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Jolie Harrison, Chief  
Permits and Conservation Division  
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National Marine Fisheries Service  
1315 East West Highway  
Silver Spring, MD 20910.  
Submitted via: [www.regulations.gov](http://www.regulations.gov): 0648–BF02

August 13, 2015

**Re: Taking Marine Mammals Incidental to Northeast Fisheries Science Center  
Fisheries Research: NOAA-NMFS-2015-0078**

Dear Ms. Harrison,

On behalf of the members and constituents of The Humane Society of the United States and Whale and Dolphin Conservation, we offer the following comments on the proposal to issue a five-year authorization to take multiple species of marine mammals incidental to the Northeast Fisheries Science Center's (NEFSC) research and your proposal to issue regulations related to the authorization. 80 Fed. Reg. 39,542(July 9, 2015).

The background documents entitled "Request for Rulemaking and Letters of Authorization Under Section 101(A)(5)(A) of the Marine Mammal Protection Act for the Take of Marine Mammals" and "DRAFT Programmatic Environmental Assessment for Fisheries Research Conducted and Funded by the Northeast Fisheries Science Center" (Draft PEA) are dated December, 2014. We submitted comments on both of these documents and those comments are incorporated by reference. In our comments, we provided the agency with a critique of some of the accounting of mortality and the methods proposed for mitigation.

In the current notice, NMFS directs reviewers to the Draft PEA document for more information on gear types and the area under consideration for permitting.<sup>1</sup> Additionally, the agency states that it has "evaluated the Draft EA and [we] are proposing to adopt it,"<sup>2</sup> which would seem to indicate that no or only insubstantial changes were made, despite substantial critique of the Draft PEA. Moreover, NMFS appears to have finalized the Draft PEA as it states that our comments were "considered" in finalizing the PEA.<sup>3</sup> However, we are unable to locate a copy of the finalized PEA or where it was published. It is critical that NMFS provide commenters

<sup>1</sup> 80 Fed. Reg. 39,600.

<sup>2</sup> *Id.*

<sup>3</sup> *Id.*

with easy access to the comments on the Draft PEA to allow understanding of whether NMFS is proposing to adopt the Draft PEA in toto or with changes that were suggested by commenters, including our organizations. It would be important for commenters at this stage to understand whether the agency was simply adopting status quo mitigation measures discussed in the preferred alternative of the DPEA or including additional conservation measures for this permit. And it would be helpful to compare the data being used in assessing status of, and impacts to, marine mammals that were discussed in the Draft PEA and which we critiqued in our comments. Yet there is no means of comparing what was proposed in the draft to what NMFS says it will adopt in a final form to allow understanding of whether changes were made in response to comments.

The following critique of this proposed LOA contains some of the comments contained in our original comments on the Draft PEA with regards to mitigation measures, which are hereby incorporated by reference. These concerns still exist and have not been adequately addressed by the agency in deciding to adopt the Draft PEA without addressing public comments submitted.<sup>4</sup> In our original comments on the Draft PEA, we raised concerns with the failure to consider adopting requirements for a number of reasonable measures, including the use of “streamers” on longline gear to deter bird interactions, use of trained protected species monitors, or the use of acoustic monitoring for marine mammals. We also expressed concern that there was an undue reliance on visual observation for marine mammals at night when the visibility is so limited as to render this purported mitigation measure meaningless. In addition, we took issue with the agency’s failure to consider a seminal study indicating that acoustic methods measures of censusing fish caused biologically significant changes in whale behaviors.<sup>5</sup> We also raised concerns with the adequacy of information in some of the species accounts.

We found an error in one of the species accountings in Table 20 (“Summary Information Related to Proposed Annual Take Authorization in the Atlantic Coast Region, 2015-2020”). This table indicates that the Potential Biological Removal level (PBR) for “Short-Beaked Common Dolphins is 170; however, the NMFS stock assessment states that it is over 1,000; and it is the average “annual human-caused mortality” that is 170.<sup>6</sup> This should be corrected in Table 20, although the information does appear to be correct in Table 3.

