



MARINE MAMMAL COMMISSION

18 April 2019

Mr. Christopher Putnam
U.S. Fish and Wildlife Service
Office of Marine Mammals Management, MS 341
1011 East Tudor Road
Anchorage, Alaska 99503

Dear Mr. Putnam:

The Marine Mammal Commission (the Commission), in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the U.S. Fish and Wildlife's (FWS) 19 March 2019 notice (84 Fed. Reg. 10224) and the 28 June 2018 petition¹ submitted by Hilcorp Alaska LLC (Hilcorp), Harvest Alaska, LLC (Harvest), and the Alaska Gasline Development Corporation (AGDC), seeking issuance of regulations under section 101(a)(5)(A) of the Marine Mammal Protection Act (MMPA). The Commission also reviewed FWS's 5 April 2019 notice to extend the comment period to 30 days for the proposed regulations. The applicants are seeking authorization to take small numbers of northern sea otters by harassment incidental to conducting various oil and gas-related activities in Cook Inlet, Alaska, during a five-year period. Activities would occur from April to October for the next five years (1 April 2019² to 1 April 2024).

Background

Hilcorp and Harvest are proposing to conduct oil and gas exploration, development, production, and decommissioning activities in middle and lower Cook Inlet (south of a line from the Susitna River Delta to Point Session and north of a line from Rocky Cove to Coal Cove, excluding Ursus Cove, Iniskin Bay, Iliamna Bay, and Tuxedni Bay). Proposed activities include two- and three-dimensional (2D and 3D) seismic surveys, geohazard surveys (using echosounders³ and subbottom profilers), exploratory drilling (including drive pipe installation and vertical seismic profiling (VSP)), causeway construction (including vibratory sheet pile driving and dredging), platform and pipeline maintenance (including use of grinders, water jets, pingers, and/or subbottom profilers), tug towing, and use of other associated support vessels and aircraft.

¹ The Hilcorp and Harvest petition published on the NMFS website is dated September 2018 and appears to include further revisions of the relevant analyses since the submission of the June 2018 update to FWS. The Commission also was informed by NMFS that it received further revisions in November 2018 from Hilcorp and Harvest, as well as revisions from AGDC in October 2018. The extent of the revisions and their applicability to the information contained in FWS's petition are unclear.

² Hilcorp and Harvest have since notified FWS that seismic survey activities planned to begin in April 2019 would be delayed until Fall 2019. Irrespective, the final rule would not be issued until well after the proposed activities were originally scheduled to begin. AGDC's proposed activities would not begin until November 2019.

³ That operate above 200 kHz.

AGDC is proposing to construct a liquefied natural gas (LNG) facility on the Kenai Peninsula, which would include construction of a marine terminal on the western side of middle Cook Inlet near Beluga and a pipeline across the inlet to a proposed onshore facility near Nikiski. AGDC's proposed activities include vibratory and impact pile driving, dredging, trenching, anchor handling, and use of associated support vessels and aircraft.

FWS preliminarily has determined that the proposed activities could cause Level A and B harassment of small numbers of northern sea otters from both the southwest and southcentral stocks, but that the total taking would have a negligible impact on the species or stocks. FWS does not anticipate any lethal take of sea otters. FWS believes that the potential for take by Level A and B harassment would be at the least practicable level because of the applicants' proposed mitigation measures. The proposed mitigation, monitoring, and reporting measures include—

- using observers to monitor the Level A and B harassment zones⁴ for 30 minutes before, during, and for 30 minutes after proposed activities that generate underwater sound levels greater than or equal to 160 dB re 1 μ Pa between 125 Hz and 38⁵ kHz;
- using various ramp-up/soft-start, delay, power-down, and shut-down procedures;
- use of a single “mitigation” airgun during power down of a seismic array;
- implementing emergency shut-down procedures if one or more sea otters are observed showing signs of acute distress within either the Level A or B harassment zones;
- minimizing vessel and aircraft interactions with sea otters through operational and speed reduction procedures, as appropriate⁶;
- avoiding active or anticipated subsistence hunting areas;
- reporting all injured or dead sea otters to FWS and/or the Alaska Sea Life Center within 48 hours⁷; and
- submitting weekly and monthly monitoring reports and a final report to FWS.

Availability of marine mammals for subsistence use

Based on the timing and location of the proposed activities and of subsistence hunting in the project area(s), FWS preliminarily has determined that the proposed taking would not have an unmitigable adverse impact on the availability of sea otters for subsistence use by Alaska Natives. FWS would require a separate letter of authorization (LOA) for each proposed activity⁸ that would occur under the final rule. Per section 18.134(b)(3) of the proposed rule, FWS would require that each request for an LOA include (1) a plan of operations, (2) a site-specific marine mammal mitigation and monitoring plan (4MP)⁹, and (3) an assessment of potential effects of the proposed

⁴ Identified as exclusion and safety zones, respectively, in the preamble and proposed rule.

