

Burdick: The truth about invasive species

Author Alan Burdick said that even the most prevalent ecosystem invaders have surprisingly little impact on their new environments.

The wooden boat creaked as it rocked gently over the waves. One minute the boat rushed at the dock; the next it strained against the thick rope binding it to shore, longing to return to sea.

Within the ship, crowds of anxious immigrants waited to enter the New World. Some came seeking a new life and others to avoid the old. And some, like the European periwinkle, were just hitching a ride.

The European periwinkle, a snail, arrived in Nova Scotia in 1840 on the bottom of ships. Forty years later, the snail settled in New England and the East Coast.

"The European periwinkle is like a goat with no legs," *Discover* magazine senior editor [Alan Burdick](#) told a Lehigh audience during a recent lecture. "If I set goats loose by 100,000 or millions for 100 years, imagine what effect that would have."

That is exactly what happened underwater, Burdick said in his lecture, "What's Wrong with Aliens?", sponsored by the [Weinstock Center for Journalism](#) and Lehigh's [Environmental Initiative](#). Burdick, author of *Out of Eden: An Odyssey of Ecological Invasion*, a finalist for the 2005 National Book Award, spoke at Lehigh on Nov. 10 at Neville II.

When the European periwinkle moved in, it displaced the previous residents, native mud snails, and ate other snails' food, according to a report by the [Aquatic Nuisance Species Research Program](#).

By the time marine ecologists studied the area, the damage was done, and the ecology was changed. The European periwinkle was so common that it seemed to be just another member of the marine community, Burdick said.

Scientists did not suspect that the snail was not native to the East Coast until someone pointed out that it was found in both Europe and America without any means of traveling between the two except by boat.

Scientists now know the European periwinkle is an introduced species, a species not native to a region but living in that region. Introduced species become invasive when they compete with native species for food, space and other resources.

An accelerating phenomenon

Invasive species are everywhere. The Chesapeake Bay harbors an Asian green crab; the Great Lakes are infested with zebra mussels, and south Florida battles an increasing population of released exotic pets. Off the shores of San Francisco, 300 introduced species have appeared.

Popular traveling destinations and small islands are especially vulnerable to invasive species. Guam, a small island in the Pacific, knows this too well.

"Guam has the largest K-Mart and the most snakes per square mile," Burdick said. "Only 50 years ago, Guam had no snakes."

The only species of snake found on Guam is the brown tree snake, originally from Asia. The snake arrived in Guam during World War II in the cargo of an air craft.

Guam's plentiful birds provided food for the snake, which flourished without predators and diseases to check the population growth. In Asia, the brown tree snake grows 3 to 4 feet and is a "small fry in the food chain," Burdick said. But in Guam, the snake can be 11 feet long. They crawl out of faucets,

emerge from toilets and fall from car air conditioning vents.

Today, no birds sing in Guam: The snake devoured them all. Without the birds for food, the snake eats anything it can find, even garbage.

"It's a rat without legs," Burdick says.

But not all non-native species become invasive like the brown tree snake. Burdick estimated that 15,000 species are in transit on the hulls of boats or in the ballast water. Around 95 percent of these species do not become invasive, Burdick said.

"It's like playing ecological roulette," Burdick said.

So, what allows one species to flourish in a new area and another to fail? And does the ecology of an area make it more vulnerable to invasion?

"The surprising answer is that the ecology may not have so much to do with invasions," Burdick said.

Instead, Burdick uses a "noodle theory" to describe this phenomenon. "If you throw enough noodles at a wall, eventually one will stick," Burdick said. "It doesn't matter what the wall or the noodle is made of, but the concentrated effort."

Invasive species travel where humans do. "We are the vector," Burdick said.

Scientists believe that invasive species disrupted the native ecology, which took millions of years to develop. "You ought to be able to look at an ecosystem and determine if they were thrown together last week or if they developed through time and nature," Burdick said.

Scientists, however, are finding native ecosystems difficult to distinguish from those with introduced species. To determine the effects of introduced species, ecologists need to study an area for thousands of years, but most grants only last 20 years. Ecologists also need to identify a region with little or no introduced species as a control group.

When Burdick understood how few ecosystems are not invaded, he reconsidered his views on invasive species.

"I really thought native species matter because they mattered to nature," Burdick said. "Now, it is not at all clear."

He realized that native species matter because they matter to us. "I think it's worthwhile to consider why native species are important to you," he said.

Burdick sees native ecosystems as art, connecting the present with history. "Like a 3,000-year-old statue, it is humbling to think about the time scale," Burdick said. "You need a physical embodiment to see it."

Diversity in nature, like art, sparks our imagination and provides a cultural backdrop. But as more species are introduced to new areas, the overall diversity is reduced.

So, Burdick asked, "What kind of nature do you want to be surrounded by?"

--Becky Straw