



## Alien Invasive Species

*By Herb Curl, Science Advisor*

“Invasive species represent the greatest threat to the native forests of the world. Period.”

–Dr. Jerry Franklin, an internationally renowned forestry expert and professor at the University of Washington.

And not just forests. Invasive, non-native species are harming our forests, lakes, rangelands, coasts, farms, deserts, waterways, parks, and wild lands and hardly anyone has noticed.

However, alien invasive species have finally emerged as a top economic and environmental concern. The recent increase in international trade following the implementation of the World Trade Organization in 1994 has caused imports to rise 82 percent. This has led to a corresponding increase in entry pathways for invasive species. More trade, without increased measures to prevent the introduction of invasive species, is a recipe for disaster.

What is an Alien Invasive Species?

An alien invasive species is a recently introduced (as in the last 200 years) organism that is not a normal component of ecosystems that have evolved over thousands to millions of years. They are present due to careless or deliberate human introduction. In the past as humans explored new lands they carried with them animals and plants that they needed for sustenance. More recently, botanists, horticulturists, farmers, gardeners, sportsmen and hobbyists have introduced new species. Some fared poorly or died but others escaped and spread, and are still spreading, severely altering natural ecosystems. We are so used to seeing some invasive species that we take them for natives but a careful examination shows that the organisms are “new” and destructive.

Examples are House (English) Sparrows, Starlings, Rock Doves (pigeons), English Ivy, Clematis species, Purple Loosestrife, Japanese Knotweed (Polygonum), Cheat grass, Asian Long-horned Beetles, Fire Ants, Formosan Termites, Sudden Oak Death, Dutch Elm Disease, Chestnut Blight, West Nile Disease, Chinese Mitten Crabs, Snakehead fish, Green Crabs and Zebra Mussels.

These are organisms introduced from outside North America. However, people have also moved native species around as well: introducing bass into trout waters, and bullfrogs into the Pacific Northwest.

### How Do They Get Here?

Many invasive pests and pathogens enter the United States by hitchhiking on imports. There are three main pathways of entry for forest pests: 1) live plants or nursery-related materials; 2) unprocessed wood (logs, lumber, railroad ties, and chips); and 3) Wood crates, pallets and dunnage (wood packing materials) used to transport other imports. Animal pathogens such as West Nile Virus arrive on illegally imported birds and animals. Aquatic invasives have arrived in packing material for shellfish, as predators along with the imported organism, in ballast water, and as live plants for gardens and ponds. Many garden plants have escaped cultivation and have entered natural habitats.

### What are the Problems?

Introduced species have few or no natural enemies, or can occupy new niches. Forty-nine percent of species on the threatened or endangered list are there because of invasive species. Invasive weeds infest an additional 4,600 acres of western public lands every day. Invasive plants generally exclude native species with wildlife values or shade out ground plants aquatic plants. Aquatic invasives such as *Myriophyllum* may make swimming, boating and fishing impossible.

Bullfrogs eat other frogs, small turtles, snakes and fish. Walking catfish and Snakeheads outcompete and eat native species. Zebra mussels completely alter freshwater ecosystems by filtering out plankton, clogging water intakes and making locks inoperative. Untreated ballast water in ocean-going vessels introduces alien planktonic organisms and the larvae of invasive invertebrate species.

We frequently don't notice the loss of native plants because green invasive weeds, shrubs, and trees often fill the space. Though the damage goes unnoticed, changes due to invasive species affect whole ecosystems. Food sources for fish and mammals are altered, endangered species are wiped out, diversity is lost (making the forest susceptible to future invasives), natural fire patterns are changed, and the general balance of the ecosystem is disrupted.

### What is the Cost?

Alien invasive species destroy functioning ecosystems and natural communities. The resulting altered habitat is usually less productive and has less biodiversity. The economic loss to agriculture and forestry is enormous. The cost of controlling invasives increases as they spread.

A Cornell University study shows that invasives already cost the U.S. \$137 billion per year. Campbell and Schlarbaum in *Fading Forests II* write: "USDA APHIS has estimated that the establishment of Asian wood-boring insects . . . could, if left unchecked, cause \$41 billion in losses to forest products, commercial fruit, maple syrup, nursery, and tourist industries in the Northeast. Nationwide, Asian Longhorned beetle damage to urban trees could reach \$669 billion."

Yet, relatively little is being done. The main government agency charged with curtailing invasive species, the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS), has not taken adequate measures in response to increased trade, partly due to underfunding and a focus solely on agriculture. The US Coast Guard is charged with regulating discharge of ballast water but has ceded control to the states.

#### What Can be Done?

There is a need for the conservation community to recognize the seriousness of the problems and have a voice in invasive species issues. In 1999, a Consultative Group on Biological Diversity (CGBD) paper stated, "NGO advocacy toward improving federal policy has suffered from inadequate support." Unfortunately, there haven't been significant changes in foundation support or policy efforts in the three years since the CGBD report came out.

