



# MARINE MAMMAL COMMISSION

19 March 2019

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) 27 February 2019 notice (84 Fed. Reg. 6576)<sup>1</sup> and the letter of authorization applications submitted by the Southeast Fisheries Science Center (SEFSC) and Texas Parks and Wildlife Department (TPWD) seeking issuance of regulations under section 101(a)(5)(A) of the Marine Mammal Protection Act. The taking would be incidental to fisheries research surveys during a five-year period.

## Background

*SEFSC*—Fisheries research surveys would be conducted in the (1) Atlantic Ocean from North Carolina to Florida and associated estuaries (ARA), (2) Gulf of Mexico and associated estuaries (GOMRA), and (3) Caribbean Sea around Puerto Rico and the U.S. Virgin Islands (CRA). The objectives are to monitor fish stock recruitment, abundance, survival, biological rates, geographic distribution, and ecosystem process changes and to conduct marine ecological research. Researchers would conduct approximately 74 survey programs during the five-year period. The surveys could occur during daytime and nighttime hours.

SEFSC requested authorization to take by Level A harassment, serious injury, or mortality individuals from numerous species and stocks of marine mammals incidental to interactions with fisheries survey gear. SEFSC would use towed nets and trawls, gillnets, longline gear, seine nets, traps/pots, other gear (e.g., plankton nets, camera traps, dredges, electrofishing gear, etc.), and remotely operated vehicles to conduct the surveys. Among these, based on historical data from research surveys and/or commercial fisheries, marine mammals are likely to interact only with trawls, gillnets, longline gear, and traps/pots. Researchers would implement standard mitigation measures including using move-on rules and delay procedures, limiting gear set times, implementing visual monitoring and net tending, and prohibiting chumming. SEFSC also would investigate the effectiveness of modifying lazy lines to reduce entanglement of common bottlenose dolphins and establish and convene the South Carolina Department of Natural Resources Working Group to

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<sup>1</sup> The Commission informally noted numerous typos, errors, and missing information throughout the notice including the various take tables. NMFS indicated most would be fixed in the preamble and final rule.

better understand entanglement of bottlenose dolphins in trawl nets and to apply effective mitigation strategies. In addition, SEFSC would conduct concurrent hydrographic, bathymetric, and oceanographic sampling. Researchers could use multi-frequency, narrow-beam echosounders, multibeam echosounders, single-frequency omni-directional 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 less than 200 up to 224 dB re 1  $\mu$ Pa at 1 m. SEFSC has requested to take by Level B harassment individuals from numerous marine mammal genera, species, and stocks incidental to use of the acoustic sources. Researchers would implement various monitoring and reporting measures during the proposed activities.

*TPWD*—Fisheries research surveys would be conducted in 10 Texas bay systems from Lower Laguna Madre to Sabine Lake. The objectives are to assess abundance and size of finfish and shellfish in those bay systems. *TPWD* requested authorization to take by mortality or serious injury (M/SI) individuals from multiple stocks of bottlenose dolphins incidental to interactions with gillnets. Nets would be set only at night to minimize interactions with boaters and anglers. *TPWD* would implement standard mitigation measures including setting only new or fully repaired nets, setting nets with minimal slack and short marker buoys, modifying gillnets to reduce the gap between the float/lead line and net from 8 to 4 inches, minimizing soak time by using the 'last out/first in' strategy, implementing visual monitoring and delay procedures, and avoiding setting nets in fishing grids where dolphins have interacted with gear previously<sup>2</sup>. Researchers would implement various monitoring and reporting measures during the proposed activities as well.

