



FROM STUDIES OF CAPTIVE AND STRANDED ANIMALS TO RESEARCH ON FREE-RANGING INDIVIDUALS: AN EXPANSION OF FALSE KILLER WHALE SCIENCE WORLDWIDE

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y first time seeing a false killer whale was in May 1987, and it was a dead individual washed up on Denman Island, in British Columbia, Canada. This was the first time a false killer whale had been documented in Canada, and we took measurements and collected the stomach contents, tissue samples, and the skeleton. With so little research having been undertaken on false killer whales anywhere at that time, a lot could be learned from just one dead individual. Working with Pam Stacey and Ken Langelier, we wrote up a note on this stranding and submitted it to the Canadian Field-Naturalist, reporting that the animal had fed on salmon and had high levels of persistent organic pollutants, among other things (Baird et al. 1989). When I mentioned our stranding and write-up 'in progress' to Steve Leatherwood at the Seventh Biennial Conference on the Biology of Marine Mammals, seven months later, he invited me to work with him on a literature review of this species. As a 24-year-old biologist who had only recently started working with marine mammals, I jumped at the offer, and Steve flew me down to San Diego to work with him a year later<sup>1</sup>. During that visit, Steve mentioned that he and Randy Reeves were likely going to be doing a survey for false killer whales in Hawai'i later on in 1989, and that I might be able to come along. While his project went ahead, he wasn't able to find the money to fly me out, so I lost my first chance to work with false killer whales in Hawai'i!

The results of their 1989 survey got buried in a report, and would not be published until well after Steve's death, but the survey turned out to be an important factor in the eventual endangered listing of what we now call the main Hawaiian Islands insular population of false killer whales (Reeves et al. 2009).

The report we wrote in 1989 (Leatherwood et al. 1989), as well as a later review published as a Mammalian Species account (Stacey et al. 1994), revealed that research on false killer whales at the time was focused almost entirely on stranded animals, animals taken in drive fisheries, and a few captive individuals. False killer whales regularly mass strand, with the largest event involving 835 individuals stranding at Mar del Plata in Argentina in October 1946 (Caillet-Bois 1948). Strandings in Scotland, Australia, and South Africa, in particular, provided large numbers of specimens for study (e.g., Kitchener et al. 1990). Conflicts with fishermen off Japan also fueled directed fisheries for false killer whales, and thus large numbers of individuals were available for examination (Kasuya 1986). But while studies of free-ranging individuals of many other species of cetaceans—such as humpback whales and North Atlantic right whales, as well as killer whales and bottlenose dolphins-started in the 1970s, similar work with false killer whales would not really get started until the 1990s, primarily because their tropical and offshore habits placed them far from the eyes of most researchers. Dan McSweeney off the island of Hawai'i was a

**Top Photo:** Individual HIPc201 from Cluster 3 of the endangered main Hawaiian Islands population, first documented off Hawai'i Island in December 2004 and last seen off O'ahu in July 2024. *Photo by Robin W. Baird/Cascadia Research.* 

Page 6 Photo: Perhaps the most distinctive false killer whale from our Hawai'i photo-ID catalog, HIPc197. This individual is part of the rarely-seen Cluster 2 of the endangered main Hawaiian Islands population. Based on our satellite tag data from that Cluster, they mainly spend their time in the 'Alenuihāhā Channel and off the north side of Maui and Moloka'i. HIPc197 was first photographed off Kona as a subadult by Dan McSweeney in October 1986, and was seen again by Dan off Kona in 1987 and 1990, and during Cascadia Research Collective projects off Kona in 2004, 2006, 2010, and 2011. This photo is from O'ahu from December 2024, contributed by Wild Side Specialty Tours, one of the tour companies actively engaged in citizen science in Hawai'i. Photo by Bethany King/Wild Side Specialty Tours.

notable exception-starting in 1986 he began consistently photographing false killer whales whenever he encountered them, and he later contributed those photos, as well as those of a number of other species, to catalogs that were established more than a decade later. While studying bottlenose dolphins off Costa Rica in the early 1990s, Alejandro Acevedo-Gutierrez similarly photographed false killer whales (as well as recording many aspects of their behavior), and published the first photoidentification study of this species (Acevedo-Gutierrez et al., 1997, see Annie Douglas' article in this issue). Since then, research with live, free-swimming false killer whales has steadily increased world-wide.

Focused field efforts in Hawai'i and New Zealand started in almost the same year (1999 and 2000, respectively) and have continued and expanded ever since. In the last 15 years, numerous independent studies on free-ranging individuals either have been published or have started in Mexico and the Pacific coast of Central America, off the Azores and mainland Portugal, in northern Australia, and off Okinawa. There may even be others that have started elsewhere (South America? SE Asia? Africa?) that I am not aware of. These studies of freeranging individuals in multiple areas around the world are beginning to reveal both similarities and differences among populations, similar to the diversity in killer whale (Orcinus spp.) populations world-wide.

The type and focus of graduate degrees can be interesting indicators of progress

<sup>1</sup> Little did we know that sightings of false killer whales off southern California would start becoming more common 25 years later.

