



# MARINE MAMMAL COMMISSION

24 October 2014

Mr. Chris Yates  
Assistant Regional Administrator  
Protected Resources Division  
West Coast Region  
National Marine Fisheries Service  
501 W. Ocean Blvd, Suite 4200  
Long Beach, CA 90802

Re: NOAA–NMFS–2013–0073

Dear Mr. Yates:

On 25 August 2014 the National Marine Fisheries Service (NMFS) solicited comments on the proposed issuance of an amended incidental take permit under section 101(a)(5)(E) of the Marine Mammal Protection Act (MMPA) to the California thresher shark/swordfish drift gillnet fishery (CA DGN) and the Washington/Oregon/California (WA/OR/CA) sablefish pot fishery (79 Fed. Reg. 50626). NMFS believes that the proposed permit to authorize the take of sperm and humpback whales from the CA/OR/WA stocks incidental to these fisheries would have a negligible impact on the stocks. The Marine Mammal Commission (Commission), in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed this notice and offers comments and recommendations on the proposed permit issuance for sperm whales. The Commission agrees with the analyses and actions proposed for the humpback whale stock and has no other comments or recommendations.

## RECOMMENDATIONS

The Marine Mammal Commission recommends<sup>1</sup> that the National Marine Fisheries Service—

- be explicit in future negligible impact determinations and stock assessment reports using a non-standard averaging period about the factors it considered and the quantitative or qualitative criteria it used to decide whether substantial and significant changes in the system consisting of the fishery and sperm whale stock have, or have not, occurred, ... and define the circumstances under which non-standard averaging periods are appropriate;

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<sup>1</sup> Full recommendations are provided in the body of the letter. The core of each recommendation is repeated here to provide a readily accessible summary of the MMC's recommendations.

- continue to monitor the CA DGN fishery and, if the observed or reported mortality and serious injury of sperm whales exceeds the level specified in the Incidental Take Statement (adjusted for the number of sets in the fishery), 1) reinitiate formal consultation in accordance with 50 C.F.R. § 402.16(a), 2) reassess the MMPA negligible impact determination, and 3) reconvene the Pacific Offshore Cetacean Take Reduction Team (POCTRT) to consider whether additional measures are necessary to reduce the probability of interactions; and
- further justify its proposed negligible impact determination under Criterion 3 given its requirement that there be “certainty of data” that the population is stable or increasing and given the substantial uncertainty regarding the population’s trend, and review and improve the criteria for making negligible impact determinations before any more such determinations are issued.

## **BACKGROUND**

The Endangered Species Act (ESA) prohibits the take of listed species absent authorization. In the case of commercial fishing, such authorizations are issued via an incidental take statement under section 7(b)(4) of the Act after preparation of a biological opinion, and the issuance of a corresponding incidental take permit under section 101(a)(5)(E) of the MMPA. In 2004 NMFS completed a biological opinion for the highly migratory species fisheries management plan, which included the CA drift gillnet fishery, and appended an incidental take statement for that fishery (NMFS 2014). On 26 October 2007 NMFS issued a three-year permit under the MMPA authorizing the incidental take of CA/OR/WA sperm whales by the fishery (72 Fed. Reg. 60814). On 5 December 2010, less than two months after the 2007 permit had expired, two sperm whales were caught in a single set – one died and the other was seriously injured. Because observer coverage in 2010 was 11.9 percent, those two takes extrapolated to an estimated 16 mortalities and serious injuries annually for the fishery as a whole. In a series of communications and meetings from December 2010 through June 2011 the Sustainable Fisheries Division of NMFS discussed with the Protected Resources Division in the NMFS Southwest Region the taking of the two sperm whales during the 2010-2011 fishing season of the CA DGN fishery, which had apparently, at the time, exceeded the authorized take level. In July 2012, the Protected Species Division reinitiated consultation under section 7 of the ESA. This resulted in the release of a new biological opinion and incidental take statement in May 2013. On 8 May 2013 NMFS requested comments on the proposed issuance of an MMPA permit to the CA DGN fishery to authorize the incidental taking of sperm whales (78 Fed. Reg. 26751), which was based on analyses in the new biological opinion and a new negligible impact determination (NMFS 2013) suggesting that incidental take of sperm whales by the fishery was below the stock’s potential biological removal (PBR) level of 1.5 whales per year. However, further analyses showed that the level of take was actually 3.8 whales per year and that it exceeded the stock’s PBR, which led the Service to withdraw its proposal to issue an incidental take permit under the MMPA.

