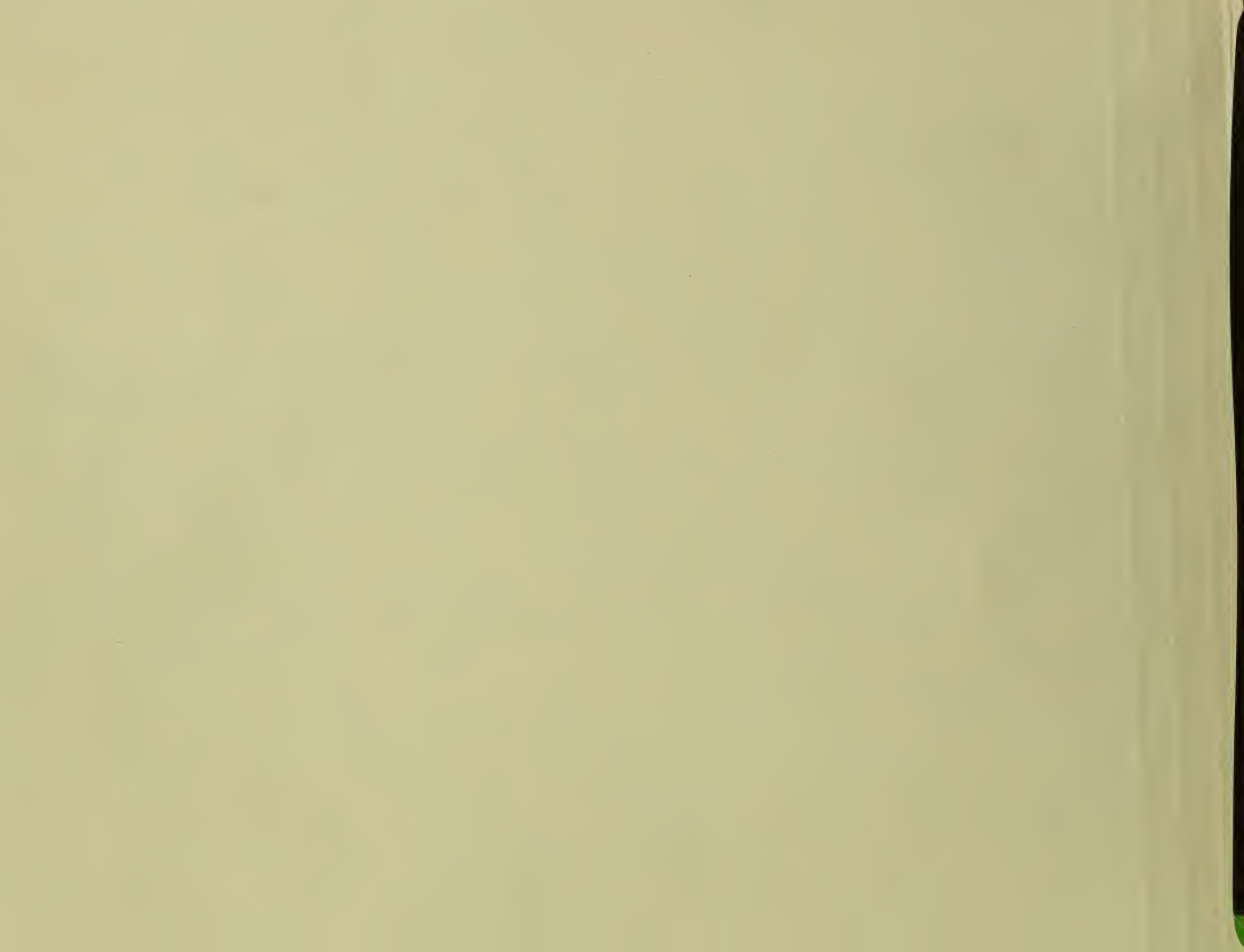


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This beetle's appetite for hardwood could spell destruction for America's trees and could change landscapes for generations to come.

Asian Longhorned Beetle
Anoplophora glabripennis



Asian Longhorned Beetle, *Anoplophora glabripennis*

The Asian longhorned beetle is a native of China. It was first found in 1996 in New York City and Amityville, NY (on Long Island). Since then, it has also been found in the Ravenswood neighborhood of Chicago and in two suburbs of Chicago, Summit and Addison, IL. Scientists think that the beetle got into the United States via the wood of crates and pallets used in shipping cargo from China.