**Top Photo:** A juvenile false killer whale from Cluster 1 of the endangered main Hawaiian Islands population, approaching a photographer in the water off 0'ahu. This individual, HIPc636 in Cascadia Research Collective's photoidentification catalog, was documented as a newborn off Hawai'i Island in April 2014, and this photo was taken off 0'ahu in November 2015. *Photo by Paul Johnson/ Paulphin Photography.* 

Page 9 Photo: These types of inverted leaps are common during attacks on mahimahi in Hawai'i. *Photo by Robin W. Baird/Cascadia Research.* 



#### Robin W. Baird Cont.

in science on any particular species. From the number and focus of graduate students working with false killer whales, it is clear that false killer whale research is both changing and rapidly expanding. To the best of my knowledge, the first graduate degree that was substantially based on work with false killer whales was Catherine Combelles' (1995) Master's thesis at the University of Hawai'i, examining hormone levels in three captive false killer whales (as well as bottlenose dolphins). This was quickly followed by additional studies with the same captive individuals in Hawai'i, including Scott Murray's (1997) Master's, examining vocalizations of two individuals, Michelle Yuen's (2005) PhD on auditory perception (of Kina—see Brijonnay Madrigal's article in this issue), Aude Pacini's (2011) PhD on hearing, and Laura Kloepper's (2012) PhD on echolocation, among others. During this same period, Ines Ferreira's (2008) Master's thesis examined growth and reproduction in false killer whales based on animals that stranded in South Africa or were killed in directed fisheries in Japan. Katrina MacIver's (2012) Master's thesis from the University of St. Andrews, on vocal repertoires from two individuals tagged with Dtags in the Bahamas (see my article on the history of tagging in this issue) may have been the first graduate degree completed that focused exclusively on false killer whales based on data collection from free-ranging animals in the wild. Kerry Foltz's (2012) Master's

thesis from Hawai'i Pacific University included analyses of samples from both stranded and free-ranging false killer whales, among other species. This was followed by Jochen Zaeschmar's (2014) Master's thesis from Massey University, based on a multiyear study involving photo-identification and behavioral observations of false killer whales around New Zealand (see Jochen's article in this issue). Yvonne Barkley's (2020) PhD thesis from the University of Hawai'i classified whistles of free-ranging false killer whales, among other topics. Maurice Kasprowsky's (2022) Master's thesis from Georg-August-Universität in Germany used sighting data off New Zealand to examine habitat preferences, another study based on free-ranging individuals.

At the moment, there are four graduate students working on PhDs largely or entirely focused on false killer whales in the wild, and all four have articles in this issue—Catherine Meyer on false killer whales in New Zealand, and Jens Currie, Brijonnay Madrigal, and Michaela Kratofil all on false killer whales in Hawai'i. Combined, their work incorporates a diversity of methodologies (drone photogrammetry, suction-cup and LIMPET tagging, genetic and stable isotope analyses of biopsy sampling, acoustics) and a wide-range of questions on four different populations of false killer whales, reflecting how research on false killer whales in the wild is maturing. Two of these studies also include results either based on samples from

strandings (Meyer) or from work with captive animals (Currie), showing synergy among these types of studies. There is another PhD student working in part with samples from stranded or bycaught false killer whales -Jana Phipps at the University of Hawai'i and a Master's student using passive acoustic localization to better understand the interaction between false killer whales and fisheries—Hadley Clark at the University of California San Diego. Captive studies, and studies from strandings or bycaught animals, will continue, but this shift from exclusively studies of captive or dead animals to primarily studies of live animals in the wild reflects both a recognition of where false killer whales can be found in the wild often enough to actually study them, and also an increased interest and investment into science focused on them.

As is apparent from the list above, much has been learned from studies of captive or dead false killer whales. The most relevant to conservation and understanding social organization based on association patterns (admittedly my bias) may be information on life history. Females do not start reproducing until 9 or 10 years of age, and they only give birth to calves on average every 6.9 to 8.8 years (Ferreira et al. 2014; Oleson et al. 2010). Like humans, killer whales, and short-finned pilot whales, false killer whale females go through menopause, and they may live long after they stop reproducing (Photopoulou et al. 2017). Also very relevant to conservation



are studies that have provided evidence of population structure. Kitchener et al. (1990) found differences in skull morphology among animals stranded in Australia, South Africa, and Scotland, which suggested there may be considerable population structure. Keep in mind that much of insights on population structure in killer whales, including evidence for multiple species, has come from differences in pigmentation patterns (e.g., eye patch shape, size, and orientation, saddle patch shape, size, and intensity)-obviously, with a species that appears almost uniformly black or dark gray, finding such evidence for major population structure might require detailed examinations of specimens, in addition to genetic analyses (see Karen Martien's article in this issue). Ferreira et al.'s (2014) study of age and growth showed that individuals from South Africa appear to be smaller than those off Japan, also providing evidence of major population structure. Such population structure, while it may seem academic, is key to conservation, as it helps illustrate that the units of concern are much smaller than the species itself. It is these conservation concerns, and increasing evidence that false killer whale populations are at risk in a number of locations worldwide, that is driving much of the research that is occurring today. Let us hope that this diverse and exciting science helps find solutions to the problems facing false killer whales, rather than just documenting the slow and steady decline of some populations.

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# False Killer Whales The Pseudorca Issue

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