

FEATURE ARTICLES

**DISTRIBUTION AND PREVALENCE OF MOSQUITO-BORNE DISEASES IN O‘AHU
‘ELEPAIO**

ERIC A. VANDERWERF^{1,3}, MATTHEW D. BURT², JOBY L. ROHRER², AND STEVEN M. MOSHER²

¹*U.S. Fish and Wildlife Service, 300 Ala Moana Boulevard, Room 3-122, Box 50088, Honolulu, HI 96850*

²*U.S. Army Garrison, Environmental Division, Directorate of Public Works, Schofield Barracks, HI 96857*

Manuscript received 29 September 2005; accepted 6 June 2006.

³ E-mail: eric_vanderwerf@fws.gov

Abstract. The endemic Hawaiian avifauna is one of the most imperiled on earth, and diseases have been one of the most serious causes of species declines. From 1995–2005, we mist-netted and banded 266 endangered O‘ahu ‘Elepaio (*Chasiempis sandwichensis ibidis*) from 23 sites, examined them for visible symptoms of avian pox virus (*Poxvirus avium*), and screened blood samples for avian malaria (*Plasmodium relictum*). Pox-like lesions and malaria were found in all ‘Elepaio populations on O‘ahu; no parts of the island were free of these mosquito-borne diseases. Each year, 20% ± 4% of ‘Elepaio had active lesions likely caused by pox and an additional 16% ± 4% had deformities and missing toes indicative of healed pox lesions. Prevalence of malaria was 87% over all years combined. Pox prevalence varied among years and was associated with annual rainfall, presumably due to greater abundance of mosquito breeding sites in wet years. Rainfall amounts at least as high as those associated with pox epizootics in 1996 and 2004 have occurred in 13 years since 1947, or once every 4.5 years. Severity of infection varied considerably among birds, and infections involving three or more toes, the feet, or the head were less common in birds with healed lesions than those with active lesions, suggesting such infections resulted in mortality more often. Disease resistance may be evolving in some areas, but ‘Elepaio populations on O‘ahu are likely to further decline.

Key words: *Chasiempis sandwichensis, disease, ‘Elepaio, Hawai‘i, malaria, mosquito, pox virus.*