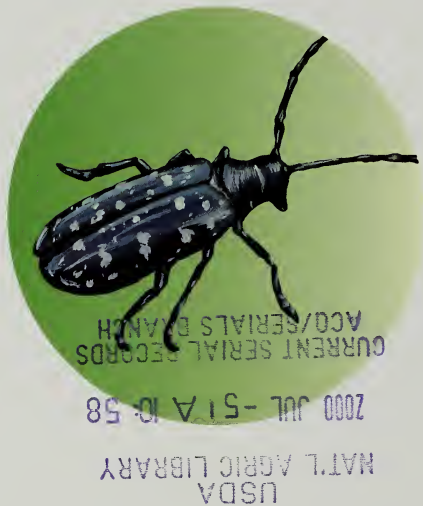
Asian longhorned beetles are big, showy insects, shiny and coal black with white spots. Adults are about 1 inch (2.5 cm) long. On their head is a pair of very long feelers (antennae) that are black with white rings. These antennae are even longer than the insect's body.

This beetle has a voracious appetite for wood. It especially likes the taste of maple trees: Norway, sugar, silver, and red maple are among its favorite foods. But

the Asian longhorned beetle doesn't limit its menu. It also feeds on horsechestnut, poplar, willow, elm, mulberry, and black locust. Females of this species chew into the bark and lay eggs. When the eggs hatch, the immature beetles, which look like big white worms, chew their way far-

ther into the tree. When they mature, the full-grown beetles chew their way out of the tree. The beetle life cycle leaves trees riddled with holes, oozing sap.

The only way to get rid of Asian longhorned beetles is to cut down, chip, and burn the trees. Since 1996, more than 3,000 trees have been destroyed to eradicate this pest in New York and Illinois. This beetle's appetite for hardwood could spell destruction for America's trees and could change landscapes for generations to come.



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This crab is a mean,
green, eating machine...

European Green Shore Crab

Carcinus maenas

European Green Shore Crab, *Carcinus maenas*

The European green shore crab is native to Europe's North Atlantic coast. The first of this species invaded North America not too long after the formation of the United States. In the early 1800's, this crab established itself along the eastern seaboard from New Jersey north to Nova Scotia, Canada. Now, almost 2 centuries later, the European green shore crab has found a new home in California.

The first of this species on the U.S. west coast was discovered in the San Francisco Bay in 1989. Throughout the nineties, it has advanced north along the coast, inhabiting bay and estuarine mudflats and occasionally regions of rocky platforms.

The European green shore crab has the potential to live on the west coast all the way from Baja California up to southern Alaska.

Despite its name, the crab's shell (technically called a carapace) can vary

from dark, mottled green to orange or red with yellow patches. Bodies of adults are usually no smaller than 2.5 inches (66 mm) across, and each has four pairs of walking legs. The European green shore crab has three teeth between its eyes and five to either side.



This crab poses a serious threat to sea life all along the coast because it can eat everything it sees, figuratively speaking. One adult crab can consume 40 half-inch clams a day and will attack and devour other crabs even as large as itself. This pest also eats oysters, mussels, marine worms, small crustaceans, and shellfish. All this eating means less food for other fish and birds. It also means less food for people who harvest sea life from the oceans. This crab is a mean, green, eating machine!

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Occasionally, they even sneak into homes and bite sleeping adults and children...

Brown Tree Snake
Boiga irregularis

Brown Tree Snake, *Boiga irregularis*

Anative of northern Australia, eastern Indonesia, the Solomon Islands, and Papua New Guinea, the brown tree snake is a bird-eating monster of a reptile. Luckily, it hasn't become established in America yet. The snake currently infests the island of Guam, a U.S. territory southwest of Hawaii and east of the Philippines. It most likely reached the island after World War II concealed inside a military transport plane. Since then, the snake has literally taken over parts of the island. In some forested areas, there can be as many as 12,000 snakes/mi² (4,615/km²). That's a lot of snakes!

Adult brown tree snakes can grow as long as 9 ft (3 m) and weigh as much as 5.5 lb (2.5 kg). This snake is greenish-brown and has eyes that bulge out. When threatened, the snakes will literally stand upright. The brown tree snake is mildly poisonous and kills its prey by injecting venom. The species is a very good climber and likes to forage for food in trees and shrubs. It is nocturnal and will stalk lizards, birds, and small mammals, using its keen sense of smell.

The female brown tree snake can lay 12 eggs at a time, sometimes twice in 1 year. The young snakes hatch in about 3 months and can grow a yard in their first year.

It is almost too late to save Guam's natural wildlife from this foreign pest. The brown tree snake has decimated the island's population of birds and small mammals and amphibians. The snakes climb along electrical wires, causing at



least one power outage every 6 days. They will raid kitchens for food and eat small pets. Pet birds are a favorite of the carnivorous snakes. Occasionally, they even sneak into homes and bite sleeping adults and children.

