

Over-fished and under-appreciated: conservation and management of false killer whales, Hawai'i's rarest whale

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False killer whales: a primer

- Found throughout the tropics
- Upper trophic-level predator therefore naturally rare
- Long-lived (up to 60+ years)
- Slow to mature (age of first reproduction ~10 years) and slow to reproduce (one offspring every 6-7 years)

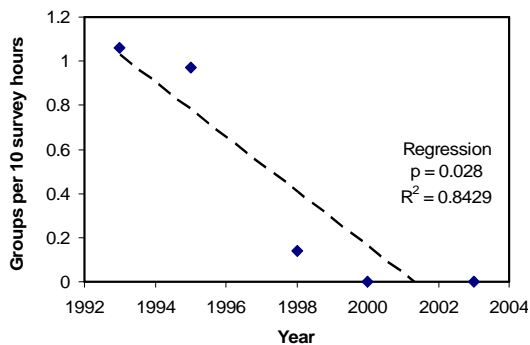
What's special about false killer whales in Hawai'i?

- Two genetically differentiated populations: island-associated (insular) and offshore ("pelagic")
- Insular population only known resident genetically-isolated island-associated population of this species in the world
- Least abundant of 18 species of odontocetes in Hawai'i
- Abundance of the insular population estimated at 123 individuals based on photo-identification data in 2005



Evidence of a population decline

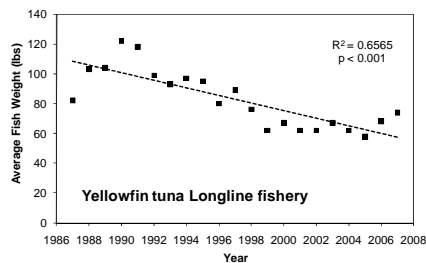
- Aerial surveys from 1993-2003 found a significant decline in sighting rates



Data from J. Mobley, U. Hawai'i West O'ahu

Additional evidence of a population decline

- In 1989 aerial survey were 3rd most common species, in 2000-2010 boat-based surveys are 9th most common species
- Largest group documented in 1989 survey was 470 individuals (>3 x's more than current estimate)
- Genetic analyses indicate a recent decline in effective population size (estimated at 46 individuals)
- Decline in sighting rates since mid-1980s in boat-based studies off island of Hawai'i (D. McSweeney).



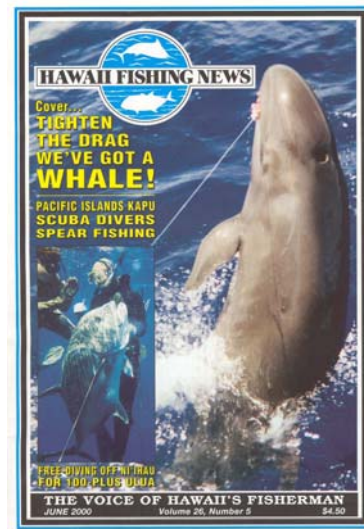
Dorsal fin disfigurement caused by line injury

What has caused the decline? The possibilities include:

- High levels of persistent organic pollutants (e.g., PCBs, PBDEs). Three of nine samples from insular individuals had PCB levels high enough to cause immunosuppression
- Reduction in prey base (size and CPUE of yellowfin tuna and other primary prey has declined).
- Bycatch in fisheries (most frequently recorded cetacean seriously injured or killed in longline fishery, possible bycatch in other unobserved fisheries)
- Deliberate shooting to reduce depredation of catch

Bycatch in the longline fishery and formation of a Take Reduction Team

- The Hawai'i-based longline fishery is the only fishery with an observer program in Hawai'i, currently with 20% coverage in the deep-set tuna fishery
- False killer whale bycatch has exceeded the "sustainable" levels (the "Potential Biological Removal" level) since at least 1999
- NMFS formed a Take Reduction Team (TRT) in January 2010, including fishermen, scientists and conservationists
- The TRT produced a consensus draft Take Reduction Plan (TRP) that NMFS is now considering for drafting regulations to reduce bycatch
- Draft TRP includes mandatory circle hooks, weak hooks, year-round closure of area around main Hawaiian Islands



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Will the insular population be listed as Endangered?

- NMFS was petitioned by NRDC in 2009 to list the insular population as "Endangered"
- Status review currently being undertaken and listing decision should be announced October 1, 2010

The problems facing this population will not be solved just with an ESA listing and new regulations to reduce bycatch

- Many of the problems are insidious (e.g., pollutants, ingestion of hooks in free-swimming fish, deliberate shooting)
- Many of the problems require both national and international solutions (reducing levels of pollutants, allowing fish populations to recover)

Solutions will have to be long-term and require broad public support, but false killer whales lack a constituency



Hui Malama Na Mea a Kane, Hawai'i Academy of Arts & Sciences



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How to raise awareness?

False killer whales should be listed as a "resource" in the Hawaiian Islands Humpback Whale National Marine Sanctuary

The 7th and 8th grade class at Hui Malama Na Mea a Kane, the Hawai'i Academy of Arts & Sciences, started a petition to have false killer whales listed as Hawai'i's state whale

<http://www.thepetitionsite.com/1/save-the-pseudorca>

References available at www.cascadiaresearch.org/hawaii/falsekillerwhale.htm

- Baird, R.W. 2009. A review of false killer whales in Hawaiian waters: biology, status, and risk factors. U.S. Marine Mammal Commission Report under Order No. E40475499.
- Baird, R.W., & A.M. Gorgone. 2005. False killer whale dorsal fin disfigurements as a possible indicator of long-line fishery interactions in Hawaiian waters. *Pacific Science* 59:593-601.
- Baird, R.W., A.M. Gorgone, D.J. McSweeney, D.L. Webster, D.R. Salden, M.H. Deakos, A.D. Ligon, G.S. Schorr, J. Barlow and S.D. Mahaffy. 2008. False killer whales (*Pseudorca crassidens*) around the main Hawaiian Islands: long-term site fidelity, inter-island movements, and association patterns. *Marine Mammal Science* 24:591-612.
- Baird, R.W., G.S. Schorr, D.L. Webster, D.J. McSweeney, M.B. Hanson and R.D. Andrews. 2010. Movements and habitat use of satellite-tagged false killer whales around the main Hawaiian Islands. *Endangered Species Research* 10:107-121.
- Chivers, S.J., R.W. Baird, K.M. Martien, B.L. Taylor, E. Archer, A.M. Gorgone, B.L. Hancock, N.M. Hedrick, D. Matilla, D.J. McSweeney, E.M. Oleson, C.L. Palmer, V. Pease, K.M. Robertson, J. Robbins, J.C. Salinas, G.S. Schorr, M. Schultz, J.L. Theilackering, and D.L. Webster. 2010. Evidence of genetic differentiation for Hawai'i insular false killer whales (*Pseudorca crassidens*). NOAA Technical Memorandum NMFS-SWFSC-458, 46p.
- Reeves, R.R., S. Leatherwood and R.W. Baird. 2009. Evidence of a possible decline since 1989 in false killer whales (*Pseudorca crassidens*) around the main Hawaiian Islands. *Pacific Science* 63:253-261.
- Yitlalo, G.M., R.W. Baird, G.K. Yanagida, D.L. Webster, S.J. Chivers, J.L. Bolton, G.S. Schorr, and D.J. McSweeney. 2009. High levels of persistent organic pollutants measured in blubber of island-associated false killer whales (*Pseudorca crassidens*) around the main Hawaiian Islands. *Marine Pollution Bulletin* DOI:10.1016/j.marpolbul.2009.08.029.