

## STEJNEGER'S BEAKED WHALE (*Mesoplodon stejnegeri*): Alaska Stock

### STOCK DEFINITION AND GEOGRAPHIC RANGE

Stejneger's, or Bering Sea, beaked whale is rarely seen at sea, and its distribution generally has been inferred from stranded specimens (Loughlin and Perez 1985, Mead 1989, Walker and Hanson 1999). It is endemic to the cold-temperate waters of the North Pacific Ocean, Sea of Japan, and deep waters of the southwest Bering Sea (Fig. 34). The range of Stejneger's beaked whale extends along the coast of North America from Cardiff, California, north through the Gulf of Alaska to the Aleutian Islands, into the Bering Sea to the Pribilof Islands and Commander Islands, and, off Asia, south to Akita Beach on Noto Peninsula, Honshu, in the Sea of Japan (Loughlin and Perez 1985). Near the central Aleutian Islands, groups of 3-15 Stejneger's beaked whales have been sighted on a number of occasions (Rice 1986). The species is not known to enter the Arctic Ocean and is the only species of *Mesoplodon* known to occur in Alaska waters. The distribution of *M. stejnegeri* in the North Pacific corresponds closely, in occupying the same cold-temperate

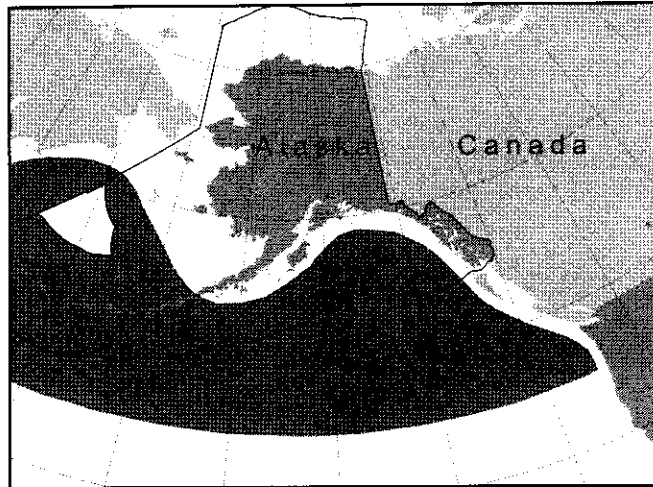


Figure 34. Approximate distribution of Stejneger's beaked whales in the eastern North Pacific (shaded area). Sightings (circles) and strandings (squares) within the last 10 years are also depicted (Walker and Hanson 1999, NMFS unpublished data).

niche and position, to that of *M. bidens* in the North Atlantic. It lies principally between 50° and 60°N and extends only to about 45°N in the eastern Pacific, but to about 40°N in the western Pacific (Moore 1963, 1966). Acoustic signals believed to be produced by Stejneger's beaked whales (based on frequency characteristics, interpulse interval and geographic location, Baumann-Pickering et al. 2012a) were recorded 2-5 times a week in July off Kiska Island and almost weekly from July 2011 to February 2012 in the northern Gulf of Alaska (Baumann-Pickering et al. 2012b).

There are insufficient data to apply the phylogeographic approach to stock structure (Dizon et al. 1992) for Stejneger's beaked whale. The Alaska Stejneger's beaked whale stock is recognized separately from *Mesoplodon* spp. off California, Oregon, and Washington because of: 1) the distribution of Stejneger's beaked whale and the different oceanographic habitats found in the two areas, 2) the large distance between the two non-contiguous areas of U.S. waters in conjunction with the lack of any information about whether animals move between the two areas, and 3) the different fisheries that operate within portions of those two areas, with bycatch of *Mesoplodon* spp. only reported from the California/Oregon/Washington thresher shark and swordfish drift gillnet fishery. The California/Oregon/Washington stock of all *Mesoplodon* spp. and a *Mesoplodon densirostris* stock in Hawaiian waters 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.

### **CURRENT AND MAXIMUM NET PRODUCTIVITY RATES**

A reliable estimate of the maximum net productivity rate is currently unavailable for the Alaska stock of Stejneger'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 Stejneger'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 Stejneger's beaked whales.

### **STATUS OF STOCK**

Stejneger'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 Stejneger'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 and the use of military sonars have been found to alter dive behavior and movements, as well as vocal activity in some species of beaked whales (Aguilar de Soto *et al.* 2006, 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., including *M. stejnegeri*, in the California Current large marine ecosystem. Little is known about the effects of noise on beaked whales in Alaska. Ingestion of marine debris, particularly plastics, is a concern; plastic is occasionally found in the stomach contents of stranded beaked whales, including Stejneger's beaked whales. (Smithsonian Institution, Cetacean Distributional Database, accessed 04 June 2012).