Since the snakes have nearly saturated their niche in Guam's ecosystem, they need to find new habitat elsewhere. By slithering aboard outbound boats and planes, brown tree snakes have made it to Hawaii at least six times. Fortunately, inspectors caught the snakes each time before they could escape into the wild. It would take the escape of only one pregnant female in Hawaii to establish that very undesirable species at America's Pacific gateway.

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Tropical bont ticks could come to this country. Heartwater and related diseases would follow, damaging the cattle industry and driving up the price of your next hamburger...

Tropical Bont Tick

Amblyomma variegatum

Tropical Bont Tick, *Amblyomma variegatum*

Tropical bont ticks were introduced onto the eastern Caribbean island of Guadeloupe in the 1800's on cattle imported from French West Africa. Since then, and particularly in recent years, the tropical bont tick has spread as far north as Puerto Rico and as far south as Barbados and St. Vincent. The reason the tick is dangerous is that it harbors organisms that cause serious diseases in cattle and wildlife.

The life cycle of *Amblyomma* ticks may take from 5 months to 4 years to complete. Thus, the disease agents may persist in the environment, inside these ticks, for a long time. The immature stages of the tick feed on a wide variety of livestock as well as wildlife (e.g., deer, ground-dwelling birds, small mammals, reptiles, and amphibians). The ticks thus spread the infectious diseases efficiently and rapidly.

The tropical bont tick carries a particularly nasty and fatal livestock and wildlife disease called heartwater and a cattle disease called acute bovine dermatophilosis (a skin infection). These diseases are not themselves contagious but are transmitted by the ticks.



Scientists believe that much of the recent interisland spread of the tropical bont tick has occurred through movement of infested migratory birds, and in particular cattle egrets. Because these egrets can fly between the Caribbean and Florida, there is a significant chance that tropical bont ticks could come with them to this country. Heartwater and related diseases would follow, damaging the cattle industry and driving up the price of your next hamburger.

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This noxious weed quickly cuts off native vegetation from water in the soil and then moves into the natives' space after they die.

Spotted Knapweed

Centaurea maculosa

Spotted Knapweed, *Centaurea maculosa*

Accidentally introduced into America in the late 1800's, the spotted knapweed has established itself throughout the country. This noxious weed was most likely brought to the United States in a shipment of alfalfa seed from Asia Minor. Generally, the spotted knapweed will establish a colony in areas where there isn't a lot of competition from other plants. Once established though, spotted knapweed will spread into nearby areas crowded with native plants. Spotted knapweed is most frequently found in dry meadows, pastureland, stony hills, roadsides, and the sandy or gravelly flood plains of streams and rivers where soils are light textured and well drained and receive summer rain showers.

Spotted knapweed is a biennial; this means that it lives less than 2 years. It usually forms between 1 and 20 slender, upright stems 1 to 3.5 feet (30–100 cm) tall. Most of the stems branch on their upper half. The knapweed has pretty flowers that can be white, pink, purple, or a mix of all three colors.

Like their cousin yellow starthistle, spotted knapweed can produce a large num-

ber of seeds, which drop after the plant dries out in late summer. These seeds can be carried away by the wind, animals, and even people. And the seeds are long lived: they can lie dormant up to 8 years if weather conditions don't favor reproduction and still sprout and produce viable plants. As many as 146,000 seeds/yard² have been reported in areas of heavy infestation.

Spotted knapweed hogs moisture and nutrients to the detriment of native plants



nearby. This noxious weed quickly cuts off native vegetation from water in the soil and then moves into the natives' space after they die. Knapweed infestations do not spread quickly over large distances, but their slow, methodical advance can wipe out whole pastures. Knapweed can thrive in areas of heavy grazing. Native grasses stop regrowing after repeated grazing by livestock. Once the grasses die back, knapweed moves in and displaces them permanently. Spotted knapweed can cause chewing disease in horses, but animals tend to avoid eating it because it tastes bitter. Essentially, spotted knapweed is a troublesome noxious weed that chokes rangeland and doesn't provide nutritious food for grazers or wildlife either.

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This tiny pest may prove powerful enough to damage the entire food web in America's inland waterways.

Spiny Water Flea

Bythotrephes cederstroemi

Spiny Water Flea, *Bythotrephes cederstroemi*

The spiny water flea isn't really a flea at all. It is a tiny crustacean distantly related to shrimp, lobster, and crayfish. This native of Europe first appeared in North America in Lake Huron in 1984. Three years later, it could be found in all five Great Lakes.

