

SHORT-FINNED PILOT WHALE (*Globicephala macrorhynchus*): California/Oregon/Washington Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

Short-finned pilot whales were once commonly seen off Southern California, with an apparently resident population around Santa Catalina Island, as well as seasonal migrants (Dohl et al. 1980). After a strong El Niño event in 1982-83, short-finned pilot whales virtually disappeared from this region, and despite increased survey effort along the entire U.S. west coast, few sightings were made from 1984-1992 (Jones and Szczepaniak 1992; Hill and Barlow 1992; Carretta and Forney 1993; Shane 1994; Green et al. 1992, 1993). In 1993, six groups of short-finned pilot whales were again seen off California (Mangels and Gerrodette 1994; Carretta et al. 1995), and mortality in drift gillnets increased (Julian and Beeson, 1998). Figure 1 summarizes the sighting history of short-finned pilot whales off the U.S. west coast. Although the full geographic range of the California/Oregon/Washington population is not known, it may be continuous with animals found off Baja California, and its individuals are morphologically distinct from short-finned pilot whales found farther south in the eastern tropical Pacific (Polisini 1981). Separate southern and northern forms of short-finned pilot whales have also been documented for the western North Pacific (Kasuya et al. 1988; Wada 1988; Miyazaki and Amano 1994). For the Marine Mammal Protection Act (MMPA) stock assessment reports, short-finned pilot whales within the Pacific U.S. Exclusive Economic Zone are divided into two discrete, non-contiguous areas: 1) waters off California, Oregon and Washington (this report), and 2) Hawaiian waters.

POPULATION SIZE

Based on surveys conducted within 300 nmi of the California, Oregon and Washington coast in 1991, 1993, and 1996, Barlow (1997) has recently calculated an abundance estimate of 970 (CV = 0.37) short-finned pilot whales.

Minimum Population Estimate

The log-normal 20th percentile of the above abundance estimate is 717 short-finned pilot whales.

Current Population Trend

Approximately nine years after the virtual disappearance of short-finned pilot whales following the 1982-83 El Niño, they appear to have returned to California waters, as indicated by an increase in sighting records as well as incidental fishery mortality (Mangels and Gerrodette 1994; Carretta et al. 1995; Julian and Beeson, 1998). However, this cannot be considered a true growth in the population, because it merely reflects large-scale, long-term movements of this species in response to changing oceanographic conditions. It is not known where the animals went after the 82-83 El Niño, nor where the recently observed animals came from. Until the range of this population and the movements of animals in relation to environmental conditions are better documented, no inferences can be drawn regarding trends in abundance of short-finned pilot whales off California, Oregon and Washington.

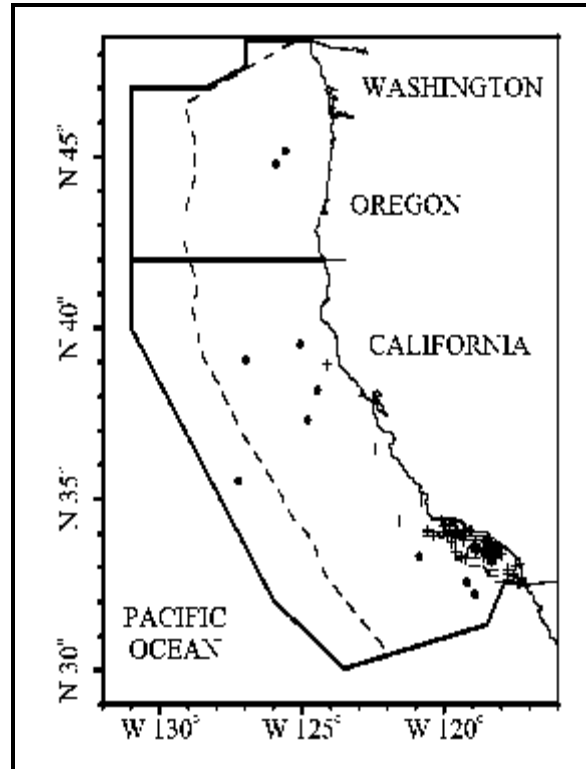


Figure 1. Short-finned pilot whale sightings made during aerial and shipboard surveys conducted off California in 1975-83 (+) and off California, Oregon and Washington, 1989-96 (!). Dashed line represents the U.S. EEZ, thick line indicates the outer boundary of all surveys combined. Greater effort was conducted off California (south of 42°N) and in the inshore half of the U.S. EEZ. See Appendix 2 of Barlow et al. (1997) and Barlow (1997) for data sources and information on timing and location of survey effort.