## CITATIONS

- Aguilar deSoto, N., Johnson, M., Madsen, P. T., Tyack, P. L., Bocconcelli, A. & Borsani, F. 2006. Does intense ship noise disrupt foraging in deep diving Cuvier's beaked whales (*Ziphius cavirostris*)? *Mar. Mamm. Sci.* 22 (3), 690-699.
- Angliss, R. P. and D. P. DeMaster. 1998. Differentiating Serious and Non-Serious Injury of Marine Mammals Taken Incidental to Commercial Fishing Operations. NOAA Tech Memo. NMFS-OPR-13, 48 p.
- Andersen, M. S., K. A. Forney, T. V. N. Cole, T. Eagle, R. Angliss, K. Long, L. Barre, L. Van Atta, D. Borggaard, T. Rowles, B. Norberg, J. Whaley, and L. Engleby. 2008. Differentiating Serious and Non-Serious Injury of Marine Mammals: Report of the Serious Injury Technical Workshop, 10-13 September 2007, Seattle, Washington. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-OPR-39. 94 p.
- Baumann-Pickering S., A. E. Simonis, S. M. Wiggins, et al. 2012a. Aleutian Islands beaked whale echolocation signals. *Mar. Mamm. Sci.* 29:221-227. doi: 10.1111/j.1748-7692.2011.00550.x
- Baumann-Pickering, S., A. Širović, J. Hildebrand, A. Debich, R. Gottlieb, S. Johnson, S. Kerosky, L. Roche, A. S. Berga, L. Wakefield, and S. Wiggins. 2012b. Passive Acoustic Monitoring for Marine Mammals in the Gulf of Alaska Temporary Maritime Activities Area 2011-2012. Marine Physical Laboratory, Scripps Institute of Oceanography. MPL Technical Memorandum # 538.
- Breiwick, J. M. 2013. North Pacific marine mammal bycatch estimation methodology and results, 2007-2011. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-260, 40 p.
- Dizon, A. E., C. Lockyer, W. F. Perrin, D. P. DeMaster, and J. Sisson. 1992. Rethinking the stock concept: a phylogeographic approach. *Conserv. Biol.* 6:24-36.
- Loughlin, T. R., and M. A. Perez. 1985. *Mesoplodon stejnegeri*. Mammalian Species, No. 250.
- McCarthy E., D. Moretti, L. Thomas, N. DiMarzio, R. Morrissey, et al. 2011. Changes in spatial and temporal distribution and vocal behavior of Blainville's beaked whales (*Mesoplodon densirostris*) during multiship exercises with mid-frequency sonar. *Mar. Mamm. Sci.* 27: E206-E226.
- Mead, J. G. 1989. Beaked whales of the genus - *Mesoplodon*. Pp. 349-430 In S. H. Ridgway and R. Harrison (eds.), *Handbook of marine mammals: River dolphins and the larger toothed whales*. Academic Press, New York.
- Moore, J. C. 1963. Recognizing certain species of beaked whales of the Pacific Ocean. *Amer. Midl. Nat.* 70:396-428.
- Moore, J. C. 1966. Diagnoses and distributions of beaked whales of the genus *Mesoplodon* known from North American waters. Pp. 32-61 In K. S. Norris (ed.), *Whales, dolphins and porpoises*. Univ. California Press, Berkeley.
- Moore J. E., J. P. Barlow. 2013. Declining Abundance of Beaked Whales (Family Ziphiidae) in the California Current Large Marine Ecosystem. *PLoS ONE* 8(1): e52770. doi:10.1371/journal.pone.0052770
- NOAA. 2012. Federal Register 77:3233. National Policy for Distinguishing Serious From Non-Serious Injuries of Marine Mammals. <http://www.nmfs.noaa.gov/op/pds/documents/02/238/02-238-01.pdf>.
- Rice, D. W. 1986. Beaked whales. Pp. 102-109 In D. Haley (ed.), *Marine mammals of the eastern North Pacific and Arctic waters*. Pacific Search Press, Seattle.
- Tyack P. L., W. M. X. Zimmer, D. Moretti., B. L. Southall, D. E. Claridge, J. W. Durban, C. W. Clark, A. D'Amico, N. DiMarzio, S. Jarvis, E. McCarthy, R. Morrissey, J. Ward, I. L. Boyd. 2011. Beaked Whales Respond to Simulated and Actual Navy Sonar. *PLoS ONE* 6(3):e17009. doi:10.1371/journal.pone.0017009
- Wade, P. R., and R. Angliss. 1997. Guidelines for assessing marine mammal stocks: report of the GAMMS workshop April 3-5, 1996, Seattle, WA. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-OPR-12, 93 pp.
- Walker, W. A., and M. B. Hanson. 1999. Biological observations on Stejneger's beaked whale, *Mesoplodon stejnegeri*, from strandings on Adak Island, Alaska. *Mar. Mammal Sci.* 15(4): 1314-1329.