### **Affected species**

NMFS assessed the species and stocks of marine mammals that could be taken relative to both SEFSC's and *TPWD*'s proposed activities. The *Federal Register* notice indicated that fin, sei, and Bryde's whales were considered extralimital or rarely sighted in the CRA and were not considered further in SEFSC's analysis. The Commission notes that, similar to minke whales which were included in the analysis, all three species have been documented in the waters surrounding Puerto Rico and the U.S. Virgin Islands (Erdman et al. 1973, Mignucci-Giannoni et al. 1998, Ward et al. 2001, Prieto et al. 2012). Fin and sei whales were observed at higher sighting rates<sup>3</sup> than minke whales in waters off Puerto Rico and the U.S. Virgin Islands, with all three species occurring in winter and spring in both nearshore and shelf edge waters (Mignucci-Giannoni et al. 1998). Bryde's whales also have been observed in waters off Puerto Rico and the U.S. Virgin Islands and generally occur in nearshore and shelf edge waters (Erdman et al. 1973, Ward et al. 2001). In recent years, there have been anecdotal reports and video recordings of Bryde's whales off Puerto Rico as well. Given that all three species are known to occur in CRA waters and are frequently confused with one another, the Commission recommends that NMFS revise Table 3a in the *Federal Register* notice to

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<sup>2</sup> Specifically, where dolphins have interacted with gear on more than one occasion or where multiple adjacent grids have had at least one dolphin encounter.

<sup>3</sup> Most sightings were reported as *Balaenoptera* spp. (n=14) due to the difficulty in distinguishing between fin and sei whales. There were an additional three and two sightings attributed to fin and sei whales, respectively. Researchers also noted that sei whales can be confused with Bryde's whales at sea (Prieto et al. 2012). Only three minke whale sightings were documented by (Mignucci-Giannoni et al. 1998).

include fin, sei, and Bryde's whales as marine mammals that potentially occur in the CRA and revise its analyses and take estimates as necessary.

### **Appropriate threshold for non-impulsive, acoustic sources**

Although NMFS has proposed to authorize the taking by Level B harassment from the use of echosounders and other sonars by the SEFSC, NMFS has not provided consistent guidance for determining when prospective applicants should request such taking. On multiple occasions, NMFS has determined that sound emitted from echosounders, other sonars (side-scan and fish-finding), and subbottom profilers<sup>4</sup> have the potential to cause Level B harassment. However, NMFS has yet to adopt generally applicable guidance or to follow a consistent approach in assessing 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 understands that NMFS plans to continue its examination of the effects of anthropogenic sound on marine mammal behavior and to focus its work in the coming years on developing guidance regarding such effects (83 Fed. Reg. 36372). In the meantime, the Commission recommends that NMFS provide interim guidance based on various criteria (e.g., source level, peak frequency, bandwidth, signal duration and duty cycle, affected species or stocks) for determining when prospective applicants should request taking by Level B harassment from the use of echosounders, other sonars, and subbottom profilers.

The Commission continues to believe that NMFS is using an outdated and incorrect behavior threshold for echosounders, other sonars, and subbottom profilers. A decade ago, NMFS categorized sound sources as either impulsive or continuous when determining its generic 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 (the Navy) has twice updated the criteria and thresholds<sup>5</sup> it uses for non-impulsive, acoustic sources (i.e., sonar and other acoustic sources) and impulsive<sup>6</sup> explosive sources (i.e., underwater detonations; see Finneran and Jenkins (2012) and Department of the Navy (2017) for the Navy's current criteria and thresholds). NMFS instructs applicants who plan to use underwater detonations during their proposed activities to utilize the Navy's current criteria and thresholds for explosives. However, for non-impulsive, acoustic sources, NMFS continues to rely on the generic thresholds from the 2005 guidance, which do not reflect the best available science.

Numerous recent and forthcoming studies address behavioral effects on marine mammals, dose response functions, and suggested thresholds. Thus, the Commission recommends that NMFS make it a *priority* to update its generic behavior thresholds and formulate a strategy for updating those thresholds for all types of sound sources (i.e., impulsive and non-impulsive, which can be either intermittent or continuous) and for incorporating new data regarding behavior thresholds as

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<sup>4</sup> For subbottom profilers that are considered 'chirps' or are used in 'chirp' mode.

<sup>5</sup> The Navy uses NMFS's generic thresholds only for vibratory pile-driving, impact pile-driving, and airgun activities (120 and 160 dB re 1  $\mu$ Pa, respectively).

