

FACTSHEET

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Invasive Species

Over the past 200 years, several thousand foreign plant and animal species have become established in the United States. About one in seven has become invasive, leading to problems that, according to figures provided by Cornell University, cost the United States more than \$138 billion each year. An invasive species is an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health. Invasive plants, animals, and aquatic organisms often reduce the economic productivity and ecological integrity of U.S. agriculture and natural resources.

The most common vertebrate invasive species in the continental United States include nutria, house sparrows, European starlings, and commensal rodents (roof rat, Norway rat, and house mouse). Additionally, numerous invertebrate invasive species have also become established in the United States. Examples include zebra mussels, imported fire ants, Africanized honey bees, and many other insects. In Hawaii and some mainland States, feral pigs, goats, and cats have severely impacted natural and environmental resources. Feral animals are domesticated animals that have escaped and become wild, including their offspring born in the wild.

Effects of Invasive Species

Many harmful invasive species clearly impair biological diversity by causing population declines, species extinctions, shifts in predator-prey dynamics, shifts in species niches, changes in habitat, and reductions in ecosystem complexity. The very establishment of a harmful invasive species diminishes biological diversity because, as certain species disperse to more places, the originating and invaded areas become more alike biologically.

In 1993, Congress' Office of Technology Assessment reported that devastating invasions of plants, insects, aquatic invertebrates, pathogens, and

other organisms have changed ecosystems and permanently diminished the biological diversity associated with them. Examples of these in the United States include: melaleuca (a wetlands tree), gypsy moth, spruce bark beetle, zebra mussel, larch canker, chestnut blight, and pinewood nematodes. Fear of the incursion of other harmful invasive species, such as the brown tree snake, is increasing.

Conservation experts have found that in the United States, invasive alien plant infestations cover 100 million acres and are spreading at a rate of 14 percent per year—an area twice the size of Delaware. Recent studies have also revealed that San Francisco Bay is invaded by a new exotic species on the average of once every 12 weeks.

Movement

Naturally occurring movement of species into the United States is uncommon. Most invasive species arrive in association with human activities or transport. Species can be brought into the country and released intentionally, or their movement and release can be an unintentional byproduct of cultivation, commerce, tourism, or travel.

Many species enter the United States each year as contaminants of commodities. Agricultural produce, nursery stock, cut flowers, and timber can harbor insects, plants pathogens, slugs, and snails. Weeds continue to enter the United States as seed contaminants. Plant pathogens sometimes arrive as unintended contaminants of plant materials.

Fish and shrimp pathogens and parasites have been introduced into the United States on infected stock for aquaculture. Crates and containers can harbor snails, slugs, mollusks, beetles, and microorganisms. Military cargo transport also brings in harmful species, such as the Asian gypsy moth and brown tree snakes. Ballast water that is released from ships as cargo is loaded or unloaded has brought in several destructive aquatic species.

Safeguarding the United States from Invasive Species

On February 3, 1999, President Clinton signed Executive Order 13112 enhancing and coordinating Federal activities to control and minimize the economic, ecological, and human health impacts caused by invasive species. The Executive order also established a National Invasive Species Council to oversee a management plan detailing the goals and objectives of the efforts of the involved Federal agencies. This Executive order provides new impetus and importance to the basic work performed by the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) to prevent pests and diseases that threaten our biological resources from being introduced and becoming established in the United States.

Both ecosystems and the individual species within them are vulnerable to invasive pests and pathogens. In protecting the United States from harmful invasive species, APHIS is responsible for excluding and managing invasive species that can potentially affect plant and animal health, either directly or indirectly. Through its activities, APHIS protects not only agriculture but also forest, rangeland, and wetland ecosystems. APHIS works closely with USDA's Forest Service and the U.S. Department of the Interior's Bureau of Land Management, National Park Service, and Fish and Wildlife Service. APHIS controls certain types of invasive species and vertebrate pests that affect native ecosystems, rather than agricultural resources. Certain specific activities focus on protecting and managing endangered species as well as migratory bird populations.

The first and most effective means of protection is through exclusion or prevention of intentional or unintentional entry of harmful invasive species. A second strategy uses tactics including detecting, eradicating, managing, or controlling specific pests that have become established. Third, certain endangered species need special protection against a host of attackers. Endangered species are rescued from illegal trade at ports of entry and protected within the United States. Invasive species can be a threat to indigenous endangered species. Finally, human populations need help in coping with the needs of certain organisms, such as migratory birds, so that human activity and wildlife can coexist.

APHIS' Role in Safeguarding

Many plants and plant germplasm are imported intentionally for propagation and use. Organisms are intentionally brought in for biological control, including insects, fish, snails, plant pathogens, and nematodes. APHIS has a permitting system to assess organisms for plant pest risk or risk to animals. Entry may be authorized under certain conditions. Scientifically based methods of risk assessment allow APHIS to make informed decisions as to the potential for risk to the environment. APHIS has biological scientists skilled in making the assessments necessary to issue or deny a permit.

