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Rough-toothed dolphins on a Navy range in Hawai'i: using LIMPET satellite-tag data to assess movements, habitat use, and overlap with Navy activities

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Much of the U.S. Navy's training activities in Hawai'i occur on the Pacific Missile Range Facility (PMRF), an area between the islands of Kaua'i and Ni'ihau. Surveys show that rough-toothed dolphins are the most frequently encountered and likely most abundant odontocete found on PMRF. Long-term photo-identification data indicate that individuals show considerable fidelity to Kaua'i and Ni'ihau, and genetic studies indicate they are demographically isolated from rough-toothed dolphins off Hawai'i Island. We use LIMPET satellite tag data from 14 individuals tagged between 2011 and 2015 to assess site fidelity and movements of rough-toothed dolphins around Kaua'i and Ni'ihau, and estimate the overlap of the population with PMRF. Tag data were obtained for periods from 3.4 to 21.8 days (median=12.5). Assessment of overlap of movements indicate that two individuals were not acting independently, thus analyses were restricted to 13 individuals. Although tagged dolphins moved a cumulative distance of 11,994 km, grand median distance from tagging locations was only 25.5 km (median of maximums=57.6 km). Individuals remained broadly associated with Kaua'i and Ni'ihau with one moving to western O'ahu and back. Grand median depths and distance from shore for tagged animal locations were 1,215 m and 12.2 km, respectively. Only 6 of 13 individuals were tagged on PMRF, but all individuals used the range, moved onto PMRF a mean of once every 30 hours and spent a mean of 38.9% of their time on PMRF. Home range and core area calculated using the 95% and 50% kernel density utilization distributions of tag data were 11,953 and 1,413 square km, respectively, with 48% of the dolphin's core area overlapping with PMRF. Given the frequency of Navy training activities on PMRF, results indicate that rough-toothed dolphins are likely regularly and repeatedly exposed to mid-frequency active sonar and other Navy activities on PMRF.

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