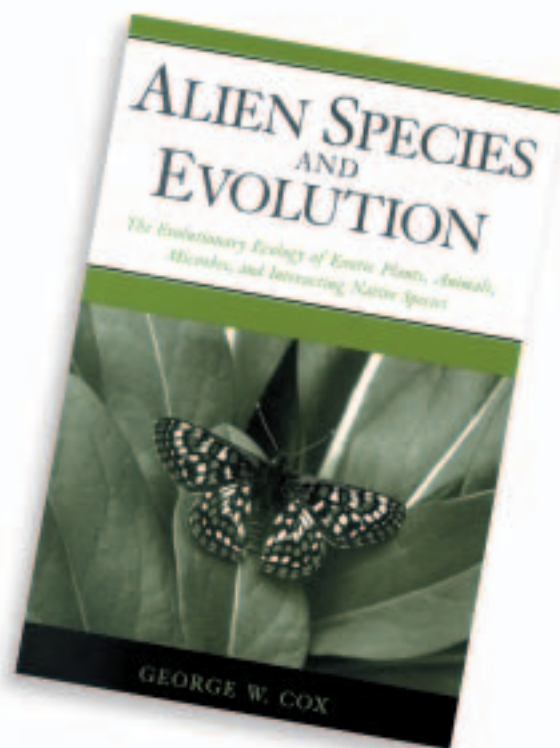


Alien Species and Evolution: The Evolutionary Ecology of Exotic Plants, Animals, Microbes and Interacting Native Species

George W Cox

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Nearly 70 y ago mammalogist WJ Hamilton (1939) questioned whether the Florida panther would survive the eradication of its primary food, the white-tailed deer, to control tick fever, a threat to a booming cattle industry in southern Florida. The herd was decimated but the panther survived. In pre-settlement southern Florida, the panther's dietary alternative would have been rabbits and rodents—unsatisfactory fare for such a large carnivore. Fortunately for the panther, Spanish conquistadors brought domestic swine with them to the New World during the 16th century. As deer were slaughtered, feral descendants of De Soto's pigs, now naturalized and widespread, likely became the mainstay of the panther's diet. They were prolific breeders, easy to catch, and the perfect size. Thus, an exotic species may be responsible for the existence of the only known population of *Puma concolor* in eastern North America.

Unfortunately, the stories for most introduced species are benign at best. Often they are the cause of ecological catastrophe for local biodiversity. Humanity, all 6.4 billion of us, are engaged in a huge global experiment—namely, how to support a burgeoning population. Virtually every other animal species that has been well studied exhibits reduced fecundity with

increased density. Our immunity to density-dependant population regulation is partly to blame for many of the problems with exotic species. Parts of the experiment include the domination of every land mass, the translocation of species to foreign continents, and the engineering of plant and animal genes to produce more food. George Cox (also author of *Alien Species in North America and Hawaii*, Island Press 1999) examines the phenomenon of homogenizing the world's biota in *Alien Species and Evolution*. The invasion of weedy species, the hybridization of once-disjunct forms, the proliferation of transgenic crops, introduced diseases, denatured landscapes, and changing climatic patterns have combined to create novel plant and animal communities with unexpected consequences. Who would have imagined that a genetically reduced ant, a rather benign part of the South American fauna, would become an aggressive invader in North America *because* of its genetic impoverishment? Should it be a surprise that genetically engineered plants and their increasing place in agriculture have spawned an evolutionary arms race with their predators that will make pest control increasingly difficult with traditional herbicides and pesticides? How difficult might the restoration of California coastal areas become with the dominance of a hybrid cordgrass that chokes

out tidal mudflats that are important to migrating and resident shorebirds? Cox reminds us repeatedly that when it comes to alien species and the human desire to “improve” on nature, if something can go wrong it will.

This book is an essential read for academics and their students who are engaged in research on community restoration, invasive species biology, economic entomology, horticulture, agronomy, and the development of new crop forms. The list could go on. It should also be read by agency and industry biologists and planners who manage natural areas, university arboretums, highway medians, fisheries, urban parks, and so on. It could readily be a textbook for a graduate course on invasive species ecology and management because it goes beyond the description of a myriad of case studies and delves into the processes and characteristics of the invasion phenomenon. Cox’s clear writing makes the story of alien species as interesting as it is disturbing. Although it is clearly too late to return the Earth’s biotic communities to some semblance of evolutionary purity, and some exotics are even beneficial, Cox argues that much more should be done to stem the alien tide and the “invasional meltdown” that follows. It is unlikely there are many invasive species that have the capacity to prevent the extinction of a native one. Regardless, the future of life on Earth has been forever transformed by the new competitive and evolutionary pathways that now occur in even the remotest places. It behooves all of us to understand the impacts that are so clearly described in *Alien Species and Evolution*.

—David S Maehr

David S Maehr is Associate Professor of Conservation Biology in the Department of Forestry, University of Kentucky, where he examines the ecology, conservation, and restoration of large mammals and other imperiled vertebrates. His current research examines a naturally colonizing bear population in eastern Kentucky, reintroduced elk, and conservation of small black bear populations in Florida. Dave has authored more than 120 articles and 3 books including the award-winning *The Florida Panther: Life and Death of a Vanishing Carnivore* (1997) and *Large Mammal Restoration: Ecological and Sociological Challenges in the 21st Century* (2001).

Hamilton Jr WJ. 1939. *American mammals*. New York (NY): McGraw-Hill Book Company Inc.