⁵ Section 18.137(b)(1)(iii) of the proposed rule refers to an upper frequency limit of 32 rather than 38 kHz. Presumably this is a typographic error.

⁶ Including requiring vessels to maintain a separation distance of 100 m from any sighted sea otter and 500 m from rafts of otters and requiring aircraft to maintain a minimum altitude of 305 m.

⁷ Activities would cease immediately if a sea otter was injured or killed during the course of conducting the activities.

⁸ The Commission presumes that this means that annual LOAs would be issued to both Hilcorp and Harvest and AGDC for only those activities they plan to conduct in a given year.

⁹ The Commission notes that Hilcorp and Harvest submitted a marine mammal mitigation and monitoring plan, but AGDC did not.

activity on subsistence hunting of sea otters. The latter would require that the applicant(s), as part of the request for an LOA, communicate with potentially affected Alaska Native subsistence communities regarding the location, timing, and methods used by the applicant(s), and inquire whether the proposed activity will interfere with subsistence activities. If any conflicts are identified, the applicant(s) would be required to develop a plan of cooperation (POC) specifying the particular steps that would be taken to address any effects the proposed activities might have on subsistence hunting.

Hilcorp and Harvest have submitted a stakeholder engagement plan, which they indicated incorporates the specific requirements of the POC. However, that plan refers only to contacts made with Cook Inlet communities prior to submission of the petition—it did not include a summary of input received, a schedule for ongoing engagement, or measures that would be implemented to mitigate any potential conflicts. AGDC did not provide either a stakeholder engagement plan or POC. Therefore, the Commission recommends that FWS ensure that all applicants submit, as part of their LOA requests, a site-specific stakeholder engagement plan or POC that includes a summary of input received, a schedule for ongoing community engagement, and measures that would be implemented to mitigate any potential conflicts with subsistence hunting.

Inconsistencies and ambiguities in description of proposed activities

Types of sound sources—In reviewing both the petition and the preamble to the proposed rule, the Commission noted multiple inconsistencies and ambiguities in regard to the proposed activities. For example, FWS indicated that the 24-inch piles would be installed using only an impact hammer in Table 9 of the *Federal Register*, whereas the petition indicated that both vibratory and impact hammers would be used to install the 24-inch piles. In addition, neither FWS nor the applicants specified whether a chirp or boomer subbottom profiler would be used, or both, during the proposed geohazard surveys¹⁰; therefore, impacts of the surveys cannot be analyzed appropriately or accurately absent that information.

In addition, section 6.2.1 of the petition stated that FWS generally does not regulate incidental harassment for transiting vessels, and therefore vessel noise was not used to evaluate potential Level A or B harassment. However, section 6.2.6.2 of the petition stated that the activity of towing the rig on site is not considered “typical” and therefore measured sound levels from a similar tug were used to evaluate Level A and B harassment. It is not clear how the rig-towing tug is different from other vessels proposed for use for the various activities or how it differs from tug towing in general, which is not a source that FWS has regulated in Cook Inlet or elsewhere. If general vessel use is discounted as a source of potential harassment, use of the tug should be as well. Furthermore, FWS proposed to authorize taking for AGDC’s proposed anchor handling activities. Those activities were not included in AGDC’s revised application that was submitted to NMFS in September 2018, presumably because NMFS determined that those takes would not rise to the level of harassment¹¹.

¹⁰ This issue is discussed in detail in a subsequent section herein.

¹¹ Moreover, the estimated Level B harassment should be 11.7 m rather than 37.4 m as noted in Table 7 of the *Federal Register* notice. Errors in the calculations of the various harassment zones are discussed in a subsequent section herein. The Commission is not convinced a sea otter would come that close to the anchor handling vessel when it is actively moving the anchors.

Lastly, FWS indicated that the source level for the underwater pipe cutter was 148 dB re 1 μ Pa, and was 159 dB re 1 μ Pa for the hydraulic grinder—both presumably referenced to 1 m (but this should be clarified). Despite their similar source levels, only the grinder was included in the proposed authorization as a source that could result in Level B harassment. Neither source is typically included when authorizing incidental taking of marine mammals, presumably due to their low source levels and rapid attenuation. Moreover, FWS used 160- rather than 120-dB re 1 μ Pa as the threshold for estimating Level B harassment takes. Neither source would exceed that threshold. Thus, it is not clear why takes were not discounted for both sources. The Commission recommends that FWS address and fix all these issues.

Duration of proposed activities—Table 1 of the *Federal Register* notice¹² provided a summary of the proposed activities and the total anticipated duration of each activity, in days, during the five-year period covered by the proposed rule. Table 9 of the *Federal Register* notice also provided the duration of each activity to be covered by the proposed rule, for the purpose of estimating the total number of takes. However, the number of days for several of the activities listed are not the same in each table. For example, Table 1 indicated that the 2D and 3D seismic surveys would occur for 30 and 90 days, respectively; whereas, Table 9 indicated that the same activities would occur only for 10 and 60 days, respectively.