<sup>6</sup> Including thresholds for mortality, injury, permanent threshold shift (PTS), temporary threshold shift (TTS), and behavior.

soon as possible—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 echosounders, other sonars, and subbottom profilers<sup>7</sup>, 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<sup>8</sup> have observed various species of marine mammals, including the same species that could be harassed by SEFSC, responding to sound from sources (e.g., acoustic deterrent devices, acoustic harassment devices, pingers, echosounders, multibeam sonars) with characteristics similar to those used by SEFSC at received levels below 160 dB re 1  $\mu$ Pa. Specifically, harbor porpoises and beaked whales respond at some of the lowest source levels (Culik et al. 2001, Kastelein et al. 2001, Carlstöm et al. 2002, Barlow and Cameron 2003, Caretta et al. 2008).

More recently, Quick et al. (2017) determined that short-finned pilot whales changed their heading more frequently when a narrow-beam echosounder was active than when not. NMFS noted that although those less overt responses to sound exposure are difficult to detect by visual observation, they may have important consequences if the exposure interferes with biologically important behavior (84 Fed. Reg. 6608). Cholewiak et al. (2017) also found that beaked whales both detected the sound from and changed their behavior when narrow-beam echosounders were active. The researchers indicated that those responses could indicate interruption of foraging activity or vessel avoidance. All these observations support Lurton and DeRuiter's (2011) suggestion that 130 dB re 1  $\mu$ Pa would be a reasonable rough estimate for the behavioral response threshold of marine mammal species that are sensitive to those 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. In its Phase III documents, the Navy used unweighted thresholds<sup>9</sup> of 120 dB re 1  $\mu$ Pa for harbor porpoises and a dose response function for beaked whales<sup>10</sup> with a 50 percent probability of response at 144 dB re 1  $\mu$ Pa (Department of the Navy 2017). The Commission notes that the Navy's updated dose response functions incorporate both level- and context-based responses<sup>11</sup>. At higher amplitudes, a level-based response relates the received sound level to the probability of a behavioral response; whereas, at lower amplitudes, sound can cue the presence, proximity, and approach of a sound source and stimulate a context-based response based on factors other than received sound level<sup>12</sup>.

In addition, the terms impulsive and continuous are not dichotomous and should not be used in a mutually exclusive manner. Rather, sources should be characterized as impulsive or non-

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<sup>7</sup> See the Commission's [23 June 2016 letter](#).

<sup>8</sup> See 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 b, Carretta et al. 2008, Carlström et al. 2009, Götz and Janik 2010, Lurton and DeRuiter 2011, Brandt et al. 2012 and 2013, Götz and Janik 2013, Hastie et al. 2014, Kastelein et al. 2015a and b, Tougaard et al. 2015.

<sup>9</sup> NMFS's generic thresholds also are unweighted step functions.

<sup>10</sup> The Navy's Phase II documents used an unweighted threshold of 140 dB re 1  $\mu$ Pa for beaked whales.

<sup>11</sup> A phenomena NMFS itself noted relative to Cuvier's beaked whales, but then apparently discounted in the *Federal Register* notice (84 Fed. Reg. 6608).

<sup>12</sup> e.g., the animal's previous experience, separation distance between sound source and animal, and behavioral state including feeding, traveling, etc.

impulsive. As stated in NMFS's 2018 revision to its final technical guidance regarding thresholds for PTS and TTS<sup>13</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 contrast, non-impulsive sources can be broadband, narrowband or tonal, brief or prolonged, continuous or intermittent and typically do not have a high peak sound pressure with rapid rise/decay time that is indicative of impulsive sounds (ANSI 1995, NIOSH 1998)<sup>14</sup>. The Commission does not consider echosounders, other sonars, or subbottom profilers to be impulsive, even if they have intermittent characteristics<sup>15</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—characteristics that are not reflective of impulsive sources.

