

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

Daniel L. Webster*, Robin W. Baird, Brenda K. Rone, David B. Anderson

Cascadia Research Collective, Olympia, Washington, USA (*DWebster@cascadiaresearch.org)

Why is this interesting?

- Re-sightings and genetic analyses indicate that rough-toothed dolphins off Kaua'i and Ni'ihau are demographically isolated from the Hawai'i Island population (Albertson et al. submitted; Baird et al. 2008).
- Navy training activities in Hawai'i are concentrated between Kaua'i and Ni'ihau, on the Pacific Missile Range Facility (PMRF).
- Rough-toothed dolphins are the most frequently encountered odontocete species around Kaua'i and Ni'ihau, and thus are regularly exposed to mid-frequency active (MFA) sonar.



A LIMPET satellite tag on a rough-toothed dolphin

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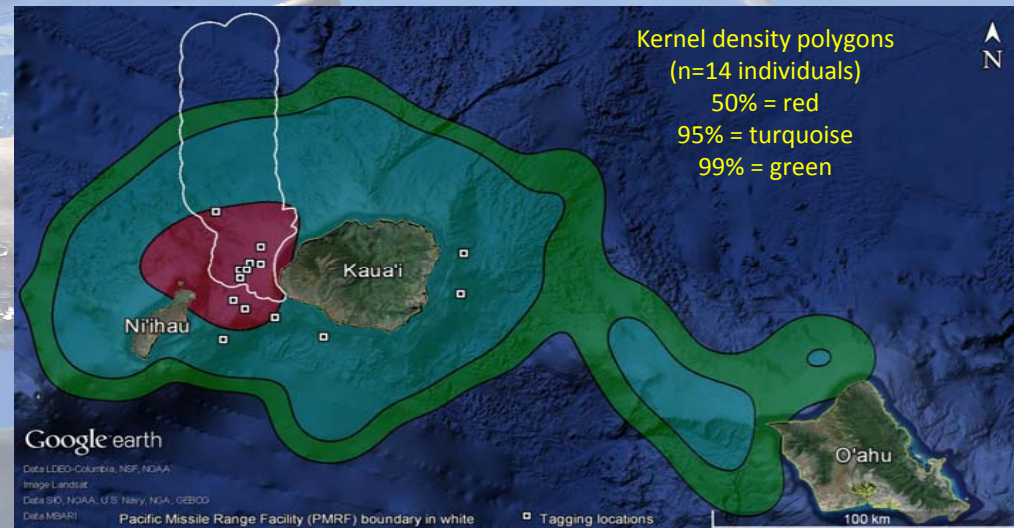
What we did

- We used data from remotely-deployed LIMPET satellite tags on 14 different individuals tagged off Kaua'i and Ni'ihau in 5 years (2011-2015), in 6 different months of the year.
- Data were obtained for periods from 7-27 days (median = 13 days) and processed through the Douglas Argos-filter.
- We estimated the proportion of time spent inside the PMRF boundaries, and calculated the 50% (core range), 95% and 99% kernel density utilization distributions (see polygons on map), excluding the first 24 h from each individual.

Acknowledgements - This research was funded by Commander, U.S. Pacific Fleet under the US Navy's Marine Species Monitoring Program, as well as the Living Marine Resources Program. We thank Morgan Ritchie at NAVFAC Pacific and Mark Deakos at HDR for technical support, Dave Moretti and the M3R program for directing us to some groups, and a large number of individuals for assistance in the field. Research undertaken under NMFS Permit No. 15330. For more information see www.cascadiaresearch.org/Hawaii/rougtootheddolphin.htm and www.cascadiaresearch.org/hawaii.htm

The core range of rough-toothed dolphins off Kaua'i and Ni'ihau overlaps with the Pacific Missile Range Facility

- Tagged dolphins moved a cumulative 13,026 km, yet remained a grand median distance of 25 km from where they were tagged (range of median distances 10.7 – 63.8 km).
- Seven of 14 individuals were tagged off PMRF, yet all visited it (median = 0.8 times/day; range = 0.18 – 1.32) and spent a grand median of 39.6% of their time inside range boundaries.



Individuals from the resident population of rough-toothed dolphins off Kaua'i and Ni'ihau are regularly and repeatedly exposed to MFA sonar

- Ongoing studies are examining movements of tagged animals in relation to MFA sonar exposure (e.g., Baird et al. 2014).
- Future studies will assess age structure of this population in comparison to the resident population off Hawai'i Island, with relatively little sonar exposure, to assess potential population-level impacts.

References

- Albertson, R.G., R.W. Baird, M. Oremus, M.M. Poole, K.K. Martien and C.S. Baker. Submitted. Staying close to home? Genetic differentiation of rough-toothed dolphins near oceanic islands in the central Pacific Ocean.
- Baird, R.W., S.W. Martin, D.L. Webster, and B.L. Southall. 2014. Assessment of modeled received sound pressure levels and movements of satellite-tagged odontocetes exposed to mid-frequency active sonar at the Pacific Missile Range Facility: February 2011 through February 2013. Prepared for U.S. Pacific Fleet, submitted to NAVFAC PAC by HDR Environmental, Operations and Construction, Inc.
- Baird, R.W., D.L. Webster, S.D. Mahaffy, D.J. McSweeney, G.S. Schorr and A.D. Ligon. 2008. Site fidelity and association patterns in a deep-water dolphin: rough-toothed dolphins (*Steno bredanensis*) in the Hawaiian Archipelago. *Marine Mammal Science* 24:535-553.

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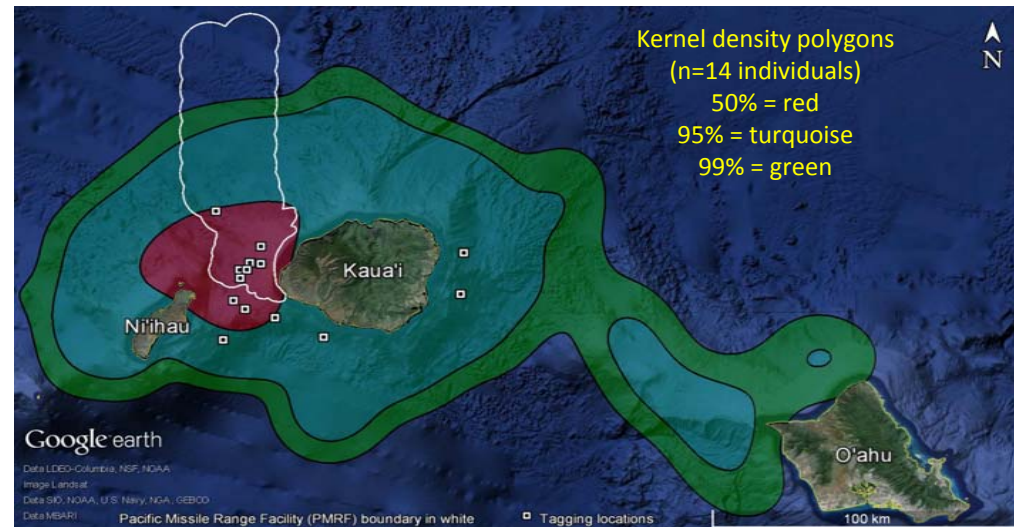
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