# FRASER'S DOLPHIN (*Lagenodelphis hosei*):
Hawaii Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

Fraser's dolphins are distributed worldwide in tropical waters (Dolar 2009 in Perrin et al. 2009). They have only recently been documented within the U.S. Exclusive Economic Zone (EEZ) of the Hawaiian Islands, during a 2002 cetacean survey (Barlow 2006), and were seen 4 times during a similar 2010 survey (Bradford et al. 2017, Figure 1). There have been only 2 sightings of Fraser's dolphins during 13 years of nearshore surveys in the leeward main Hawaii Islands (Baird et al. 2013).

For the Marine Mammal Protection Act (MMPA) stock assessment reports, there is a single Pacific management stock including animals found both within the Hawaiian Islands EEZ and in adjacent high seas waters. Because data on abundance, distribution, and human-caused impacts are largely lacking for high seas waters, the status of this stock is evaluated based on data from U.S. EEZ waters of the Hawaiian Islands (NMFS 2005).
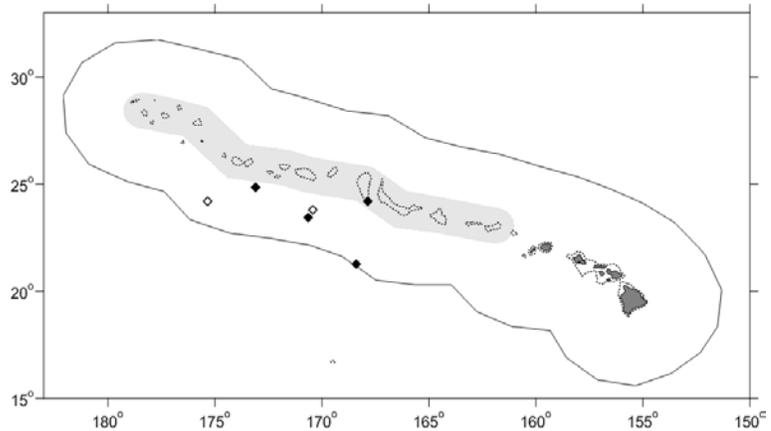
Figure 1. Fraser's dolphin sighting locations during the 2002 (open diamonds) and 2010 (black diamonds) shipboard cetacean surveys of U.S. waters surrounding the Hawaiian Islands (Barlow 2006, Bradford et al 2017; see Appendix 2 for details on timing and location of survey effort). Outer line indicates approximate boundary of survey area and U.S. EEZ. Gray shading indicates area of Papahanaumokuakea Marine National Monument. Dotted line represents the 1000 m isobath.

POPULATION SIZE

Encounter data from a 2010 shipboard line-transect survey of the entire Hawaiian Islands EEZ was recently evaluated using Beaufort sea-state-specific trackline detection probabilities for bottlenose dolphins, resulting in an abundance estimate of 51,491 (CV = 0.66) Fraser's dolphins (Bradford et al. 2017) in the Hawaii stock. A 2002 shipboard line-transect survey of the same area resulted in an abundance estimate of 10,226 (CV=1.16) Fraser's dolphins (Barlow 2006). Species abundances estimated from the 2002 HICEAS survey used pooled small dolphin, large dolphin, and large whale g(0) (the probability of sighting and recording an animal directly on the track line) estimates stratified by group size (Barlow 1995). Since then, Barlow (2015) developed a more robust method for estimating species-specific g(0) values that are adjusted for the Beaufort sea states that are encountered during a survey. This new method was used for analyzing the data from the 2010 survey, but has not yet been used to analyze the 2002 data. Population estimates for Fraser's dolphins have been made 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.

Minimum Population Estimate

The minimum population size is calculated as the lower 20th percentile of the log-normal distribution (Barlow et al 1995) of the 2010 abundance estimate or 31,034 Fraser's dolphins.

Current Population Trend

Abundance analyses of the 2002 and 2010 datasets used different g(0) values. The 2002 survey data have not been reanalyzed using this method. This change precludes evaluation of population trends at this time. Assessment of population trend will likely require additional survey data and reanalysis of all datasets using comparable methods.

CURRENT AND MAXIMUM NET PRODUCTIVITY RATES

Abundance analyses of the 2002 and 2010 datasets used different g(0) values. The 2002 survey data have not been reanalyzed using this method. This change precludes evaluation of population trends at this time. Assessment of population trend will likely require additional survey data and reanalysis of all datasets using comparable methods.

POTENTIAL BIOLOGICAL REMOVAL

The potential biological removal (PBR) level for the Hawaii stock of Fraser's dolphin is calculated as the minimum population size within the U.S. EEZ of the Hawaiian Islands (13,034) times one half the default maximum net growth rate for cetaceans (½ 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 Hawaiian Islands EEZ; Wade and Angliss 1997), resulting in a PBR of 310 Fraser'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. No interactions between nearshore fisheries and Fraser's dolphins have been reported in Hawaiian waters.

There are currently two distinct longline fisheries based in Hawaii: a deep-set longline (DSLL) fishery that targets primarily tunas, and a shallow-set longline fishery (SSLL) that targets swordfish. Both fisheries operate within U.S. waters and on the high seas. Between 2011 and 02015, no Fraser's dolphins were observed hooked or entangled in the SSLL fishery (100% observer coverage) or the DSLL fishery (20-21% observer coverage) (Bradford 2017, Bradford and Forney 2017, McCracken 2017). However, four unidentified cetaceans were taken in the DSLL fishery, and one unidentified cetacean was taken in the SSLL fishery, some of which may have been Fraser's dolphins.

STATUS OF STOCK

The Hawaii stock of Fraser's dolphins is not considered strategic under the 1994 amendments to the MMPA. The status of Fraser'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 stock. Fraser's dolphins are not listed as "threatened" or "endangered" under the Endangered Species Act (1973), nor designated as "depleted" under the MMPA. Given the absence of recent recorded fishery-related mortality or serious injuries the total fishery mortality and serious injury can be considered to be insignificant and approaching zero.

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