Risk assessment uses scientific information to determine numbers and kinds of organisms that have the potential to become established and harmful. Sophisticated methodologies measure the level of risk. This information assists APHIS in decisions to issue permits for introduction, interstate movement, and release into the environment of organisms that can be beneficial to society.

In response to and in anticipation of increased movement of people and biological products and organisms—both intentional and unintentional, legal and illegal—APHIS scientists and other professionals have been developing new risk assessment methodologies, regulatory processes, and assessments of effectiveness in the agency's programs. These efforts include the development of specific regulations that outline the types of scientific information needed to obtain a permit to import and/or release into the environment invasive species that are potential plant pest risks. APHIS is also reviewing its statutory base for the regulation of noxious weeds that have entered the United States. In addition, APHIS is reviewing and assessing the effectiveness of its activities for safeguarding the United States from invasive species.

APHIS is responsible for implementing several multilateral and bilateral international treaties directly or indirectly related to invasive species. These include the International Plant Protection Convention, Convention on Prevention of Diseases in Livestock (United States-Mexico), Convention on International Trade in Endangered Species of Wild Flora and Fauna, Convention for the Protection of Migratory Birds (United States-Canada), and Convention for the Protection of Migratory Birds and Game Animals (United States-Mexico).

Domestic laws that APHIS implements include the Plant Pest Act, the Plant Quarantine Act, the Federal Noxious Weed Act, certain provisions of the Federal Seed Act, and the Honeybee Act.

The following are examples of APHIS' eradication and control programs for invasive species.

Asian longhorned beetle, which kills hardwood trees, has been detected in New York, Chicago, and warehouses in several U.S. cities. APHIS is working to develop and implement new regulations for incoming solid wood packing material and has issued an interim rule for solid wood packing material coming from China. These initiatives will minimize the likelihood of future Asian longhorned beetle introductions. Additionally, APHIS has initiated eradication campaigns to eliminate Asian longhorned beetle from areas where they have been detected.

Yellow star thistle is the most problematic weed in California. APHIS has established a partnership with the California Department of Food and Agriculture and USDA's Agricultural Research Service to fund a scientist position at the Albany quarantine facility in California. This individual will work on a wide variety of issues including yellow star thistle control.

Brown tree snakes have caused the decline of many native wildlife species (particularly birds), large economic losses from power outages, and hazards to human safety from bites. The Department of Defense provides \$1 million to APHIS each year to conduct the control program on Guam. APHIS has identified, contacted, and established cooperative service agreements with nearly every company and agency involved with the shipment of cargo from Guam. Cargo shipments are potential risks for the snakes to be moved to Hawaii and other places currently free of brown tree snake. Other APHIS cooperators include: Guam International Airport Authority, Guam Power Authority, Commercial Port Authority, and approximately 17 privately owned processing warehouses. In addition to cooperative agreements and trapping efforts, Jack Russell terriers are used to detect snakes in air cargo. To further efforts, personnel at APHIS' National Wildlife Research Center are developing and testing potential brown tree snake toxicants, repellants, and attractants.

Nutria, once a fur market resource, escaped into Louisiana's coastal marshes in the late 1930's. In addition to damaging private property by destroying ornamental plants and excavating burrows, nutria aggravate coastal erosion, which already destroys as much as 40 square miles of Louisiana's coastal marshes each year. Nutria can be found from Texas

to Florida on the Gulf coast and as far north as Maryland on the Atlantic coast. Their geographic range continues to expand, essentially unchecked, into new areas and problems have continued to escalate. APHIS cooperates with the Louisiana Department of Wildlife and Fisheries, providing direct control and technical assistance. APHIS has also provided technical assistance to managers of the Blackwater National Wildlife Refuge in Maryland, who requested advice on resolving nutria problems along the Chesapeake Bay.

Tropical bont tick is a pest of major concern to the United States because it can carry a parasite that causes heartwater disease—a threat to domestic livestock. This tick belongs to the genus *Amblyomma* and is prevalent on Caribbean islands, posing a threat to the U.S. mainland due to frequent travel and commerce between the areas. Since 1994 APHIS, has provided technical advice and council to the Caribbean *Amblyomma* Programme. APHIS also contributes \$330,000 annually to help fund the program.

Boll weevil is the primary insect pest of cotton that came to the United States from Mexico in 1892. This pest costs U.S. farmers more than \$200 million annually in control efforts and yield losses. APHIS participates in the boll weevil eradication program through cost sharing with the affected States and cotton growers and by providing technical support. Due to the overall success of the program many States contribute additional funding to these eradication efforts, reducing grower costs and stimulating rural economies.

Additional Information

For more information on APHIS' role in managing invasive species, please visit the APHIS Website at www.aphis.usda.gov or contact

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