SC/64/SM30

Review of current knowledge on pygmy beaked whale *Mesoplodon peruvianus* including identification of knowledge gaps and suggestions for future research

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ABSTRACT

Mesoplodon peruvianus was fairly recently described (1991) and very little is known about it. Numerous sightings of a mesoplodont with a distinctive color pattern that is presumed to be this species suggests it is fairly common and largely endemic to the warmest waters of the eastern tropical Pacific. However, few specimens have ever been examined. There is little information on threats and none on population trends.

KEYWORDS: GENETICS, TAXONOMY, NOISE, PACIFIC OCEAN, STRANDINGS

1. INTRODUCTION

Mesoplodon peruvianus was first described in 1991 by J. Reyes, J. G. Mead, and K. Van Waerebeek based on 10 specimens collected between 11°12'S and 19°19'S in south central Peru (Reyes *et al.* 1991). Shortly afterward, Urbán and Aurioles (1992) expanded the known range of this species when they reported two stranded specimens from southern Baja California, Mexico (stranding locations: 24°24'N, 110°38'W, and 24°25'N, 1l0°25'W, respectively). A third specimen collected during the summer of 1988 or 1989, near Guaymas, Mexico, (about 27°57'N, 1l0°59'W) was reported by Vidal *et al.* (1993). Five more recently reported strandings from Mexico include four from the area around Bahia de La Paz, BCS, and another from Bahia de Banderas (Urbán-R. 2010).

Prior to the description of this species, Pitman *et al.* (1987) had reported on 24 sightings of a distinctively patterned *Mesoplodon* species from the eastern tropical Pacific Ocean which they referred to as "*Mesoplodon* sp. A". The coloration that they described for presumed adult males matched no other known mesoplodont and they suggested that it could be an undescribed species. In a follow-up paper, Pitman and Lynn (2001) provided strong circumstantial evidence that *Mesoplodon* sp. A was in fact *M. peruvianus*, which had been described in the interim. Although this inference has not met with universal acceptance (e.g., Culik 2011), for the purposes of this report, it will be considered a correct assumption.

2. TAXONOMY AND NOMENCLATURE

Status as a separate species was determined morphologically and later confirmed through phylogenetic analysis of mitochondrial DNA control-region and cytochrome b sequences (Dalebout *et al.* 2004). Common names include pygmy, lesser and Peruvian beaked whale.

3. DISTRIBUTION, POPULATION STRUCTURE AND MOVEMENTS

Based on the 24 at-sea sightings (of *Mesoplodon* sp. A) presented by Pitman *et al.* (1987) and 85 different sightings by Hamilton *et al.* (2009), *M. peruvianus* appears to be endemic to the eastern tropical Pacific Ocean, with most at-sea sightings concentrated in the warmest waters of the ETP, the "Eastern Pacific Warm Pool", an area with sea surface temperatures > 27.5°C (Fiedler and Talley 2006). Comparing the plots in Fig. 27 (*Mesoplodon peruvianus*) with Fig. 28 (*Mesoplodon* sp.) in Hamilton *et al.* (2009), it seems likely that this species may be particularly abundant in the southern Gulf of California, Mexico (see also Ferguson *et al.* 2006). A few other sighting locations in Mexico include Bahia de Banderas, Los Barriles, Baja California Sur, and Bahia Concepcion, BCS (Urbán-R 2010).

The northernmost record of this species was a 363 cm female that stranded alive in Moss Landing, California (36°47'N, 121°47′W), on 13 Jan 2001 (Moss Landing Marine Laboratories MM858). Another, 370 cm male stranded at Newport Beach, California (33° 22'N, 117° 34'W), on 18 Feb 1998 (Los Angeles Museum of Natural History 95654). A worn partial skull at San Diego Museum of Natural History (SDNHM 23763), collected in December 1980 at Malarrimo Beach near the mouth of Ojo de Liebre (Scammon's) Lagoon, on the Pacific side of Baja California, Mexico, was previously identified as *M. ginkgodens* (Leatherwood *et al.* 1988, Urbán-R.and Aurioles-G.1992, Vidal *et al.* 1993) but was recently identified genetically at SWFSC lab as *M. peruvianus*. The northernmost *live* sighting of this species from was from 26° 10'N, 110° 48'W on 11 August 2006, in the central Gulf of California, Mexico (SWFSC unpubl. data).

The southernmost record in the eastern Pacific was a stranded specimen from northern Chile at 29°17'S, 71°24'W. The specimen, a partial skull without mandibles, was collected in May 1995 and is currently housed at Centre for Marine Mammals Research – Leviathan (CMMR Leviathan), PC 7640392, Santiago, Chile (specimen no. GPS004; Sanino *et al*. 2007). Sanino *et al.* (2007) also listed several possible at-sea sightings off Chile, north of the stranding, but the identities of those animals cannot be confirmed. The only record of this species away from the eastern Pacific was a stranding of a 327 cm male from Oaro, Kaikoura, South Island, New Zealand in 1991 (Baker and Van Helden 1999; Museum of New Zealand MM2142). Whether the latter specimen is indicative of a wider distribution for this species, or just an errant individual is unknown.

There is no information on population structure or movements.

4. LIFE HISTORY PARAMETERS

With a maximum reported length of 3.9 m (Reyes 2009), this is the smallest known mesoplodont. Calves are about 1.6 m at birth; a physically mature male measured 3.7 m (Reyes *et al.* 1991).

5. ABUNDANCE AND TRENDS

Abundance. There are no estimates of abundance. However, Ferguson and Barlow (2001) estimated there were 32,678 *Mesoplodon* spp. in the eastern Pacific based on numerous, standardized cetacean sighting surveys and a correction factor for missed animals. They argued that the majority were *M. peruvianus* and *M. densirostris.* This species is listed as Data Deficient under IUCN Red List.

Trends. Unknown (IUCN).

6. DIRECT REMOVALS

6.1 Directed takes There are no known directed takes.

6.2 Incidental takes Incidental takes in nets set for sharks has been reported off Peru (Reyes *et al.* 1991).

7. OTHER ACTUAL AND POTENTIAL THREATS

As with all of the beaked whales, this species may be vulnerable to anthropogenic noise produced by military sonar and seismic research (Malakof *et al*. 2002, Cox *et al*. 2006), and entanglement in fishing gear, especially gillnets set in deep water.

8. STATUS

Based on sighting surveys in the eastern tropical Pacific Ocean by the Southwest Fisheries Science Center this species is presumed to be fairly common within its range (Ferguson and Barlow 2001).

9. RECOMMENDATIONS

It would be very helpful to confirm that *Mesoplodon* sp. A is in fact *M. peruvianus*. That will require a biopsy sample from an adult male at sea (unlikely), or a color pattern description of a freshly-stranded adult male *M. peruvianus*. Beaches adjacent to the southern Gulf of California, especially around Bahia de La Paz and the offshore waters, would seem to offer the highest likelihood of success for either of these events.

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