Further, the estimated days to install the conductor pipes as indicated in Table 9 of the *Federal Register* notice does not comport with the statement in section 6.5.1.3 of the petition that it takes three days to install each pipe. If there will be four wells at Lower Cook Inlet and two wells at Trading Bay, that is a total of six wells. Six wells multiplied by three installation days per well totals 18 days, as opposed to the 4.5 days stated in Table 9 of the *Federal Register* notice. Similarly, Hilcorp and Harvest estimated that VSP would occur for up to two days per well, yet a total of only two days was indicated for VSP in Table 9 for all four exploratory wells proposed for lower Cook Inlet. The reductions appear to account only for the amount of time an activity is expected to occur on a given day (e.g., pile driving would occur for only 6 hours per day and VSP would occur for 4 hours per day), with fractions of days summed to generate the total number of days used to estimate takes for each proposed activity. This method vastly underestimates the total number of takes and also contradicts FWS's statement that one take per day is assumed regardless of duration of work within a day (84 Fed. Reg. 10240). The Commission recommends that FWS require the applicants to ensure that the total number of days for each activity is accurate and consistent and revise the number of days used to estimate the number of sea otter takes for each of the proposed activities based on the number of days each type of activity is scheduled to occur regardless of the duration of those activities on a given day.

The number of days needed to conduct a geohazard survey at each well site also appears to have been calculated incorrectly in section 6.5.1.2 of the petition (and subsequently noted in Table 9 of the *Federal Register* notice). The total distance required to be surveyed at each well site is given as 153.6 km, which is divided into 32 transects of 4.8 km each. If each transect takes 0.65 hr (38 min) to complete¹³, the total time to complete the survey then would be 20.8 hrs. Assuming the survey occurs for 12 hrs per day, a maximum of 18 transects could be completed each day. Based on that, it

¹² Which appears to be based on Tables 1 and 6-10 in the applicants' petition.

¹³ Assuming a vessel speed of 4 knots, or 7.41 km/hr.

would take only 2 days to complete a geohazard survey, not 7.7 days as stated in Table 9. If the survey durations in Table 9 are incorrect, the Commission recommends that FWS require the applicants to revise the survey durations for each of the well sites (the four lower Cook Inlet OCS sites, the North Cook Inlet Unit site, and the two Trading Bay area sites)¹⁴ accordingly and re-estimate the number of sea otter takes.

Timing of proposed activities—After the *Federal Register* notice published, the Commission was informed that Hilcorp and Harvest intended to delay its 3D seismic survey activities, previously scheduled to begin in lower Cook Inlet in April 2019, until August 2019. Since the 3D survey will be delayed until fall, it is unclear if the survey can be completed this year. This delay likely will affect how the numbers of takes of sea otters were estimated, and ultimately the numbers to be authorized, in both 2019 and 2020. The Commission recommends that FWS determine which of the proposed activities will actually occur this year and which will be delayed until 2020 and revise the numbers of sea otter takes accordingly.

Extents of the Level A harassment zones

FWS based the extents of the Level A harassment zones on various assumptions described in Table 6 of the *Federal Register* notice. Unfortunately, several of these assumptions are either incorrect or inconsistent with information provided elsewhere in the preamble. For example, the source level for anchor handling was 188 dB re 1 μ Pa (with no reference distance noted) in Table 3 and 179 dB re 1 μ Pa at 1 m in Table 6 of the *Federal Register* notice. The source level for the 2D/3D seismic was noted at 217 dB re 1 μ Pa at 100 m in units of root-mean-square (rms); however, that source level is actually based on a peak sound pressure level (SPL_{peak}) and the SPL_{rms} source level is 197 dB re 1 μ Pa at 100 m—both are noted in Table 3 of the *Federal Register* notice.

FWS indicated that the subbottom profiler is an impulsive source in Table 3, but the weighting factor adjustments, pulse duration, and repetition rate reveal that it is in fact a non-impulsive source. The Commission asked FWS whether the subbottom profiler was a chirp or boomer. And although FWS indicated it was a boomer, the types of sources FWS actually specified include both chirps (i.e., Edgetech 3200¹⁵) and boomers (i.e., Applied Acoustics AA251¹⁶). This confusion explains why FWS inappropriately used a combination of assumed thresholds and inputs. The Edgetech 3200 is a chirp, which is a non-impulsive source, and the 20-msec pulse duration and repetition rate can be considered appropriate. However, the pulse duration and repetition rate given for the Applied Acoustics AA251 is not appropriate. The pulse duration is 90 msec and thus could never repeat at a rate of every 30 msec (see Tables 4 and 5 in Crocker and Fratantonio (2016)¹⁷).

