

# Using Satellite Tags To Study Spotted Dolphin Movements in Hawai'i

by Robin Baird, Cascadia Research Collective and the Hawai'i Institute of Marine Biology

■ Perhaps the most abundant dolphin species found from O'ahu to the Big Island are pantropical spotted dolphins, often referred to as *kiko* (Hawaiian for "spot"), or porpoise in Hawai'i (although technically they aren't porpoise, which are a distantly related group of colder-water species, such as the harbor and Dall's porpoise seen off the U.S. West Coast). Most of the time spotted dolphins are found offshore, unlike spinner dolphins, which rest in shallow-water areas during the day. As juveniles, the two species can be difficult to tell apart because spotted dolphins don't have any spots when born; they develop spots with age. Light spots emerge on their dark dorsal surface, and dark spots appear on their lighter sides and belly. Comparing dorsal fin shape and beak shape is the best way to tell the two species apart.

In 1965, biologist Ken Norris captured a spotted dolphin off Wai'anae and attached a numbered plastic tag to its dorsal fin. The same individual was seen three and a half years later with the tag still on the fin. Ken concluded that spotted dolphins were resident to O'ahu.

My work in Hawai'i began off Maui in 1999. Although false killer whales, beaked whales and a couple of other species have been the primary focus of our research, we've been working with spotted dolphins ever since. Covering more than 70,000 miles of ocean in the last 17 years, working off all the main Hawaiian Islands, we've encountered 20 different species of whales and dolphins in Hawai'i, with spotted dolphins making up almost one out of every five groups of whales or dolphins encountered. As part of this work we use a crossbow and a biopsy tip on the end of a crossbow bolt to collect skin samples. The tip takes a small plug of skin and blubber and allows us to examine their genetics. For spotted dolphins, these samples have been used as part of a study that has shown that mating of spotted dolphins between the main Hawaiian Islands is so rare that there is a distinct genetic signal. Effectively there appear to be three different populations resident to the islands: one around O'ahu; one around Maui and Lana'i; and the last around Hawai'i Island. This doesn't mean the spotted dolphins don't ever move among the islands, just that they do so rarely. Around Kaua'i and Ni'ihau, spotted dolphins are extremely rare, and the genetics of those individuals appear more similar to open-ocean or pelagic dolphins.



(c) Robin W. Baird/Cascadia Research

Pantropical spotted dolphins showing the variability in spotting patterns with age.



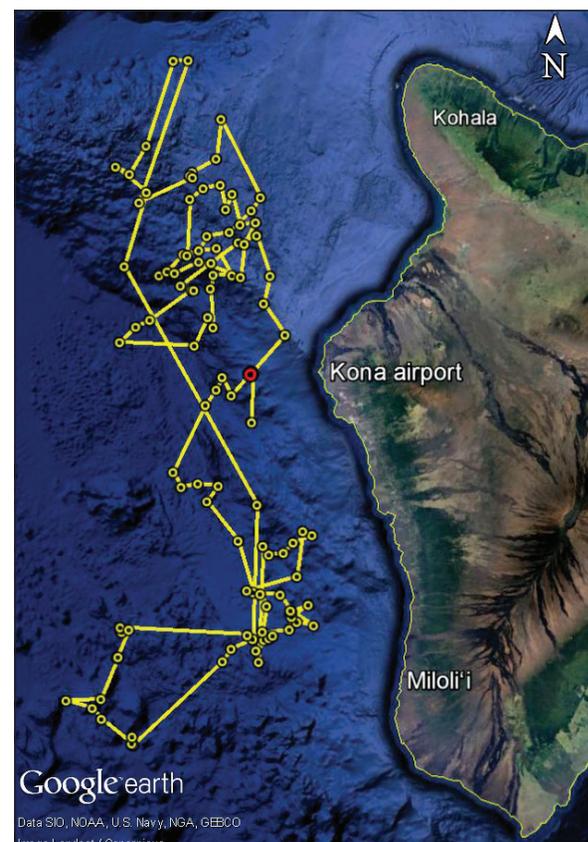
(c) Ann

A spotted dolphin off O'ahu with a satellite tag on the dorsal fin.

Since 2006 we've been using an air rifle to remotely deploy satellite tags on whales and dolphins in Hawai'i. The tags, which are attached with two titanium darts that anchor into the dorsal fin, give us information on movements over periods from weeks to months. We've deployed more than 270 of these tags on 12 different species of whales and dolphins in Hawai'i in the last 11 years, including four on spotted dolphins in the last two years.

## Are There 'Northern' and 'Southern' Schools off Kona?

I've heard suggestions that there are northern and southern schools of spotted dolphins off Kona. We've only tagged one spotted dolphin off the Big Island (in April 2015), and obtained just 11 days of movements, but the dolphin moved along the entire west side of the island, spending time both on the "grounds" and ranging as far south as Miloli'i. Originally tagged off the airport, over those 11 days the dolphin (and presumably the rest of the school) covered a range of more than 80 miles from north to south, and traveled as far as 40 miles from shore. Interestingly, after 11 days it was back close to where it had been tagged. These wide-ranging movements over such a short period suggest that the spotted dolphins of Kona use the entire coastline. **continued...**



