EARTHJUSTICE

April 16, 2019

Via Certified U.S. Mail, Return Receipt Requested

Naval Facilities Engineering Command Pacific
Attention: MITT Supplemental EIS/OEIS Project Manager
258 Makalapa Drive, Suite 100
Pearl Harbor, HI 96860–3134

Re: Request for Comment on Draft Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement for Mariana Islands Training and Testing, 84 Fed. Reg. 677 (Jan. 31, 2019); 84 Fed. Reg. 8,515 (Mar. 8, 2019); 84 Fed. Reg. 12,238 (Apr. 1, 2019)

To Whom It May Concern:

Earthjustice submits these comments on behalf of Tinian Women Association, Guardians of Gani', PåganWatch, and Center for Biological Diversity in response to the U.S. Navy's request for public input on the Draft Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement ("SEIS") for Mariana Islands Training and Testing ("MITT"). *See* 84 Fed. Reg. 677 (Jan. 31, 2019); 84 Fed. Reg. 8,515 (Mar. 8, 2019); 84 Fed. Reg. 12,238 (Apr. 1, 2019).

The National Environmental Policy Act ("NEPA") commands all federal agencies, including the Navy, to prepare an environmental impact statement ("EIS") for all "major Federal actions significantly affecting the quality of the human environment." 42 U.S.C. § 4332(2)(C). "The primary purpose of an [EIS] is to serve as an action-forcing device to insure that the policies and goals defined in [NEPA] are infused into the ongoing programs and actions of the Federal Government." 40 C.F.R. § 1502.1. An EIS must "provide full and fair discussion of significant environmental impacts and [must] inform decisionmakers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment." *Id.* An EIS must discuss, among other things: the environmental impact of the proposed federal action, any adverse and unavoidable environmental effects, any alternatives to the proposed action, and any irreversible and irretrievable commitment of resources involved in the proposed action. 42 U.S.C. § 4332(2)(C); *see also id.* § 4332(2)(E).

Effects of the Action

The Draft SEIS falls far short of complying with NEPA's command for the Navy to take a "hard look" at the environmental consequences of its proposed training and testing activities in the Mariana Islands. *'Ilio'ulaokalani Coalition v. Rumsfeld*, 464 F.3d 1083, 1094 (9th Cir. 2006). To

MID-PACIFIC 850 RICHARDS STREET, SUITE 400 HONOLULU, HI 96813
T: 808.599.2436 F: 808.521.6841 MPOFFICE@EARTHJUSTICE.ORG WWW.EARTHJUSTICE.ORG

comply with NEPA, the SEIS must thoroughly analyze all impacts associated with all proposed activities, including all "ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health" effects. 40 C.F.R. § 1508.8. Among other things, the SEIS must analyze the impacts to local communities from noise, restrictions on access to fishing grounds, restrictions on access to beaches used for recreation and subsistence activities, and disruptions to marine and air transportation between the Mariana Islands that is vital for, among other things, access to emergency medical treatment. The SEIS must disclose all impacts, "whether direct, indirect, or cumulative." *Id.*

Cumulative Impacts

With respect to cumulative impacts, the SEIS must consider the full range of past, current and planned future military activities in the Mariana Islands. *See id.* §§ 1508.7, 1508.25(a)(2) & (c). The quality of life of local communities in the Mariana Islands is threatened by a wide range of current and proposed military activities that the Navy is obliged to, but failed to, examine fully in the SEIS.

The Draft SEIS acknowledges the Navy's duty to analyze the cumulative impacts of a number of past, present and reasonably foreseeable "military mission, testing, and training activities" in the Marianas, including, but not limited to, the relocation of thousands of Marines from Okinawa to Guam, the Commonwealth of the Northern Mariana Islands ("CNMI") Joint Military Training ("CJMT") proposal, and Divert activities and exercises. *See* Draft SEIS at Table 4.2-1. Unfortunately, the Draft SEIS then fails to take the requisite "hard look" and, instead, provides only cursory, conclusory statements.

For example, the Draft SEIS states vaguely that "[o]ther military activities that limit access to popular fishing sites could increase cumulative socioeconomic impacts on commercial, recreational, and subsistence fishers beyond impacts associated with the Proposed Action." *Id.* at 4-45. The Draft EIS then notes the potential for "significant cumulative impacts on certain socioeconomic resources in the Study Area … if they resulted in extensive limitations on accessibility by residents, businesses, and tourists to ocean areas needed for commercial, recreational, and subsistence fishing and tourism." *Id.*