Also in Table 20, we see no estimated take of Northern Florida Coastal Bottlenose Dolphins<sup>7</sup>, whereas in Table 7-2 of the original application for an LOA, that stock was listed as being affected at a level of 28% of its PBR.<sup>8</sup> Since the research plans have not changed, dropping consideration of impacts to this stock, which were said to exceed one quarter of its PBR, is inappropriate. The area in which research will be

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<sup>4</sup> 80 Fed. Reg. 39,600 (“We have independently evaluated the Draft EA and are proposing to adopt it.”).

<sup>5</sup> Risch D, Corkeron PJ, Ellison WT, Van Parijs SM (2012) Changes in Humpback Whale Song Occurrence in Response to an Acoustic Source 200 km Away. PLoS ONE 7(1). At:

<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0029741> Where the authors found that social and feeding-related vocalizations were significantly reduces concurrent with transmissions of an Ocean Acoustic Waveguide Remote Sensing (OAWRS) experiment approximately 200 km away during an 11 day period in autumn 2006.

<sup>6</sup> See NMFS Stock Assessment Report for Short-beaked Common Dolphins at:

[http://www.nmfs.noaa.gov/pr/sars/2013/ao2013\\_commondolphin-shortbeaked-wna.pdf](http://www.nmfs.noaa.gov/pr/sars/2013/ao2013_commondolphin-shortbeaked-wna.pdf).

<sup>7</sup> 80 Fed. Reg. 39,595.

<sup>8</sup> NEFSC 2014. Request for Rulemaking and Letters of Authorization Under Section 101(A)(5)(A) of the Marine Mammal Protection Act for the Take of Marine Mammals Incidental to Fisheries Research Activities conducted by NOAA Fisheries Northeast Fisheries Science Center At:

[http://www.nmfs.noaa.gov/pr/permits/incidental/research/nefsc\\_loaapplication\\_dec2014.pdf](http://www.nmfs.noaa.gov/pr/permits/incidental/research/nefsc_loaapplication_dec2014.pdf)

conducted has not apparently changed thus the same species said to be affected in the DPEA and permit application should be included here as well.

In our previous comments, we also pointed out that other coastal stocks would likely be affected within the area of the proposed research; however, rather than expanding the possible list of 6 coastal dolphin stocks affected to include consideration of all bottlenose dolphin stocks, NMFS has—without explanation—reduced that list to only three: Western North Atlantic (WNA) Offshore, WNA Northern Migratory Coastal and WNA. This was done without apparent explanation, given that the area of the research has not changed. Further, in the December 2014 application for an LOA, the NEFSC/NMFS stated that: “takes *could be distributed among all 16 currently defined stocks* within the overall region of NEFSC research. However, such taking would be more likely to occur in the offshore stock and the two coastal migratory stocks...”<sup>9</sup> [emphasis added] The fact that takes may be more likely to fall on those three stocks does not mean that takes of other stocks are not possible. NMFS, itself, states that impacts could fall on all 16 currently defined dolphin stocks.<sup>10</sup> The Final PEA and permit should reflect this fact and properly account for these takes. We also note that, both in this original Federal Register notice the recent correction to this notice,<sup>11</sup> table 20 that summarizes annual takes, provides a footnote that says “[f]or species with multiple stocks in the Atlantic coast regions or for species groups...indicated level of take could occur to individuals from any stock or species (not including coastal and estuarine stocks of bottlenose dolphins).” Two of the three stocks of bottlenose in this table of stocks needing take authorizations are coastal migratory stocks and they may mix at times with other coastal stocks that were originally part of the request and thus—depending on the timing of the activity—could be taken. The footnote attempt to exclude from consideration “coastal” bottlenose stocks makes no sense in light of the fact that some of those included in the proposed take authorization are indeed “coastal” and they may mix seasonally with individuals in other coastal stocks. The authorization must include consideration of takes of more than just the single offshore and two coastal stocks of bottlenose dolphins.

This portion of the LOA application is deficient in consideration of impacts on the bottlenose dolphin stocks that have very recently lost in combination more than sixteen hundred of their members to an unusual mortality event (UME).<sup>12</sup> The impact of the UME on overall abundance (and thus PBR for each stock) has not yet been assessed but it is known to have affected at least bottlenose dolphins from the migratory populations of the Northern Migratory Coastal and the Southern Migratory Coastal stocks, and resident populations of the South Carolina/Georgia Coastal, North Florida Coastal and Central Florida Coastal stocks. NMFS should reconsider the impacts of additional research-related takes on the affected stocks. The agency should also either include (or explain why it does not include) the stocks that the original LOA request stipulated were likely to be affected.