Although the Commission has made many of these points in previous letters and NMFS recently issued a final rule for the Northwest Fisheries Science Center's (NWFSC) fisheries research surveys in which it attempted to respond to Commission recommendations, NMFS has yet to address any of these points. As such, the facts provided continue to support using 120 rather than 160 dB re 1  $\mu$ Pa as the Level B harassment threshold. Therefore, for non-impulsive, acoustic sources (including echosounders, other sonars, and subbottom profilers) that NMFS plans to regulate and *until such time* that NMFS revises its generic Level B harassment thresholds for non-Navy-related acoustic sources, the Commission recommends that NMFS require SEFSC to estimate the numbers of marine mammals to be taken based on the 120- rather than the 160-dB re 1  $\mu$ Pa threshold. If NMFS again decides not to implement this recommendation, the Commission alternatively recommends that NMFS require SEFSC to estimate the numbers of marine mammal takes based on the non-impulsive, acoustic thresholds set forth in Department of the Navy (2017)<sup>16</sup>, including the Navy's unweighted 120-dB re 1  $\mu$ Pa threshold for harbor porpoises and the various biphasic dose response functions for the other marine mammal species. This approach<sup>17</sup> is the same as NMFS has implemented for many years for thresholds involving explosives.

### Category 1 sources

NMFS has delineated two categories of acoustic sources, Category 1 (>180 kHz) and Category 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). In addition, NMFS stated that Category 1 sources are highly unlikely to be of sufficient intensity to result in behavioral

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<sup>13</sup> Similar definitions are given in the preamble in the *Federal Register* notice as well and have been provided in NMFS's numerous draft and final technical guidance documents since 2014.

<sup>14</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>15</sup> Which NMFS has repeatedly used as the basis for its characterization of echosounders, other sonars, and subbottom profilers as impulsive rather than continuous.

<sup>16</sup> The data that underlie the behavior thresholds set forth in Department of the Navy (2017) are more applicable to echosounders, other sonars, and subbottom profilers and the species that could be affected as compared to NMFS's generic 120- and 160-dB re 1  $\mu$ Pa thresholds that were based on mysticete responses to drilling and seismic activities.

<sup>17</sup> Requiring all action proponents to implement the Navy's current thresholds.

harassment and any individual marine mammal would be unlikely to even receive a signal that would almost certainly be inaudible.

NMFS acknowledged two recent studies that demonstrated behavioral responses by marine mammals to acoustic signals at frequencies above 180 kHz (Deng et al. 2014, Hastie et al. 2014). Deng et al. (2014) determined that three commercially available sonars<sup>18</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). Those sounds were likely detectable by the animals over distances of up to several hundred meters (see Table 1) and could affect the behavior of marine mammals in fairly close proximity to the sources (Deng et al. 2014). Hastie et al. (2014) conducted behavioral response experiments with captive gray seals exposed to two sonars<sup>19</sup> and determined that both had significant effects on the seals' behavior—effects that would be deemed Level B harassment by NMFS. 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.

Although NMFS referenced those two studies in the *Federal Register* notice<sup>20</sup>, it indicated that detectability of the sources by the animals was in reference to ambient noise<sup>21</sup> rather than to NMFS's established 160-dB re 1  $\mu$ Pa threshold. NMFS based that assessment on the source levels (135–166 dB re 1  $\mu$ Pa at 1 m) being either below NMFS's generic 160-dB re 1  $\mu$ Pa threshold or the sound attenuating to such a level within a few meters of the source. The Commission would not refute those suppositions if the (1) generic 160-dB re 1  $\mu$ Pa threshold was applicable for assessing Level B harassment from non-impulsive, acoustic sources, which clearly is contradicted by the Hastie et al. (2014) study or (2) responses above ambient, and specifically those that reflect clear avoidance and displacement, were not the very behavioral reactions that constitute Level B harassment. Rather than reassessing the applicability of its generic threshold, NMFS has chosen to apply that threshold to situations for which it is not appropriate. The Commission has provided similar comments in previous letters that have yet to be addressed by NMFS. Therefore, for acoustic sources (including echosounders and other sonars) that NMFS plans to regulate *until such time* that NMFS amends its generic Level B harassment thresholds, the Commission again recommends that NMFS estimate numbers of takes associated with those acoustic sources (or similar acoustic sources) with frequencies above 180 kHz that have been shown to elicit behavioral responses above the 120-dB re 1  $\mu$ Pa threshold.

