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BRYDE'S WHALE (Balaenoptera edeni): Hawaii Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

Bryde’s whales occur in tropical and warm temperate waters throughout the world. Leatherwood et al. (1982) described the species as relatively abundant in summer and fall on the Mellish and Miluoki banks northeast of Hawaii and around Midway Islands. Ohsumi and Masaki (1975) reported the tagging of “many” Bryde’s whales between the Bonin and Hawaiian Islands in the winters of 1971 and 1972 (Ohsumi 1977). Summer/fall shipboard surveys of the waters within the U.S. Exclusive Economic Zone (EEZ) of the Hawaiian Islands resulted in 13 Bryde’s whale sightings throughout the study area in 2002 and 30 in 2010 (Figure 1; Barlow 2006; Bradford et al 2013). There is currently no biological basis for defining separate stocks of Bryde’s whales in the central North Pacific. Bryde’s whales were seen occasionally off southern California (Morejohn and Rice 1973) in the 1960s, but their seasonal occurrence has increased since at least 2000 based on detection of their distinctive calls (Kerosky et al. 2012).

For the MMPA stock assessment reports, Bryde’s whales within the Pacific U.S. EEZ are divided into two areas: 1) Hawaiian waters (this report), and 2) the eastern Pacific (east of 150°W and including the Gulf of California and waters off California). The Hawaiian stock includes animals found both within the Hawaiian Islands EEZ and in adjacent high seas waters; however, 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).

POPULATION SIZE

Tillman (1978) concluded from Japanese and Soviet CPUE data that the stock size in the North Pacific pelagic whaling grounds, mostly to the west of the Hawaiian Islands, declined from approximately 22,500 in 1971 to 17,800 in 1977. An estimate of 13,000 (CV=0.20) Bryde’s whales was made from vessel surveys in the eastern tropical Pacific between 1986 and 1990 (Wade and Gerrodette 1993). The area to which this estimate applies is mainly southeast of the Hawaiian Islands, and it is not known whether these animals are part of the same population that occurs around the Hawaiian Islands. A 2002 shipboard line-transect survey of the entire Hawaiian Islands EEZ resulted in an abundance estimate of 469 (CV=0.45) Bryde’s whales (Barlow 2006). A more recent estimate from a similar 2010 EEZ-wide survey resulted in an abundance estimate of 798 (CV = 0.28) Bryde’s whales (Bradford et al. 2013). This is currently the best available abundance estimate for this stock.

Minimum Population Estimate

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 633 Bryde’s whales.

Current Population Trend

No data are available on current population trends. The broad and overlapping confidence intervals around
the 2002 and 2010 estimates preclude assessment of trends with the available data.

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 the Hawaii stock of Bryde’s whales is calculated as the minimum population size within the U.S EEZ of the Hawaiian Islands (633) 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 6.3 Bryde’s whales per year.

HUMAN-CAUSED MORTALITY AND SERIOUS INJURY
New Serious Injury Guidelines
NMFS updated its serious injury designation and reporting process, which uses guidance from previous serious injury workshops, expert opinion, and analysis of historic injury cases to develop new criteria for distinguishing serious from non-serious injury (Angliss and DeMaster 1998, Andersen et al. 2008, NOAA 2012). NMFS defines serious injury as an “injury that is more likely than not to result in mortality”. Injury determinations for stock assessments revised in 2013 or later incorporate the new serious injury guidelines, based on the most recent 5-year period for which data are available.

Fishery Information
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 2007 and 2011, no Bryde’s whales were observed hooked or entangled in the SSLL fishery (100% observer coverage) or the DSLL fishery (20-22% observer coverage) (McCracken 2013, Bradford & Forney 2013). One Bryde’s whale was observed entangled in shallow-set longline gear off the Hawaiian Islands in 2005 (Forney 2010).

Historical Mortality
Small numbers of Bryde's whales were taken near the Northwestern Hawaiian Islands by Japanese and Soviet whaling fleets in the early 1970s (Ohsumi 1977). Pelagic whaling for Bryde's whales in the North Pacific ended after the 1979 season (IWC 1981), and coastal whaling for this species ended in the western Pacific in 1987 (IWC 1989).

STATUS OF STOCK
The Hawaii stock of Bryde’s whales is not considered strategic under the 1994 amendments to the MMPA. The status of Bryde's whales in Hawaiian waters relative to OSP is unknown, and there are insufficient data to evaluate trends in abundance. Bryde’s whales 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 within the Hawaiian Islands EEZ, the total fishery mortality and serious injury can be considered to be insignificant and approaching zero. The increasing level of anthropogenic noise in the world’s oceans has been suggested to be a habitat concern for whales (Richardson et al. 1995, Weilgart 2007).

REFERENCES