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<sup>9</sup> See discussion page 7-7 (emphasis added) and table 7-2 at “Request for Rulemaking and Letters of Authorization Under Section 101(A)(5)(A) of the Marine Mammal Protection Act for the Take of Marine Mammals Incidental to Fisheries Research Activities. NOAA/NEFSC. December 22014. At: [http://www.nmfs.noaa.gov/pr/permits/incidental/research/nefsc\\_loaapplication\\_dec2014.pdf](http://www.nmfs.noaa.gov/pr/permits/incidental/research/nefsc_loaapplication_dec2014.pdf).

<sup>10</sup> Supra note 8

<sup>11</sup> 80 Fed. Reg. 39,595 and 80 Fed. Reg. 46,939 at table 20

<sup>12</sup> See FAQs on the 2013-2014 Bottlenose Dolphin UME in the Mid-Atlantic at: <http://www.nmfs.noaa.gov/pr/health/mmume/midatliddolphins2013.html>. This provides a brief discussion and graphics that provide NMFS’ estimates of numbers and geographic distribution of deaths and the fact that both coastal and offshore animals (resident and migratory) were affected. Estimated losses as of April 2015 were 1,66-dead from NY through North Florida (Brevard County).

We continue to maintain that the “volumetric density” estimates present an inaccurate and risk-prone basis for calculating impacts, particularly for seasonally migratory stocks that are not evenly distributed throughout the range in all seasons (e.g., porpoises, right whales, humpbacks, etc.). This, then, calls into question the calculation of likely take levels. Further, given the results of acoustic studies by Risch, et al.,<sup>13</sup> that found behavioral impacts to humpback whales as far as 200km from the acoustic sound source used in fishery research, it seems likely that disturbance from some activities will be more widespread than projected and thus the occurrence of level B harassment take has been under-estimated. For example, only five humpbacks are said likely to be disturbed by noise. If fishery research and technologies such as this OAWRS technology continue to be used to assess fish stock abundance and distribution (something of tremendous interest to fishermen in the northeast) these effects will only magnify. As such, the level B harassment take (i.e., behavioral disturbance) for many species—including endangered whales—would seem likely to be significantly higher than the five humpbacks stipulated. This is but one example of what we see as a likely underestimation of impacts.

With regard to this proposal, the general conditions imposed include a requirement for monitoring of the sampling areas to detect the presence of marine mammals before deployment of pelagic trawl nets, pelagic or demersal longline gear, dredge gear, fyke nets, and beach seines; a requirement to implement standard tow durations of not more than 30 minutes to reduce the likelihood of incidental take of marine mammals; adoption of the “move on rule” that requires a vessel to leave an area to avoid conflict with marine mammals; compliance with seasonal and other vessel speed restrictions designed to protect marine mammals and compliance with take reduction plans for marine mammals. We believe that these are generally appropriate requirements. However, as previously stated, we strongly disagree with the agency’s decision to not accept the additional mitigation measures that were proposed in other alternatives in the Draft PEA and instead rely solely on extant measures such as largely ineffective night-time visual observations rather than requiring acoustic monitoring to detect marine mammals in the vicinity when failure to detect animals has resulted in prior instances of entanglement.

The agency provides six goals that should be accomplished by mitigation measures. One of them seeks, “[f]or monitoring directly related to mitigation, an increase in the probability of detecting marine mammals, thus allowing for more effective implementation of the mitigation.”<sup>14</sup> Again, conducting research activities at night (in particular when using mobile gear and set gillnets) reduces the likelihood of visual detection of marine mammals rendering the use of any other mandated mitigation measures ineffective or impossible.<sup>15</sup> For example, without the ability to detect a marine mammal at night, mitigation measures such as delaying the setting of longline gear after visual monitoring or retrieval and/or hauling of gillnet gear if marine mammals are visually detected would be rendered moot. Again, this argues for the use of passive acoustic monitoring, as with hydrophones, to assure that condition 6 can be met. We reiterate our support for requiring acoustic monitoring.

