Box 1.8 Invasive Species

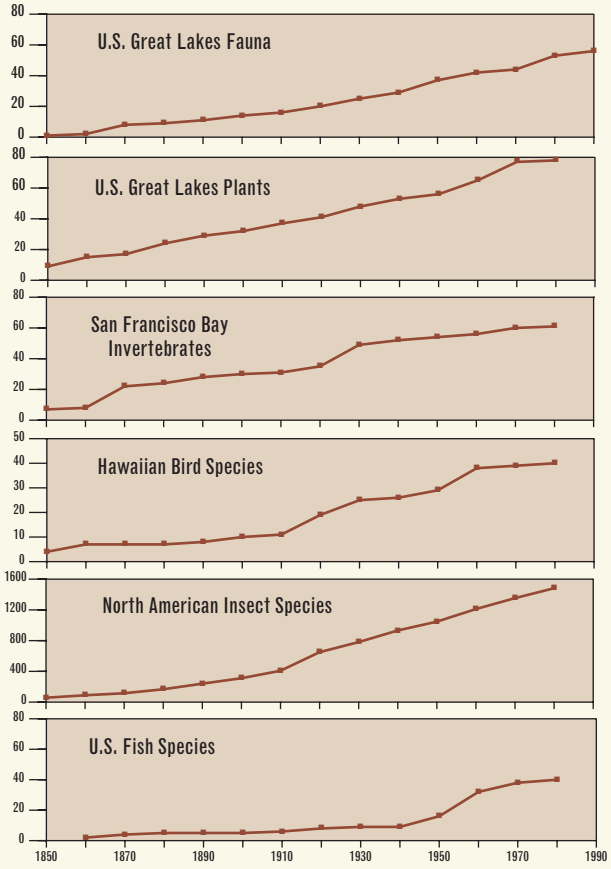
No ecosystem is immune to the threat of invasive species. They crowd out native plants and animals, degrade habitats, and contaminate the gene pools of indigenous species. Island ecosystems are particularly vulnerable because of their high levels of endemism and isolation; many island species evolved without strong defenses against invaders. On Guam, for example, the brown tree snake from Papua New Guinea has eaten twelve of the island's fourteen flightless bird species, causing them to become extinct in the wild. In New Zealand, roughly two-thirds of the land surface is covered by exotic plants (Bright 1998:115). Half of Hawaii's wild species are nonnative (OTA 1993:234).

Invasive species are a costly problem:

- Leidy's comb jellyfish, native to the Atlantic coast of the Americas, was pumped out of a ship's ballast tank into the Black Sea in the early 1980s. Its subsequent invasion has nearly wiped out Black Sea fisheries, with direct costs totaling $250 million by 1993 (Travis 1993:1366). Meanwhile, the zebra mussel, native to the Caspian Sea, was similarly dumped into the United States' Great Lakes in the late 1980s. Controlling this invader, which colonizes and clogs water supply pipes, costs area industries millions of dollars per year—perhaps $3–$5 billion total to date (Bright 1998:182).
- The Asian tiger mosquito, now spreading throughout the world, is a potential transmitter of 18 viral pathogens (Bright 1998:169). One of those pathogens is the West Nile virus. In 1999, a director with the U.S. Geological Survey noted that recent crow die-offs in Wisconsin suggest that the West Nile virus could be more deadly to North American bird species than to species in Africa, the Middle East, and Europe, where the virus is normally found (USGS 1999:1).
- In South Africa's Western Cape, invasive trees threaten to cut Cape Town's water supply by about a third in the next century. (See Chapter 3, "Working for Water.")

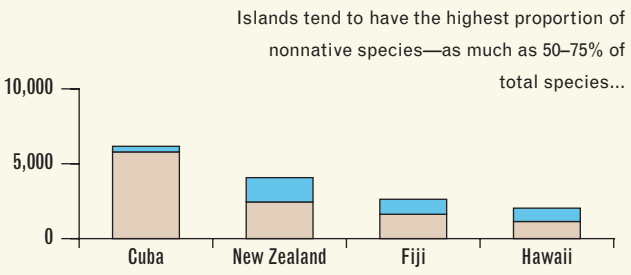
Regulation and control are complicated by the many modes of invasion. Some species find their way to new habitats by accident: they hitchhike in ships or planes, on traded goods or travelers. Other species are intentionally introduced for hunting, fishing, or pest control. Still other invasives "escape" their intended confines, like the seaweed *Caulerpa taxifolia*, which was originally intended for aquariums in Europe but now also carpets thousands of acres of French and Italian coastlines (MCBI 1998).

Cumulative Number of Nonnative Species in U.S. Regions by Decade of Introduction



Source: Ruesink et al. 1995:466.

Native vs. Nonnative Plant Species in Selected Regions



Sources: Vitousek et al. 1997; Vitousek et al. 1996.