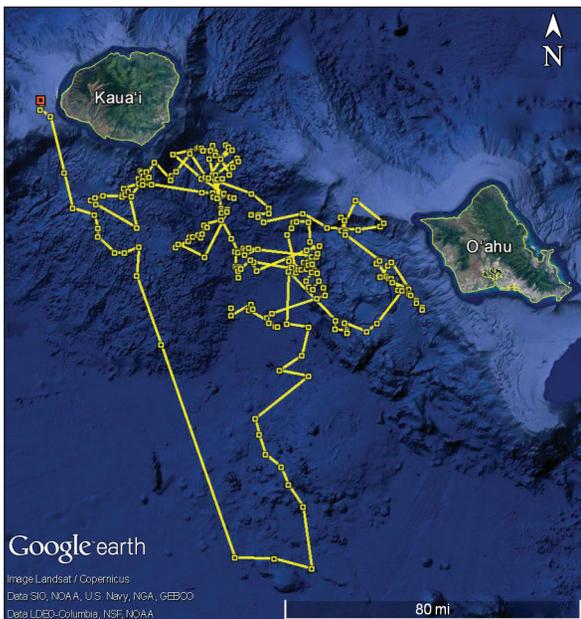
Map showing locations of a tagged pantropical spotted dolphin off Kona over an 11-day period in late April and May 2015. Tagging location is shown with a red symbol.



A pantropical spotted dolphin leaping off Kona.

### Pelagic Spotted Dolphins off Kaua'i and Ni'ihau

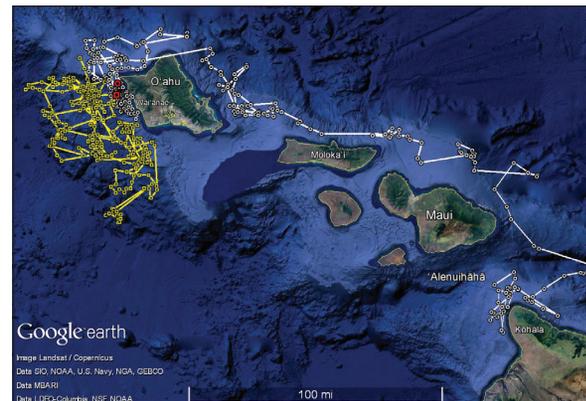
We've spent a lot of time working off Kaua'i and Ni'ihau in recent years, funded by the Navy to assess whale and dolphin populations that may be exposed to Navy sonar. Spotted dolphin sightings there are extremely rare in comparison to the other islands. We encountered a group in February 2016, which was only the 10th time we'd seen spotted dolphins off Kaua'i since first working there in 2003. We were able to satellite tag one individual, and its movements (see map) over an 18-day period indicated that it wasn't associated with the islands, spending most of its time in deep water far offshore.



Map showing the movements of a pelagic spotted dolphin over an 18-day period in February and March 2016. The tagging location is indicated in red. This individual moved as far as 93 miles offshore.

### Movements Among Islands

We've only satellite tagged four pantropical spotted dolphins so far, and with each additional tag deployment we are learning new things. We've tagged two individuals off the Wai'anae Coast of O'ahu, one in January and one in October 2016. Both were tagged in the same general area, and while one moved inshore and offshore off the west and southwest part of O'ahu (shown in yellow on the map), the other showed a lot more variability in movement patterns. This individual (shown in white in the map) spent just three days off Wai'anae before extending its movements off of the North Shore of O'ahu, and on day 10 moved to the east side of the island for a few days, before continuing east. Despite the genetic differences among spotted dolphins off different islands, this individual showed that movements can and do occur among the islands. Fifteen days after it was tagged off Wai'anae, it was crossing the 'Alenuihaha Channel, and it spent the last three days off Kohala before the tag stopped transmitting. Whether this represents a permanent move, or the animal was just on a walkabout is unknown, although the individual was well-marked and with a good quality photo we'll be able to identify it again.



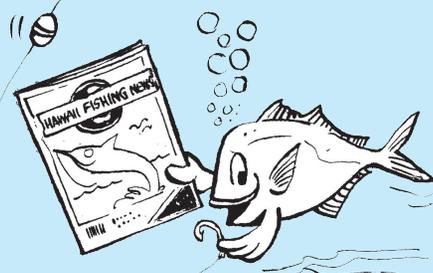
Movements of two spotted dolphins tagged off Wai'anae in 2016, one in January (shown in yellow) and one in October (shown in white). Both tracks are approximately 19 days long.

This association has not been studied in Hawai'i's waters, although with the remote deployment of satellite tags possible on spotted dolphins and tagging tuna, the association could be studied here relatively easily.

Through field observations, satellite tagging, genetic analyses and photo identification, we are learning more about these animals each year, however, much is still unknown. If you are interested in more information on our research on spotted dolphins and other species of whales and dolphins in Hawai'i, contact me at <[crwbaird@cascadiaresearch.org](mailto:crwbaird@cascadiaresearch.org)>. Also, a new book that summarizes our work, *The Lives of Hawai'i's Dolphins and Whales: Natural History and Conservation*, is available through the University of Hawai'i Press, <[www.uhpress.hawaii.edu/p-9708-9780824859985.aspx](http://www.uhpress.hawaii.edu/p-9708-9780824859985.aspx)>. . . . Robin

### Tuna and Dolphins

As fishermen well-know, 'ahi regularly associate with spotted dolphins, both in Hawai'i and elsewhere in the tropical Pacific. Studies in the Eastern Tropical Pacific have shown that the 'ahi follow the dolphins, not the other way around, presumably to benefit from the dolphins' ability to find and herd schools of smaller fish, which both then feed on.



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