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<sup>13</sup> Supra n4.

<sup>14</sup> 80 Fed. Reg. 39,566.

<sup>15</sup> For example, in the mitigation measures NMFS proposes for gillnets, the agency states on 80 Fed. Reg. 29,563 that “[i]f a marine mammal is sighted during the soak and appears to be at risk of interaction with the gear, then the gear is pulled immediately.” Yet on page 39,564 it also admits that soaks can last up to 24 hours, which includes night time, when visual monitoring would be virtually impossible for harbor porpoises, lone dolphins or other small cetaceans.

The agency published a supplementary notice extending the comment deadline to allow additional time for the public to review changes the agency proposes to make to impacts on multiple stocks subsequent to publication of the original request for comments.<sup>16</sup> The corrections include an increase in the projected mortality estimates for gray and harbor seals. While we appreciate the agency's attempt to present more accurate estimates, we were curious as to the reason for the increase. For example, were more animals taken in the Center's research subsequent to the initial proposal in January of this year than would have been permitted under this proposal, necessitating the agency adjusting the estimated mortality to assure that future research stay within the requested lethal taking authorization? It would be useful to know the reason for the need to increase the request for incidental mortality of pinnipeds.

While we applaud the agency for, at long last, seeking the requisite incidental take authorizations for its fishery-related research, there are still deficiencies that must be addressed. As we have pointed out above, NMFS should re-examine likely impacts to all coastal bottlenose dolphin stocks and should require additional mitigation measures that were dropped from consideration.

Sincerely,



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<sup>16</sup> 80 Fed. Reg.. 46,939 at table 20



# MARINE MAMMAL COMMISSION

24 August 2015

Ms. Jolie Harrison, Chief  
Permits and Conservation Division  
Office of Protected Resources  
National Marine Fisheries Service  
1315 East-West Highway  
Silver Spring, MD 20910-3225

Dear Ms. Harrison:

The Marine Mammal Commission (the Commission), in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the National Marine Fisheries Service's (NMFS) 9 July 2015 notice (80 Fed. Reg. 39542), its revised 6 August and 17 August 2015 notices (80 Fed. Reg. 46939 and 80 Fed. Reg. 49196, respectively), and the letter of authorization application submitted by the Northeast Fisheries Science Center (NEFSC) seeking issuance of regulations under section 101(a)(5)(A) of the Marine Mammal Protection Act. The taking would be incidental to fisheries research activities during a five-year period.

## Background

NEFSC plans to conduct fisheries research surveys in the Atlantic Ocean from the United States–Canada border to Florida, primarily in the Northeast U.S. Continental Shelf Large Marine Ecosystem. The objectives are to monitor fish stock recruitment, abundance, survival, biological rates, geographic distribution, and ecosystem process changes. Researchers would conduct approximately 48 survey programs during the five-year period. The surveys could occur on Service-owned and -operated vessels, charter vessels, or commercial fishing vessels during daytime and nighttime hours.

NEFSC requested authorization to take by Level A harassment, serious injury, or mortality of individuals from up to 12 species or stocks of marine mammals<sup>1</sup> incidental to gear interactions. The takes would occur through marine mammal interactions with fisheries survey gear. NEFSC would use trawls, longlines, gillnets, fyke nets, beach seines, other types of gear (e.g., dredges, traps/pots, plankton nets, etc.), and remotely operated vehicles to conduct the surveys, but marine mammals are likely to interact only with trawls, longlines, gillnets, and fyke nets based on historical data. Researchers would implement standard mitigation measures<sup>2</sup> including using a move-on rule<sup>3</sup>, pingers, marine mammal excluder devices, continuous visual monitoring, and/or net tending. In addition, NEFSC would conduct concurrent hydrographic, bathymetric, and oceanographic

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<sup>1</sup> Including unidentified pinnipeds and unidentified cetaceans.

<sup>2</sup> Including Take Reduction Plan mitigation measures and gear requirements for the respective fishery and area (e.g., sinking ground lines, weak links, pingers).

