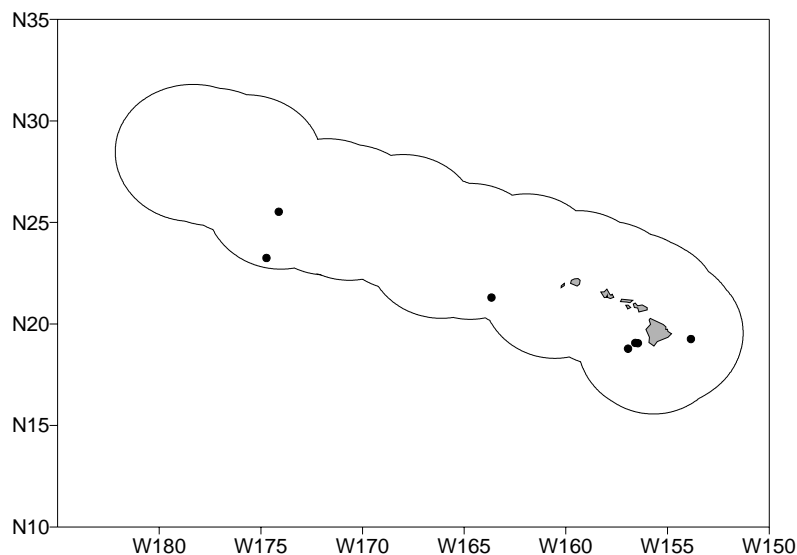


## RISSO'S DOLPHIN (*Grampus griseus*): Hawaiian Stock

### STOCK DEFINITION AND GEOGRAPHIC RANGE

Risso's dolphins are found in tropical to warm-temperate waters worldwide (Kruse et al. 1999). Although they have been considered rare in Hawaiian waters (Shallenberger (1981), six sightings were made during a 2002 survey of the U.S. Exclusive Economic Zone (EEZ) of the Hawaiian Islands (Figure 1). There are five stranding records from the main islands (Nitta 1991; Maldini 2005). For the Marine Mammal Protection Act (MMPA) stock assessment reports, Risso's dolphins within the Pacific U.S. EEZ are divided into two discrete, non-contiguous areas: 1) Hawaiian waters (this report), and 2) waters off California, Oregon and Washington.



**Figure 1.** Risso's dolphin sighting locations during the 2002 shipboard cetacean survey of U.S. EEZ waters surrounding the Hawaiian Islands (Barlow 2003; see Appendix 2 for details on timing and location of survey effort). Outer line represents approximate boundary of survey area and U.S. EEZ.

### POPULATION SIZE

Population estimates have been made off Japan (Miyashita 1993) and in the eastern tropical Pacific (Wade and Gerrodette 1993), but it is not known whether these animals are part of the same population that occurs around the Hawaiian Islands and in the central North Pacific. 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 (Mobley et al. 2000). Only one sighting of a single Risso's dolphin was made, and no abundance estimate was calculated. A 2002 shipboard line-transect survey of the entire Hawaiian Islands EEZ resulted in an abundance estimate of 2,351 (CV=0.65) Risso's dolphins (Barlow 2003). This is currently the best available abundance estimate for this stock.

### Minimum Population Estimate

The log-normal 20th percentile of the 2002 abundance estimate is 1,426 Risso's dolphins.

### 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 Hawaiian animals.

### POTENTIAL BIOLOGICAL REMOVAL

The potential biological removal (PBR) level for this stock is calculated as the minimum population size (1,426) 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 stock of unknown status with no known fishery mortality or serious injury within the U.S. EEZ of the Hawaiian Islands; Wade and Angliss 1997), resulting in a PBR of 14 Risso's dolphins per year.

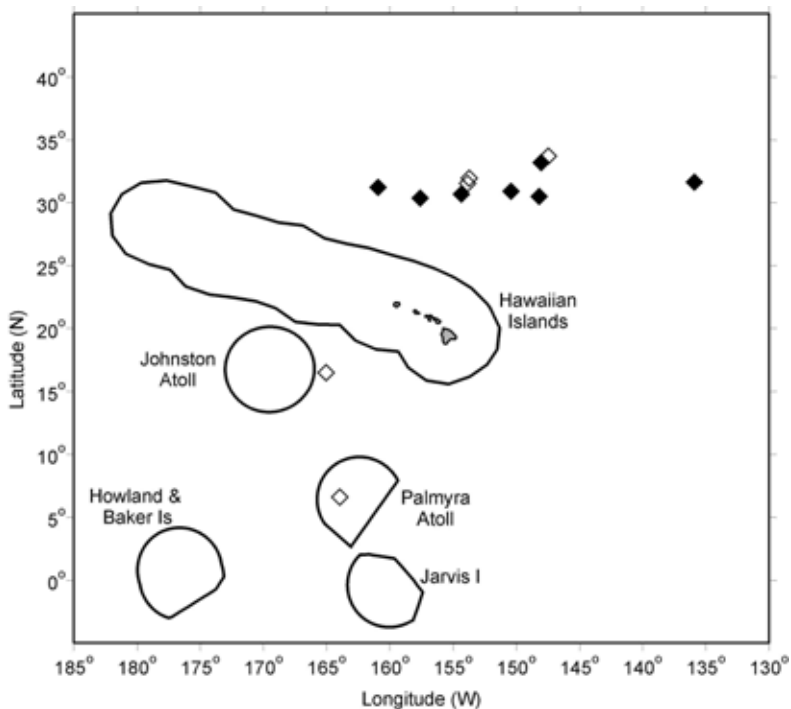
### HUMAN CAUSED MORTALITY AND SERIOUS INJURY

#### Fishery Information

Information on fishery-related mortality and serious injury 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).

