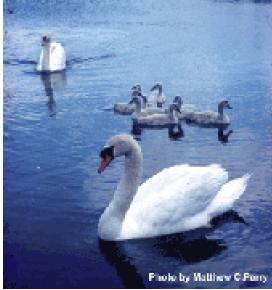


Invasive Species Gallery

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|  | <p>Gypsy Moth: The gypsy moth was brought to this continent from Europe in the 1800s by an entomologist who intended to use it for silk production. The moth quickly escaped captivity and has been a pest of our northeastern forests ever since, with serious outbreaks occurring every 10-12 years defoliating thousands of acres of eastern hardwood forests.</p> <p><i>Photo: US Department of Agriculture</i></p> |
|  <p><small>Photo by Matthew C. Perry</small></p> | <p>Mute Swan: The popularity of these graceful birds in their native Europe sparked an interest in bringing them to the U.S. to adorn public parks and private lands. Five individuals escaped captivity in Maryland in the 1960s and formed a wild population that grew to 4000 individuals by 2000. Voracious and aggressive, the swans are now interfering with efforts to restore native vegetation and waterfowl in the Chesapeake Bay.</p> <p><i>Photo: Matthew C. Perry, USGS PWRC</i></p> |
|  | <p>Kudzu: Known as "mile-a-minute weed" and "the vine that ate the South," Kudzu was introduced as an ornamental plant and was promoted for erosion control until it began to aggressively invade surrounding areas. The vine now infests over 2 million acres of the Southeast, where it overgrows almost anything that stands still, including hillsides, trees, telephone poles, and billboards, choking out native plants and destroying habitat for birds and small mammals.</p> <p><i>Photo: Jack Anthony</i></p> |



Wooly Adelgid: Varieties of this aphid-like insect have caused severe declines of hemlock, fir and spruce trees in the Northwest, Northeast, and Appalachian Mountains. The insects arrived from Asia and attach to the trees' needles, feeding on the sap. The name comes from the a wooly coating with which the insect attaches to the branch (shown in photo).

Photo: University of British Columbia



Hydrilla: This plant is a popular aquarium species that entered America's waterways from people emptying their fish tanks. It forms dense mats over nearly 100,000 acres of canals and lakes in the Southeast, shading out native plants and impeding boating and fishing.

Photo: Vic Ramey, University of Florida



Melaleuca: Sometimes called paperbark tree, it was imported from Australia as an ornamental and now infests nearly half a million acres of south Florida's wetlands. The tree, once established, is able to create the slightly moist conditions that favor propagation of itself over the native vegetation of the area: it frequently drops its leaves, which form a dense layer above the water surface, and its roots pull large amounts of moisture out of the surrounding soil. It is also extremely flammable, and can survive fires that kill off the surrounding vegetation; afterwards, it puts out a huge number of seeds. Unfortunately, it provides little or no habitat for birds or other animals.

Photo: Jim Snyder

Fire Ant: Accidentally imported from South America over 60 years ago, fire ants are infamous

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across 300 million acres of the southern U.S. for their swarming, biting, and resistance to all efforts to eradicate them. The egg-laying queen lives up to six feet underground and food is transferred to her in an assembly-line of worker ants eating and regurgitating, making it nearly impossible to reach her with pesticides. Pesticide applications in the 1950s and 60s cost \$172 million and probably helped the fire ant by killing off its competitors.

Photo: Scott Bauer, USDA



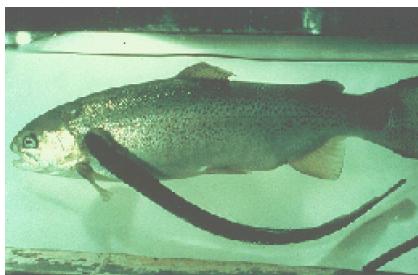
Asian Long-horned Beetle: These beetles bore into hardwood trees – such as maples and horsechestnuts – to lay their eggs. The larvae feed on the tree, killing it by the time they emerge in spring. Transported accidentally to the United States in 1996 in wood packing material from China, the beetle has already cost over \$20 million. Thousands of trees in New York City and Chicago have been burned in an attempt to contain the infestation. Millions of acres hardwood forests in the Northeast could be devastated if this effort fails.

Photo: USDA APHIS



Zebra Mussel: A small mollusc that arrived in the United States in the 1980s as a hitchhiker in the ballast water of ocean vessels. It has now spread to the waters of over 19 states. Zebra mussels can achieve such high densities that they clog water pipes and boat motors, causing costly repairs. They are also filter feeders, eating so many microscopic plankton that the food supply for other organisms is greatly reduced.