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<sup>18</sup> Kongsberg SM2000 200-kHz multibeam imaging sonar, BioSonics DT-X split-beam scientific echosounder operated at 210 kHz, and Imagenex model 965 260-kHz multibeam imaging sonar.

<sup>19</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).

<sup>20</sup> And in its preamble to the NWFSC's final rule (83 Fed. Reg. 36372).

<sup>21</sup> Which is closer to NMFS's 120-dB re 1  $\mu$ Pa threshold.

## Take estimates

*Level A harassment takes*—NMFS proposed to authorize SEFSC to take by Level A harassment bottlenose dolphins<sup>22</sup> from the Mississippi Sound, Lake Borgne, Bay Boudreau (MS Sound) stock based on the potential that a captured or entangled marine mammal would not die or be seriously injured (M/SI) but be injured nonetheless. The Commission supports NMFS's approach but is puzzled why that same approach was not used for TPWD's activities. SEFSC may be conducting more activities in MS Sound (see Table 1 of the *Federal Register* notice) than TPWD proposed to conduct, but TPWD has documented more marine mammal encounters with fishing gear and more instances of animals being released alive than SEFSC.

Specifically, SEFSC has documented only 5 encounters in the last 17 years with dolphins in the various bay, sound, and estuarine systems of GOMRA, 3 of which occurred in MS Sound with only one of those dolphins being released alive. TPWD, on the other hand, has documented 14 encounters in the last 17 years in various bay systems, with 10 of those dolphins being released alive. Although TPWD did not specify whether the animals released were seriously injured, it is assumed that at least some were not. It would be prudent for NMFS to authorize TPWD to take by Level A harassment dolphins that could be captured or entangled in nets but not seriously injured—particularly given that the potential for incidental capture and release has been reported more often during TPWD's activities. Further, half of TPWD's 10 encounters involved dolphins from the Copano Bay, Aransas Bay, San Antonio Bay, Redfish Bay, Espirtu Santo Bay (Copano Bay) stock, indicating an even greater likelihood that Level A harassment could occur in the Copano Bay stock than the other three stocks<sup>23</sup> for which taking would be authorized. The Commission recommends that NMFS authorize (1) 0.4 Level A harassment takes of bottlenose dolphins per year (2 dolphins during the five-year period) in the Copano Bay stock and 0.2 Level A harassment takes of bottlenose dolphin per year (1 dolphin during the five-year period) in each of the Laguna Madre, Neuces Bay, and Matagorda Bay stocks for TPWD's activities in the final rule and (2) 0.2 Level A harassment takes of bottlenose dolphins per year (1 dolphin during the five-year period) in the MS Sound stock for SEFSC's activities in the final rule.

*Level B harassment takes*—To estimate the numbers of takes subsequent to SEFSC's use of acoustic sources, NMFS used various abundance and volumetric density estimates. However, in certain instances, abundances and densities were not available<sup>24</sup>, but were specified as such in footnotes associated with Table 6-9 of SEFSC's application. Blue, sei, and killer whales in the ARA and humpback and minke whales in the GOMRA were not included in either Table 11 of the *Federal Register* notice, denoting species for which densities were available, or the footnotes associated with Table 6-9 of the application that states densities were not available. Thus, it is unclear upon what the Level B harassment takes for those species were based.

Moreover, Table 13 in the *Federal Register* notice compared the calculated takes to group size estimates and provided the resulting proposed take estimates. However, the table is missing various species for which Level B harassment takes would be authorized including North Atlantic right

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<sup>22</sup> 0.2 bottlenose dolphins per year or 1 bottlenose dolphin during the five-year period.

<sup>23</sup> (1) Laguna Madre, (2) Neuces Bay, Corpus Christie Bay (Neuces Bay), and (3) Matagorda Bay, Tres Palacios Bay, Lavaca Bay (Matagorda Bay).