Furthermore, the pulse durations of 20 msec included in Table 6 of the preamble for both VSP and impact pile driving are not correct. NMFS has indicated in its manual for its user spreadsheet that, when pulse durations are not available for these sources, 100 msec should be used

¹⁴ The number of days to conduct the geohazard surveys is used to estimate takes, so take estimates should be revised as well.

¹⁵ With a source level of 210 dB re 1 μ Pa at 1 m and operating frequency of 2–24 kHz, this is the SB-424 variant. https://seatronics-group.com/files/1214/2063/0402/Edgetech_3200_-_Datashet.pdf

¹⁶ With a source level of 212 dB re 1 μ Pa at 1 m and operating frequency of 1–4 kHz.

¹⁷ The Edgetech 3200/424 variant also is included in this document. Note that all measured source levels are less than manufacturer specifications.

as the default (see Appendices B and C in NMFS 2018). Alternatively, FWS could have used single-strike sound exposure level (SEL_{s-s}) source levels, which obviates the need for a pulse duration, similar to what was noted in Table 6 for the 2D/3D seismic survey. In any event, the source level provided for pipe driving in Table 6 is based on SPL_{rms} and a pulse duration is not provided. FWS either needs to use source levels based on SPL_{rms} and appropriate pulse durations or source levels based on SEL_{s-s} for all activities involving seismic airguns and impact pile driving. Moreover, SPL_{peak} source levels were not provided for the subbottom profiler, VSP, or pipe driving either in Tables 1 or 6 of the *Federal Register* notice or in the application. Yet, FWS reported the extents of various Level A harassment zones to the 232-dB re 1 μPa_{peak} threshold in Table 7 of the notice.

More troubling is the fact that, when the assumptions stipulated in Table 6 are used to estimate the extents of the Level A harassment zones, many of the zones are not the same as those listed in Table 7 of the *Federal Register* notice¹⁸. In some instances, the calculated zones are larger and in other instances, they are smaller. Since the zones stipulated in Table 7 cannot be recreated based on the information in Table 6 and many of the assumptions and thresholds used to estimate those zones are incorrect, the proposed numbers of takes cannot be substantiated. It is therefore impossible to deem the mitigation measures¹⁹ based on those zones as effecting the least practicable adverse impact. As such, the Commission recommends that FWS recalculate all of the Level A harassment zones²⁰ and revise the numbers of sea otter takes and mitigation measures accordingly.

Appropriateness of the Level B harassment threshold

Non-impulsive, continuous sources—As with numerous other proposed authorizations in recent years, FWS used the 160- rather than 120-dB re 1 μPa threshold for non-impulsive, continuous sources²¹ to estimate the extent of the Level B harassment zone and the number of takes during vibratory pile driving and removal. This approach differs from the USCG authorization for its 2015 activities (79 Fed. Reg. 58798) and other authorizations issued for activities that had the potential to harass southern sea otters (82 Fed. Reg. 6631). In those instances, FWS used the 120-dB re 1 μPa threshold²² for activities involving vibratory pile driving.

The Commission continues to question²³ FWS's assumption that disruption of behavioral patterns occurs only at levels that *exceed* 160 dB re 1 μPa . In this particular *Federal Register* notice, FWS indicated that it used 160 dB re 1 μPa as the threshold for Level B harassment for both impulsive and non-impulsive sources based on the lack of disturbance or any other reaction by sea otters to the 1980s playback studies of Riedman (1983, 1984) and the absence of a clear pattern of disturbance or avoidance behaviors attributable to underwater sound levels up to about 160 dB re 1 μPa resulting from vibratory pile driving during previous monitoring activities. The Riedman (1983,

¹⁸ This is an issue for the Level B harassment zones as well.

¹⁹ Which would include the number and locations of protected species observers as well.

²⁰ This applies to Level B harassment zones and takes as well, particularly if FWS chooses not to implement the Commission's recommendations in the subsequent section of this letter.

²¹ FWS did indicate that it used the National Marine Fisheries Service's (NMFS) Level A harassment thresholds based on permanent threshold shift (PTS) for *non-impulsive, continuous* sources. Thus, the appropriate Level A harassment thresholds were used.

²² Which is based on Malme et al. (1988) investigating gray whale responses to playbacks of drillship sounds in Alaska and a 50 percent response rate of those whales at 120 dB re 1 μPa .

²³ See the Commission's [1 May 2018 letter](#) and [13 June 2017 letter](#) detailing this issue.