Scientists believe that the spiny water flea was brought over by a transoceanic ship, trapped in the ship's ballast tanks. When a cargo ship leaves the United States bound for overseas, it drops off its cargo but doesn't always pick up new cargo for the trip home. Because there is no new cargo weighing the ship down and providing stability in the water, the ship must fill special tanks with seawater to supply needed ballast. Back home, the ship empties its ballast tanks when new cargo is loaded. The problem is that sometimes ships suck up exotic sea life, like spiny water fleas and zebra mussels, when they fill their tanks and then drop that sea life when they dump their ballast water here. This route is believed to be how the spiny water flea came to the United States.

While spiny water fleas aren't really fleas, they are spiny. Each has a tail

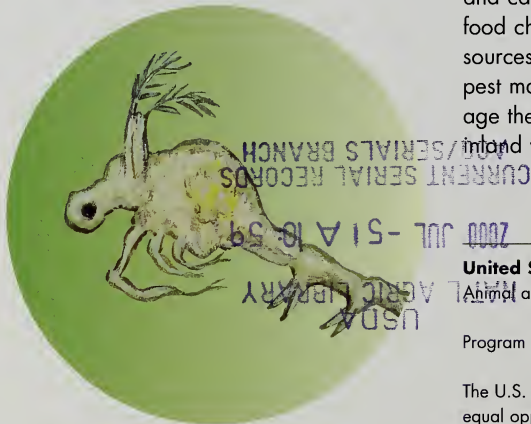
rimmed with several sharp spikes and barbs. When small fish try to eat these crustaceans, the barbs choke the fish, causing them to spit the spiny water flea back into the water. Fish that have gone through this experience tend to avoid the fleas in the future.

The spiny water flea is very small—only 2/5 inch (12 mm) long as an adult. And that size includes its tail, which makes up at least 70 percent of its length.

Spiny water fleas reproduce rapidly. During the warm summer months, each

female can give birth to up to 10 offspring every 2 weeks. Females go on laying eggs in the winter, but the eggs lie dormant until the water warms up the following summer. When it comes to reproduction, the spiny water flea never takes a break.

The threat posed by the spiny water flea is one of the scariest. It is unknown. Scientists studying the effects of the spiny water flea in the Great Lakes have learned that the tiny crustacean, in large numbers, will devour native plankton. The loss of plankton can change a lake's ecosystem and cause other species higher on the food chain to move elsewhere to find new sources of food or even die off. This tiny pest may prove powerful enough to damage the entire food web in America's inland waterways.



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Through their excretions, nutria can pass paratyphoid and parasites to people. Basically, nutria are bad news no matter how you look at them.

South American Nutria

Myocastor coypus

South American Nutria, *Myocastor coypus*

The South American nutria, a furry, plant-eating rodent, is native to Argentina, Bolivia, Chile, Paraguay, and Uruguay. It was brought to the United States in 1899 for its fur, but it wasn't until the 1930's that the animal found its way from captivity into the wild. A furrier released six breeding pairs on Avery Island, LA, to start a commercial breeding farm. Over the course of 2 years, several animals escaped and established colonies elsewhere on the island. Then, in 1940, a hurricane washed Avery Island clean of nutria. Unfortunately, these nutria were scattered to other parts of the State, where they continued to breed and expand their range. Eventually, nutria spread throughout Alabama, Georgia, Mississippi, Texas, and Florida. Now, they can be found throughout the United States thanks to subsequent importers who brought them into the country for food and fur.

Nutria have big, buck teeth like beavers but lack the beaver's wide, flat tail. The tail of a nutria is long, thin, and hairy and looks like a rat's tail. As the animals swim, their tail floats on the surface behind them.

Frequently, they can be found in streams, lakes, ponds, and swamps. They reproduce rapidly, often having two or three litters a year with five to eight young in each. Adult nutria generally grow more than 12 inches (30 cm) long, not including the tail, and weigh as much as 18 lb (8 kg).

Originally, scientists thought that nutria could offer potential as biological control agents for undesirable water vegetation. It turns out that they are excellent in this

role. They will eat aquatic weeds and other noxious plants to the point of eradication. The problem is that they will also eat all the good plants. In fact, they will even come out of the water to dine on crops of cabbage, corn, lettuce, peas, etc. While this poses an obvious threat to agricultural resources, nutria do even more damage to marshes and swampland. These pests will clear a marsh of its plants and leave behind nothing but a big, muddy hole in the ground.

Nutria can act as vectors for wildlife diseases and have been known to spread tuberculosis, false tuberculosis, and septicemia. Through their excretions, nutria can pass paratyphoid and parasites to people. Basically, nutria are bad news no matter how you look at them.



