

CUVIER'S BEAKED WHALE (*Ziphius cavirostris*): Alaska Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

The distribution of Cuvier's beaked, or goosebeak, whale (Fig. 1) is known primarily from strandings, which indicate that it is the most widespread of the beaked whales and is distributed in all oceans and most seas except in the high polar waters (Moore 1963). In the Pacific, they range north to the northern Gulf of Alaska, the Aleutian Islands, and the Commander Islands (Rice 1986, 1998). In the northeastern Pacific from Alaska to Baja California, no obvious pattern of seasonality to strandings has been identified (Mitchell 1968). Strandings of Cuvier's beaked whales are the most numerous of all beaked whales, indicating that they are probably not as rare as originally thought (Heyning 1989). Observations reveal that the blow is low, diffuse, and directed forward (Backus and Schevill 1961, Norris and Prescott 1961), making sightings more difficult, and there is some evidence that they avoid vessels by diving (Heyning 1989). Relatively few (4 total) acoustic detections of Cuvier's beaked whales were recorded off Kiska Island (1 in summer) and in the offshore Gulf of Alaska (3 total detections, 1 in October and 2 in January; Baumann-Pickering et al. 2012a, 2012b).

Mitchell (1968) examined skulls of stranded whales for geographical differences and thought that there was probably one panmictic population in the northeastern Pacific. Otherwise, there are insufficient data to apply the phylogeographic approach to stock structure (Dizon et al. 1992) for the Cuvier's beaked whale. Therefore, Cuvier's beaked whale stocks are defined as the three non-contiguous areas within Pacific U. S. waters where they are found: 1) Alaska, 2) California/Oregon/Washington, and 3) Hawaii. These three stocks were defined in this way because of: 1) the large distance between the areas in conjunction with the lack of any information about whether animals move between the three areas, 2) the different oceanographic habitats found in the three areas, and 3) the different fisheries that operate within portions of those three areas, with bycatch of Cuvier's beaked whales only reported from the California/Oregon thresher shark and swordfish drift gillnet fishery. The California/Oregon/Washington and Hawaiian Baird's beaked whale stocks are reported separately in the Stock Assessment Reports for the Pacific Region.

POPULATION SIZE

Reliable estimates of abundance for this stock are currently unavailable.

Minimum Population Estimate

At this time, it is not possible to produce a reliable minimum population estimate (N_{MIN}) for this stock, as current estimates of abundance are unavailable.

Current Population Trend

No reliable estimates of abundance are available for this stock; therefore, reliable data on trends in population abundance are unavailable.

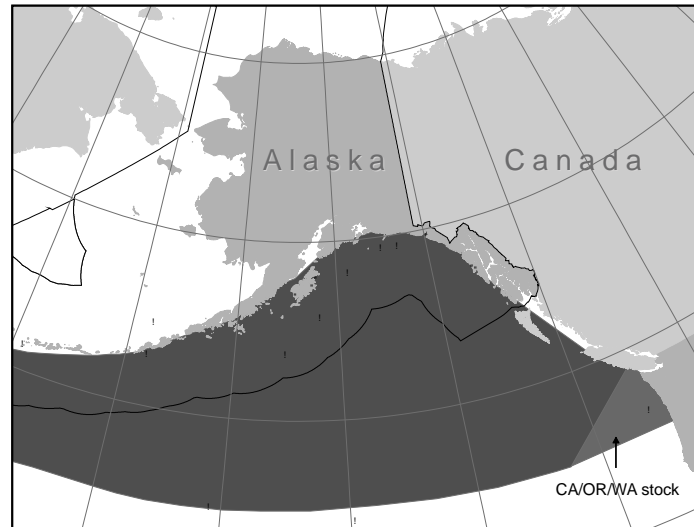


Figure 1. Approximate distribution of Cuvier's beaked whales in the eastern North Pacific (shaded area). Sightings (circles) and strandings (squares) within the last 10 years are also depicted (Forney and Brownell 1996, NMFS unpublished data).

CURRENT AND MAXIMUM NET PRODUCTIVITY RATES

A reliable estimate of the maximum net productivity rate is currently unavailable for the Alaska stock of Cuvier's beaked whale. Hence, until additional data become available, it is recommended that the cetacean maximum theoretical net productivity rate (R_{MAX}) of 4% be employed (Wade and Angliss 1997).

