

FALSE KILLER WHALE (*Pseudorca crassidens*): Hawaiian Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

False killer whales are found worldwide mainly in tropical and warm-temperate waters (Stacey et al. 1994). In the North Pacific, this species is well known from southern Japan, Hawaii, and the eastern tropical Pacific. It occurs around all the main Hawaiian Islands, but its presence around the Northwestern Hawaiian Islands has not yet been established (Nitta and Henderson 1993). Recent sighting locations around the main Hawaiian Islands (Mobley et al. 2000) are shown in Figure 1. There are only 4 stranding records from Hawaiian waters (Nitta 1991). Large numbers of false killer whales have been taken in direct fisheries in southern Japan, and small numbers have been taken incidental to fishing operations in the eastern tropical Pacific. Most knowledge about this species comes from outside Hawaiian waters (Stacey et al. 1994). Recent genetic analyses of tissue samples from Hawaiian false killer whales indicate that they may be genetically distinct from animals found in both the eastern and western North Pacific (S. Chivers, NMFS unpublished data); however, the offshore range of this Hawaiian population is unknown. Efforts are currently underway to obtain additional samples of false killer whales for further studies of population structure in the North Pacific Ocean. For the Marine Mammal Protection Act (MMPA) stock assessment reports, there is a single Pacific management stock including only animals found within the U.S. Exclusive Economic Zone (EEZ) of the Hawaiian Islands.

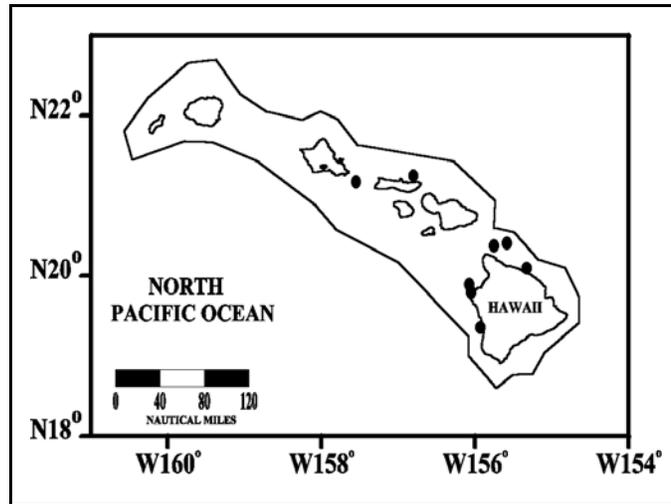


Figure 1. False killer whale sighting locations during 1993-98 aerial surveys within about 25 nmi of the main Hawaiian Islands (see Appendix 2 for details on timing and location of survey effort). Outer line indicates approximate boundary of survey area.

POPULATION SIZE

Population estimates for this species have been made from shipboard surveys in Japan (Miyashita 1993) and the eastern tropical Pacific (Wade and Gerrodette 1993), but evidence suggests that false killer whales around Hawaii form a distinct population (S. Chivers, NMFS unpublished data). As part of the Marine Mammal Research Program of the Acoustic Thermometry of Ocean Climate (ATOC) study, a total of twelve aerial surveys were conducted within about 25 nmi of the main Hawaiian Islands in 1993, 1995 and 1998. An abundance estimate of 121 (CV=0.47) false killer whales was recently calculated from the combined survey data (Mobley et al. 2000). This abundance underestimates the total number of false killer whales within the U.S. EEZ off Hawaii, because areas around the Northwest Hawaiian Islands (NWHI) and beyond 25 nautical miles from the main islands were not surveyed and estimates are uncorrected for the proportion of diving animals missed from the survey aircraft. A line-transect vessel survey of the Hawaiian archipelago EEZ was completed in 2002 and is expected to provide a more comprehensive estimate of abundance for Hawaiian false killer whales in the near future.

Minimum Population Estimate

The log-normal 20th percentile of the combined 1993-98 abundance estimate is 83 false killer whales. As with the best abundance estimate above, this includes only areas within about 25 nmi of the main Hawaiian Islands and is therefore an underestimate.

Current Population Trend

No data are available on current population trend.

CURRENT AND MAXIMUM NET PRODUCTIVITY RATES

No data are available on current or maximum net productivity rate for this species in Hawaiian waters.

POTENTIAL BIOLOGICAL REMOVAL

The potential biological removal (PBR) level for this stock is calculated as the minimum population size (83) times one half the default maximum net growth rate for cetaceans ($\frac{1}{2}$ of 4%) times a recovery factor of 0.5 (for a species of unknown status; Wade and Angliss 1997), resulting in a PBR of 0.8 false killer whales per year.

HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

Fishery Information

Information on fishery-related mortality of cetaceans in Hawaiian waters is limited, but the gear types used in Hawaiian fisheries are responsible for marine mammal mortality and serious injury in other fisheries throughout U.S. waters. Gillnets appear to capture marine mammals wherever they are used, and float lines from lobster traps and longlines can be expected to occasionally entangle whales (Perrin et al. 1994). In Hawaii, no mortality of false killer whales has been observed in inshore gillnets, but these fisheries are not observed or monitored. Regulations governing the use of nearshore gillnets (lay nets) are currently under review by the State of Hawaii.

Interactions with cetaceans have been reported for all Hawaiian pelagic fisheries, and false killer whales have been identified in fishermen's logs and NMFS observer records as taking catches from pelagic longlines (Nitta and Henderson

1993, NMFS unpublished data). They have also been observed feeding on mahi mahi, *Coryphaena hippurus*, and yellowfin tuna, *Thunnus albacares*, and frequently steal large fish (up to 70 pounds) (Shallenberger 1981) from the trolling lines of both commercial and recreational fishermen (S. Kaiser, pers. comm.).