<sup>3</sup> If one or more marine mammals are observed within 1.85 km of or near the planned fishing location (depending on the type of survey) in the 30 minutes before setting the gear, NEFSC would move to a different section of the sampling area. If after moving on marine mammals remain within 1.85 km or near the planned fishing location, NEFSC may decide to move again or to skip the station.

sampling. Researchers could use multi-frequency, narrow-beam echosounders, multibeam echosounders, narrow-beam sonar (i.e., fish-finding sonar), acoustic Doppler current profilers, and net monitoring systems that operate at frequencies from 18 to 333 kHz at source levels of 190 to 224 dB re 1  $\mu$ Pa at 1 m. NEFSC has requested to take by Level B harassment individuals from numerous marine mammal species, stocks, and genera incidental to use of the acoustic sources and vessel presence. Researchers would implement various monitoring and reporting measures during the proposed activities.

### **Non-impulsive, acoustic sources and the appropriate behavioral threshold**

Although NMFS has proposed to authorize the taking by Level B harassment from the use of subbottom profilers, echosounders, and other sonars by the NEFSC, NMFS has not provided consistent guidance for determining when prospective applicants should request such taking. On several occasions, NMFS has determined that sound emitted from subbottom profilers, echosounders, and other sonars (side-scan and fish-finding) have the potential to cause Level B harassment. Similar to NEFSC sources, NMFS has issued multiple incidental harassment authorizations to Cape Wind Associates for the use of a shallow-penetration subbottom profiler, medium-penetration subbottom profiler, single-beam echosounder, multibeam echosounder, side-scan sonar, and magnetometer to conduct site assessment surveys for renewable energy development off Nantucket Island (76 Fed. Reg. 80891, 78 Fed. Reg. 19217, 79 Fed. Reg. 25835) and an authorization to Hilcorp Alaska, LLC, for the use of a subbottom profiler, multibeam echosounder, single-beam echosounder, side-scan sonar, and/or magnetometer to conduct a shallow geohazard survey in the Beaufort Sea (80 Fed. Reg. 39062). In addition, NMFS is considering rulemaking to authorize Level B harassment takes for the use of only high-frequency sound sources (single-beam and multibeam echosounders and side-scan sonar) to conduct hydrographic surveys (78 Fed. Reg. 1205). However, NMFS has yet to adopt generally applicable guidance regarding when such authorizations are needed (e.g., for the National Science Foundation and associated entities, oil and gas industry, geological and geophysical survey operators and researchers, shipping industry, or the general public). The Commission believes that NMFS should provide that guidance and follow a consistent approach in assessing the potential for taking by Level B harassment from subbottom profilers, echosounders, and other sonars, including whether applicants should include requests for authorizations of such taking in their applications. Therefore, the Commission recommends that NMFS develop criteria (e.g., based on source level, peak frequency, bandwidth, signal duration and duty cycle, affected species or stocks) and guidance for determining when prospective applicants should request taking by Level B harassment from the use of subbottom profilers, echosounders, and other sonars.

The Commission also believes that NMFS is using an outdated and incorrect behavior threshold when subbottom profilers, echosounders, and other sonars are proposed for use. A decade ago NMFS categorized sound sources as either impulsive or continuous when determining thresholds for Level B harassment based on behavioral disturbance (160 vs 120 dB re 1  $\mu$ Pa, respectively; 70 Fed. Reg. 1871). Since that time, the U.S. Navy has updated the criteria and thresholds<sup>4</sup> it uses for non-impulsive, acoustic sources (i.e., sonar and other acoustic sources) and impulsive explosive sources (i.e., underwater detonations; see Finneran and Jenkins (2012) for the

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<sup>4</sup> The Navy uses NMFS's "old" thresholds only for vibratory pile-driving, impact pile-driving, and airgun activities (120 and 160 dB re 1  $\mu$ Pa, respectively).

Navy's current criteria and thresholds). NMFS instructs applicants who plan to use underwater detonations during their activities to utilize the Navy's current impulsive criteria and thresholds<sup>5</sup>. However, for other non-impulsive, acoustic sources, NMFS relies on the thresholds from the 2005 guidance. That guidance is outdated and not reflective of best available science. NMFS is aware of that shortcoming and is in the process of updating the criteria and thresholds for PTS and TTS but not for behavior. Numerous studies have been published in recent years, and will be published in the near-term, regarding behavioral effects on marine mammals, dose response functions, and suggested thresholds. The Commission does not believe NMFS can ignore those studies any longer. As such, the Commission recommends that NMFS formulate a strategy for updating the behavior thresholds for all types of sound sources (i.e., impulsive and non-impulsive, which can be both intermittent or continuous) and incorporate new data regarding behavior thresholds as soon as possible—the Commission believes such revised behavior thresholds should be peer reviewed, made available to the public for review, and finalized within the next year or two.