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This is one ant you don't want to see at your picnic!

Red Imported Fire Ant
Solenopsis invicta Buren

Red Imported Fire Ant, *Solenopsis invicta* Buren

Red imported fire ants are native to the central parts of South America. Scientists believe they arrived in Mobile, AL, around 1930 in soil that had been used for ship ballast. These aggressive ants proceeded to spread and now infest all or part of 14 Southern and Western States.

Fire ants look a lot like ordinary ants. They are 1/8 inch to 1/4 inch (3–6 mm) long and reddish brown. Fire ants are probably best distinguished by their aggressive behavior and characteristic mound-shaped nests. People and fire ants often come into conflict when people accidentally bump into these mounds while mowing, step on them, or otherwise disturb them in the normal course of farming or family life. When their nests are disrupted, fire ants swarm out to bite whatever hit their home—pets; kids, or lawn equipment.

Anyone who has had an encounter with them can tell you why these pests are called fire ants. They clamp onto their target with powerful jaws and sting it repeatedly. Each sting injects venom, which causes a burning sensation and itching



blisters that can become infected. Red imported fire ants attack and kill newborn domestic animals, pets, and wildlife and destroy seedling corn, soybeans, and other crops. They can even remove bands of bark from young citrus trees, often killing them. The ants' nests can grow up to 2 feet (60 cm) high and are hazards in yards, parks, and other recreational areas. This is one ant you don't want to see at your picnic!

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Although it is very attractive, this plant is deadly to American wetlands because it crowds out the native plants that support bird and animal populations in marshy areas.

Purple Loosestrife

Lythrum salicaria

Purple Loosestrife, *Lythrum salicaria*

Purple loosestrife is a pretty, purple-flowered plant that was brought to the United States from wetlands areas in Europe in the early 1800's, most likely because of its ornamental value. Although it is very attractive, this plant is deadly to American wetlands because it crowds out the native plants that support bird and animal populations in marshy areas. Purple loosestrife, also known as the purple plague, got its American start in New England. From there, it spread rapidly north into Canada, south into Virginia, and west through the States bordering the Great Lakes. Currently, it can be found throughout the United States and is menacing the wetlands in the Northeast and upper Midwest.

Purple loosestrife is a big, long-lived perennial (life cycle lasting longer than 2 years) that can grow almost 6 feet (2 m) tall. Its square, tough stems grow in a cluster and support lance-shaped leaves about 3 inches (8 cm) long. At the top of the stems are flowers ranging in color from deep purple to bright magenta.

Each mature plant produces more than a

million seeds that can be carried by wind and water. Adult plants can also regrow from just roots or pieces of stems. These qualities make purple loosestrife a terrific reproducer.

This plant is used for landscaping in some States because of the beauty of its flowers. Purple loosestrife is also used by beekeepers because of its sweet nectar. Currently, purple loosestrife is listed as a noxious weed by about 2 dozen States. This means that the plant cannot be



brought into those States or sold in nurseries there.

Unfortunately, researchers have not found any species of wildlife that can make use of loosestrife. Once it starts to grow in the wild, it displaces native plants that are useful to wildlife. The fact that purple loosestrife is a long-lasting perennial and can produce so many seeds makes it a serious threat to wetlands in the United States. It can take over areas such as lakeshores, streambanks, and marshes and then outpace most native plants, including some species of endangered orchids. After only a few summers, fields of the purple plague can grow to thousands of acres, virtually eliminating marsh and wetland habitats with its dense clusters of stems.

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The scariest thing about these fruit flies is that you often can't see their damage until you bite into a piece of fruit....

Mexican Fruit Fly

Anastrepha ludens (Loew)

Mediterranean Fruit Fly

Ceratitis capitata (Wiedemann)

Mexican Fruit Fly, *Anastrepha ludens* (Loew) **Mediterranean Fruit Fly, *Ceratitis capitata* (Wiedemann)**

The Mediterranean fruit fly (also called Medfly) and the Mexican fruit fly are among the world's most destructive pests. The Medfly is originally from Africa and has spread throughout southern Europe, the Middle East, western Australia, South and Central America, and Hawaii. Medflies accidentally brought into Florida and California in imported fruit have almost established permanent populations on many occasions. But Government and the agricultural community have stopped this pest each time.

As its name implies, the Mexican fruit fly is from Mexico, but it does not stop at the border. Each year, populations of this pest fly into the fruit groves of the lower Rio Grande Valley in Texas. It also frequently threatens California. Government and the agricultural community also combine forces against the Mexican fruit fly.

