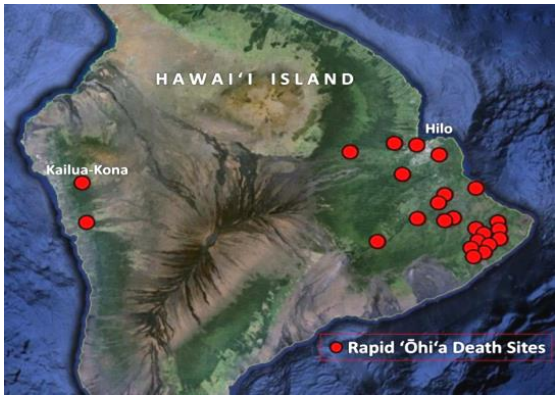
ScienceWatch – Hawai‘i: Invasive Species Heaven



“With dozens of species on the [endangered species] list, Hawaii leads all regions in the U.S. in terms of threats, yet received less than 5% of the recovery funds from the federal government’s endangered species program. Presumably this is because more charismatic species receive a disproportionate share.” – J. Fitzpatrick, Cornell Lab of Ornithology, NYT, 8/31/14

Thoughts of Hawai‘i usually conjure up a tropical paradise richly endowed with striking examples of flora and fauna. While that was true before humans arrived, today’s Hawaiian Islands have more invasive species than any other state in the U.S. At least 34,000 species are non-native. These include 3,400 insects, spiders or mites, over 10,000 flowering plants, 19 mammals, 55 birds, 24 reptiles and six species of amphibians. Even the state tree (Kukui) is not a native, but was brought to the islands from Asia. Invasive species began arriving some 1,500 years ago with the first Polynesians who brought their chickens, pigs, goats, dogs … and rats, and they continue arriving even today.

The latest threat, described by journalist Inga Vesper in the October 21, 2016 issue of *Science*, is a fungus (*Ceratocystis fimbriata)* that is killing ‘ōhi‘a trees (*Metrosideros polymorpha***)** on Hawai‘i island. The disease causes rapid ‘ōhi‘a death (ROD). ROD was first discovered in 2010, but most likely began 10 years earlier when the fungus was carried to Hawai‘i island, probably on imported plants. In 2014 the outbreak exploded, destroying an estimated 6,000 acres. By 2016 it had devastated over 50,000 acres of native forest.


Figure 1. 'i'iwi on lobelia

The ‘ōhi‘a is endemic to the islands. It is a keystone species, a pioneer that can colonize bare lava and hold water, preventing runoff. Mature trees create forest habitat for endemic passerines like nectar-feeding honeycreepers. At least 55 honeycreeper species existed before humans arrived but only 17 survive today. Sadly, Hawai‘i’ was once home to over 107 endemic bird species but only about 50 survive. In fact, with only 0.2% of U.S. land mass, Hawai‘i’ accounts for 84% (21 of 25) of recent U.S. bird extinctions and 74% (14 of 19) of our critically endangered birds.


Figure 2. 'i'iwi on ‘ōhi‘a

Many honeycreepers co-evolved with endemic lobelias. These plants developed flowers with curved, tubular corollas and the birds evolved correspondingly sickle-shaped beaks to harvest the nectar at the bottom. But as lobelias were driven to near extinction by introduced livestock, some honeycreepers began feeding on ‘ōhi‘a flowers instead. The ’i’iwi (Drepanis *coccinea),* last of the sickle-beaked honeycreepers, is now a major ‘ōhi‘a pollinator (see Figures 1&2).

So far ROD is limited to Hawai‘i island, and the Department of Agriculture has placed a permanent prohibition on moving ‘ōhi‘a wood, flowers and soil anywhere else, even to other parts of the island. Currently there is no “silver bullet” to eradicate the fungus. So the strategy is to contain it while scientists try to figure out how it spreads (certain wood-boring beetles are suspected), and hopefully eradicate it.

A lot is at stake!

‘Alalā released into the wild

To highlight some better news about Hawai‘i here is a follow-up to my last *ScienceWatch* about tool-using crows (http://hras.org/sw/swjanfeb2017.htm).

Five young ‘Alalā—critically endangered Hawaiian crows—were released into a reserve on Hawai‘i island on December 14, 2016. The male birds slowly emerged from the aviary where they were temporarily housed, and appeared to show a natural curiosity for their surroundings.

“After being released, the ‘Alalā quickly adjusted to their new home, and began to search for and find food items in the forest,” said Bryce Masuda, conservation program manager of the Hawaii Endangered Bird Conservation Program. “Although the birds have now been released, we will continue to monitor them and provide appropriate supplemental food, to ensure they are supported as they encounter challenges.” Masuda plans to release 12 crows per year for the next five years.

A release in the 1990’s failed due to disease and predation, but let’s be hopeful.

A lot is at stake!

Saul Scheinbach