As discussed in previous letters to NMFS regarding subbottom profilers<sup>6</sup>, echosounders, and other sonars, those sources have temporal and spectral characteristics which suggest that a lower, more precautionary Level B harassment threshold of 120 dB re 1  $\mu$ Pa would be more appropriate than the 160-dB re 1  $\mu$ Pa threshold that continues to be used. Numerous researchers have observed various species of marine mammals, including the same species that could be harassed by NEFSC, responding to sound from sources (e.g., acoustic deterrent devices, acoustic harassment devices, pingers, echosounders, multibeam sonars) with characteristics similar to those used by NEFSC at received levels below 160 dB re 1  $\mu$ Pa (Watkins and Schevill 1975, Olesiuk et al. 1995, Kastelein et al. 1997, Kastelein et al. 2000, Kastelein et al. 2001, Morton 2000, Culik et al. 2001, Johnston 2002, Morton and Symonds 2002, Kastelein et al. 2005, Barlow and Cameron 2003, Kastelein et al. 2006a and 2006b, Carretta et al. 2008, Carlström et al. 2009, Lurton and DeRuiter 2011, Brandt et al. 2012 and 2013, Götz and Janik 2013, Hastie et al. 2014, Kastelein et al. 2015a and 2015b, Tougaard et al. 2015). Specifically, harbor porpoises and beaked whales respond at some of the lowest source levels (Culik et al. 2001, Kastelein et al. 2001, Carlström et al. 2002, Barlow and Cameron 2003, Carretta et al. 2008). These observations support Lurton and DeRuiter's (2011) suggestion that 130 dB re 1  $\mu$ Pa may be a reasonable rough estimate for the behavioral response threshold of sensitive marine mammal species to these sources. The Navy already uses Level B behavioral harassment thresholds for non-impulsive, acoustic sources that are much lower than 160 dB re 1  $\mu$ Pa. The Navy currently uses unweighted thresholds<sup>7</sup> of 120 and 140 dB re 1  $\mu$ Pa for harbor porpoises and beaked whales, respectively.

Additionally, the terms impulsive and continuous are not dichotomous and should not be used in a mutually exclusive manner as NMFS does. NMFS should be characterizing sources as impulsive or non-impulsive. As stated in NMFS's 2014 draft criteria and thresholds for PTS and TTS<sup>8</sup>, impulsive sources are transient, brief (less than 1 second), and broadband and typically consist of high peak pressure with rapid rise time and rapid decay (American National Standards Institute (ANSI) 1986, National Institute for Occupational Safety and Health (NIOSH) 1998, ANSI 2005). In

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<sup>5</sup> Including thresholds for mortality, injury, permanent threshold shift (PTS), temporary threshold shift (TTS), and behavior.

<sup>6</sup> For subbottom profilers that are considered 'chirps' or are in 'chirp' mode.

<sup>7</sup> NMFS's 'old' thresholds also are unweighted, step functions.

<sup>8</sup> Similar definitions are given in the preamble in the *Federal Register* notice as well.

contrast, non-impulsive sources can be broadband, narrowband, or tonal, brief or prolonged, continuous or intermittent, and typically do not have a high peak pressure with rapid rise time (typically only small fluctuations in sound level), which is characteristic of impulsive signals (ANSI 1995, NIOSH 1998)<sup>9</sup>. The Commission does not consider subbottom profilers, echosounders, and other sonars to be impulsive, even if they have intermittent characteristics<sup>10</sup>, because those sources lack the high peak pressure and rapid rise time of an impulsive source. Indeed NMFS has indicated that the proposed sources are relatively high frequency, directional, and brief repeated signals<sup>11</sup>—characteristics that are not reflective of impulsive sources.

