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SHEARWATERS AS ECOSYSTEM INDICATORS: CONNECTING PREDATORS IN THE CALIFORNIA CURRENT

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The *Puffinus* shearwaters are an ideal focal taxa for monitoring ocean conditions in the California Current System (CCS) because these predators are abundant, conspicuous, and highly responsive to oceanographic variability. The goal of this study was to evaluate the utility of black-vented (*Puffinus opisthomelas*), Buller's (*P. bulleri*), flesh-footed (*P. carneipes*), pink-footed (*P. creatopus*), short-tailed (*P. tenuirostris*), and sooty (*P. griseus*) shearwaters as fishery-independent indicators by developing multivariate models of fish availability by integrating three disparate datasets: shearwater abundance, oceanographic metrics, and commercial fishery catch. We analyzed four years (1996, 2001, 2005, 2008) of monthly (August-November) National Oceanic and Atmospheric Administration (NOAA) seabird surveys, and United States Geological Survey (USGS) Pacific Coast Fisheries Database fisheries catch, from the coast of California seaward to 200 nm (370 km) offshore. Multiple linear regression models were created for the thirteen fish/squid species using five shearwater metrics: density, aggregation, and behavior (traveling, stationary, feeding), three basin-wide oceanographic indices, and latitude. Of the six shearwater species considered, black-vented shearwater metrics were most frequently related to the fisheries examined, and yielded the highest explanatory power. In particular,

feeding black-vented shearwater abundance explained 75% of the dolphinfish (*Coryphaena hippurus*) caught with set longline. These results indicate that the *Puffinus* shearwaters are indicative of the spatial and temporal variability that affects other commercially-valuable predators in the CCS ecosystem.