Interactions with cetaceans have been reported for all Hawaiian pelagic fisheries (Nitta and Henderson 1993), and some of these interactions involved Risso's dolphins. Between 1994 and 2002, seven Risso's dolphins were observed hooked or entangled in the Hawaii-based longline fishery outside of U.S. EEZ waters, with approximately 4-25% of all effort observed (Table 1; Figure 2; Forney 2004). During the 905 observed trips with 11,014 sets, the average interaction rate of Risso's dolphins was one animal per 129 fishing trips, or one animal per 1,573 sets. All Risso's dolphins caught were considered seriously injured (Forney 2004), based on an evaluation of the observer's description of the interaction and following established guidelines for assessing serious injury in marine mammals (Angliss and Demaster 1998). Average 5-yr estimates of annual mortality and serious injury for 1998-2002 are 8.2 (CV = 0.66) Risso's dolphins outside of U.S. EEZs, and none within the Hawaiian Islands EEZ. Several additional unidentified cetaceans, which may have been Risso's dolphins, were also taken in this fishery (Figure 2, Forney 2004) in international waters and U.S. EEZ waters of Palmyra Island. In 2001, regulations in the Hawaii-based longline fishery prohibited swordfish style fishing methods north of the equator in an effort to reduce sea turtle mortality (NMFS 2001); however, a portion of the Hawaii-based fleet subsequently moved to California and continued to fish in international waters of the North Pacific, in roughly the same areas as previously. No Risso's dolphins were observed taken in the California-based longline fishery during 2001 and 2002, with roughly 5.5% observer coverage (Forney 2004). Preliminary data for 2003 indicate one Risso's dolphin was hooked and released alive in international waters (NMFS/SWR, unpublished data). Since 2001, the Hawaii-based longline fishery has undergone further regulatory changes, but potential impacts of these changes on the rate of Risso's dolphin takes are unknown.



**Figure 2.** Locations of Risso's dolphin takes (filled diamonds) and possible takes of this species (open diamonds) in the Hawaii-based longline fishery, 1994-2002. Solid lines represent the U.S. EEZs. Set locations in this fishery are summarized in Appendix 1.

**Table 1.** Summary of available information on incidental mortality and serious injury of Risso's dolphin (Hawaii stock) in commercial fisheries, within and outside of U.S. EEZs (Forney 2004). Mean annual takes are based on 1998-2002 data unless otherwise indicated; n/a = not available.

Fishery Name	Year	Data Type	Percent Observer Coverage	Mortality and Serious Injury outside of U.S. EEZ			Mortality and Serious Injury within Hawaiian Islands EEZ		
				Observed	Estimated (CV)	Mean Annual Takes (CV)	Observed	Estimated (CV)	Mean Annual Takes (CV)
<b>Hawaii-based longline fishery</b>	1998	observer data	4.6%	0	0 (-)	8.2 (0.66)	0	0 (-)	0 (-)
	1999		3.5%	1	29 (1.0)		0	0 (-)	
	2000		11.8%	1	8 (1.0)		0	0 (-)	
	2001		22.7%	1	4 (1.0)		0	0 (-)	
	2002		24.9%	0	0 (-)		0	0 (-)	

Fishery Name	Year	Data Type	Percent Observer Coverage	Mortality and Serious Injury outside of U.S. EEZ			Mortality and Serious Injury within Hawaiian Islands EEZ		
				Observed	Estimated (CV)	Mean Annual Takes (CV)	Observed	Estimated (CV)	Mean Annual Takes (CV)
California-based longline fishery	2001	observer data	5.5% (2001-02)	0	0 (-)	0 <sup>1</sup>			
	2002			0	0 (-)				
	2003	observer data	n/a	1	n/a				
<b>Minimum total annual takes within U.S. EEZ waters</b>									0 (-)

<sup>1</sup>Mean annual takes for the California-based longline fishery are based on 2001-2002.

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 Risso's dolphins are involved.

### STATUS OF STOCK

The status of Risso's dolphins 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. The Hawaiian stock of Risso's dolphin is not considered strategic under the 1994 amendments to the MMPA given the absence of reported fisheries related mortality within the U.S. EEZs. The potential effect of injuries sustained by Risso's dolphins in U.S. pelagic longline fisheries in international waters is not known. Insufficient information is available to determine whether the total fishery mortality and serious injury for Risso's dolphins is insignificant and approaching zero mortality and serious injury rate.

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