Revised 6/4/2014

PYGMY SPERM WHALE (Kogia breviceps):
Hawaii Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE
Pygmy sperm whales are found throughout the world in tropical and warm-temperate waters (Caldwell and Caldwell 1989). Pygmy sperm whales have been observed in nearshore waters off Oahu, Maui, Niihau, and Hawaii Island (Shallenberger 1981, Mobley et al. 2000, Baird 2005, Baird et al. 2013). Two sightings were made during a 2002 shipboard survey of waters within the U.S. Exclusive Economic Zone (EEZ) of the Hawaiian Islands (Figure 1; Barlow 2006). A freshly dead pygmy sperm whale was picked up approximately 100 nmi north of French Frigate Shoals on a similar 2010 survey (NMFS, unpublished data). Nothing is known about stock structure for this species.

For the Marine Mammal Protection Act (MMPA) stock assessment reports, pygmy sperm whales within the Pacific U.S. EEZ are divided into two discrete areas: 1) Hawaiian waters (this report), and 2) waters off California, Oregon and Washington. The Hawaii 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
A 2002 shipboard line-transect survey of the entire Hawaiian Islands EEZ resulted in an abundance estimate of 7,138 (CV=1.12) pygmy sperm whales (Barlow 2006), including a correction factor for missed diving animals. This estimate for the Hawaiian EEZ is more than 8 years old and therefore will no longer be used based on NMFS Guidelines for Assessing Marine Mammal Stocks (NMFS 2005). A 2010 shipboard line-transect survey within the Hawaiian EEZ did not result in any sightings of pygmy sperm whales (Bradford et al. 2013).

Minimum Population Estimate
No minimum estimate of abundance is available for pygmy sperm whales, as there were no on-effort sightings during a 2010 shipboard line-transect survey of the Hawaiian EEZ.

Current Population Trend
No data are available on current population abundance or trend.

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 this stock is calculated as the minimum population size within the U.S EEZ of the Hawaiian Islands 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). Because there is no minimum population size estimate for pygmy sperm whales in Hawaii, the PBR is undetermined.

**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**

Information on fishery-related mortality 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. One pygmy sperm whale was found entangled in fishing gear off Oahu in 1994 (Bradford & Lyman 2013), but the gear was not described and the fishery not identified. No estimates of human-caused mortality or serious injury are currently available for nearshore hook and line fisheries because these fisheries are not observed or monitored for protected species bycatch.

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, one pygmy or dwarf sperm whale was observed hooked in the SSLL fishery (100% observer coverage) (Figure 2, Bradford & Forney 2013, McCracken 2013). 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 (NMFS 2012), this animal was considered not seriously injured (Bradford & Forney 2013). No pygmy sperm whales were observed hooked or entangled in the DSLL fishery (20-22% observer coverage). Eight unidentified cetaceans were taken in the DSLL fishery, and two unidentified cetaceans were taken in the SSLL fishery, some of which may have been pygmy sperm whales.

**STATUS OF STOCK**

The Hawaii stock of pygmy sperm whales is not considered strategic under the 1994 amendments to the MMPA. The status of pygmy sperm whales in Hawaiian waters relative to OSP is unknown, and there are insufficient data to evaluate trends in abundance. Pygmy sperm 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), particularly for deep-diving whales like pygmy sperm whales that feed in the oceans’ “sound channel”. One pygmy sperm whale found stranded in the main Hawaiian Islands tested positive for Morbillivirus (Jacob 2012). Although morbillivirus is known to trigger lethal disease in cetaceans (Van Bressem et al. 2009), its impact on the health of the stranded animal is unknown (Jacob 2012). The presence of morbillivirus in 10 species of cetacean in Hawaiian waters (Jacob 2012) raises concerns about the history and prevalence of this disease in Hawaii and the potential population impacts on Hawaiian cetaceans.

Table 1. Summary of available information on incidental mortality and serious injury of pygmy sperm whales (Hawaiian stock) in commercial longline fisheries within and outside of the Hawaiian Islands EEZ (McCracken 2013). Mean annual takes are based on 2007-2011 data unless otherwise indicated. Information on all observed takes (T) and combined mortality events & serious injuries (MSI) is included. Total takes were prorated to deaths, serious injuries, and non-serious injuries based on the observed proportions of each outcome.

<table>
<thead>
<tr>
<th>Fishery Name</th>
<th>Year</th>
<th>Data Type</th>
<th>Percent Observer Coverage</th>
<th>Obs. T/MSI Outside U.S. EEZs</th>
<th>Estimated M&amp;SI (CV)</th>
<th>Obs. T/MSI Inside Hawaiian EEZ</th>
<th>Estimated M&amp;SI (CV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hawaii-based deep-set longline fishery</td>
<td>2007</td>
<td>Observer data</td>
<td>20%</td>
<td>0</td>
<td>0 (-)</td>
<td>0</td>
<td>0 (-)</td>
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<tr>
<td></td>
<td>2008</td>
<td></td>
<td>22%</td>
<td>0</td>
<td>0 (-)</td>
<td>0</td>
<td>0 (-)</td>
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<tr>
<td></td>
<td>2009</td>
<td></td>
<td>21%</td>
<td>0</td>
<td>0 (-)</td>
<td>0</td>
<td>0 (-)</td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td></td>
<td>21%</td>
<td>0</td>
<td>0 (-)</td>
<td>0</td>
<td>0 (-)</td>
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<tr>
<td></td>
<td>2011</td>
<td></td>
<td>20%</td>
<td>0</td>
<td>0 (-)</td>
<td>0</td>
<td>0 (-)</td>
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<tr>
<td>Mean Estimated Annual Take (CV)</td>
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<td></td>
<td></td>
<td>0 (-)</td>
<td>0 (-)</td>
<td></td>
<td></td>
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<tr>
<td>Hawaii-based shallow-set longline fishery</td>
<td>2007</td>
<td>Observer data</td>
<td>100%</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td></td>
<td>2008</td>
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<td>100%</td>
<td>0</td>
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<td></td>
<td>2009</td>
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<td>100%</td>
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<td>0</td>
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<tr>
<td></td>
<td>2010</td>
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<td>100%</td>
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<td>0</td>
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<tr>
<td></td>
<td>2011</td>
<td></td>
<td>100%</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Mean Annual Takes (100% coverage)</td>
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<td></td>
<td></td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum total annual takes within U.S. EEZ</td>
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<td></td>
<td></td>
<td>0</td>
<td>0</td>
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</tbody>
</table>

*One animal was identified as either a pygmy sperm whale or a dwarf sperm whale.

REFERENCES


NMFS Pacific Islands Regional Office Stranding Database. Available from NMFS-PIRO 1601 Kapiolani Blvd, Ste. 1110, Honolulu, HI 96814.


