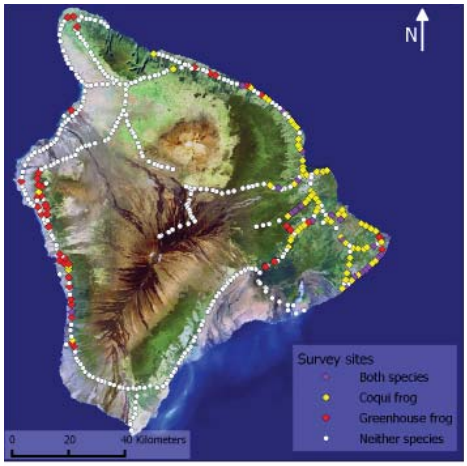

Coqui and Greenhouse frog presence/absence points on the island of Hawaii, USA. If a frog was detected during any survey, it was included as present. (Source: Landsat –http://hawaii.gov/dbedt/gis/)

Detection probabilities of two introduced frogs in Hawaii: implications for assessing non-native species distributions

By Christina A. Olson, Karen H. Beard, David N. Koons & William C. Pitt

Understanding the distribution of non-natives, especially cryptic non-natives, is critical in determining their degree of invasiveness and managing their spread. Two non-native Caribbean frogs, the Puerto Rican coqui and the Cuban greenhouse frog, recently invaded Hawaii. Because of its louder breeding call, management efforts have focused on the Coqui, while little has been done to address the quieter Greenhouse frog, even though it may be as widespread and have similar ecological impacts. We determined the distribution and detection probability of both species on the island of Hawaii by conducting a breeding call presence/absence survey at 446 sites every 2 km along major road networks. We re-surveyed 125 sites twice to determine detection and occupancy probabilities. Greenhouse frog detection probabilities were lower than Coqui detection probabilities and increased with visits while those of the Coqui did not. Greenhouse frog detection probabilities were lower in the presence of Coquis for the first two surveys than in sites with Greenhouse frogs alone, while Greenhouse frogs had no effect on the detection of Coquis. Overall site occupancy estimates for both species were similar, suggesting they are equally widespread. Results suggest multiple visits to sites are required to detect the Greenhouse frog, and that accounting for detectability is essential when determining the distribution of cryptic species.

C.A.Olson, K. H. Beard, D. N. Koons, W. C. Pitt, *Biol. Inv.* **14**, 889 (2012).