

# Rats run amok on isles

## KIA'I MOKU

By Lissa Fox



human

“Rats have plagued Hawaiians for a very long time, and not just the residents.”

Rats were the first invasive species in Hawaii. The first voyagers to the Hawaiian Islands brought Polynesian rats, *Rattus exulans*, and they spread quickly, colonizing the islands faster and farther than the people. Ancient Hawaii was a world full of spectacular birds, insects, and plants; the only native land mammal didn't crawl - it flew - the hoary bat.

These native species evolved without seed-eating, egg-stealing rodents, so when rats arrived, plants were defenseless and birds were naive to this new threat. Compounding the situation, the Polynesian rat was followed by other rodents: the Norwegian ship rat and house mouse - hitchhikers in the European and American ships of the late 1700s and 1800s. Rodents ate their way through Hawaii, overrunning the islands from the shore to mountain top, fueled by a diet rich in plants, birds, snails and insects.

According to Peter Dunlevy, a U.S. Department of Agriculture Animal and Plant Health Inspection Service biologist with 15 years of experience researching rats, the greatest impact isn't on any one particular area. Rats hammer numerous aspects of the environment - from the seeds they devour to the nesting albatross they attack. “But everything is on such

a small scale with rodents; it's easy to overlook.” Rats destroy ecosystems in Hawaii as dramatically as the goats that denude mountain slopes.

Rats beat the first Hawaiians into the forests. As people colonized the islands, rats were a step or two ahead. Rats have a litter of four young up to six times a year, and the only predators they encountered in Hawaii were the pueo and the io, the Hawaiian owl and hawk. On Oahu's Ewa Plain, archaeological evidence from sinkholes indicates a dramatic decline in native loulu palms after Polynesians' arrival in Hawaii but before any sign of human settlement in the area, suggesting the rat as the culprit. Loulu produce large, protein-rich seeds that rats eat. Even today, rat predation on seeds and flowers of loulu and other native plants threatens wild populations.

Rats failed to colonize every island in Hawaii. Small, steep, offshore islands, like Huelo off the north coast of Molokai, show no evidence of rats ever living there. Huelo offers a rare glimpse of a Hawaiian island without rats: The loulu palms that are in decline throughout the main islands of Hawaii dominate this tiny islet. Rats could not colonize Nihoa, in the Northwestern Hawaiian Islands, and despite the human settlement, native vegetation and seabirds remain abundant.

Most seabirds are easy prey for a rat. Having evolved on rodent-free islands, they nest on the ground or in burrows. Seabirds always return to the island of their birth to nest, even in the face of obvious threats. Laysan albatross seem incapable of protecting themselves. Adults will stay on their nests while rats



Above: A rat attacks a Laysan albatross. *MARK RAUZON photo*

Below Left: Rat-eaten kahuli shells lie on the ground. *USFWS photo*

Below Right: Rats are known to prey on wedge-tail shearwater eggs. *ERIC VANDER WERF photo*



chew through their feathers and feed on the exposed flesh, eventually killing the birds. Eggs and chicks are particularly vulnerable.

Without seabirds, there's not much left to a seabird island. Seabird guano, famous for its fertilizing effects, makes plants grow and, in turn, supports insects. When rats arrive, they dramatically alter the entire ecosystem of seabird islands, changing food webs and nutrient cycling in a way that threatens both the seabird survival and native plant and insect populations.

But when rats are eradicated, the benefits are almost immediate: Native plants and animals come back. “You never notice the impacts, but when you take rats out of the picture . . . you see recruitment on all levels,” says Dunlevy. Next month, read about new

methods being developed to deal with rat infestations in Hawaii. For more information about the impacts of rats on seabird islands, go online to [www.seapre.org](http://www.seapre.org), and for rodent control efforts specific to Hawaii, see [www.removeratsrestorehawaii.org](http://www.removeratsrestorehawaii.org).

■ *Lissa Fox is the public relations and education specialist for the Maui Invasive Species Committee. “Kia'i Moku,” (Guarding the Island) is prepared by the Maui Invasive Species Committee to provide information on protecting the island from invasive plants and animals that can threaten the island's environment, economy and quality of life.*