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LONG-BEAKED COMMON DOLPHIN (*Delphinus capensis capensis*): California Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

Long-beaked common dolphins were recognized as a distinct species in the 1990s (Heyning and Perrin 1994; Rosel et al. 1994). Along the U.S. west coast, their distribution overlaps with that of the short-beaked common dolphin, and much historical information has not distinguished between these two species. Long-beaked common dolphins are commonly found within about 50 nmi of the coast, from Baja California (including the Gulf of California) northward to about central California (Figure 1). Along the west coast of Baja California, long-beaked common dolphins primarily occur inshore of the 250 m isobath, with very few sightings (<15%) in waters deeper than 500 meters (Gerrodette and Eguchi 2011). Stranding and sighting records indicate that the abundance of this species off California changes both seasonally and inter-annually. Although long-beaked common dolphins are not restricted to U.S. waters, cooperative management agreements with Mexico exist only for the tuna purse seine fishery and not for other fisheries which may take this species (e.g. gillnet fisheries). For the MMPA stock assessment reports, there is a single Pacific management stock including only animals found within the U.S. Exclusive Economic Zone off California.

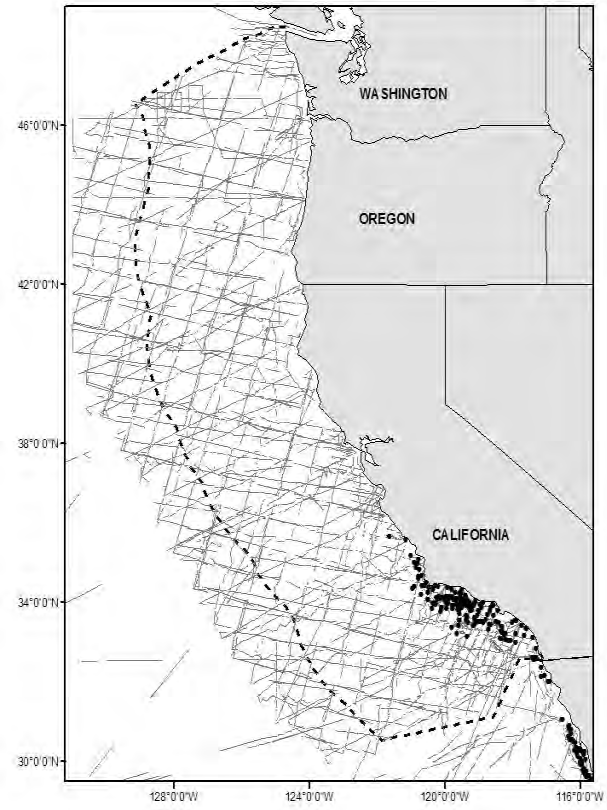

Figure 1. Long-beaked common dolphin sightings based on shipboard surveys off California, Oregon, and Washington, 1991- 2010 (see Appendix 2 for information on timing and location of survey effort). No Delphinus sightings have been made off Washington. Dashed line represents the U.S. EEZ, thin lines indicate completed transect effort of all surveys combined.

POPULATION SIZE

The most recent abundance estimates for this stock are 62,447 (CV=0.80) and 183,396 (CV=0.41) dolphins, based on 2008 and 2009 ship line-transect surveys, respectively (Barlow 2010; Carretta *et al*. 2011). The distribution and abundance of long-beaked common dolphins off California varies inter-annually and seasonally (Heyning and Perrin 1994). As oceanographic conditions change, long-beaked common dolphins may move between Mexican and U.S. waters, and therefore a multi-year average abundance estimate is the most appropriate for management within the U.S. waters. The geometric mean abundance estimate for California, Oregon and Washington waters based on two ship surveys conducted in 2008 and 2009 (Barlow 2010; Carretta *et al*. 2011) is 107,016 (0.42) long-beaked common dolphins.

Minimum Population Estimate

The log-normal 20th percentile of the weighted average abundance estimate is 76,224 long-beaked common dolphins.

Current Population Trend

California waters represent the northern limit for this stock and animals likely move between U.S. and Mexican waters. While no formal statistical trend analysis exists for this stock of long-beaked common dolphin, abundance estimates for California waters from a 2009 vessel-based line-transect survey were the highest of any survey dating back to 1991 (Carretta *et al*. 2011). The ratio of strandings of long-beaked to short-beaked common dolphin in southern California increased following a strong 1982-1983 El Niño (Heyning and Perrin 1994). Within San Diego County, dramatic increases in the ratio of long-beaked to short-beaked common dolphin strandings were observed between 2006 and 2008 (Danil *et al*. 2010), with higher numbers of long-beaked strandings persisting through 2010 (NMFS unpublished stranding data). During a 2009 ship-based survey of California and Baja California waters, the ratio of long-beaked to short-beaked common dolphin sightings was nearly 1:1, whereas during previous surveys conducted from 1986 to 2008 in the same geographic strata, the ratio was approximately 1:3.5 (Carretta *et al*. 2011). There appears to be an increasing trend of long-beaked common dolphins in California waters over the last 30 years.

CURRENT AND MAXIMUM NET PRODUCTIVITY RATES

There are no estimates of current or maximum net productivity rates for long-beaked common dolphins.

POTENTIAL BIOLOGICAL REMOVAL

The potential biological removal (PBR) level for this stock is calculated as the minimum population size (76,224) times one half the default maximum net growth rate for cetaceans (½ of 4%) times a recovery factor of 0.40 (for a species of unknown status with a mortality rate CV > 0.80 ; Wade and Angliss 1997), resulting in a PBR of 610 long-beaked common dolphins per year.

HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

Fishery Information

A summary of recent fishery mortality and injury for long-beaked common dolphins is shown in Table 1. More detailed information on these fisheries is provided in Appendix 1. Mortality estimates for the California drift gillnet fishery are included for the five most recent years of monitoring, 2006-2010 (Carretta and Enriquez 2007, 2009a, 2009b, 2012). Acoustic pingers have been shown to significantly reduce the bycatch rates of short-beaked common dolphins (*Delphinus delphis*) (Barlow and Cameron 2003, Carretta and Barlow 2011). The effectiveness of pingers on reducing bycatch of long-beaked common dolphins is expected to be similar to that shown for short-beaked common dolphins but is unknown, because long-beaked common dolphins are rarely observed entangled in this fishery.

Long-beaked common dolphin mortality has also been reported in halibut set gillnets in California (Julian and Beeson 1998, Carretta and Enriquez 2012, Table 1).

Thirty-six common dolphins (two unidentified common dolphins and 34 long-beaked common dolphins) stranded with evidence of fishery interactions (NMFS, Southwest Region, unpublished data) between 2006-2010. Most strandings showed evidence of an interaction with an unknown entangling net fishery (severed flukes, knife cuts, net marks, or net fragments wrapped around the animal). Mean annual takes in Table 1 are based on 2006-2010 data.

Gillnets have been documented to entangle marine mammals off Baja California (Sosa-Nishizaki et al. 1993), but no recent bycatch data from Mexico are available.

Other Mortality

In the eastern tropical Pacific, 'northern common dolphins' have been incidentally killed in international tuna purse seine fisheries since the late 1950's. Cooperative international management programs have dramatically reduced overall dolphin mortality in these fisheries (Joseph 1994). Between 2004-2008, annual fishing mortality of northern common dolphins (potentially including both short-beaked and long-beaked common dolphins) ranged between 55 and 156 animals, with an average of 112 (IATTC 2010). Although it is unclear whether any long-beaked dolphins are taken in international purse seine fisheries in the eastern tropical Pacific, common dolphins in this region are managed separately under a section of the MMPA written specifically for the management of dolphins involved in eastern tropical Pacific tuna fisheries.

Table 1. Summary of available information on the incidental mortality and injury of long-beaked common dolphins (California Stock) and prorated unidentified common dolphins in commercial fisheries that might take this species. All observed entanglements resulted in the death of the animal. Coefficients of variation for mortality estimates are provided in parentheses, when available. Mean annual takes are based on 2006-2010 data unless noted otherwise. n/a = information not available.

Fishery Name	Data Type	Year(s)	Percent Observer Coverage	Observed (or self-reported)	Estimated Annual Mortality	Mean Annual Takes (CV in parentheses)
CA thresher shark/swordfish drift gillnet fishery	observer	2006 2007 2008 2009 2010	18.5% 16.4% 13.5% 13.3% 11.9%	1 0 1 0 1	5 (1.04) 0 7 (1.08) 0 8 (1.00)	4.0 (1.01)
CA small mesh drift gillnet fishery for white seabass, yellowtail, barracuda, and tuna	observer	2006 2007 2008 2009 2010	17.6% not observed not observed not observed not observed	1 n/a n/a n/a n/a	5 (1.18) n/a n/a n/a n/a	5 (1.18)
CA halibut/white seabass and other species set gillnet fishery	Self report & observer	2006 2007 2008 2009 2010	~1% 17% not observed not observed 12.5%	0 0 0 0 1	0 0 0 0 7 (1.07)	1.4 (1.07)
Undetermined	strandings	2006-2010	36 common dolphins (two unidentified and 34 longbeaked common dolphins) stranded with evidence of fishery interactions. Evidence of fishery interactions included severed flukes, net fragments, net marks, positive metal detector scans, and knife marks or cuts. Some strandings may have come from observed fisheries that already have bycatch estimates and these are not included in the annual average to prevent double-counting of fishery mortality. Mean annual takes are therefore based on stranded animals only if the stranding can be attributed to a fishery lacking an observer program or cases where stranded animals represent the only documented fishery-related deaths in a given year. This results in a minimum of 13 long-beaked common dolphin strandings over the 5 year period, or 2.6 animals annually.			≥ 2.6 (n/a)
Minimum total annual takes						13.0 (0.55)

'Unusual mortality events' of long-beaked common dolphins off California due to domoic acid toxicity have been documented by NMFS as recently as 2007. One study suggests that increasing anthropogenic CO_2 levels and ocean acidification may increase the toxicity of the diatom responsible for these mortality events (Tatters et al. 2012).

Three long-beaked common dolphins died near San Diego in 2011 as the result of blast trauma associated with underwater detonations conducted by the U.S. Navy. Three days later, a fourth animal stranded approximately 70 km north of that location with similar injuries (Danil and St. Leger 2011).

STATUS OF STOCK

The status of long-beaked common dolphins in California waters relative to OSP is not known, and there are insufficient data to evaluate potential trends in abundance. Exposure to blast trauma resulting from underwater detonations is a local concern for this stock, but population level impacts from such activities are unclear. In response to the 2011 event, the U.S. Navy has implemented new training protocols to reduce the probability of blast trauma events occurring (Danil and St. Leger 2011). Long-beaked common dolphins are not listed as "threatened" or "endangered" under the Endangered Species Act nor as "depleted" under the MMPA. Including past mortality both from commercial fisheries between 2006 and 2010 (13.0 animals per year) and the average annual mortality resulting from the single blast

trauma event of 2011 (0.8 animals per year for the 5-yr period 2007 to 2011), the average annual human-caused mortality is 13.8 long-beaked common dolphins. This does not exceed the PBR (610), and therefore they are not classified as a "strategic" stock under the MMPA. The average total fishery mortality and injury for long-beaked common dolphins (13.0) is less than 10% of the PBR and therefore, is considered to be insignificant and approaching zero mortality and serious injury rate.

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