1984) studies were part of the larger Malme et al. (1983, 1984) playback studies that were conducted off the California coast to assess responses of migrating gray whales and helped inform the 160-dB re 1 μ Pa threshold for impulsive sources. However, the studies conducted by Riedman (1983, 1984) were not true controlled exposure experiments, because information was not provided regarding received levels *paired* with an otter's response (or lack thereof) to the associated sound emitted. Furthermore, Riedman (1983) noted that the sound levels of the playback studies in the otter-inhabited areas of the kelp beds were estimated to be 110 dB re 1 μ Pa—a level not expected to elicit a behavioral response from impulsive or non-impulsive sources. The Commission questions the use of the Riedman data in general²⁴ but also notes that methods associated with controlled exposure experiments have advanced considerably in the last 35 years. The Commission also is perplexed that FWS accepts the data from the Malme (1983, 1984) studies on gray whale response to impulsive sources but rejects the same studies related to gray whale response to non-impulsive sources (Malme et al. 1988). That choice appears arbitrary.

FWS also indicated that previous monitoring results during vibratory pile driving in California²⁵ showed no clear pattern of sea otter disturbance or avoidance in relation to the various levels of underwater sound exposure. The Commission disagrees. During vibratory installation of sheet piles, 55 percent of the observed sea otters traveled away from the area or exhibited a startle dive in response to received levels less than 160 dB re 1 μ Pa (Table 8 in ESNERR 2011). Similarly, 50 percent of the observed sea otters²⁶ traveled away from the area or exhibited a startle dive in response to received levels ranging from 141–144 dB re 1 μ Pa during vibratory installation of H-piles, and 33 percent of the observed sea otters traveled away from the area at received levels less than 135 dB re 1 μ Pa (Table 7 in ESNERR 2011)²⁷. ESNERR (2011) additionally indicated that the decreased abundance inside Parsons Slough ($p=0.08$) resulted from female-pup pairs and other individuals remaining in Yampah Marsh and avoiding passing through the construction zone to get to upstream areas of Parsons Slough. The pattern is quite clear that sea otters are disturbed by or avoid vibratory pile-driving activities well below 160 dB re 1 μ Pa. The Commission further notes that these observed responses would equate to a behavioral severity score of 6 or more (based on Southall et al. 2007)—which has a greater potential to affect sea otter foraging, reproduction, or survival—and should be sufficient for FWS to derive its own thresholds²⁸. More importantly, the observed behavioral responses and decreased abundance are some of the same responses that FWS indicated disrupt biologically significant behaviors and are considered Level B harassment (see 84 Fed. Reg. 10234).

In addition, FWS asserted that much of the sound generated by vibratory pile driving is expected to be inaudible or marginally audible to sea otters based on their poor hearing sensitivity

²⁴ Including issues associated with inclement weather conditions as referenced by Riedman (1983) and greater distances to the target animals from the playback source in Riedman (1984). Specifically, Riedman (1983) indicated that it was possible that the high winds, frequent periods of heavy rain, large swells, and rough seas may have affected the way in which otters perceived the sounds, as well as the observer's ability to monitor the animals effectively.

²⁵ Elkhorn Slough National Estuarine Research Reserve (ESNERR, 2011).

²⁶ At 30–60 m from the source.

²⁷ Although sea otter responses were noted, ESNERR (2011) further indicated that it is quite possible that the animals in the Yampah Marsh area are accustomed to mechanical sounds, considering that the area abuts a wrecking yard and is bisected by an active railroad track. Thus, sea otters that are not routinely exposed to 'mechanical' sounds would likely exhibit responses at lower received levels, which would be the case in Cook Inlet.

²⁸ Some of the current thresholds are based on lesser amounts of data. Based on these data alone, the Level B harassment threshold for non-impulsive sources could be set at 141 dB re 1 μ Pa.

below 2 kHz (Ghoul and Reichmuth 2014²⁹) and most of the acoustic energy emitted during vibratory pile driving being limited to frequencies below 2 kHz (Dahl et al. 2015). Based on the previous monitoring results discussed herein, sea otters can definitely hear vibratory pile driving. Thus, FWS's assertion that vibratory pile driving sound is inaudible is incorrect. The assumption that vibratory pile driving sound would be marginally audible also is refuted by the actual reference provided by FWS to support its claim. Ghoul and Reichmuth (2014) indicated that sea otter hearing sensitivity measured from 125 Hz to 2 kHz ranged from 90 to 116 dB re 1 μ Pa, is below 120 dB re 1 μ Pa. An additional point to note is that the Level B harassment thresholds are all unweighted—that is, sounds at 125 Hz and 2 kHz are assumed to be perceived by an animal equally and an animal needs to only hear the greatest sound pressure level in any octave band to respond. Sea otters can hear, and thus respond to, vibratory pile-driving sound down to the 120-dB re 1 μ Pa threshold.