CURRENT AND MAXIMUM NET PRODUCTIVITY RATES

No information on current or maximum net productivity rates is available for short-finned pilot whales off California, Oregon and Washington.

POTENTIAL BIOLOGICAL REMOVAL

Based on this stock's unknown status and growth rate and given the precision of the estimate of annual fishery mortality ($CV = 0.50$), the recovery factor (F_r) is 0.48. $\frac{1}{2}R_{max}$ is the default value of 0.02. Multiplying these two values times the minimum population estimate of 717 yields a potential biological removal (PBR) of 6.9 animals per year.

HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

Fishery Information

A summary of known fishery mortality and injury for this stock of short-finned pilot whale is shown in Table 1. More detailed information on these fisheries is provided in Appendix 1 of Barlow et al. (1997). The average estimated annual mortality for short-finned pilot whales in this fishery for the five most recent years of monitoring, 1993-97, is 13 ($CV = 0.50$) animals (Julian and Beeson 1998; Julian 1997, Cameron 1998). In 1996-97, a pinger experiment was conducted to evaluate whether these acoustic alarms may reduce cetacean entanglement rates in the drift gillnet fishery. Based on the positive results of this study (Cameron 1998), pingers were made mandatory in this fishery in November 1997. The observed mortality of a single short-finned pilot whale in 1997 was in a pingered net.

Table 1. Summary of available information on the incidental mortality and injury of short-finned pilot whales (California/Oregon/Washington Stock) in commercial fisheries that might take this species. All observed entanglements of pilot whales resulted in the death of the animal. Coefficients of variation for mortality estimates are provided in parentheses; n/a = not available.

Fishery Name	Data Type	Year(s)	Percent Observer Coverage	Observed Mortality	Estimated Annual Mortality	Mean Annual Takes 1993-97
CA/OR thresher shark/swordfish drift gillnet fishery	observer data	1993	13.4%	8	60 (0.54)	13 (0.50)
		1994	17.9%	0	0	
		1995	15.6%	0	0	
		1996	12.4%	0	0	
		1997	26.6%	1	6 (0.96)	
Undetermined (probably squid purse seine fishery)	strandings	1975-90	14 short-finned pilot whales stranded in Southern California with evidence of fishery interactions, probably with the squid purse seine fishery			n/a
Minimum total annual takes 1993-97						13 (0.50)

Drift gillnet fisheries for swordfish and sharks exist along the entire Pacific coast of Baja California, Mexico and may take animals from the same population. Quantitative data are available only for the Mexican swordfish drift gillnet fishery, which has increased from two vessels in 1986 to 29 vessels in 1992 (Sosa-Nishizaki et al. 1993). The total number of sets in this fishery in 1992 can be estimated from data provided by these authors to be approximately 2700, with an observed rate of marine mammal bycatch of 0.13 animals per set (10 marine mammals in 77 observed sets; Sosa-Nishizaki et al. 1993). This overall mortality rate is similar to that observed in California driftnet fisheries during 1990-95 (0.14 marine mammals per set; Julian and Beeson 1998), but species-specific information is not available for the Mexican fisheries.

Historically, short-finned pilot whales were also killed in squid purse seine operations off Southern California (Miller et al. 1983; Heyning et al. 1994). No recent mortality has been reported, presumably because short-finned pilot whales are no longer common in the areas of squid purse seine fishing activity; however, there have been recent anecdotal reports of pilot whales seen near squid fishing operations off Southern California during the October 1997-

April 98 fishing season. This fishery is not currently monitored, and has expanded markedly since 1992 (California Department of Fish and Game, unpubl. data).

STATUS OF STOCK

The status of short-finned pilot whales off California, Oregon and Washington in relation to OSP is unknown. They have declined in abundance in the Southern California Bight, likely a result of a change in their distribution since the 1982-83 El Niño, but the nature of these changes and potential habitat issues are not adequately understood. Short-finned pilot whales are not listed as "threatened" or "endangered" under the Endangered Species Act nor as "depleted" under the MMPA. Because the average annual human-caused mortality for 1993-97 (13 animals per year) exceeds the PBR (6.9) short-finned pilot whales off California are a "strategic" stock under the MMPA, and the total fishery mortality and injury cannot be considered to be insignificant and approaching zero. A take reduction plan for the drift gillnet fishery, including mandatory pingers and a minimum 6-fathom suspender length, was implemented in 1997, and preliminary results indicate that cetacean mortality has decreased markedly (Cameron 1998).

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