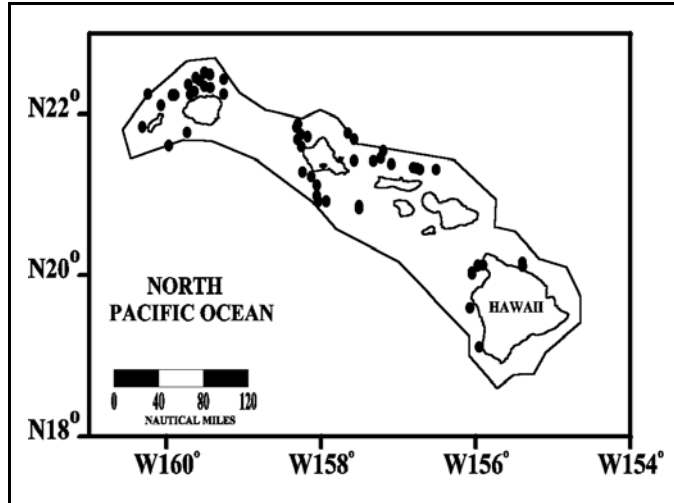


## **SHORT-FINNED PILOT WHALE (*Globicephala macrorhynchus*): Hawaiian Stock**

### **STOCK DEFINITION AND GEOGRAPHIC RANGE**

Short-finned pilot whales are found in all oceans, primarily in tropical and warm-temperate waters. They are commonly observed around the main Hawaiian Islands and are probably also present around the Northwestern Hawaiian Islands (Shallenberger 1981). Recent sighting locations around the main Hawaiian Islands (Mobley et al. 2000) are shown in Figure 1. Several mass strandings have been reported from the main islands (Tomich 1986; Nitta 1991). Stock structure of short-finned pilot whales has not been adequately studied in the North Pacific, except in Japanese waters, where two stocks have been identified based on pigmentation patterns and differences in the shape of the heads of adult males (Kasuya et al. 1988). The pilot whales in Hawaiian waters are similar morphologically to the Japanese "southern form." Recent genetic analyses of tissue samples from Hawaiian short-finned pilot 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they may be genetically distinct from animals found in both the eastern and western North Pacific (S. Chivers, NMFS unpublished data); however, the offshore range of this Hawaiian population is unknown.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 short-finned pilot whales for further studies of population structure in the North Pacific Ocean. Preliminary photo-identification work with pilot whales in Hawaii indicated a high degree of site fidelity around the main island of Hawaii (Shane and McSweeney 1990). For the Marine Mammal Protection Act (MMPA) stock assessment reports, short-finned pilot whales within the Pacific U.S. Exclusive Economic Zone (EEZ) are divided into two discrete, non-contiguous areas: 1) Hawaiian waters (this report), and 2) waters off California, Oregon and Washington.



**Figure 1.** Short-finned pilot 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**

Estimates of short-finned pilot whale populations have been made off Japan (Miyashita 1993) and in the eastern tropical Pacific (Wade and Gerrodette 1993), but it is not known whether any of these animals are part of the same population that occurs around the Hawaiian Islands. 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 1,708 (CV=0.32) short-finned pilot whales was recently calculated from the combined survey data (Mobley et al. 2000). This abundance underestimates the total number of short-finned pilot 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. 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 short-finned pilot whales in the near future.

### **Minimum Population Estimate**

The log-normal 20th percentile of the combined 1993-98 abundance estimate is 1,313 short-finned pilot 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.

### POTENTIAL BIOLOGICAL REMOVAL

The potential biological removal (PBR) level for this stock is calculated as the minimum population size (1,313) times one half the default maximum net growth rate for cetaceans ( $\frac{1}{2}$  of 4%) times a recovery factor of 0.50 (for a species of unknown status with no known fishery mortality within the U.S. EEZ off Hawaii; Wade and Angliss 1997), resulting in a PBR of 13 short-finned pilot whales per year.

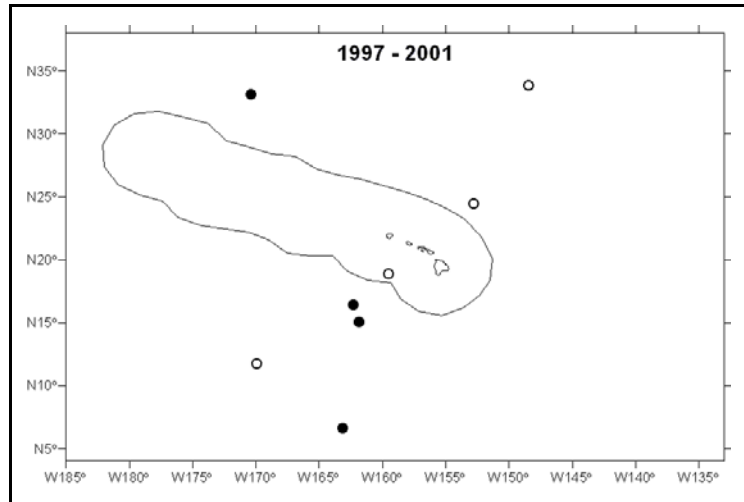
### HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

#### 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 short-finned pilot 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 (Nitta and Henderson 1993). Between 1997 and 2001, four short-finned pilot 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 9.3 (95% CI = 3-22) short-finned pilot 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). Two of the short-finned pilot whales, both taken outside the Hawaiian Islands EEZ, were dead or considered seriously injured. The resulting estimate of serious injury or mortality for short-finned pilot whales in the entire fishery during the five most recent years for which data are available (1997-2001) is 23 (95% CI = 3-74), or an average of 4.6 short-finned pilot whales per year (NMFS, unpublished data, Kleiber 1999). Considering only animals taken within the Hawaiian Islands EEZ, this rate drops to zero. In addition, four unidentified cetaceans that may have been short-finned pilot whales were taken in the longline fishery, including one animal taken within the Hawaiian Islands EEZ with injuries of unknown severity, and three animals taken outside the Hawaiian Islands EEZ with undetermined, non-serious, and serious injuries, respectively. If the single unidentified cetacean taken within EEZ waters was a short-finned pilot whale, this would yield a Hawaiian Islands EEZ rate of serious injury or mortality of 0-2.3 short-finned pilot 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



**Figure 2.** Locations of observed short-finned pilot 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).

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 short-finned pilot whales are involved.

### **Other Removals**

Since 1963, at least 20 short-finned pilot whales have been live-captured from Hawaiian waters by Sea Life Park/Oceanic Foundation (Shallenberger 1981).

### **STATUS OF STOCK**

The status of short-finned pilot 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. Although information on short-finned pilot whales in Hawaiian waters is limited, this stock would not be considered strategic under the 1994 amendments to the MMPA, because the estimated rate of serious injury within the Hawaiian Islands EEZ (0-2.3 short-finned pilot whales per year), is less than the PBR (13). However, there is no systematic monitoring of gillnet fisheries that may take this species, and the potential effect of mortality in the Hawaiian longline fishery in international waters is not known. Insufficient information is available to determine whether the total fishery mortality and serious injury for short-finned pilot whales is insignificant and approaching zero mortality and serious injury rate.

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