Star Advertiser

Health Options
Alan Titchenal
& Joannie Dobbs

Tuesday September 27, 2016

Eradication of mosquitoes could save threatened birds

In many parts of the world, mosquitoes transmit serious diseases ranging from malaria to the Zika virus. In Hawaii, there is a particular concern about Zika, as well as other mosquito-borne diseases including dengue fever, yellow fever and Chikungunya. There are many very serious public health concerns related to these mosquito-borne diseases and if they became established here in Hawaii, the impact to the tourist industry could be devastating.

At the recent International Union for Conservation of Nature meeting in Honolulu, there was serious discussion of technologies that could be implemented to eradicate mosquitoes from Hawaii or bioengineer them to be unable to carry a pathogen like malaria. In this case, much of the concern was focused on preservation of Hawaii's rapidly vanishing species of endemic birds.

For most of us, it is easy to relate to the risks of these diseases to humans. However, Hawaii's native bird species have been devastated by mosquito-borne diseases for over 150 years.

Question: How have mosquitoes affected the endemic Hawaiian bird population?

Answer: Both the mosquito-borne avian malaria and avian pox have contributed to the extinction of 38 endemic Hawaiian birds. Of the remaining 32 endemic species, 21 are considered to be threatened by these diseases that are expected to lead to their extinction in the near future.

Q: Who came first, mosquitoes or birds?

A: Hawaiian forest birds evolved over millennia in Hawaii. Mosquitoes arrived via whaling ships only about 200 years ago. Providing deep cultural perspective to the mosquito risk to birds, Samuel M. ʻOhukaniʻohiʻa Gon III, senior scientist and cultural adviser for The Nature Conservancy of Hawaii, explained to his IUCN audience that the Kumulipo creation chant of Hawaii places forest birds in Hawaii even before the major Hawaiian gods.

Thus, Hawaiian culture considers birds to be elders, even of the gods. Gon stresses that endemic Hawaiian birds are to be "revered, respected and cared for."

Q: What biological technologies could be used to prevent mosquito-borne diseases?

A: Genetic technologies have the potential to eradicate mosquitoes and the diseases that they deliver to people and birds without the drawbacks of pesticides. These include the release of sterile male mosquitoes, the use of bacteria that can prevent viruses from being carried by mosquitoes, and controversial gene-drive technology that could completely eradicate mosquitoes from Hawaii.

Of course, all of these approaches require challenging evaluation of possible and unexpected environmental impact.

Since mosquitoes were not part of the original island ecology, Hawaii could be a good place to test the effects of mosquito eradication.

How much longer can we make the forest birds wait? How many more bird species can we allow to be lost?

Joannie Dobbs, PhD, CNS and Alan Titchenal, PhD, CNS
are nutritionists in the Department of Human Nutrition, Food and Animal Sciences,
College of Tropical Agriculture and Human Resources, UH-Manoa.
Dr. Dobbs also works with the University Health Services Manoa.