

Denizens of the deep: Three lines of evidence suggest a pelagic population of Risso's dolphins in Hawaiian waters

Annie B. Douglas and Robin W. Baird
Cascadia Research Collective, Olympia, WA USA (abdouglas@cascadiaresearch.org)



Risso's dolphins are occasionally encountered in Hawaiian waters; is there a resident, insular population?

- More than half of the species of odontocetes (11 of 18) documented in Hawaiian waters have resident, insular populations around the main Hawaiian Islands.
- One acoustic study (Au et al., 2014) suggested that Risso's dolphins were relatively common in shallow waters around Kaua'i and Ni'i'hau, but those acoustic detections were never confirmed with sightings.

We investigated three lines of evidence to assess whether Risso's dolphins may have an insular, resident population and may be found in shallow waters:

- Sighting rates in relation to depth from 21 years of small-boat surveys among the main Hawaiian Islands
- Re-sightings from photo-identification data
- Satellite tag data from one LIMPET tag deployment

Findings

- Of 3,235 odontocete sightings, there were only 18 sightings of Risso's dolphins (group size range 1-35, median=7.5), representing 0.5% of all odontocete sightings (Figure 1).
- Despite extensive effort off Kaua'i and Ni'i'hau (22,968 km of trackline, 1,367 hours, across 12 years) there were no Risso's dolphin sightings off those islands.
- Of the 17 sightings off Hawai'i Island, the shallowest was 3.4 km from shore (1,366 m depth), and sighting rates increase with depth, with the highest sighting rates in depths of >4,000 m (Figure 2).
- One-hundred and seventy-one individuals were photo-identified from 15 encounters (1986 and 2022) with no re-sightings, suggesting a large population with low site fidelity.
- One LIMPET satellite tag was remotely deployed in April 2015. Over the 14-day period the tagged individual used deep waters offshore of the islands (median/max depth=4,217m, 4,816m; median/max distance from shore=57.6km, 113.9km; Figure 3).

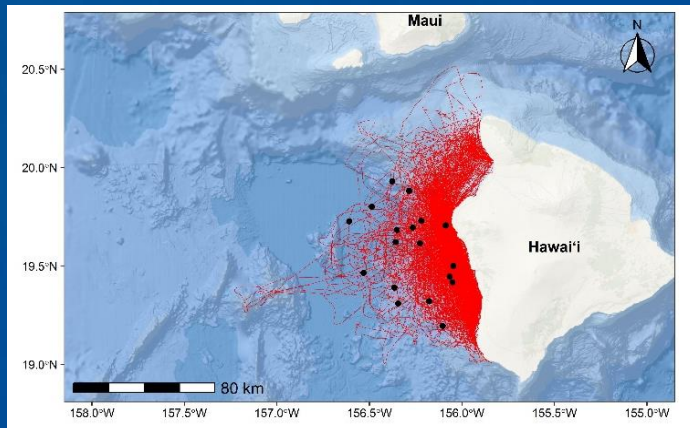


Figure 1. Risso's dolphin sightings (black circles) and survey effort off Hawai'i Island

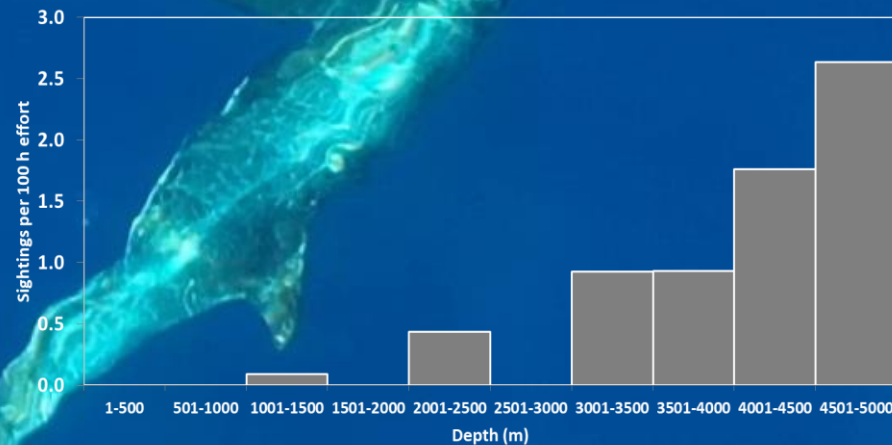


Figure 2. Sightings per unit effort shows increased sighting rates with increasing depth

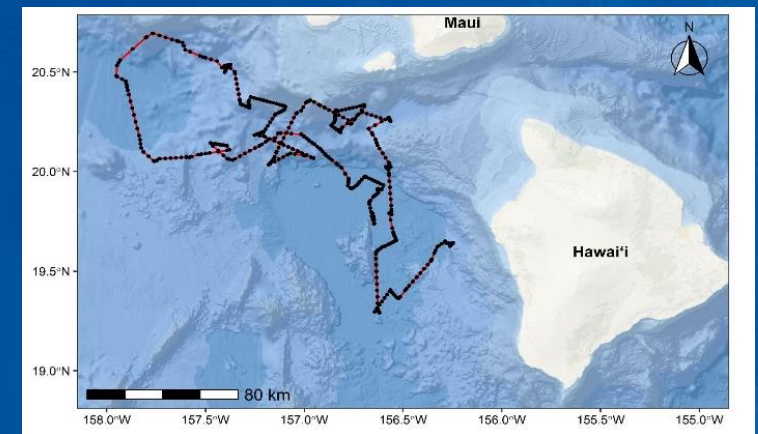


Figure 3. Crawl model of satellite tag data (14 days) shows wide-ranging movements.

Combined, all three lines of evidence suggest that there is no resident, insular population of Risso's dolphins around the main Hawaiian Islands, similar to a handful of other species including striped dolphins, Fraser's dolphins and killer whales