The Medfly is slightly smaller than a common house fly and very colorful. It has

dark blue eyes, a shiny black thorax (back), and a yellowish abdomen with silvery cross bands. Its wings have yellow, brown, and black spots and bands. The Mexican fruit fly is larger than a house fly. It has green eyes, transparent wings with "V" marks, and a yellowish-brown body with black specks.



These nasty cousins destroy many types of fruit, including oranges, grapefruits, peaches, and pears. Female fruit flies lay their eggs in pieces of fruit. The eggs hatch into larvae (also called maggots). The maggots eat the flesh of the fruit, causing it to rot.

These flies could cause billions of dollars' worth of damage if they became established in the United States. The scariest thing about these fruit flies is that you often can't see their damage until you bite into a piece of fruit....

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These twin terrors
could eat their way
clear across America...

Gypsy Moth and Asian Gypsy Moth
Lymantria dispar (Linnaeus)

Gypsy Moth and Asian Gypsy Moth, *Lymantria dispar* (Linnaeus)

In 1869, a French naturalist living near Boston imported gypsy moths into the United States in an attempt to breed them with silkworms. Some gypsy moth caterpillars escaped during his experiments, and these natives of Europe, Asia, and North Africa found the climate of Massachusetts excellent for their survival.

Descendants of those first gypsy moths currently infest all or part of 15 U.S. States. This pest eats the foliage of many hardwood trees, especially oaks.

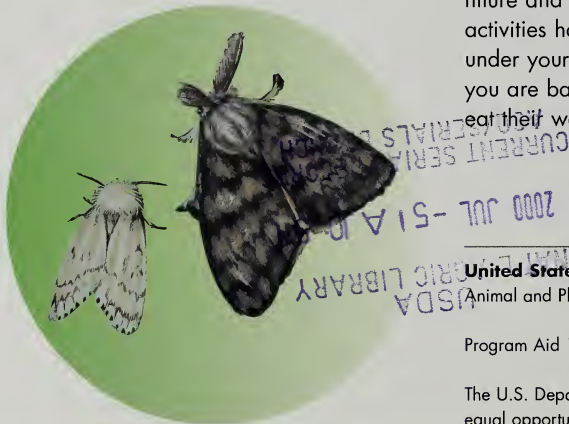
In 1993, a ship docked at Wilmington, NC, and opened its cargo hold. Out flew dozens of Asian gypsy moths—Asiatic relatives of the European gypsy moth that share the same scientific name and look just like the gypsy moths already common in America. This new pest is even more threatening to U.S. trees. It eats foliage from both hardwoods and conifers, making it dangerous to commercial softwood operations like Christmas-tree farms and tree nurseries in the Northwest and the Deep South. Plus, female Asian gypsy moths can fly (European females can't). This capability makes it much easier for Asian gypsy moth populations to spread quickly into uninfested areas.

Since 1993, Asian gypsy moths popped out of cargo vessels on a few other occasions. But fortunately, State and Federal Government insect experts were able to control these small populations and keep the new Asiatic strain of gypsy moths from getting established here.

The gypsy moth has four life stages: egg, larva, pupa (cocoon), and adult. Larvae (caterpillars) are 1 to 2 inches (2–5 cm) long with "hairs" along their whole body. They are gray with five pairs of blue spots and six pairs of red spots along their

back. Adult female gypsy moths are white with brownish banding on their wings. Males are smaller and brown with bands of different shades of brown, and they have oblong brown antennae that look almost like little feathers. In appearance, the European and Asian strains of gypsy moth are almost identical. It is virtually impossible for anyone but an entomologist to tell them apart.

The current U.S. gypsy moth population can eat all the leaves on 13 million acres of trees in 1 season. Gypsy moth caterpillars also crawl on homes, get on lawn furniture and in pools, and make outdoor activities hard to enjoy. Plus, they squish under your shoes or between your toes if you are barefoot. These twin terrors could eat their way clear across America.



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Scientists consider the Giant African snail to be one of the most damaging land snails in the world...

Giant African Snail

Achatina fulica (Bowdich)

Giant African Snail, *Achatina fulica* (Bowdich)

Scientists consider the giant African snail to be one of the most damaging land snails in the world. Luckily, it has not established a foothold in the continental United States, even though that almost happened at least twice. Originally from an area south of the Sahara in East Africa, this snail has established itself in Asia and the Indo-Pacific Islands, including Hawaii. The two near misses took place in California just after World War II and in Miami, FL, in 1966.

In the Florida incident, a young boy returning from Hawaii smuggled three giant African snails into Miami as pets. His grandmother eventually released the snails into her garden. Seven years later, more than 18,000 snails had been found along with lots of eggs. It took the State of Florida almost 10 years and cost more than \$1 million to rid itself of this slow but persistent pest.

