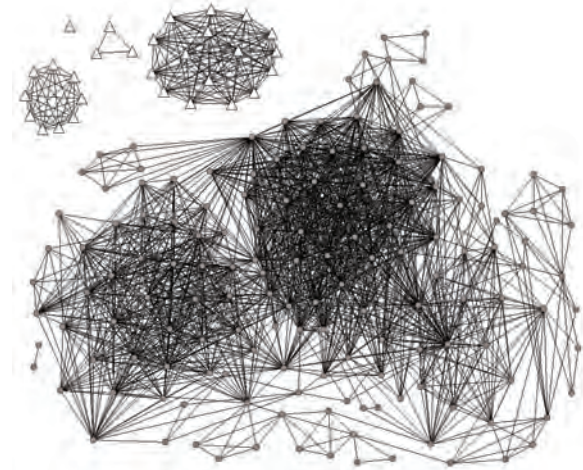


## Using social networks to assess populations:



Similar to the Facebook social network, we visualize social networks of whales or dolphins with each individual as a circle connected by lines to their “friends” to assess population structure. Above is a social network of false killer whales. All individuals from the Hawai‘i insular population (circles) are connected to each other through the network, while individuals from the pelagic population (triangles) are not connected, evidence they are a separate population.



## Management of populations

Our work is regularly presented to the Pacific Scientific Review Group (an advisory body for NMFS), we participate in the False Killer Whale Take Reduction Team, and we present information at scientific conferences and workshops, as well as publishing papers on our results. Copies of publications and reports can be downloaded

at: [www.cascadiaresearch.org/hawaii/publications.htm](http://www.cascadiaresearch.org/hawaii/publications.htm)



**Seabirds of Hawai‘i** We also record and photograph unusual seabirds, and contribute sightings and photos to the Bishop Museum and the Hawai‘i Birding Group.

[www.cascadiaresearch.org/hawaii/HIseabirds.htm](http://www.cascadiaresearch.org/hawaii/HIseabirds.htm)

Cascadia coordinates field efforts but our work is a collaborative effort with researchers from Wild Whale Research Foundation, University of Alaska Fairbanks/Alaska SeaLife Center, the Northwest Fisheries Science Center, Southwest Fisheries Science Center, Pacific Islands Fisheries Science Center, and Hawai‘i Pacific University. Other researchers on the water also provide photographs of many species that help us understand movements of different species among the islands.

**Got photos?** If you have dorsal fin or body photos of any species of toothed whales or dolphins in Hawai‘i that you are willing to contribute for our research, please contact Robin Baird at:

[rwbaird@cascadiaresearch.org](mailto:rwbaird@cascadiaresearch.org) or 360-943-7325



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Produced by Cascadia Research Collective, a 501(c)3 non-profit research and education organization, based in Olympia, WA.

# Studies of Hawai‘i’s resident whales and dolphins



This work is conducted under NMFS Scientific Research Permits

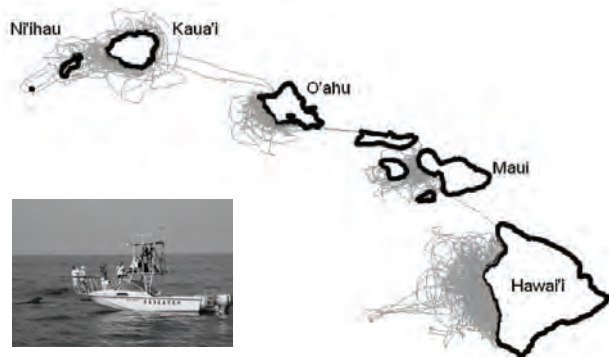


**18 species of toothed whales and dolphins reside around the Hawaiian Islands!**

Short-finned pilot whales	Blainville's beaked whales
Pantropical spotted dolphins	Sperm whales
Bottlenose dolphins	Striped dolphins
Spinner dolphins	Pygmy killer whales
Rough-toothed dolphins	Risso's dolphins
Dwarf sperm whales	Pygmy sperm whales
Cuvier's beaked whales	Longman's beaked whales
Melon-headed whales	Fraser's dolphins
False killer whales	Killer whales



We work with all species but focus on the lesser-studied ones. Our highest priority species are false killer whales, pygmy killer whales, beaked whales, and melon-headed whales. Our effort over the last 11 years is shown below.



Since 2000, we've covered almost 39,000 miles of survey tracklines around the main Hawaiian Islands and have documented almost 1500 sightings of 18 species of toothed whales and dolphins.

**Questions we are trying to answer**

**How large are the populations?**

By using photos, we are able to identify individuals and track them over time. We currently have catalogs of 10 species. With these catalogs, we've estimated population size of six species so far. For Cuvier's beaked whales, the population off the west side of the island of Hawai'i numbers only about 50 individuals.



**Melon-headed whales**

Photo-ID has indicated two populations exist in Hawai'i: a large population that moves among islands (main Hawaiian Islands population) and a small Hawai'i Island resident population.



**How many populations are there?**

We are collaborating with geneticists at Southwest Fisheries Science Center and graduate students at Portland State University and Oregon State University to examine stock structure of a number of species: melon-headed whales, false killer whales, rough-toothed dolphins, pygmy killer whales, among others. This work has shown the existence of multiple populations of some species in Hawai'i; for bottlenose dolphins, there are discrete populations around each of the main island groups.



**What levels of pollutants are they dealing with?**

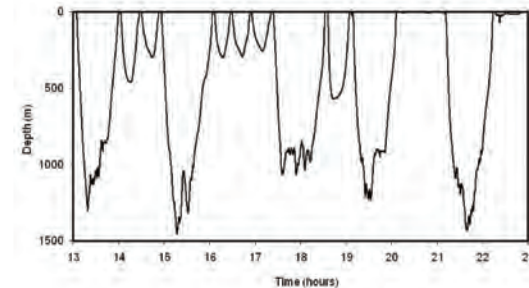
Working with the Northwest Fisheries Science Center, we discovered that false killer whales have high levels of persistent organic pollutants in their blubber - levels are high enough that they may influence the immune system. We are now working with NWFSC and Hawai'i Pacific University to examine pollutant levels in a number of species.

[www.cascadiaresearch.org/hawaii/hawaii.htm](http://www.cascadiaresearch.org/hawaii/hawaii.htm)

**What do they do at night and at depth?**



Through the use of suction-cup attached time depth recorders, we are able to examine behavior even when these animals are not visible.



Cuvier's beaked whales are susceptible to impacts from Navy sonar. Our work on diving behavior using suction-cup attached tags (10 hours of data shown above) has helped explain why this species may be impacted more often than others. Cuvier's dive to over 5000 feet and hold their breath for up to 90 minutes



**How are these species utilizing different habitats?**

Using longer-term satellite tags, we are able to examine movements and habitat use. Two satellite tagged pygmy killer whales remained strongly associated with the island of Hawai'i, providing evidence they may be from a resident population (see map below).

