

Q: Why are invasive species a problem?

A: The introduction of invasive species can have a dramatic effect on our natural resources, human health, and economy. When non-native species are introduced into an ecosystem in which they did not evolve their populations sometimes explode in numbers. The reason for this is that in a natural or native community, species evolve together into an ecosystem with many checks and balances that limit the population growth of any one species. These checks and balances include such things as: predators, herbivores, diseases, parasites, other organisms competing for the same resources and limiting environmental factors. These checks and balances form the complex web of life that makes up an ecosystem and in which a native species competes for survival. However, when an organism is introduced into an ecosystem in which it did not evolve naturally, it no longer has those limits and its numbers can sometimes dramatically increase. The unnaturally large population numbers can then have severe impacts. The following discussion highlights examples of each of these impacts.

Impacts to Natural Resources and the Environment

Invasive species are harmful to our natural resources (fish, wildlife, plants and overall ecosystem health) because they disrupt natural communities and ecological processes. This causes harm to the native species in that ecosystem because they are suddenly competing with a new species for the same resources (food, water, shelter, etc.). The invasive species can outcompete the native species for food and habitats and sometimes even cause their extinction. Even if the native species are not completely eliminated, the ecosystem often becomes much less diverse. A less diverse ecosystem is more susceptible to further disturbances such as diseases and natural disasters. Invasive species can:

- Reduce the ability of streams to make historic water deliveries. Examples include:
 - Phragmites colonization of river channels in Nebraska, which has resulted in localized flooding and a reduced capacity for safe water conveyance downstream.
 - Tamarisk (saltcedar) spreading along stream channels, bars, and beaches throughout the arid interior West, which has altered riverine and riparian habitats, caused localized flooding, and increased the loss of already-scarce streamflow to evapotranspiration.
- Displace native plant communities and/or radically change the nature of the habitats they invade. Examples include:
 - Purple loosestrife, water hyacinth, yellow star thistle, and many other invasive plants across the nation
 - Zebra mussels in our rivers and streams
 - Nutria in our nation's coastal marshes.
- Compete for the same natural resources and life requirements (food, water, space, shelter) as native species and degrade local ecologies by disrupting the food chain. Examples include:
 - The ruffe and round goby in the Great Lakes
 - The brown tree snake in Guam
 - The introduction of rats and the Indian mongoose to Hawaii
- Cause the extinction of native species. Examples include:
 - The brown tree snake in Guam has caused the extirpation of many of Guam's native terrestrial vertebrates, including fruit bats, lizards, and virtually all of the island's forest birds.

- Goats caused the extinction of 8 plants on San Clemente Island in California.
- Increase soil erosion and fire hazard.
 - One example includes cheatgrass, which was partly responsible for the fires at Hanford Reach National Monument and Saddle Mountain National Wildlife Refuge.
- Decrease the quality of understory habitat in forests and facilitate the spread of other invasive species.
 - One example includes wild pigs in the Hawaiian forests.
- Decrease the quality and amount of range for wildlife (and range animals).
 - Examples include leafy spurge and yellow starthistle which are problems in the northwestern states, where rangeland with more than 10-20% leafy spurge will not be grazed by cattle thus also affect the quality of range for wildlife.
- Degrade aquatic habitats and clog waterways. Examples include:
 - Giant salvinia, in the south, can quickly cover an entire water body. This prevents sunlight from getting to the aquatic plant and phytoplankton and preventing new oxygen from entering the waters. Decaying organic material then uses up the existing oxygen thus causing harm to organisms that need oxygen. The salvinia also prevents many forms of aquatic recreation such as fishing and boating.
 - Other plants that cause similar problems across the nation include alligatorweed, Brazilian elodea, water hyacinth, hydrilla, Eurasian water-milfoil, water lettuce, and Caulerpa taxifolia (an invasive seaweed which was eradicated from San Diego, CA waters).

Invasive Species Impacts to the Economy

In addition to harming the natural world, invasive species also have serious effects on our economy. Invasive species can alter the habitats they invade to the point that natural-resource based businesses can suffer. We also spend millions of dollars every year on the eradication of invasive species and the restoration of the habitats they have invaded.

Invasive species can:

- Cause reduced revenues to natural resource based businesses.
 - Giant salvinia completely covers water bodies making it impossible to go fishing and allowing no space for waterfowl to land thus making hunting much less profitable. Aquaculture and rice production could also be severely impacted by giant salvinia.
 - The sea lamprey and round goby have caused decreases in native fish populations in the Great Lakes.
 - The Indian mongoose damages some papaya and banana crops in Hawaii
 - Honeybee mites can kill bees, thus damaging honey crops
- Affect boaters and fisherman by changing fish habitat and clogging waterways.
 - Hydrilla and water hyacinth are clogging waterways in the south. Giant salvinia may soon join in if it cannot be contained.
- Act as hosts for other damaging organisms.
 - Buckthorn is an invasive shrub that also carries an oat rust that damages oat crops.
 - Johnsongrass, an invasive grass native to the Mediterranean, harbors viruses that affect corn.
- Decrease the quality and quantity of rangeland.

- Leafy spurge and yellow starthistle are problems in the northwestern states. Rangeland with more than 10-20% leafy spurge will not be grazed by cattle.
- Decrease land values and cost the landowner time and money.
 - Many perennial weeds (knapweed, leafy spurge) are known to reduce production and thus ultimately reduce land values.
- Cause soil erosion.
 - This is common when native plants with fibrous roots are replaced with invasive broad-leaved plants with taproots.
- Cause damage and increased maintenance costs to power plants and industrial water systems.
 - Zebra mussels, quagga mussels, and Asian clams.
 - Aquatic nuisance plants like giant salvinia and water hyacinth.
- Have a negative impact of tourism.
 - In Colorado, many invasive plants are replacing the beautiful blend of grasses and wildflowers in our refuges and parks that visitors come to photograph.
 - In Hawaii, the tourism and real estate industries are being affected by a combination of invasive species. The disturbingly loud call of a Puerto Rican frog known as the coqui is keeping tourists awake at night, while invasive seaweeds are damaging coral reef ecosystems and washing up on the beaches in huge amounts, causing foul odors as they decay.
 - In the Sonoran Desert, which attracts a lot of eco-tourists due to the desert's high plant diversity, dense buffleggrass stands can cause the disappearance of 90 out of 100 species (see [Invasive Plants of the Sonoran Desert](#)).

Invasive Species Impacts to Human Health

Although most of the impacts caused by invasive species are to our ecology and economy, invasive species can also have severe impacts on human health. Invasive species can:

- Serve as vectors (carriers) for human diseases
 - The Asian tiger mosquito can carry the West Nile virus.
 - The Indian Mongoose can carry rabies.
 - At least one species of invasive snail carries schistosomiasis.
 - Cholera has been found in the ballast water of ships.
- Be poisonous or caustic to humans.
 - Approximately half of the poisonous plants in the eastern U.S. in non-agricultural areas are non-native and many are invasive
 - The Brazilian pepper tree in Florida produces allergens that cause respiratory difficulty and contact dermatitis.
 - African honey bees and fire ants can bite or sting.