Subsequently, NMFS reconvened the POCTRT, which met twice in 2013 to consider modified or new measures designed to reduce the number of interactions between sperm whales and gear from the CA DGN fishery. Based in part on the recommendations of the POCTRT, NMFS issued an emergency rule under section 305(c) of the Magnuson-Stevens Fishery Conservation and Management Act, effective from 15 August 2013 through 31 January 2014 (78 Fed. Reg. 54548). The rule defined what it called the 100 percent observer coverage zone (the Zone), which contained most California waters deeper than the main 1,100 fathom (approximately 2,000 m) contour, which runs north-south from the California-Oregon border to the Mexican border. The rule made three changes to the management of the CA DGN fishery: 1) all vessels in the fishery were required to use a vessel monitoring system, 2) all vessels fishing in the Zone were required to carry observers, and 3) the fishery would be closed if one sperm whale was killed or seriously injured. Based on the provisions of that rule, which were designed to minimize further interactions, NMFS issued an incidental take permit under the MMPA on 4 September 2013 valid for a period of up to three years (78 Fed. Reg. 54553). In February 2014, NMFS reconvened the POCTRT to consider short- and long-term measures to further reduce sperm whale bycatch in the CA DGN fishery.

In April 2014, before the POCTRT had completed its review, NMFS asked the team to consider new analyses of CA/OR/WA sperm whale abundance and trends and the rate of mortality and serious injury (due to human causes). Scientists at NMFS's Southwest Fisheries Science Center (SWFSC) had developed three new analytic methods to be applied to CA/OR/WA sperm whale 2014 stock assessment and the negligible impact determination discussed herein.

1. The first method revised the estimation of 'g(0)', the probability of detecting marine mammals on a survey transect line.<sup>2</sup> Application of that change in methodology reportedly did not strongly affect the estimated stock size, but it did increase its variance (Jay Barlow, NMFS-SWFSC, statement made to the POCTRT on 17 June 2014).
2. The second method applied a Bayesian hierarchical trend model to the full series of survey results to estimate any trends in the number of sperm whales in U.S. waters off California, Oregon, and Washington, and to provide more precise stock-size estimates for each survey (Moore and Barlow 2014). Prior to the adoption of the trend method, NMFS used the geometric mean of the relevant single-survey, stock-size estimates to calculate PBR. A single-survey estimate in 2005 of 3,140 and an estimate in 2008 of 300 whales, gave a stock-size estimate of 971, which produced a PBR of 1.5. However, the trend analysis produced a stock-size estimate for 2008 of 2,106, which led to a PBR of 2.7.
3. Data on mortalities and serious injuries are typically averaged over five-year periods. The third change in methodology averaged sperm whale mortalities and serious injuries over 13 years (2001-2013) to improve the accuracy of the estimated mean. This approach was adopted because it was considered more appropriate for rare events, such as observed interactions between sperm whales and the CA DGN. The 13-year average was 1.7 whales per year, one-half the 5-year average.

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<sup>2</sup> This work was reported in the negligible impact determination as being in press, but without a citation.

Using these new methods produced an 80 percent increase in the stock's PBR and a 50 percent decrease in estimated mortalities and serious injuries, and, as a result, a conclusion that the number of mortalities and serious injuries is less than PBR. This, in turn, led NMFS to conclude that the impact of the CA DGN fishery on sperm whales is negligible and prompted it to propose issuing a new incidental take permit.

## **RATIONALE**

### ***Averaging Period***

In almost all of NMFS's marine mammal stock assessments and in the few 101(a)(5)(E) negligible impact determinations that it has conducted, mortality and serious injury data are averaged over the most recent five years to smooth out short-term variation in factors that affect the probability of detecting marine mammal-fishery interactions (e.g., the distributions of the marine mammals and fisheries, marine mammal and fishery behavior, marine mammal abundance, fishery effort, observer coverage) and whether those interactions result in mortalities or serious injuries. NMFS's stock-assessment guidance (NMFS 2005) states:

It is suggested that mortality estimates could be averaged over as many years necessary to achieve a CV [coefficient of variation] of less than or equal to 0.3, but should usually not be averaged over a time period of more than the most recent 5 years for which data have been analyzed. However, information that is more than 5 years old should not be ignored if it is the most appropriate information available in a particular case.

