



Integrated Pest Management

Reducing Risks from Pests and Pest Management Activities

What is Integrated Pest Management or IPM?

Integrated pest management (IPM) is “a sustainable approach to managing pests by combining biological, cultural, physical, and chemical tools in a way that minimizes economic, health, and environmental risks” (7 USC 136r-1). It is a long-standing, science-based, decision-making process that identifies and reduces risks from pests and pest management related strategies.

What are the benefits of IPM?

IPM can:

- 1) Reduce risks from pests and pest management related strategies to people, property, resources, and the environment;
- 2) Save time and resources by understanding pest biology and conditions that favor the pest;
- 3) Increase implementation of more effective pest management strategies;
- 4) Increase scientific management of pest species rather than being reactive or managing pests on a calendar basis;
- 5) Increase accountability for pest management decision-making and on-the-ground results;
- 6) Increase coordination and partnerships for effective pest management;
- 7) Decrease or eliminate unnecessary pesticide use;
- 8) Decrease pest resistance from repetitive pesticide use;
- 9) Increase safer uses of pesticides and other management tools.

Integrated pest management coordinates the use of pest biology, environmental information, and available technology to prevent unacceptable levels of pest damage by the most economical means, while posing the least possible risk to people, property, resources, and the environment.

encompassing, minimal-risk approach to protect resources and people from pests.

What is a pest?

A pest is any organism that interferes with desired resource management goals, or any organism that may cause damage to a resource that you are trying to protect. Some questions to consider when managing pests are:

Where can you use IPM?

IPM provides an effective strategy for managing indoor (museums, living quarters, visitor centers) and outdoor (hatcheries, wetland management areas, refuges) pests. IPM serves as an umbrella to provide an effective, all

- 1) Is the pest at levels that interferes with completion of your management goals?
- 2) Is it a native or exotic species?
- 3) What conditions foster the pest?



*The U.S. Fish and Wildlife Service manages for invasive weed species that threaten native habitats, such as this orange hawkweed (*Hieracium aurantiacum*) infestation on Kodiak Island National Wildlife Refuge, Alaska, July 2002. The Service is currently using the herbicide clopyralid to treat this infestation.*

4) What are the chances of successful pest management?

What pest species do the U.S. Fish and Wildlife Service manage?

The Service usually manages pest species to restore habitat or create habitat for wildlife, including habitat for threatened or endangered species. In the case of habitat restoration, the Service may manage invasive weed species with the goal of native habitat restoration. One example where the Service manages an invasive non-native plant is the melaleuca tree (*Melaleuca quinquenervia*) which occurs throughout southern Florida and can be found at the Arthur R. Marshall Loxahatchee National Wildlife Refuge. This invasive species chokes out important native vegetation. In the case of creating habitat, the Service may manage agricultural pests with the goal of creating cover or growing corn, rice, or other foods for wildlife. The Service also manages for disease vectors, like mosquitoes, when documented human or wildlife health risk exists, like West Nile virus.

What are some of the components of a successful IPM program?

- 1) Understanding site management objectives and establishing short and long term priorities.
- 2) Preventing pest species from becoming a pest in the first place—this is the first line of defense against any pest species.
- 3) Identifying, monitoring, and mapping current and potential pest species. Understanding their biology and conditions conducive to support the pest(s) (air, water, food, shelter, temperature and light).
- 4) Understanding the physical and biological factors that affect the number and distribution of pests and their natural enemies. Conserving natural enemies when implementing any pest management strategy.
- 5) Establishing “action thresholds” at which point a management strategy will be implemented to reduce the pest population.

6) Reviewing available tools and best management practices for the management of the identified pest(s). Tools may include: 1) no action, 2) physical (manual and mechanical), 3) cultural, 4) biological, and 5) chemical management strategies.

7) Building partnerships and consensus with stakeholders—occupants, decision-makers and technical experts (ongoing throughout the process).

8) Obtaining approval, defining responsibilities, and implementing selected best management strategies, in accordance with applicable laws, regulations, and policies.

9) Evaluating results of management strategies; determining if objectives have been achieved; modifying strategies if necessary.

10) Documenting decisions and maintaining records.

11) Outreach and education.



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Phragmites (Phragmites australis) management at Horsehead Wetland Center, Maryland using glyphosate; flooding can also be used with some success as part of an IPM approach. Some of the most common herbicides used by the U.S. Fish and Wildlife Service for invasive weed management include glyphosate, imazapyr, triclopyr, and clopyralid.



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Integrated pest management flood-fallowing project, Klamath National Wildlife Refuge, Oregon, 2003.

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