Finally, FWS attempted to assuage the Commission's concerns regarding the inappropriate use of the 160-dB re 1 μ Pa threshold by comparing that threshold to the threshold for temporary threshold shift (TTS) in the preamble to the proposed rule. In doing so, FWS used the TTS threshold of 199 dB re 1 μ Pa²-sec³⁰ for *non-impulsive* sources and source levels³¹ and other assumptions from a 3D seismic survey, which is an *impulsive* source³² (see 84 Fed. Reg. 10230). A complicating factor is that some sources are mobile, while others are stationary³³. The information in FWS' example in the preamble is neither correct nor appropriate. Rather, FWS should have used source levels and assumptions³⁴ associated with a non-impulsive, stationary source and the relevant TTS and behavior thresholds. For example, during vibratory sheet pile driving³⁵, the range to TTS would be 15.3 m and the range to behavior based on the 160-dB re 1 μ Pa threshold would be 10 m. Thus, an otter would experience TTS before responding behaviorally, which is illogical. Moreover and all errors aside, FWS incorrectly asserted that the TTS threshold is likely to be more accurate than the 160-dB re 1 μ Pa when the *behaviors* of otters can be closely monitored. FWS appears to be unaware of, or is simply ignoring, the fact that TTS (and PTS) is a physiological response and the 160- and 120-dB re 1 μ Pa thresholds are based on behavioral responses—it is wholly inappropriate to be attempting to use the thresholds interchangeably. TTS and behavioral response are considered two different types of Level B harassment, with TTS being a more severe, detrimental effect.

²⁹ Best hearing sensitivity is defined as occurring within 20 dB of the lowest measured threshold (Reichmuth et al. 2013, Ghoul and Reichmuth 2014). Although FWS noted that best hearing sensitivity for sea otters ranged from 8–16 kHz (83 Fed. Reg. 18079), Ghoul and Reichmuth (2014) indicated that the best hearing sensitivity actually occurred from 2–26 kHz. It is important to note that FWS, in another recent proposed authorization, indicated that the sea otter's best hearing sensitivity occurred between 1.25 and 27 kHz (83 Fed. Reg. 18333), which is more comparable to the hearing data provided by Ghoul and Reichmuth (2014). FWS should not have differing stances on a sea otter's best hearing sensitivity when the underlying data are the same.

³⁰ Based on a cumulative sound exposure level (SEL_{cum}).

³¹ FWS also used a source level based on peak sound pressure level (SPL_{peak}) rather than either SEL_{cum} or root-mean-square sound pressure level (SPL_{rms}), which are necessary when dealing with SEL_{cum}-based thresholds and weighting factor adjustments.

³² The appropriate TTS threshold for impulsive sources is 188 dB re 1 μ Pa²-sec.

³³ FWS used the user spreadsheet tab for stationary, *non-impulsive* sound sources. Airguns that are used in 3D seismic surveys are considered mobile, *impulsive* sound sources. VSP activities are stationary, *impulsive* sources, similar to impact pile driving.

³⁴ Including whether it is stationary or mobile.

³⁵ Assuming 160 dB re 1 μ Pa at 10 m for the source level, a weighting factor adjustment of 2.5 kHz, and 4.8 hours of activities as specified in Table 6 of the preamble.

The additional information FWS attempted to use to support the use of the 160-dB re 1 μ Pa threshold for non-impulsive, continuous sound sources results in numerous inaccuracies and misinformation. This highlights that use of the 160-dB re 1 μ Pa threshold is arbitrary and gives the appearance of an attempt to reduce the numbers of Level B harassment takes. Until such time that the 120- and 160-dB re 1 μ Pa thresholds are updated, the Commission again recommends that FWS use the 120- rather than 160-dB re 1 μ Pa threshold to estimate the extents of the Level B harassment zones and numbers of sea otter takes when non-impulsive, continuous sources are proposed for use (including vibratory pile driving and water jetting³⁶, as described in the preamble). If FWS does not implement the Commission's recommendation yet again, the Commission further recommends that FWS use 141 dB re 1 μ Pa as the Level B harassment threshold for non-impulsive, continuous sources based on monitoring data from ESNERR (2011).

Non-impulsive, intermittent sources—The Level B harassment thresholds currently are based on impulsive or continuous sources. Hilcorp and Harvest have proposed to use chirps, which are considered non-impulsive, intermittent sources. Researchers have observed that various species of marine mammals respond to sound from sources with similar characteristics as these (including acoustic deterrent devices, acoustic harassment devices, pingers, echosounders, and sonars) at received levels below 160 dB re 1 μ Pa³⁷. The Commission has noted in numerous letters³⁸ that chirps have temporal and spectral characteristics suggesting that a lower, more precautionary Level B harassment threshold of 120 dB re 1 μ Pa would be more appropriate than the 160-dB re 1 μ Pa threshold. Since the current behavior thresholds do not reflect the best available science regarding the temporal and spectral characteristics of non-impulsive, intermittent sound sources and their impacts on marine mammals, the Commission recommends that, *until* the behavior thresholds are updated, FWS require applicants to use the 120- rather than 160-dB re 1 μ Pa threshold for intermittent, non-impulsive sources (such as chirps³⁹).