Carretta and Moore (2014) demonstrated that averaging over more years is preferred, especially when bycatch events are rare and observer coverage is low. They demonstrated that averaging over longer periods reduces the CV and reduces the possibility of small-sample bias. Simulation analyses based on the sperm whale-CA DGN fishery interactions suggested that it would require on the order of 25-30 years to reduce the CV to 0.3 (Carretta and Moore 2014). Averaging over five years of simulated mortality and serious injury data resulted in estimates that were over 25 percent greater than or smaller than the true value roughly 70 percent of the time. It was only after averaging over roughly 15 years or more that estimates were within  $\pm 25$  percent of the true value more than half the time. Because a number of factors could not be fixed in their simulations, they could not recommend precisely how many years of data should be averaged, but given that less than 25 years of mortality and serious injury data are available for this stock, they suggested that "more is better."

Averaging over any period of time is valid only if the factors that substantially contribute to the probability of the interaction or bycatch rate have not changed significantly. Carretta and Moore (2014) recommended that "managers and analysts must assess whether characteristics of the fishery have remained sufficiently constant to justify a particular pooling period." Such factors include characteristics of the fishery such as fishing practices (e.g., set or soak times), gear (e.g., mesh size, net length, use of pingers), fishing effort, and the spatial and temporal distribution of that effort.

Although not mentioned by Carretta and Moore (2014), the factors also must include characteristics of the affected marine mammal stock, such as its size, spatial and temporal distribution, and behavior of the animals.

Following the recommendations of Carretta and Moore (2014), NMFS averaged sperm whale mortality and serious injury data in its proposed negligible impact determination over the longest period during which it judged that the conditions affecting the bycatch rate had not changed substantially, the 13 year period from 2001 to 2013 (Jim Carretta, NMFS-SWFSC, pers. comm.). NMFS chose 2001 as the starting point of the period because a time-area closure, which influenced the distribution of fishing effort, was put in place that year and has remained in place (Carretta, pers. comm.). However, the draft negligible impact determination did not provide a discussion of the factors that were considered in setting the averaging period or how it was determined, either quantitatively or qualitatively, that conditions had not changed significantly during the period. Certain changes did occur during the period. For example, the sex and age structure of the sperm whale stock (the portion of the population within the EEZ off California, Oregon and Washington) may have changed, given that the estimated abundance of male groups increasing by 173 percent between the earliest (1993) and the most recent (2008) surveys (Moore and Barlow 2014). In addition, the fishing effort dropped from roughly 1,100 sets in 2008 to 500 sets in 2010. The decrease in effort was due to a decline in the number of active vessels, perhaps driven by a reduction in the catch rate for swordfish (Tina Fahy, NMFS-West Coast Region, pers. comm.). Presumably, NMFS considered these and other changes, and found them not to be important factors or significant changes.

While the Commission trusts that NMFS considered the appropriateness of averaging mortalities and serious injuries over the longer, 13-year, period, the Marine Mammal Commission recommends that NMFS be explicit in future negligible impact determinations and stock assessment reports using a non-standard averaging period about the factors it considered and the quantitative or qualitative criteria it used to decide whether substantial and significant changes in the system consisting of the fishery and sperm whale stock have, or have not, occurred. In addition, the Commission recommends that NMFS define the circumstances under which non-standard averaging periods are appropriate. For example, it should address questions such as what quantitative definition should be used to ascribe interactions as being 'rare' and whether there is an upper limit to the length of the averaging period.