It is imperative that each person take personal responsibility for recognizing and eradicating invasive species from their properties, and bringing to light the presence of invasive species on public property. .

An organized federal presence, especially by APHIS, is essential to help prevent the entry and spread of invasive species that harm wild lands and wildlife.

#### Prevention

There's an old saying that, "An ounce of prevention is worth a pound of cure." Preventing invasive species from entering our country is much easier than dealing with infestations after they're established. In fact, historically, once an invasive species has been introduced, it takes a tremendous amount of resources to stop the spread—and sometimes nothing helps. The sad stories of devastation to the American chestnut, American elm, several white pines, butternut, Port-Orford cedar, and Frasier fir show what happens when we ignore this issue. Invasive fungi, pathogens, and insects have had a "combined effect to maim much of the 272 million acres of deciduous forests in the East," writes Faith Campbell in *Wild Earth*, Summer 2001.

It's extremely difficult to predetermine which non-native species will cause trouble. Species that become invasive when relocated often have natural predators and competitors in their native habitats so they don't run rampant. Preventing possible invasive species from crossing natural boundaries is the only sure way to stop the spread.

Washington State has a coordinating Aquatic Nuisance Species Committee with members from state agencies and concerned NGOs. Member agencies are charged with oversight of ballast water regulations and the use of pesticides and herbicides. The state is a member of the Western Regional Panel with eighteen other western states.

Long- and short-term changes can be made to lessen the risk of invasive species. Here are five action items, three of which you can help bring about by informing legislators of the need:

- **SWPM:** USDA/APHIS is planning to revise regulations about Solid Wood Packaging Materials (SWPM - crates, dunnage, pallets) between now and March 2003. SWPM has been a primary pathway for hitchhiking invasive species. In fact, 72% of APHIS interceptions of exotic bark beetles have been on SWPM.
- **WTO:** Negotiations on agricultural issues, including how to regulate imports that pose an uncertain or undefined risk (i.e. most invasive species) are coming up soon. Countries are currently barred from creating trade barriers for species that aren't proven to be a problem. As we now know, most invasive species aren't known to be a problem until they're established and have caused considerable damage.
- **LIVE PLANTS:** USDA/APHIS will also be revising the regulations that govern the importation of living plants and nursery-related materials within the year. Many of the most dangerous invasive pests and pathogens come in on living plants. APHIS could strengthen inspection and quarantine.
- **RESEARCH:** Scientific research is needed to create solutions. Much more information is required to understand the mechanisms that control potential invasives in their native lands
- **FUNDING:** Congress must be educated about the importance of funding measures to stop invasive species before they spread.

### Control

At the state, county and city level you can bring the problem to the attention of legislators, elected officials and administrators. In many cases they realize there's a problem but need to be reinforced and reassured that they're doing the right thing in removing invasives and educating the public as to why it's being done. In many cases local environmental organizations and volunteers can partner with local authorities for campaigns to "Get Out the Ivy." State Noxious Weed Boards concentrate on agricultural pests but they could be required to broaden their scope to include horticultural products. Become familiar with Vegetation Management Plans for parks, open spaces and green belts. Many of them are well conceived and forward-looking but application is under funded or unfunded.

It's difficult for gardeners, garden authorities and nurseries to come to grips with the fact that they plant and promote the cultivation of invasive species: Butterfly Bush (*Buddleia*), certain *Cotoneasters*, *Pyrocantha*, English Holly and Ivy and Clematis. These plants escape the garden and infest roadsides, forests, and open fields. Their growth excludes other far more desirable plants and can completely alter habitat. There's no question, for example, that although English Holly is used for food by birds in winter, it escapes cultivation and enters old forest stands completely altering the understory.

"Ivy pulls" and personal attention to one's garden plantings are required, of course.

Resources:

- Anon. 2002. Halting the Invasion: State Tools for Invasive Species Management. The Environmental Law Institute. ([www.eli.org](http://www.eli.org)) 112 pp. pbk. with CD-ROM. \$25. The text gives a comprehensive overview of what each state is doing in prevention and control of invasive species. The CD provides a state by state listing of pertinent laws regarding invasives.
- Bright, C. 1998. Life Out of Bounds: Bioinvasion in a borderless world. Norton. pbk. \$13.00. An easy-to-read description of the problems and the solutions, which are more cultural in nature than technical.
- Campbell, F. & S. E. Schlarbaum. 2002. Fading Forests II. Healing Stones Foundation. pbk. Extremely concise and thorough discussion of the problem of invasive species in our forests with an emphasis on regulations, politics and economics.
- Randall, J. M. & J Marinelli. 1996. Invasive Plants. Brooklyn Botanic Garden. pbk. \$12.95 Describes the "scores of prized horticultural plants . . . (that) have jumped the garden gate and escaped into the natural landscape."
- Wilson, E. O. 2002. The Future of Life. Knopf. 229 pp. hd. A superb overview of the state of the conservation movement and what we can do to save Earth.