Photo: EPA Great Lakes National Program Office



Sea Lamprey: Sea lampreys, native to the Atlantic Ocean, moved upstream into the Great Lakes via canals that were created to help ships bypass the waterfalls between the Lakes. They feed by attaching to native fish, such as trout (shown), salmon, walleye and catfish, frequently weakening the victim to the point of death. Sea lampreys have been a major contributor to the decline of native fish populations in the Great Lakes.

Photo: Great Lakes Fishery Commission

Starling: The American Acclimatization Society

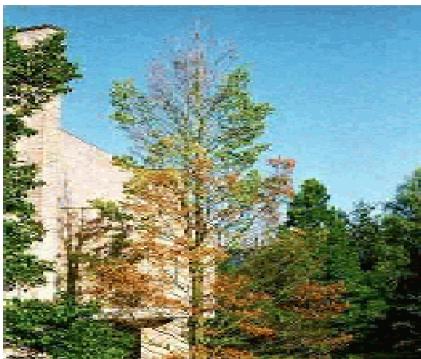
Invasive Species Gallery

Photo by Marshall Iliff



was established in the 1800s to bring to the United States animals and plants that were familiar to people who had recently arrived from Europe. One member, reputedly attempting to establish in Central Park all the birds mentioned by Shakespeare, released 100 starlings in the 1890s. They are now established across the entire North American continent, and outcompete bluebirds, woodpeckers and other birds that nest in cavities.

Photo: Marshall Iliff, USGS



Dutch Elm Disease and Chestnut Blight Elm and chestnut trees were predominant species in eastern forests until both were virtually obliterated by fungal diseases that entered the U.S. in the early 20th century in shipments of lumber and live trees. Despite years of research, no cure has been found, so the only hope for these species appears to be in hybridizing the American species with disease-resistant varieties, including, ironically, some from Asia.

Photo: The University of Edinburgh, Scotland



Nutria: Nutria is a large South American rodent similar to a beaver, which was introduced in several parts of the U.S. as a potential furbearer. Thirteen escaped captivity in 1940, and the population in Louisiana reached 20 million in under 15 years. They feed on wetland grasses and other plants, particularly the roots, destroying the entire plant in the process. This behavior converts vegetated marsh into open water, destroying nesting habitat for wetland birds, making nutria them a menace in many marsh areas, including Maryland's Blackwater National Wildlife Refuge. Control in Louisiana has been aided by an emerging market of nutria meat as a culinary delicacy.

Photo: C.C. Lockwood, Louisiana State University

Africanized Honeybee: East African honeybees were imported to Brazil in 1956 in hopes of creating a tropical-tolerant hybrid with the European

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honeybee, which itself was introduced to North and South America years earlier (no honeybees are native to the U.S.). When queens escaped and interbred with local European bees, the resultant hybrid spread quickly because it tolerated hot weather well. Unfortunately, the hybrid also maintained characteristics that are less desirable from a beekeeper's standpoint: it migrates long distances and aggressively defends its territories with repeated stinging. These "killer" bees entered the U.S. in 1990 and pose a threat to the honey and pollinating industries, already decimated by parasitic mites (another introduced species).

Photo: Smithsonian Institution



Asian Tiger Mosquito: In its native habitat, this mosquito breeds in small pools of water in tree cavities. In the modern world, water collected in used tires (shipped around the world for recycling and disposal) provides a perfect substitute, and this is probably how the Asian tiger mosquito arrived in the southern U.S. in the mid-1980s. The mosquito is known to carry eighteen tropical diseases, including dengue fever, and encephalitis, and it is expanding its range northward in this country.

Photo: Maryland Department of Agriculture



Cheatgrass: So-called because it "cheats farmers out of their crops," this grass infests millions of acres of the intermountain West. The native grassland in this region evolved without pressure from bison or other grazers, so the advent of cattle grazing in the 19th century took a heavy toll on both the plants and the soil structure. Cheatgrass is from Eurasia, and its growth form is much better adapted to co-exist with the horses and other grazers there. The vast monocultures of cheat that crowd out other species are also much more prone to fire than the scattered native grasses were. Cheatgrass fires spread faster and burn more acres than did fires in native grasslands.

Photo: Wildland Invasive Species Program (TNC/UC Davis)

Purple Loosestrife: This species was deliberately introduced across the United States for purported medicinal value, and as an ornamental, a purpose for which it is still commercially available in some

Invasive Species Gallery



areas, despite universal recognition that it is a noxious weed. Purple loosestrife invades wetlands, rapidly excluding other species, such as cattail, that provide better food and nesting habitat for birds, bog turtles, mink and muskrat. Its deep root systems and wetland habitat have made it very difficult to control with pesticides or mechanical means, but there is hope that one or more of the insect species that feed on purple loosestrife in its native Europe could be introduced here without adverse impact to other species.

