



TEN STRESSES ON THE PLANET

Invasive Species

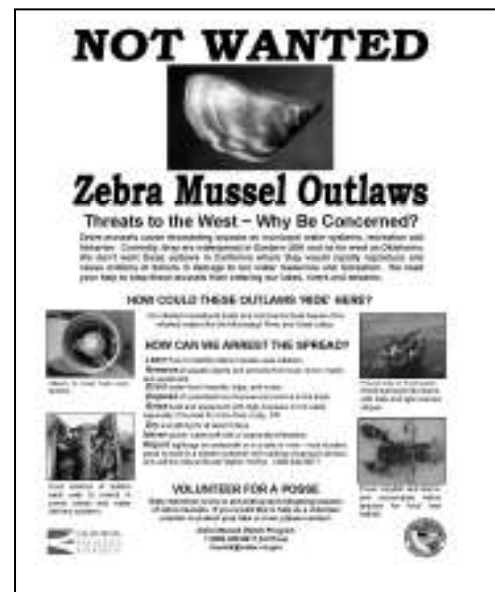
In 1986, a commercial ship, making a routine transatlantic run from Europe up the St. Lawrence Seaway, discharged its fresh water ballast into the St. Clair River near Detroit. Out of the ship gushed millions of tiny larvae destined to grow into one of the worst exotic species pests of our time: zebra mussels. By 1989, the fingernail-sized mussels had spread to Lake Erie, where their population density reached 23,000 per square meter. Unchecked by natural predators in North America, the mussels have since run amok. They clog pipes and shut down water intake systems. They mass on hulls of boats and piers. Zebra mussels displace native mussels,ⁱ and their ingestion of algae, phytoplankton, and zooplankton cuts into the food supply of other animals. By 2000, zebra mussels had advanced to the Hudson, Illinois, Mississippi, Ohio, Arkansas, and Tennessee rivers. Dealing with this pest had cost \$750 million to \$1 billion.ⁱⁱ

UPSETTING THE BALANCE

Invasive species are non-native organisms that devastate populations of native species and agricultural crops by preying on, parasitizing, infecting, or outcompeting them. These exotics, a primary driver in reducing biodiversity, are almost always introduced by humans. Sometimes, as with the zebra mussel, they are introduced unintentionally. In other cases they are deliberately introduced.

In 1953 the Soil Conservation Service planted 23 million kudzu vines throughout the South to control erosion. What was a harmless ornamental vine in other parts of the world became a scourge in southeast America. By 1981, the vine covered seven million acres and was strangling forest vegetation. Native plants simply had no prior evolutionary experience with kudzu. As a result they were unable to compete. Other examples of invasive plants that were intentionally introduced, all as ornamentals, are the water hyacinth that now chokes waterways, purple loosestrife that outcompetes native marsh vegetation, cheatgrass that has displaced millions of acres of native grasslands, and English ivy that covers the floors of some Pacific Northwest conifer forests.

The principal pathways of introduction of invasive species are global trade, trade in live plants and animals, and travel. In today's world of economic globalization, the problem of invasive species is escalating. In San Francisco Bay invasions have increased to one new species every 12 weeks.ⁱⁱⁱ The Baltic Sea is now home to 100 creatures from other parts of the world, one-third of which are native to the Great Lakes of America. Conversely, one-third of the 170 alien species in the Great Lakes are originally from the Baltic.^{iv}



An educational poster distributed by California's Department of Water Resources

Feral pigs in Hawaii, lampreys that devastated commercial fisheries in the Great Lakes, agricultural weeds like spotted knapweed and tansy ragwort, and tree diseases like the blights that wiped out American elms^v are just a few more examples of the invasive species that have upset natural balances and cost governments and businesses billions of dollars.

WHAT IS BEING DONE?

Eradicating an invasive species is no easy task. For example, the US spent \$172 million over a 24-year period to stamp out fire ants, but instead the campaign spread the pests by killing natural enemies.^{vi} The good news is that localized efforts to combat invasive species have been effective. The Nature Conservancy has a Global Invasive Species Initiative with specific programs for states and countries that focus on early detection, multi-agency efforts, outreach, and education.^{vii} One successful endeavor was in the Humboldt Bay National Wildlife Refuge where European beachgrass was removed from ten acres of protected dunes in a rigorous, time-consuming effort. Within five years native plant cover, including some endangered species, had increased by 47 percent. This achievement has encouraged other groups to carry out similar projects.^{viii}

Environmental and other groups are also working for policy changes with the realization that the solution to invasive species lies ultimately in prevention. The Invasive Species Act calls for prevention of invasive species in US waters, and an International Maritime Organization program helps developing nations prevent the transfer of aquatic organisms through ballast water.

ⁱ “Aliens,” *The Amicus Journal*, 1992

ⁱⁱ “Zebra Mussel,” ag.ansc.purdue.edu/EXOTICSP/zebra_mussel.htm & “Invasive Species,” USCUSA.org, 8/25/05

ⁱⁱⁱ Vitousek, et al, *Science*, July 1997

^{iv} *The Guardian Weekly*, April 2005

^v Diamond, Jared, *Collapse*, 2005

^{vi} “Aliens,” *ibid.*

^{vii} Global Invasive Species Initiative. The Nature Conservancy, <http://tncweeds.ucdavis.edu/index.html>, March 2006

^{viii} “Success Stories,” The Global Invasive Species Initiative, The Nature Conservancy,

<http://tncweeds.ucdavis.edu/success/ca002.html>, January 2005