<sup>24</sup> And group size was used in lieu of densities.

whales, humpback whales, minke whales, sei whales, Fraser's dolphins, harbor seals, and gray seals. Takes also are missing for blue whales, false killer whales, pygmy killer whales, Clymene dolphins, and Fraser's dolphins in Table 18 that denoted the total taking, including both takes for Level B harassment and M/SI, and the percentage of the stock what would be taken. The Commission understands that NMFS did not intentionally omit this information. However, NMFS does need to ensure that the data provided to inform public comments are accurate and complete prior to publishing any *Federal Register* notice. The Commission recommends that, in the preamble to the final rule, NMFS (1) specify in Table 11, as was done in Table 6-9 of the application, which species were lacking density data and clarify whether densities were available for blue, sei, and killer whales in ARA and humpback and minke whales in the GOMRA and (2) ensure Tables 13 and 18 include all species and stocks proposed to be taken by SEFSC's proposed activities.

### **Mitigation, monitoring, and reporting measures**

*Additional mitigation measures for TPWD*—SEFSC and TPWD would be required to implement various mitigation measures to minimize impacts to marine mammals, particularly in regards to M/SI taking. The Commission believes that the mitigation measures proposed by NMFS for SEFSC's activities are sufficient but believes that the measures proposed for TPWD should be supplemented. Unlike SEFSC, TPWD would conduct all of its activities during nighttime hours to eliminate day-use disturbances<sup>25</sup> that can alter normal fish behavior and movement patterns, to reduce the amount of disturbance by and to anglers and boaters, and to increase boater safety by reducing the likelihood of striking nets. Based on historical data for the last 35 years, TPWD incidentally captures, injures, and/or kills approximately one bottlenose dolphin per year in its gillnets. In the last eight years, all bottlenose dolphins incidentally captured have been released alive.

Incidental taking of bottlenose dolphins has occurred in “hotspots” in some of the bay systems. NMFS has proposed to restrict activities in those locations based on more than one dolphin encounter occurring in a single sample grid or at least one dolphin encounter occurring in multiple adjacent grids. Based on those criteria, TPWD would remove six sampling grids from its total available sampling areas. The Commission believes that such an approach is prudent but believes that two additional sampling grids should have been removed as well. Specifically, grids 318 and 319 in Lower Laguna Madre appear to be adjacent to one another and accounted for one encounter each (see Table 3 and Appendix 2 in TPWD's revised application). In addition, 9 of the 31 reported encounters have occurred in Aransas Bay (see Table 3 in TPWD's revised application). The proposed sampling grid removals would protect dolphins in areas associated with six of those nine encounters. Since Aransas Bay is considered the area most highly susceptible to dolphin encounters, it is unclear why either the other two grids near Allyn's Bight<sup>26</sup> were not similarly removed or net tending was not required in those grids. The Commission understands that it may be cost-prohibitive for TPWD to observe and tend all nets on any given night. However, in those instances where hot spots are known to occur or are known to occur close by, additional mitigation measures should be implemented. Accordingly, the Commission recommends that, in the LOA, NMFS require TPWD to restrict activities in grids 318 and 319 in Lower Laguna Madre and the two grids adjacent to hotspot #1 in Aransas Bay as depicted in Figure 3 of TPWD's application. If

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<sup>25</sup> i.e., boaters running the shoreline.

<sup>26</sup> Presumably grids 255 and 308. Grid numbers delineated in Table 3 were not specifically noted in any of the figures in TPWD's application.



restricting activities in additional grids in Aransas Bay would preclude TPWD from obtaining the necessary fisheries information, the Commission recommends that NMFS require TPWD to tend the nets set in those grids continuously consistent with the net-tending measures<sup>27</sup> to be required of SEFSC.