Compared to our native snails, this foreign pest is really big—about 8 inches (200 mm) long overall with the shell making up half its length. It is also showy, with a light-brown shell striped with brown and cream bands.

Two qualities make this tropical snail especially dangerous here. First, it can survive cold conditions and even snow by aestivating. This means that the snail will become slow and sluggish, essentially hibernating until warm weather returns. Theoretically, it could live in most of the United States.

Second, the giant African snail is a whiz at reproduction. For one thing, each snail contains both female and male reproductive organs! After a single mating session, each snail can produce a batch of 100 to 400 eggs. And it can keep this up several more times without having to mate again. In a typical year, every mated adult lays about 1,200 eggs. Giant African snails can live as long as 9 years, and that is plenty of time to cause trouble in the local environment.



One of the threats posed by the giant African snail is not what it eats, but what it carries. This pest can be a vector for human diseases such as eosinophilic meningitis. This disease is passed along by rat lungworm parasites that can be found on the snail. If the snail is eaten raw or isn't completely cooked, diners eating giant African snails might get the rat lungworm parasite as a side dish without knowing it—and meningitis for dessert.

Another threat is the voracious snail's appetite. It is known to eat at least 500 different types of plants, including breadfruit, cassava, cocoa, papaya, peanut, rubber, and most varieties of beans, peas, cucumbers, and melons. Unlike people, giant African snails are never picky eaters. If vegetables or fruits are not available, the snails will munch on a wide variety of ornamental plants and even tree bark. All the world's a buffet table to this snail.

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Leafy spurge presents
a threat to pastures and
rangeland for cattle.

Leafy Spurge
Euphorbia esula

Leafy Spurge, *Euphorbia esula*

Leafty spurge, a weed, was first found in the United States in Massachusetts in 1827. About 50 years later, it was found in New York, where it was described as rare. Five years after that, botanists spotted leafy spurge in several places in Michigan. The weed quickly moved westward and can now be found in every Northern State and as far south as Iowa. While it is believed to have originated in Asia, leafy spurge now exists worldwide with the exception of Australia. Currently, leafy spurge occupies about 2.5 million acres of land in North America, an area almost twice the size of Delaware.

Leafy spurge is a perennial plant. This means that its life cycle lasts more than 2 years. It can grow about 16 to 32 inches (41–81 cm) tall. Leafy spurge appears to flower in late May and early June, but these yellow bracts aren't true flowers. The real flowers don't emerge until mid-June and are small and green. These innocent-looking flowering plants usually produce 10 to 50 pods that contain 3 seeds each. When the seed pods dry out,

they explode. In this way, leafy spurge seeds can be thrown as far away as 5 yards (4.5 m). But it's not just the seed pods that account for the plant's explosive spread. Birds, animals, and even humans can accidentally spread the seeds.

Leafy spurge presents a threat to pastures and rangeland for cattle. Grass can't compete with leafy spurge very well, and when the grass dies off, the leafy spurge

expands onto its territory. Leafy spurge can increase the amount of land it takes to feed a cow by as much as 75 percent. Also, cattle prefer not to eat in areas infested by leafy spurge. They avoid this plant because all parts of it contain a white, milky, latex.

When the plant is injured, this latex will ooze out and seal the injury like a botanical bandage. The latex also burns and blisters the skin of cattle and people. Taken internally, the latex will cause severe irritation in the mouth and digestive tract of cattle. Leafy spurge, with its defensive latex, hardy nature, and ability to spread quickly, is one invasive plant that can take care of itself.



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Everybody loves sunflowers, but nobody loves yellow starthistle. It is a noxious, and obnoxious, cousin of the sunflower...

Yellow Starthistle

Centaurea solstitialis

Yellow Starthistle, *Centaurea solstitialis*

Everybody loves sunflowers, but nobody loves yellow starthistle. It is a noxious, and obnoxious, cousin of the sunflower. Other relatives include knapweeds, chicory, dandelion, safflower, and artichoke. Starthistle is a European weed that grows on various soil types and usually inhabits rangelands, vineyards, and orchards. Starthistle is also commonly seen along roadsides and in fields. It likes the sun and cannot tolerate shade, which is why it can be found in the wide-open spaces of our Western States. This weed infests about 3 million acres in Idaho, California, Oregon, and Washington.

Yellow starthistle is an annual plant, though it lasts much longer than many other annuals. Often it doesn't even mature until late summer or early fall. As starthistle reaches maturation, it begins to lose its leaves. The yellow flowers fade to light tan as entire fields become filled with skeletonlike silver-grey husks. When the flowers dry sufficiently, the seeds are ready to be scattered by the wind or other means.

