarantines that limit trade, decontamination cost impacts to consumers, reduction in forest products, increased fire damage, challenges to water quality that limit fish production, municipal water intake and filtration challenges, and aquatic trade impacts, the \$250 billion estimated annual cost to the US economy is likely a conservative estimate.

Human Health

Numerous invasive species threaten human health safety both directly and indirectly. For instance, some plants are toxic when touched such as Giant hogweed or Wild parsnip. Certain species of invasive insects, such as gypsy moth, shed hairs that cause respiratory irritation. Some invasive animals such as feral hogs, feral cats, and invertebrates carry pathogens or insects that carry pathogens such as ticks that can make humans sick or reduce water quality.

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References

1. Pimentel, D., Zuniga, R., and D. Morrison. 2005. Update on the environmental and economic cost associated with alien-invasive species in the United States. *Ecological Economics* 52. pp 273-288. Our estimate assumes a 2-3% standard inflation rate from this 2005 estimate.