Interagency consultation—In previous letters regarding these matters, the Commission had strongly suggested that FWS consult with NMFS regarding the appropriateness of the various thresholds. FWS has yet to take the Commission's advice. The unnecessary confusion afforded the Commission and the public based on the inaccuracies in the preamble and the resulting confusing ramifications for action proponents who must deal with both FWS and NMFS, make it clear that FWS should be consulting with NMFS. FWS has not provided informal or formal comments during any of the four public review comment periods for NMFS's PTS thresholds since 2013⁴⁰. FWS also did not participate with the 11 other federal agencies⁴¹ during NMFS's 2017 interagency consultation regarding its final PTS thresholds. Given that FWS is one of only two regulatory agencies

³⁶ These activities also would include tug towing, anchor handling, and hydraulic grinding if FWS retains those activities in the final rule.

³⁷ See Watkins and Schevill 1975, Olesiuk et al. 1995, Kastelein et al. 1997, Kastelein et al. 2000, Morton 2000, Culik et al. 2001, Kastelein et al. 2001, Carlström et al. 2002, 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.

³⁸ See the Commission's most recent [19 March 2019 letter](#) detailing this matter.

³⁹ This also would apply to echosounders.

⁴⁰ Six federal agencies provided formal written comments on the proposed thresholds.

⁴¹ Including NMFS, the Commission, Bureau of Ocean Energy Management, Department of State, Federal Highway Administration, National Park Service, National Science Foundation, U.S. Air Force, U.S. Army Corps of Engineers, U.S. Geological Survey, and U.S. Navy.

responsible for authorizing the incidental taking of marine mammals based on the various thresholds, the Commissions recommends that FWS take a more active role in the development, review, and implementation of any and all acoustic and behavior thresholds for marine mammal species under its jurisdiction and consult with NMFS on whether, when, and how NMFS's current thresholds should be implemented.

Number of individual sea otters taken vs. number of takes

FWS has proposed that a very small number of sea otters could be taken by Level B harassment relative to the estimated number of sea otter takes (93 individual otters and 1,662 takes during the five-year period, see Tables 8, 9, and 12 in the *Federal Register* notice)⁴². The number of individuals estimated to be taken during the course of the regulations is unrealistic based on the types of activities being conducted and the location and duration of those activities. Mobile activities, such as seismic and geohazard surveys, would be conducted over a large area and an extended period of time, resulting in the exposure of more individuals than would be exposed for stationary sources, such as pile driving. This is further exacerbated by the fact that FWS effectively underestimated the total number of days that activities could occur by a factor of up to four, as noted in a previous section of this letter. The Commission recommends that FWS require the applicants to review the method used to estimate the number of individual sea otters that could be taken by both Level A and B harassment during the various activities and adjust the takes accordingly.

Mitigation and monitoring measures

Sound source verification and establishment of harassment zones—Hilcorp and Harvest's 4MP states that they plan to perform a sound source verification (SSV) for the 3D seismic survey in lower Cook Inlet and will work with FWS to determine if an SSV is needed for other activities occurring in the project area. However, FWS did not include a requirement in the proposed rule for any of the applicants to conduct an SSV for any seismic or other proposed activities. The Commission recommends that FWS require the applicants to conduct SSVs at the beginning of the proposed activities for any sound sources for which in-situ measurements have not been made for similar activities in Cook Inlet and use those measurements to verify and adjust, if necessary, the extents of the Level A and B harassment zones.

Power downs as an alternative to shutdowns—FWS has proposed to use power-down procedures⁴³ during seismic survey activities as an alternative to implementing a full shutdown when an animal is detected within or approaching the Level A harassment zone, which would necessitate a ramp up of the full array. Power downs also may be used at the operators' discretion to reduce the likelihood of a Level B harassment take. In a mitigation and monitoring workshop for seismic surveys, industry representatives indicated that power downs may ultimately increase sound input to the marine environment due to the need to subsequently re-shoot the trackline to prevent gaps in data acquisition (unpublished workshop report, 2012; 82 Fed. 26255). For that reason and because a power down may not actually be useful, NMFS has prohibited the use of power-downs in its

⁴² The number of individual otters that could be taken by Level A harassment and the number of Level A harassment takes are similarly small relative to some of the activities.

⁴³ Power down refers to reducing the seismic array to a single element or airgun.

issuance of incidental harassment authorizations for taking of marine mammals associated with geophysical surveys in the Atlantic Ocean (83 Fed. Reg. 63350), which the Commission supported. The Commission therefore recommends that FWS prohibit the applicants from using power-down procedures as a mitigation measure for seismic surveys in Cook Inlet.

