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DEVELOPING ECOSYSTEM METRICS OF PLASTIC INGESTION BY HAWAIIAN SEABIRDS

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Since 2009, we have studied marine plastic debris ingestion in seabirds from the Main Hawaiian Islands to assess community-wide patterns in locally-breeding species and to develop local pollution metrics. Between 2009 and 2018, we have necropsied over 1000 birds of 12 species and have documented ingestion in 7 species, belonging to 4 families (Diomedidae, Hydrobatidae, Procellariidae, Phaethontidae) and representing a variety of foraging guilds. We have documented low levels of plastic ingestion in White-tailed Tropicbirds, and Newell's Shearwaters (<50% incidence); high levels (50 – 75 % incidence) in Hawaiian Petrels and Wedge-tailed Shearwaters; and very high levels (> 75 % incidence) in Band-rumped Storm-petrels, Bulwer's Petrels, and Laysan Albatross. In particular, we propose that the Wedge-tailed Shearwater (*Ardenna pacifica*) is an ideal bioindicator species of plastic in the epipelagic food web. During the breeding season, this species forages in association with subsurface-predators near their nesting colonies, is characterized by high rates of plastic ingestion in chicks (72.5%) and adults (71.4%), and can be readily sampled opportunistically by salvaging fledging chicks and accidentally-killed adults. To place the plastic ingestion data of these "tuna-birds" in a broader ecological context, we quantified the ingestion rates for island-associated predatory fishes caught by pole-and-line fishers around the Main Hawaiian Islands, and documented plastic ingestion in five species (mahi-mahi, albacore tuna, skipjack tuna, yellowfin tuna, and kawa kawa). Together, these results underscore the value of seabirds as bio-indicators of marine plastic pollution, within a broader framework incorporating information from other pelagic predators and their shared prey.