The Cost of Invasive Species

Zebra mussels invaded U.S. waters and have caused millions of dollars of damage by occluding pipes in municipal and industrial raw-water systems

The negative consequences of invasive species are far-reaching, costing the United States billions of dollars in damages every year. Compounding the problem is that these harmful invaders spread at astonishing rates. Such infestations of invasive plants and animals can negatively affect property values, agricultural productivity, public utility operations, native fisheries, tourism, outdoor recreation, and the overall health of an ecosystem.

The most widely referenced paper (Pimental et al. 2005) on this issue reports that invasive species cost the United States more than $120 billion in damages every year.

In 2011 alone, the Department of the Interior will spend $100 million on invasive species prevention, early detection and rapid response, control and management, research, outreach, international cooperation and habitat restoration.

The Environmental Impacts

In Executive Order 13112, invasive species is defined as an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health. Invasive species typically harm native species through predation, habitat degradation and competition for shared resources.

Invasive species are a leading cause of population decline and extinction in animals. For example:

- More than 400 of the over 1,300 species currently protected under the Endangered Species Act, and more than 180 candidate species for listing are considered to be at risk at least partly due to displacement by, competition with, and predation by invasive species.
- Invasive species are a leading factor in freshwater fish extinctions and endangerments.
- Brown tree snakes have been implicated in the precipitous decline in native forest birds and the modern extinction of at least 10 species in Guam.

More Facts about the Cost of Invasives:

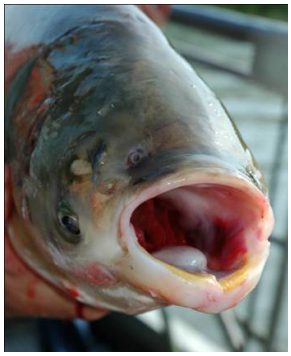
- If zebra and quagga mussels invade the Columbia River, they could cost hydroelectric facilities alone up to $250-300 million annually. This does not inclued costs associated with environmental damages or increased operating expenses to hatcheries and water diversions.
- Annually, the Massachusetts Department of Conservation and Recreation spends $250,000 on staff, $30, 000 on equipment and $25,000 on publications related to zebra mussel prevention and control. The state will spend an additional $71,000 over 5 months to install new boat ramp monitors for zebra mussels.
- An aquatic invasive plant, Eurasian watermilfoil, reduced Vermont lakefront property values up to 16 percent and Wisconsin lakefront property values by 13 percent.
- From 2010 to 2020, an invasive forest pathogen (*Phytophthora ramorum*), called sudden oak death, is projected to cost $7.5 million in tree treatment, removal and replacement costs, corresponding to a $135 million loss in residential property values for California.
- Salt cedar (*Tamarisk* spp.), an invasive tree, costs the western states $450-2,800 annually per 2.5 acres (1 hectare) in water loss (municipal, agricultural and hydropower) as well as flood control losses. Eradication and re-vegetation projects are estimated to be $7,400 per 2.5 acres.
- Annually, black and Norway rats consume stored grains and destroy other property valued over $19 billion.
- Annually, nonnative species borne in the ballast or hulls of ships cost the Great Lakes Region $200 million to control.
- U.S. agriculture loses $13 billion annually in crops from invasive insects, such as vine mealybugs.

Maryland Department of Natural Resources

Case Study: Nutria

Originally introduced for the fur trade, nutria destroy large areas of marshlands, causing significant landscape changes and erosion that threaten pollution and storm surge control, recreational and commercial fisheries, and habitats for native species. In 2005, the Service and its partners spent $2 million dollars working with 15 trappers to eradicate over 8,000 nutria from Maryland's Blackwater National Wildlife Refuge, thus helping to preserve local commercial fisheries and ecotourism valued at $15 million annually. However, other nutria populations remain in Maryland and other states. In Louisiana, for example, an estimated population of 20 to 30 million nutria continues to destroy thousands of acres of wetlands each year.

USFWS



Case Study: Asian Carp

Asian carp, which we introduced through the aquaculture industry, are voracious eaters that threaten native fisheries, including the $7 billion Great Lakes fisheries. Large silver carp, leaping out of the water at the sound of boat engines, also collide with and injure boaters. Invasive species already have been implicated in adverse effects of up to 46 percent of the Great Lakes endangered species, and introduction of Asian carp to the region could cause further harm. In 2010 alone, the federal government committed $78.5 million in investments to prevent the introduction of Asian carp to the Great Lakes, where they would threaten Great Lakes fisheries and could negatively impact remaining populations of endangered or threatened aquatic species.

NPS/Roy Wood

Case Study: Burmese Pythons

Burmese pythons in Florida are known to eat wood storks and Key Largo woodrats, both federally endangered species. From 1999 to 2009, federal and state agencies spent $1.4 million on Key Largo woodrat recovery and $101.2 million on wood stork recovery. The introduction of a reproducing population of non-native pythons places additional pressure on these two species. Many large constrictor snakes can live in habitats and climates in our states and insular territories, and their introduction and spread could threaten other populations of endangered or threatened species.

USGS

Case Study: Lionfish

The Indo-Pacific lionfish, which likely was introduced to U.S. waters through the saltwater aquarium trade, has become widely established along the Southeast United States coast and Caribbean Sea in less than a decade. Lionfish have been found as far north as offshore of New York. Lionfish have established dense populations in the Gulf of Mexico and off the coast of South America. Recent estimates indicate that lionfish have surpassed some native marine fish in population numbers. Some reports estimate more than 1,000 lionfish per acre in some locations. These fish are voracious eaters and their spines are venomous to humans. Lionfish are already estimated to reduce native reef fish recruitment by 79 percent. This species has the potential to harm economically important fisheries (including snapper and grouper), coral reef conservation efforts and tourism.

Nonnative, invasive species provide a modern example of Benjamin Franklin's famous saying that "[a]n ounce of prevention is worth a pound of cure." Through the Lacey Act, the Service imposes restrictions on the importation and movement across state lines of any species listed as "injurious" under this Act. This is an important tool in preventing the potential damage that nonnative, invasive species can cause.

U.S. Fish & Wildlife Service
http://www.fws.gov
January 2012