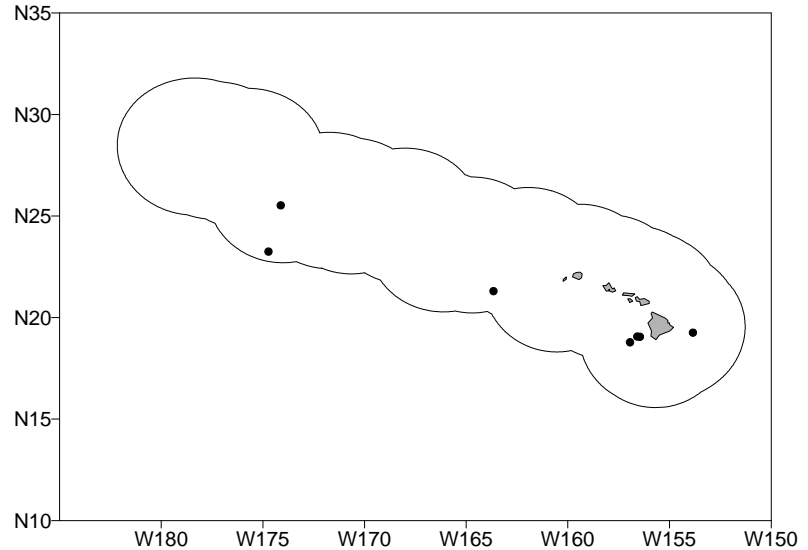


## **RISSO'S DOLPHIN (*Grampus griseus*): Hawaiian Stock**

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

Risso's dolphins are found in tropical to warm-temperate waters worldwide (Perrin et al. 2009). 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 et al. 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. The Hawaiian stock includes animals found both within the Hawaiian Islands EEZ and in adjacent international waters; however, because data on abundance, distribution, and human-caused impacts are largely lacking for international waters, the status of this stock is evaluated based on data from U.S. EEZ waters of the Hawaiian Islands (NMFS 2005).



**Figure 1.** Risso's dolphin sighting locations during the 2002 shipboard cetacean survey of U.S. EEZ waters surrounding the Hawaiian Islands (Barlow 2006; 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), in the eastern tropical Pacific (Wade and Gerrodette 1993), and off the U.S. West Coast (Barlow and Forney 2007), 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. A 2002 shipboard line-transect survey of the entire Hawaiian Islands EEZ resulted in an abundance estimate of 2,372 (CV=0.97) Risso's dolphins (Barlow 2006). This is currently the best available abundance estimate for this stock.

### **Minimum Population Estimate**

The log-normal 20th percentile of the 2002 abundance estimate (Barlow 2006) is 1,195 Risso's dolphins within the Hawaiian Islands EEZ.

### **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 within the U.S. EEZ of the Hawaiian Islands (1,195) 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 12 Risso's dolphins per year.