*Inclusion of required measures in the final rule*—Numerous mitigation, monitoring, and reporting measures that were stipulated in the preamble were not included in the proposed rule. Some of the mitigation and monitoring measures that would be required of SEFSC are based on specific measures set forth in scientific research permits for sea turtles rather than measures that would be required under the rulemaking. The Commission agrees that the details of those measures should be included in the preamble, but that the final rule would need only to note that SEFSC must abide by the measures required by the research permits (section 219.75(b)(9) of the proposed rule)<sup>28</sup>. Similarly, the proposed rule would require that TPWD not set gillnets in dolphin hot spots but the actual grid numbers where TPWD's activities would be restricted would be included in the LOA rather than the final rule (section 219.85(c) of the proposed rule)<sup>29</sup>. Generally, details regarding all other measures should be specified in the final rule. As such, the Commission recommends that NMFS ensure that the final rule includes details similar to those specified in the preamble for the various mitigation, monitoring, and reporting measures including but not limited to those involving seine nets, hook and line, other gear, electrofishing, last out/first in rule, clearance times and distances, vessel speed restrictions, the required number of trained personnel for disentanglement procedures, and research efforts and findings associated with lazy-line modifications.

### **Negligible impact determination**

Under section 101(a)(5)(A)<sup>30</sup> of the MMPA, NMFS can authorize incidental taking of marine mammals only if the total of such taking<sup>31</sup> would have a negligible impact on the species or stock. To help inform its analysis of whether the level of anticipated removals should be considered negligible, NMFS evaluated whether the proposed M/SI takes would exceed the potential biological removal (PBR)<sup>32</sup> for each stock when those removals are added to other sources of taking by M/SI<sup>33</sup>. Although the use of PBR and the criteria for making negligible impact determinations for the take of endangered and threatened species incidental to commercial fisheries under section 101(a)(5)(E) of the MMPA are not directly applicable to or synonymous with a negligible impact finding under 101(a)(5)(A), the Commission agrees that the use of PBR to aid in the section 101(a)(5)(A) analysis is appropriate.

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<sup>27</sup> Including hand checking the net every 30 minutes if soak times are longer than 30 minutes or immediately if disturbance is observed, and pulling gear immediately if disturbance in the nets is observed.

<sup>28</sup> Particularly since the permit numbers and conditions may change during the five years the rule would be effective.

<sup>29</sup> Since those grids may change during the five years the rule would be effective.

<sup>30</sup> And under section 101(a)(5)(D).

<sup>31</sup> During each five-year period.

<sup>32</sup> PBR is defined as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population.

<sup>33</sup> The other sources of M/SI for SEFSC were based on information contained in NMFS's stock assessment reports and the authorized annual taking by M/SI for the Northeast Fisheries Science Center's fisheries research surveys, which overlap with the stocks potentially affected by SEFSC's activities. The other sources of M/SI for TPWD were based only on information in the stock assessment reports.

The proposed number of takes that could result in M/SI for both SEFSC and TPWD would not equal or exceed PBR for most stocks. However, the proposed takes by M/SI for SEFSC<sup>34</sup> would equal PBR for the Northern South Carolina Estuarine (NSCE) stock of bottlenose dolphins<sup>35</sup> and would exceed PBR for the Mobile Bay, Bonsecour Bay (Mobile Bay) stock and the MS Sound stock. Although NMFS proposed to authorize the taking by M/SI of only one bottlenose dolphin during the proposed five-year period (or 0.2 dolphins per year) from each of the three stocks, when considered in light of other known causes of mortality, PBR would either be met or exceeded. The annual taking by commercial fisheries<sup>36</sup> of bottlenose dolphins from those three stocks generally exceeds the proposed taking by SEFSC<sup>37</sup> and contributes to the majority of the total fisheries interaction takes. Thus, PBR is met for the NSCE stock of bottlenose dolphins and exceeded for the Mobile Bay stock.