The Hawaiian longline fishery currently operates under new restrictions which prohibit swordfish style fishing methods in an effort to reduce sea turtle mortality (NMFS Western Pacific Pelagic Fisheries Biological Opinion 2001). Changes in this fishery have not been in place long enough to assess their influence on the rate of false killer whale interactions, but overall cetacean take rates are similar. Between 1997 and 2001, five false killer whales were observed hooked in the Hawaiian longline fishery (Figure 2), with approximately 4-23% of all effort observed each year. This extrapolates to an average interaction rate of 11.6 (95% CI = 4-25) false killer whales per year for the entire fishery (NMFS unpublished data, Kleiber 1999); however, not all interactions with longlines lead to the death or serious injury of cetaceans. Cetaceans may ingest a hook, become hooked in the mouth or other body part, or become entangled in fishing line, causing varying levels of injury. Following the guidelines of a 1997 Serious Injury Workshop (Angliss and DeMaster 1998), small cetaceans that ingest a hook, are hooked in the mouth or head, are swimming abnormally, or are entangled and released trailing gear are considered seriously injured (defined under the MMPA as likely to result in mortality). Three of the false killer whales, two of which were taken inside of the Hawaiian Islands EEZ, would thus be considered seriously injured. The resulting estimate of serious injury or mortality for false killer whales in the entire fishery during the five most recent years for which data are available (1997-2001) is 35 (95% CI = 8-92), or an average of 6.9 false killer whales per year (NMFS, unpublished data, Kleiber 1999). Considering only animals taken within the Hawaiian Islands EEZ, this rate drops to 23 (95% CI = 3-74) animals during the 5-yr period, or 4.6 false killer whales per year. In addition, five unidentified cetacean that may have been false killer whales were taken in the longline fishery, including one animal with injuries of unknown severity taken within the Hawaiian Islands EEZ, one animal considered seriously injured and taken outside the Hawaiian Islands EEZ, and three animals with injuries of unknown severity taken

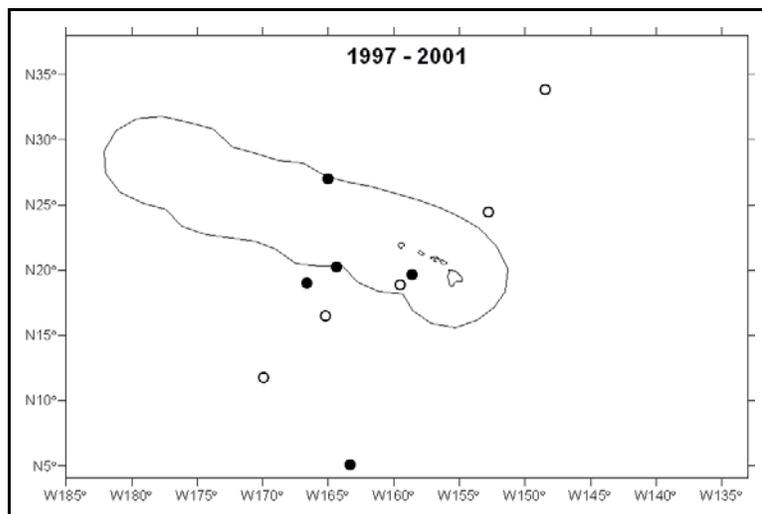


Figure 2. Locations of observed false killer whale interactions (●) and possible interactions with this species (○) in the Hawaiian longline fishery, 1997-2001. The solid line surrounding the Hawaiian Islands represents the U. S. Exclusive Economic Zone (EEZ).

outside the Hawaiian Islands EEZ. If the single unidentified cetacean taken within EEZ waters was a false killer whale, this would yield a Hawaiian Islands EEZ rate of serious injury or mortality of 4.6-6.9 false killer whales per year, depending on whether this animal is considered to have been seriously injured.

Interaction rates between dolphins and the NWHI bottomfish fishery have been estimated based on studies conducted in 1990-1993, indicating that an average of 2.67 dolphin interactions, most likely involving bottlenose and rough-toothed dolphins, occurred for every 1000 fish brought on board (Kobayashi and Kawamoto 1995). Fishermen claim interactions with dolphins who steal bait and catch are increasing. It is not known whether these interactions result in serious injury or mortality of dolphins, nor whether false killer whales are involved.

Other Removals

Since the early 1960's, at least 12 false killer whales have been live-captured by aquaria or the Navy (Pryor 1975; Shallenberger 1981; J. Thomas pers. comm.).

STATUS OF STOCK

The status of false killer whales in Hawaiian waters relative to OSP is unknown, and there are insufficient data to evaluate trends in abundance. No habitat issues are known to be of concern for this species. They are not listed as "threatened" or "endangered" under the Endangered Species Act (1973), nor as "depleted" under the MMPA. Because the rate of serious injury to false killer whales within the Hawaiian Islands EEZ in the Hawaiian longline fishery (4.6-6.9 animals per year) exceeds the PBR (0.8), this stock is considered a strategic stock under the 1994 amendments to the MMPA. The total fishery mortality and serious injury cannot be considered to be insignificant and approaching zero, because it exceeds the PBR. However, the available abundance estimate, on which PBR is based, applies only to a portion of this species' range in Hawaiian waters, and additional studies of abundance, distribution, and fishery-related mortality and injury of false killer whales in Hawaiian waters will be required to re-evaluate this species' status in the future. A line-transect vessel survey of the Hawaiian archipelago EEZ was completed in 2002 and is expected to provide a more comprehensive estimate of abundance for this stock in the near future.

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