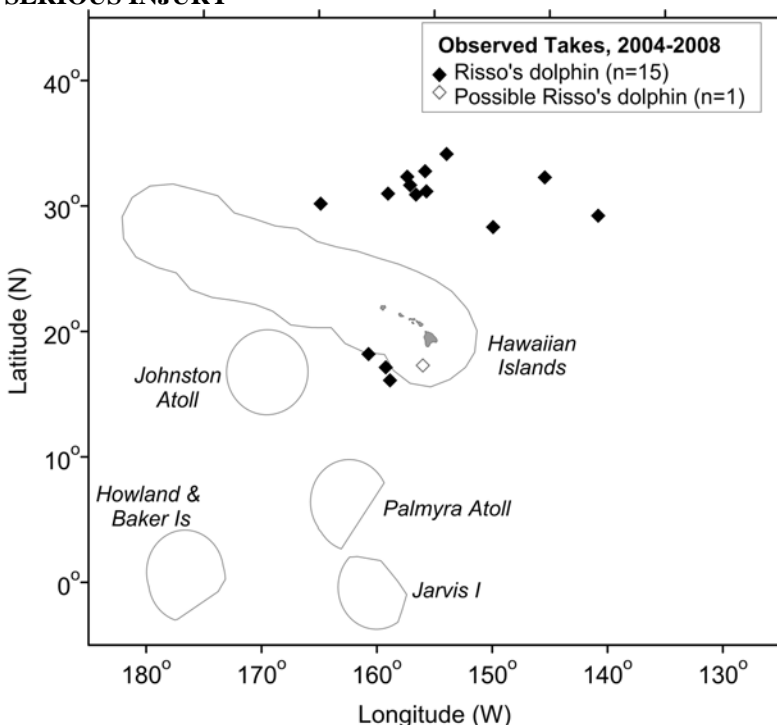
## HUMAN CAUSED MORTALITY AND SERIOUS INJURY

### 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 cetaceans (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.

There are currently two distinct longline fisheries based in Hawaii: a deep-set longline (DSL) fishery that targets primarily tunas, and a shallow-set longline fishery (SSL) that targets swordfish. Both fisheries operate within U.S. waters and on the high seas. Between 2004 and 2008, 10 Risso's dolphins were observed killed or seriously injured in the SSL fishery (100% observer coverage), and 15 Risso's dolphins were observed killed or

seriously injured in the DSL fishery (20-28% observer coverage) (Forney 2009, McCracken & Forney 2010). Three Risso's dolphin in the DSL fishery and two in the SSL fishery were killed; the remainder were determined to have been seriously injured (Forney 2009), based on an evaluation of the observer's description of the interaction and following the most recently developed criteria for assessing serious injury in marine mammals (Andersen et al. 2008). The total observed mortality and serious injury of cetaceans in the SSL fishery (with 100% coverage), and the estimated annual and 5-yr average mortality and serious injury of cetaceans in the DSL fishery are reported by McCracken and Forney (2010). Average 5-yr estimates of annual mortality and serious injury for 2004-2008 are 2.6 (CV = 0.40) Risso's dolphins outside of U.S. EEZs, and none within the Hawaiian Islands EEZ (Table 1, McCracken & Forney 2010). One additional unidentified cetacean, which may have been a Risso's dolphin, was also taken in the DSL fishery within U.S. EEZ waters during 2006 (Figure 2, Forney and McCracken 2008).



**Figure 1.** Locations of Risso's dolphin takes (filled diamonds) and possible takes of this species (open diamonds) in Hawaii-based longline fisheries, 2004-2008. Solid lines represent the U.S. EEZs. Fishery descriptions are provided 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 (McCracken & Forney 2010). Mean annual takes are based on 2004-2008 data unless indicated otherwise.

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)
Hawaii-based deep-set longline fishery	2004	observer data	25%	0	0 (n/a)	2.6 (0.4)	0	0 (-)	0 (-)
	2005		28%	2	3 (0.6)		0	0 (-)	
	2006		22%	4	5 (0.4)		0	0 (-)	
	2007		20%	4	3 (1.0)		0	0 (-)	
	2008		22%	5	2 (1.2)		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)
<b>Hawaii-based shallow-set longline fishery</b>	2004	observer data	100%	0	Same as observed	2.0	0	0 (-)	0 (-)
	2005		100%	1			0	0 (-)	
	2006		100%	2			0	0 (-)	
	2007		100%	3			0	0 (-)	
	2008		100%	4			0	0 (-)	
<b>Minimum total annual takes within U.S. EEZ waters</b>									0 (-)

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 stealing 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. It is not listed as "threatened" or "endangered" under the Endangered Species Act (1973), nor as "depleted" under the MMPA. Given the absence of recent fishery-related mortality or serious injuries within the Hawaiian Islands EEZ, the Hawaiian stock of Risso's dolphins is not considered strategic under the 1994 amendments to the MMPA, and the total fishery mortality and serious injury can be considered to be insignificant and approaching zero. However, the potential effect of injuries sustained by Risso's dolphins in U.S. pelagic longline fisheries in international waters is not known, because no abundance or bycatch estimates are available for international waters.

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