Use of a “mitigation gun”—FWS also would allow the use of a 10-in³ mitigation gun to avoid requiring operators to ramp up after the full array has not been in use (e.g., during a line turn, low visibility conditions, or other short-term interruption of seismic survey activities). In its issuance of incidental harassment authorizations for taking of marine mammals associated with geophysical surveys in the Atlantic Ocean, NMFS required that the acoustic source be deactivated when not acquiring or preparing to acquire data, except as necessary for testing, and that unnecessary use of the acoustic source be avoided (83 Fed. Reg. 63351). The Commission supports that requirement for the reasons previously stated and recommends that FWS prohibit the use of a mitigation gun to avoid implementing ramp-up procedures.

Placement and number of observers for mitigation and monitoring purposes—The *Federal Register* notice indicated that an observer may be deployed on the mitigation vessel during seismic surveys. However, it was unclear whether an observer also would be deployed on the source vessel. Deployment of the protected species observer on the source vessel would ensure that the applicable Level A and B harassment zones would be monitored, as those are based on the radial distance from any element of the airgun array. The best vantage point for 360° observations of the harassment zones would be from the source vessel rather than a vessel located on one side or the other of the array. The Commission recommends that FWS require that the applicants place an observer on the source vessel during seismic surveys; placing observers on other vessels is encouraged but should not be a substitute for the placing an observer on the source vessel.

The number and location of the observers were not stipulated for any of the other proposed activities. Rather the proposed rule indicated that a sufficient number of observers would monitor the Level A harassment zone 100 percent of the time. The preamble and proposed rule were silent on whether observers would monitor the Level B harassment zone and for what percentage of the time and where observers would be located in general⁴⁴. In some instances, particularly when the Level A and B harassment zones are recalculated, those zones may be quite large. Observers serve two functions, one is to implement mitigation and the other is to record and ensure the number of authorized takes is not met or exceeded. In the absence of the necessary information, it is unclear how FWS can determine that the measures would be effecting the least practicable adverse impact on the two stocks of sea otters. The Commission recommends that FWS require the applicants to specify how many observers would be monitoring for sea otters and where the observers would be placed and ensure that both the Level A and B harassment zones are observed during all activities. If the far extent of the Level B harassment zones cannot be monitored, the Commission recommends that FWS require the applicants to extrapolate the number of observed takes in a given area to the

⁴⁴ Some of this information is included in Hilcorp and Harvest’s 4MP. AGDC does not have a plan, so that information is unknown.

far extents of the Level B harassment zone and ensure that the number of authorized takes is not exceeded.

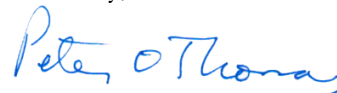
Reporting of injured, dead, or distressed sea otters—FWS has proposed that operators notify FWS or the Alaska Sea Life Center within 48 hours of an injured, dead, or distressed sea otter being observed, irrespective of whether an injury or death was associated with proposed activities (section 18.136(b) and 18.139(f) of the proposed rule). Any injury or death of a sea otter associated with the proposed activities should be reported immediately to FWS or the Alaska Sea Life Center. And, in the past, FWS has specified that notification of injured or dead otters not associated with project activities occur within 24 hours to allow for a more timely response by trained personnel as warranted. As such, the Commission recommends that FWS require the operators to notify FWS or the Alaska Sea Life Center (1) immediately if a sea otter is injured or killed during any of the proposed activities and (2) within 24 hours of observing an injured, dead, or distressed sea otter that the observer determined is not associated with project activities.

Revise and republish

Based on the numerous inconsistencies, ambiguities, and incorrect assumptions identified in the preamble to the proposed rule, and, more significantly, the errors associated with the estimation of the Level A and B harassment zones and numbers of takes, the Commission is unable to determine whether the FWS's negligible impact and small numbers determinations are valid and whether the mitigation measures would effect the least practicable adverse impact on the two stocks of sea otters. As such, neither the Commission nor the public were afforded an opportunity to provide informed and meaningful comments. This issue was further exacerbated by the fact that FWS provided only a 15-day comment period in its original *Federal Register* notice requesting comment on the proposed rule⁴⁵. Even though FWS provided an additional 15-day comment period, commenters were forced to spend time on requesting an extension on the comment period rather than reviewing the petition and *Federal Register* notice. Therefore, the Commission recommends that FWS (1) consult with the applicants regarding the numerous issues raised in this letter and direct them to revise the petition accordingly and (2) publish a revised proposed rule with a 30-day comment period prior to issuance of a final rule.

I trust these comments will be helpful. Please let me know if you or your staff have questions with regard to the Commission's recommendations.

Sincerely,



Peter O. Thomas, Ph.D.
Executive Director

cc: Diane Bowen, FWS
Jolie Harrison, National Marine Fisheries Service, Office of Protected Resources
Jon Kurland, National Marine Fisheries Service, Alaska Regional Office

⁴⁵ See the Commission's [22 March 2019 letter](#) on this issue.

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