## ***Management Response***

For many stocks, mortality or serious injury events are uncommon or rare, and there can be substantial year-to-year variation in their numbers. Therefore, basing management decisions on a single year's data could cause management to be overly reactive and inefficient. This is the reason that NMFS's stock assessment guidance recommends averaging over five years. However, because the sperm whale PBR is very low and, until very recently, observer coverage in the CA DGN fishery was low, even when averaged over five years, a single event in which two or three sperm whales are entangled or a single year with a handful of entanglements, when extrapolated, could lead to the conclusion that the number of mortalities and serious injuries exceeded PBR. This could lead NMFS

to respond by placing additional restrictions on the CA DGN fishery, which is exactly what happened as a result of the single bycatch event involving two whales in 2010. However, from a statistical perspective such events are likely to produce an inaccurate bycatch rate estimate (Moore and Barlow 2014), and from a biological perspective such events are unlikely to pose a serious threat to the population. Consequently, as described above, scientists at the SWFSC incorporated two new analyses into the draft negligible impact determination, both of which had the effect of reducing the influence of short-term, stochastic events and some sources of variability on management response. The analyses suggested that the more appropriate long-term view of the stock and fishery is that the annual number of mortalities and serious injuries of sperm whales does not exceed PBR at this time.

The Commission believes that this shift toward a longer-term view of the CA/OR/WA sperm whale stock and its interactions with the CA DGN fishery is appropriate. However, averaging mortalities and serious injuries over these longer periods of time has a risk. NMFS needs to be able to detect and respond to significant changes in the bycatch rate of sperm whales in the CA DGN fishery. Currently, under the proposed permit and associated negligible impact determination, the only event that would trigger remedial action would be mortality and serious injury that exceeded PBR. However, because sperm whale bycatch events are rare and observer coverage relatively low, for most of the 13 years used to compute the average mortality and serious injury rate, recorded bycatch was zero. Those zeros have a large influence on the mean. With each additional year without mortalities or serious injuries, a greater number of mortalities and serious injuries is required to shift the mean above PBR. For example, even with a mortality and serious injury rate of 15 whales in one year, or ten consecutive years with a rate of 4 whales per year, mortalities and serious injuries still would not exceed PBR. Based on observed interactions over the past 13 years, the probability of observing four or more mortalities or serious injuries in one year is near zero (Jim Carretta, NMFS-SWFSC, data presented to the POCTRT). Consequently, an observed or reported mortality and serious injury rate of 5-15 whales in a given year or somewhat elevated levels over several years would likely indicate that something had changed substantially in the system, and yet neither would automatically trigger management changes under the MMPA. While the POCTRT has discussed the possible establishment of mortality and serious injury thresholds that would trigger review, the Commission notes that the Incidental Take Statement in the 2013 Biological Opinion (NMFS 2013) already includes two thresholds in mortality and serious injury numbers – the mortality and serious injury of two whales in one year or of eight whales in five years would trigger reinitiation of the consultation. Therefore, the Marine Mammal Commission recommends that NMFS continue to monitor the CA DGN fishery and, if the observed or reported mortality and serious injury of sperm whales exceeds the level specified in the Incidental Take Statement (adjusted for the number of sets in the fishery), that it 1) reinitiate formal consultation in accordance with 50 C.F.R. § 402.16(a), 2) reassess the negligible impact determination under the MMPA, and 3) reconvene the POCTRT to consider whether additional measures are necessary to reduce the probability of interactions.

## ***Negligible Impact Determination Criteria***

Negligible impact determinations are made by NMFS based on five criteria established in 1999 (64 Fed. Reg. 28800). The draft amended 2014 negligible impact determination for the CA DNG and CA/OR/WA sperm whale stock is based on Criterion 3, which states that:

If total fisheries-related M/SI [mortalities and serious injuries] are greater than 10 percent of PBR and less than PBR, and the population is stable or increasing, fisheries may be permitted subject to individual review and certainty of data.

In applying the new analytical approaches for estimating mortalities and serious injuries, and stock size, and hence PBR, NMFS has determined that the mean rate of mortality and serious injury of sperm whales in the CA DGN fishery is between 10 and 100 percent of PBR. Under Criterion 3, a negligible impact determination then hinges on whether the “population is stable or increasing.” As discussed earlier, in 2014 Moore and Barlow published a trend analysis of the CA/OR/WA stock of sperm whales. While they were able to fit a trend line to the available survey data, there was considerable uncertainty in the estimated population growth rate. They stated that “[w]e were unable to obtain good estimates of abundance trends... [and] our best estimate is that numbers in the California current study area were stable from 1991 to 2008, but precision of the growth rate estimate is too low to make any reliable conclusion.” Elsewhere in the paper they stated: “[c]onclusive estimates of trends for total abundance within the study area were not obtained.” Thus, while the trend estimate obtained from their analysis was very close to zero, suggesting stability, the uncertainty in that estimate was so great that they effectively concluded they could not reliably detect a trend or lack of trend.

