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Oral Presentation

DEVELOPING METRICS FOR PLASTIC INGESTION BY WEDGE-TAILED SHEARWATERS
(*PUFFINUS PACIFICUS*)

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Wedge-tailed Shearwaters (*Puffinus pacificus*) were salvaged from O'ahu, Hawai'i to investigate the relationship of diet and condition to plastic ingestion. Necropsies were performed on 143 chicks; 70 from 2009 and 73 from 2010. Morphometric measurements, plumage characteristics, condition, and health were determined for nestlings. Principal Components Analysis was utilized to determine the relationship of nine individual characteristics. The first two axes explained 98.9% of the variation; percent down (indicative of age) had the strongest loading on PC1 whereas condition (amount of fat) and weight were the most important variables on PC2. Correlations were found between the PC axes and plastic and squid occurrence. On a subset of birds (25 per year), detailed analyses of proventriculus and gizzard contents were performed. 78% of shearwater nestlings contained plastic. All six types of plastic were documented; fragments constituted the largest proportion of incidence, followed by line and sheet. There was no correlation between plastic amount and year for 2009 and 2010; however nestlings had more plastic in the proventriculus (average of 4.1 fragments, mean weight 0.106g) than in the gizzard (average of 2.9 fragments, mean weight 0.033g). The proventriculus of one bird contained 42 fragments. All birds contained squid beaks, and their abundance varied significantly by year ($p < 0.001$) with higher numbers in 2009. More recent analyses of adult shearwaters (2010-2014) have also revealed high plastic incidence, with an increase from historical samples collected 30 years ago in O'ahu: plastic incidence was 60% in 1984 (20 birds captured live) and 71% in 2014 (28 salvaged birds killed by predators). Together, these results underscore the value of Wedge-tailed Shearwaters as bio-indicators of plastic pollution.

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