Additional bottlenose dolphin mortalities in MS Sound have been attributed to effects of the *Deepwater Horizon* oil spill (DWH). A population model developed<sup>38</sup> to estimate mortalities associated with DWH, although subject to various uncertainties<sup>39</sup>, projected 1,539 mortalities of dolphins in MS Sound for the years from 2011–15. Assuming equal distribution across all years, 308 mortalities were estimated for each year<sup>40</sup>, which far exceed PBR of 23 dolphins for that stock. It is unclear whether the yearly mortality estimate, or the projected five-year mortality total, actually occurred<sup>41</sup>. It also is unlikely that the mortality level predicted by the model reflects present-day conditions, as the unusual mortality event following the oil spill peaked in 2011–14 and the last reported stranding associated with that event occurred in 2015. Another confounding factor stems from recent abundance estimates for the MS Sound stock. Mullin et al. (2017) indicated that the total abundance for the stock ranged from 4,610 in July 2011 to 3,046 in January 2012<sup>42</sup>. However, abundance has not been estimated since that time. More recent abundance estimates and estimated survival rates are available for dolphins from Barataria Bay, which was similarly affected by DWH. McDonald et al. (2017) determined that the survival rates during the first three years (2011–2013) after DWH were low (range 0.804–0.846), but that the rate rebounded near the end of the unusual mortality event period (2013–2014) to 0.973—a rate that is similar to those reported in other studies (Wells and Scott 1990, Speakman et al. 2010<sup>43</sup>). The survival rates were based on a slight uptick in abundance post-DWH, followed by a decline<sup>44</sup>, and ultimately an increase in the abundance estimate towards

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<sup>34</sup> The proposed M/SI takes for TPWD would not equal or exceed PBR for any of the affected stocks.

<sup>35</sup> NMFS proposed to authorize M/SI of one bottlenose dolphin from each of the relevant bay, sound, and estuarine stocks during the five-year period, which would equate to 0.2 dolphins per year.

<sup>36</sup> By gillnets, hook and line, longlines, pots/traps, trawls, and purse seines.

<sup>37</sup> For Mobile Bay and MS Sound stocks, taking by commercial fisheries exceeds that proposed by SEFSC by four to five times.

<sup>38</sup> See *Deepwater Horizon* Marine Mammal Injury Quantification Team (DWH MMIQT; 2015) and Schwacke et al. (2017).

<sup>39</sup> The baseline population size was estimated from studies initiated after the initial exposure to oil. Therefore, it is possible that the pre-spill population size was larger than this baseline level and some mortality occurring early in the event was not quantified. Further, the duration of elevated mortality and reduced reproductive success after exposure is unknown, and expert opinion was used to predict the rate at which these parameters would return to baseline levels.

<sup>40</sup> From 2011–15, five bottlenose dolphin mortalities also were attributed to sea turtle relocation trawling activities and gunshot wounds, equating to one bottlenose dolphin mortality per year.

<sup>41</sup> McDonald et al. (2017) hypothesized that some dolphins in Barataria Bay likely moved out of the area, probably northward into marshes immediately after DWH, and later moved back into the area.

<sup>42</sup> Corresponding to an estimated annual survival rate of 0.73 for MS Sound dolphins.

<sup>43</sup> 0.962 and 0.951, respectively.

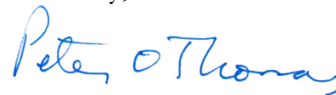
<sup>44</sup> Which was likely due to both emigration and mortalities.

the end of the event<sup>45</sup> (see Figure 6a in McDonald et al. 2017). A similar increase in the abundance estimate likely occurred for the MS Sound stock, but cannot be confirmed with the data available.

Although some of the data used to inform NMFS's negligible impact determination is outdated and may not reflect current or ongoing mortality levels, they should be considered the best available data and should form the basis for NMFS's analysis. Based on that information, it appears that removals from some bottlenose dolphin stocks exceed the various PBR levels and that any additional mortalities from those stocks should not be considered as having negligible impacts. Even though the number of takes likely to result from the proposed fisheries research surveys is small and might be considered as having negligible impacts on the affected dolphin stocks when viewed in isolation, the Commission believes that the MMPA requires NMFS to assess the impacts of the surveys while considering baseline conditions. That is, if existing takes from a stock exceed the negligible impact threshold, it follows that any additional takes that cause that threshold to be exceeded further likewise cannot be considered negligible. The Commission therefore recommends that NMFS authorize taking by M/SI only for those stocks for which a negligible impact determination can be made when looking at overall removals from each stock as a whole.

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

Sincerely,



Peter O. Thomas, Ph.D.,  
Executive Director

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<sup>45</sup> Again, likely reflecting immigration of Baratavia Bay dolphins from northern reaches of the bay.

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