Photo: Carri Benefield, California Department of Food and Agriculture



Flathead Catfish: The flathead catfish serves as a reminder that a species doesn't have to come from a continent away to be an invader. The species is native to the Great Lakes and Mississippi Valley, where popularity as a sportfish there prompted fisheries managers to introduce it to the southeastern and western United States, outside of its natural range. A fast-growing catfish that feeds voraciously on other fish, the flathead now threatens the recovery of endangered species like the razorback sucker and Colorado squawfish, as well as other commercial species like the American shad.

Photo: Jason Paul Flores, Fort Worth Zoo



Tamarisk: Tamarisk, or saltcedar, is another example of management gone wrong. Deliberately introduced 100 years ago to control erosion and provide windbreaks in the southwest, it has gone on to infest 1.2 million acres of streamside habitat. Its extremely deep root systems draw up water and salt, which are excreted through the leaves: the water evaporates, but the salt falls to the ground, leaving the soil too dry and salty for many native plant species. Unlike the natives it replaces, saltcedar does not provide food or cover for wildlife. Water tables and streamflow can be altered permanently by this species, degrading already-threatened water resources in the arid Southwest.

Photo: Julie A. Crawford, USGS

Silverleaf Whitefly: These insects probably

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Silverleaf Whitefly: These insects probably originated in the Africa or the Middle East, and most likely got a free ride throughout this country on shipments of poinsettias. In California, the silverleaf joined already-established species of whitefly, causing damage to numerous crops by feeding directly and spreading viruses. They form swarms so thick they have the appearance of clouds, and some varieties are resistant to insecticides.

Photo: Jack Kelly Clark, University of California, Kearney Agricultural Center



Russian Wheat Aphid: This pest of wheat, barley and rye entered the country in 1996. It is a "billion dollar pest" and can cause up to 50% crop loss in the fields it infests.

Photo: Alberta Department of Food, Agriculture and Rural Development



Yellow Starthistle: Yellow starthistle overruns native vegetation by sending roots deeper into the soil to reach water, and by producing huge numbers of seeds. The plant currently infests 10 million acres of California, and huge areas of surrounding states as well. It needs lots of light, so it gains a foothold where other vegetation has been removed, like roadsides and other disturbed areas.

Photo: Verde NRCD



African Snail & Rosy Wolfsnail: Hawaii is a unique island community with a tremendous number of species found nowhere else on Earth. Unfortunately, many of these species are gone forever or in extreme peril, partly due to exotic birds, cats, and mongoose, which was deliberately introduced to prey upon rats, but instead went after the largely defenseless native species. A similar example involves the African snail and the rosy wolfsnail. The former was accidentally introduced and became an agricultural pest, so the wolfsnail, which eats other snails, was brought in to control it. Instead, the rosy wolfsnail has devastated Hawaii's native snail species.

Photo: Doug Wechsler, Academy of Natural Sciences, Philadelphia

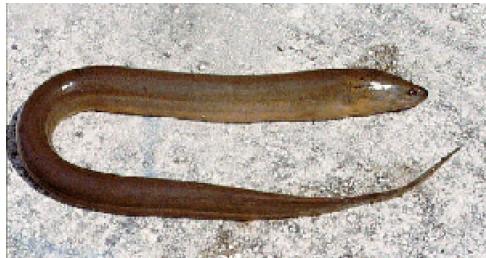
Leafy Spurge: The five million acres that this plant covers only tell part of the story: the secret to its

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Covers only 10% part of the story, the secret to its success lies underground, in its root system. The roots of a single plant can extend 25 feet in any direction. Mow down the stem, and a new plant can emerge from any of the hundreds of buds located on the roots. In addition, leafy spurge irritates the mouths and stomachs of animals that eat it, so they learn to leave it alone, grazing other plants instead.

Photo: Robert A. Masters, Institute of Agriculture & Natural Resources, University of Nebraska – Lincoln



Asian Swamp Eel: The latest in a long line of aliens to scourge the Florida Everglades, the Asian swamp eel is an aquarium species that probably escaped captivity or was discarded. It became established in the streams, lakes and drainage ditches of South Florida, where it has been devouring the young of Florida's native fish species. The eel can breathe air, allowing it to tolerate very shallow waters and even migrate across land for short distances.

Photo: Leo G. Nico, USGS



Giant salvinia: This aquatic fern was described by one scientist as "one of the worst water weeds in the world." Touted as an example of the success of detection when it was recognized and eradicated from a pond in South Carolina, the plant has, unfortunately, gone on to invade over a dozen watersheds in the southeast, California and Hawaii. Despite being listed federally as a Noxious Weed, giant salvinia is still sold legally in several states for use in water gardens.

Photo: USGS