POTENTIAL BIOLOGICAL REMOVAL

Under the 1994 reauthorized Marine Mammal Protection Act (MMPA), the potential biological removal (PBR) is defined as the product of the minimum population estimate, one-half the maximum theoretical net productivity rate, and a recovery factor: $PBR = N_{MIN} \times 0.5R_{MAX} \times F_R$. The recovery factor (F_R) for this stock is 0.5, the value for cetacean stocks with unknown population status (Wade and Angliss 1997). However, in the absence of a reliable estimate of minimum abundance, the PBR for this stock is unknown.

ANNUAL 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.

Fisheries Information

Twenty-two different commercial fisheries operating within the potential range of the Alaska stock of Cuvier's beaked whale were monitored for incidental take by fishery observers from 2007-2011 (see 76 FR 73912, final List of Fisheries for 2012). There were no serious injuries or mortalities of Cuvier's beaked whales incidental to observed commercial fisheries reported between 2007-2011 (Breiwick 2013). The estimated annual mortality rate incidental to commercial fisheries is zero.

Subsistence/Native Harvest Information

There is no known subsistence harvest of Cuvier's beaked whales.

Other Mortality

Unknown levels of injuries and mortality of Cuvier's beaked whales may occur as a result of anthropogenic noise, such as military sonars (U.S. Dept. of Commerce and Secretary of the Navy 2001) or other commercial and scientific activities producing high-energy sound. The use of active sonar from military vessels has been implicated or coincident with mass strandings of beaked whales (Cox et al. 2006, Frantzis 1998, Martel 2002, Jepson et al. 2003, Simmonds and Lopez-Jurado 1991, U.S. Dept. of Commerce and Secretary of the Navy 2001), and all atypical single and mixed-species mass strandings involved Cuvier's beaked whales (D'Amico et al. 2009). There is concern regarding the potential effects of underwater sounds from seismic operations on beaked whales, although investigations of causation of atypical strandings of Cuvier's beaked whales and nearby seismic air gun operations have been inconclusive (Gentry 2002, Gordon et al. 2003/2004, Malakoff 2002). Changes in dive behavior, particularly a quick ascent from deep dives, in response to sound exposure may result in injuries related to bubble growth during decompression (Cox et al. 2006, Tyack et al. 2011, Hooker et al. 2011). Such injuries or mortality would rarely be documented due to the remote nature of many of these activities and the low probability that an injured or dead beaked whale would strand. No estimates of potential mortality or serious injury are available for Cuvier's beaked whales in Alaska waters.

STATUS OF STOCK

Cuvier's beaked whales are not designated as “depleted” under the MMPA or listed as “threatened” or “endangered” under the Endangered Species Act. Reliable estimates of the minimum population, population trends, PBR, and status of the stock relative to its Optimum Sustainable Population size are currently not available. Because the PBR is unknown, the level of annual U.S. commercial fishery-related mortality that can be considered insignificant and approaching zero mortality and serious injury rate is unknown. However, the estimated annual rate of human-caused mortality and serious injury seems minimal for this stock. Thus, the Alaska stock of Cuvier's beaked whale is not classified as strategic.

Habitat concerns

Disturbance by anthropogenic noise is an increasing habitat concern for most species of beaked whales, particularly in areas of oil and gas activities or where shipping or military activities are high. Shipping noise may disrupt the behavior of Cuvier's beaked whales (Aguilar de Soto et al. 2006), and the use of military sonars has been found to alter dive behavior and movements, as well as vocal activity in some species of beaked whales (McCarthy et al. 2011, Tyack et al. 2011). Moore and Barlow (2013) report impacts of anthropogenic sound and ecosystem change as the most plausible hypotheses for declining abundance of *Ziphius* and *Mesoplodon* spp. in the California Current large marine ecosystem. Little is known about the effects of noise or ecosystem change on beaked whales in Alaska, and the lack of abundance estimates hinder the detection of any population trends. Ingestion of marine debris, particularly plastics, is a concern; plastic is occasionally found in the stomach contents of stranded beaked whales, including Cuvier's beaked whales. (Smithsonian Institution, Cetacean Distributional Database, accessed 04 June 2012).

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