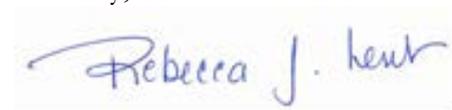
In its draft negligible impact determination, NMFS acknowledged the substantial uncertainty in the estimated growth rate and that Moore and Barlow (2014) had declined to draw any conclusions regarding trends in population size. Nonetheless, the draft determination states without further explanation that the population is stable and that Criterion 3 has been met. The Commission appreciates the difficulty in making a definitive decision in the face of such uncertainty, and NMFS’s desire to base its decision on the growth rate estimate as the only concrete evidence available, even though it is statistically unreliable. However, the Commission notes that Criterion 3 explicitly addresses uncertainty – “... fisheries may be permitted subject to individual review and certainty of data.” It would appear that NMFS has concluded that there is sufficient ‘certainty of data’ despite the contrary conclusion drawn by the authors of what the agency believes to be the best available science (Moore and Barlow 2014).

The Commission does not believe that the CA/OR/WA sperm whale stock is threatened by the CA DGN fishery at this time, but it does not see how NMFS can support a determination of negligible impact under Criterion 3 given the uncertainty regarding whether the stock is stable, increasing, or decreasing. This problem could perhaps be remedied by providing additional, quantitative guidance that clarifies the phrase ‘certainty of data’ under Criterion 3. With this and other ambiguities in the applicable criteria in mind, the Commission in its comment letter on the 2013 draft negligible impact determination (dated 25 July 2013) recommended that NMFS “review its negligible impact determination criteria and their application, and take the necessary steps to establish improved criteria that are clear, logical, internally consistent, and cover all probable

scenarios.” In its response, NMFS acknowledged that the criteria for determining negligible impact are ill defined and in need of review and modification (78 Fed. Reg. 54553). Therefore, the Marine Mammal Commission recommends that NMFS 1) further justify its proposed negligible impact determination under Criterion 3 given its requirement that there be “certainty of data” that the population is stable or increasing and given the substantial uncertainty regarding the population’s trend, and 2) review and improve the criteria for making negligible impact determinations before any more such determinations are issued. For example, NMFS could consider specifying a threshold in the probability that a stock is declining, below which it could be concluded that the stock is not declining and therefore, must be stable or increasing.

Thank you for the opportunity to comment on these actions affecting sperm whales in California. Please contact me if you have any questions about our recommendations and rationale.

Sincerely,

A handwritten signature in blue ink that reads "Rebecca J. Lent". The signature is written in a cursive style and is contained within a rectangular box.

Rebecca J. Lent, Ph.D.  
Executive Director

## References

- Carretta, J.V. and J.E. Moore. 2014. Recommendations for pooling annual bycatch estimates when events are rare. *NOAA Technical Memorandum* NOAA-TM-NMFS-SWFSC-528. 11pp.
- Moore, J.E. and J.P. Barlow. 2014. Improved abundance and trend estimates for sperm whales in the eastern North Pacific from Bayesian hierarchical modeling. *Endangered Species Research* 25:141-150.
- National Marine Fisheries Service. 2005. Revisions to Guidelines for Assessing Marine Mammal Stocks. 24pp. Available at: [www.nmfs.noaa.gov/pr/pdfs/sars/gamms2005.pdf](http://www.nmfs.noaa.gov/pr/pdfs/sars/gamms2005.pdf).
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- National Marine Fisheries Service. 2014. Draft Marine Mammal Protection Act Section 101(a)(5)(E) –Amended Negligible Impact Determination: CA/OR/WA Humpback Whale, CA/OR/WA Sperm Whale. *National Marine Fisheries Service, Protected Resources Division, West Coast Region Office*, 81 pp.