All of these facts support the Commission's continued stance that NMFS should be requiring NEFSC, and other applicants utilizing similar sources, to use 120 dB re 1  $\mu$ Pa as the Level B behavioral threshold. Therefore, for non-impulsive, acoustic sources (including subbottom profilers, echosounders, and other sonars) that NMFS plans to regulate and until such time that NMFS revises its Level B behavioral thresholds for non-Navy-related acoustic sources, the Commission recommends that NMFS require NEFSC to estimate the numbers of marine mammals taken based on the 120- rather than the 160-dB re 1  $\mu$ Pa threshold.

### Category 1 sources

NMFS has delineated two categories of acoustic sources, Category 1 (>180 kHz) and 2 (10–180 kHz), in the *Federal Register* notice. NMFS indicated that Category 1 sources are outside the known functional hearing capability of any marine mammal, but that sound emitted from those sources may be audible if sufficiently loud (e.g., Møhl 1968). NMFS further stated that Category 1 sources are highly unlikely to be of sufficient intensity to result in behavioral harassment and any individual marine mammal would be unlikely to even receive a signal that would almost certainly be inaudible. Therefore, NMFS did not expect Category 1 sources to have any effect on marine mammals and they were not considered further in the proposed rule.

Recent research raises questions regarding NMFS's assumption. Deng et al. (2014) determined that three commercially available sonars<sup>12</sup> generated sound at frequencies below the center frequency (center frequency ranging from 200–260 kHz and sub-harmonic sounds ranging from 90–130 kHz) and within the hearing range of some marine mammals (e.g., mid- and high-frequency odontocetes). Although NMFS stated in the *Federal Register* notice that those sounds would be detectable at maximum distances of only a few meters, Deng et al. (2014) indicated that such sounds were likely detectable by the animals over distances of up to several hundred meters (see Table 1) and could potentially affect the behavior of marine mammals within fairly close

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<sup>9</sup> NMFS stated that those definitions are not meant to reflect how it has previously characterized sound for behavioral thresholds. However, the Commission continues to believe that NMFS is not basing that characterization on best available science.

<sup>10</sup> Which NMFS has repeatedly used as the basis for its characterization of subbottom profilers, echosounders, and other sonars as impulsive rather than continuous.

<sup>11</sup> NMFS stated in the *Federal Register* notice that the signals from the acoustic sources proposed for use by NEFSC have high rise times, which is incorrect. Further, NMFS indicated that the sources would be operated from moving platforms, which has no bearing on the source characteristics. Both acoustic (e.g., military sonar) and impulsive (e.g., airguns) sources are operated from moving platforms.

<sup>12</sup> Kongsberg SM2000 200-kHz multibeam imaging sonar, BioSonics DT-X 210-kHz split-beam scientific echosounder, and Imagenex model 965 260-kHz multibeam imaging sonar.

proximity to the sources. In addition, Hastie et al. (2014) conducted behavioral response experiments with captive gray seals exposed to two sonars<sup>13</sup>. They determined that both sonars had significant effects on the seals' behavior. When the 200-kHz sonar was active, the seals spent significantly more time hauled out. Although the seals did not haul out when the 375-kHz sonar was active, they did surface at locations farther from the source than when the sonar was inactive. Hastie et al. (2014) indicated that, although peak sonar frequencies may be above marine mammal hearing ranges, high levels of sound can be produced within those hearing ranges that elicit behavioral responses—the 200- and 375-kHz sonars had source levels of 166 and 135 dB re 1  $\mu$ Pa at 1 m, respectively, at 20 kHz. NMFS mentioned these two references in the *Federal Register* notice, however, its interpretation of the results does not necessarily comport with the results from those studies. Therefore, the Commission recommends that NMFS incorporate the findings of the recent scientific literature on acoustic sources with frequencies above 180 kHz into its criteria and guidance for determining when prospective applicants should request authorization for taking by Level B harassment from the use of echosounders, sonars, and subbottom profilers.

The Commission hopes you find its letter useful. Please contact me if you have questions regarding its rationale or recommendations.

Sincerely,



Rebecca J. Lent, Ph.D.  
Executive Director

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<sup>13</sup> CodaOctopus Echoscope 2 375-kHz multibeam sonar and the BioSonics DT-X 200-kHz split-beam scientific echosounder used by Deng et al. (2014).

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