Adult plants grow between 2 to 3 feet (60–90 cm) tall. They have very stiff, branching stems covered with a white fuzz. The flowers are bright yellow and located on the ends of branches. There is only one flower per branch. From underneath each flower grow long, straw-colored spines. Seen from above, these spines put the "star" into starthistle. While all this makes for a pretty plant, several States have recognized the danger of this



foreign weed and made it illegal to allow yellow starthistle to grow.

Yellow starthistle is a very competitive plant. In the flora Olympics, this noxious weed wins the root-development race against most native perennial grasses every time, even in winter. While cattle, sheep, and goats may graze on the weed in early spring, they won't after the plant develops its star-patterned spines. Yellow starthistle can also present a very serious problem when found in horse pastures. If horses eat it, the starthistle can cause a neurological disorder commonly known as chewing disease (nigropallidal encephalomalacia). Between displacing native forage plants and poisoning horses, yellow starthistle poses a serious threat to U.S.

rangelands.

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Not All Alien Invaders Are From Outer Space

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This pest is a plague and shows that even pint-size invaders can cause big trouble.

Zebra Mussel

Dreissena polymorpha

Zebra Mussel, *Dreissena polymorpha*

A relatively new invader, the zebra mussel is believed to have come to America in the ballast tanks of a transoceanic ship. Native to Europe's Caspian and Black Seas, the zebra mussel was first found in North America in 1988 in Lake St. Clair between Lakes Huron and Erie. Since then, the zebra mussel has spread throughout the Great Lakes and waterways of at least 19 States, including the Hudson, Illinois, Mississippi, Ohio, and Tennessee Rivers. Currently, the zebra mussel is extending itself to the West via the Arkansas River and other tributaries. It remains unstopped by predators and parasites, leaving all waterways of North America wide open for invasion.

Zebra mussels are very small with brown and black bands. Fully grown, they are only 2 inches (5 cm) long. By themselves, these mussels don't look threatening. But 1 adult female can produce 30,000 young each season, and occasionally there are two spawning seasons in a year. The first

season is from June until mid-July and the second, when it occurs, takes place between August and October. The zebra mussels' young can attach themselves to any hard surface—a rock, a pipe, or even the shell of another sea creature.

The threat of the zebra mussel lies in its ability to reproduce in large numbers and in the fact that it can stick to anything

hard. Oftentimes, zebra mussels will block intake pipes to factories and water treatment plants. The mussels will blanket marinas and can crowd out native bivalve species like freshwater clams. Sea creatures with shells often fall victim when literally hundreds of zebra mussels cover them, preventing them from feeding, growing, moving, breathing, and reproducing. Two years after the zebra mussel's introduction into Lake St. Clair, all hard-shelled native species in the lake were encrusted by the invasive mussel. Several native species were destroyed completely. This pest is a plague and shows that even pint-size invaders can cause big trouble.



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Not All Alien Invaders Are From Outer Space

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Somewhere out there, in a remote part of the world, a creature waits...

The Unknown Invader

Scaryus eatumpis



The Unknown Invader, *Scaryus eatumupis*

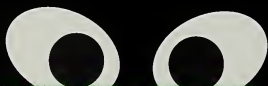
The Unknown Invader is the worst of its kind. Somewhere out there, in a remote part of the world, a creature waits. It could be a bug, a plant, an animal, even a disease. Whatever it is, it is hungry, and it is looking toward America. It dreams of spreading disease among our healthy livestock and licks its chops just thinking of our bountiful crops. As long as it just dreams, however, we are safe.

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, pushing aside native species. An invasive species is defined as a foreign species whose introduction does, or is likely to, cause economic or environmental

harm or harm to human health. Invasive plants, animals, and aquatic organisms have significantly reduced the economic productivity and ecological balance of U.S. agriculture and natural resources. Invasive organisms, like the Unknown Invader, are always on the move.

The U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) works 24 hours a day, 7 days a week to ensure that the dreams of the Unknown Invader don't become reality. APHIS inspectors scour incoming shipments

for the very clever Unknown Invader. It will cower in crates, mope in machines, and snuggle in ships. It can hide inside fruits, vegetables, and meat. Sometimes, it can even convince people to carry it across the border in their coat pockets. But every time, the Unknown Invader must hide from APHIS inspectors, who diligently watch day and night, safeguarding America's agricultural resources and allowing the movement of commodities in the global marketplace—without hitchhiking pests and diseases.



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Issued February 2000