The Draft SEIS fails, however, to "provide any objective quantification" of these potentially significant impacts, and "[t]he reader is not told what data the conclusion was based on, or why objective data cannot be provided." *Klamath–Siskiyou Wildlands Ctr. v. Bureau of Land Mgmt.*, 387 F.3d 989, 994 (9th Cir. 2004). Such "[g]eneral statements about possible effects and some risk" do

not satisfy NEPA. *Neighbors of Cuddy Mountain v. U.S. Forest Serv.*, 137 F.3d 1372, 1380 (9th Cir. 1998).[1]

Impacts to Marine Mammals

MITT activities threaten serious harm to marine mammals, with Navy use of sonar and explosives posing particularly significant threats. *See generally* U.S. Navy, *Request for Regulations and Letter of Authorization for the Incidental Taking of Marine Mammals Resulting from U.S. Navy Training Activities in the Mariana Islands Training and Testing Study Area* (Feb. 2019) ("LOA Application") (seeking authorization to harm marine mammals in conducting MITT activities); 84 Fed. Reg. 9,495 (Mar. 15, 2019). To satisfy NEPA's command to provide "high quality" environmental information to public officials and the public, the Navy must evaluate those impacts based on the most up-to-date scientific information available. *See* 40 C.F.R. § 1500.1(b).

As a threshold matter, the Draft SEIS's analysis of impacts to marine mammals relies substantially on scientific recommendations about marine mammal noise exposure criteria that are over a decade old. *See, e.g.*, Draft SEIS at 3.4-93 (citing Southall et al., 2007). The Navy must revise its analysis to incorporate the latest scientific knowledge on this critical topic. *See, e.g.*, Southall et al., *Marine Mammal Noise Exposure Critieria: Updated Scientific Recommendations for Residual Hearing Effects*, Aquatic Mammals, 45(2): 125-232 (Mar. 2019) (enclosed).

In addition, the Draft SEIS fails to take the legally required "hard look" at the impacts to marine mammals in the Marianas of stranding events related to the Navy's use of sonar, including, but not limited to, mid-frequency active ("MFA") sonar, and explosives. As the Navy has previously acknowledged, "[s]onar use during exercises involving the U.S. Navy has been identified as a contributing cause or factor in five specific mass stranding events" that "have resulted in about 40 known cetacean deaths, consisting mostly of beaked whales and with close linkages to mid-frequency active sonar activity." LOA Application at 92.[2] The Navy has further

---

[1] The Navy has already prepared final or draft NEPA documents for the military projects listed in Table 4.2-1, so the Navy has no excuse for its failure to provide more detailed, quantitative analysis, including the "underlying environmental data." *Klamath–Siskiyou Wildlands Ctr.*, 387 F.3d at 993 (citation omitted).

[2] The Navy knows that beaked whales are particularly vulnerable to navy sonar, with beaked whales—the overwhelming majority of which were Cuvier's beaked whales—the victims of all five mass stranding events "that the U.S. Navy has agreed were associated in time and location with the use of sonar." U.S. Navy, *Marine Mammal Strandings Associated with U.S. Navy Sonar Activities* at 15 (June 2017); *see also id.* at 14-19; LOA Application at 92.

conceded that "[i]mpulsive sources (e.g., explosions) also have the potential to contribute to strandings." LOA Application at 165.

In the Draft SEIS, the Navy notes that many marine mammals have died or been injured in stranding events in the Mariana Islands, including species known to be extremely sensitive to anthropogenic noise, including Navy sonar. *See, e.g.*, Draft SEIS at 3.4-8. Such species include Cuvier's beaked whales, which the draft SEIS notes has had repeated stranding events in the Marianas in the past 12 years and is known to be particularly vulnerable to Navy sonar. *Id.* at 3.4-28. The Draft SEIS fails to mention, however, that "MFA sonar was detected near Saipan concurrent with [the August 21, 2011] stranding event involving two Cuvier's beaked whales." Simonis et al., *Mid-frequency active sonar and beaked whale acoustic activity in the Northern Mariana Islands*, Journal of the Acoustical Society of America, 140(4) (November 2016) (enclosed).

Similarly, the Draft SEIS notes that melon-headed whales experienced a "mass stranding" event involving a few hundred animals at Sasanhaya Bay, Rota in 2004, but fails to disclose or analyze the implications of a National Oceanic and Atmospheric Administration ("NOAA") study that concluded a similar mass stranding event involving melon-headed whales in Hawai'i was likely caused by Navy sonar. Draft SEIS at 3.4-35; *see* Southall et al., *Hawaiian Melon-headed Whale (Peponacephala electra) Mass Stranding Event of July 3-4, 2004*, NOAA Technical Memorandum NMFS-OPR-31 (April 2006) (enclosed); *see also* Draft SEIS at 3.4-36 ("melon-headed whales may be particularly sensitive to impacts from anthropogenic sounds").

That Navy sonar may be responsible for the Cuvier's beaked whales and melon-headed whales that died and were injured in these stranding events cannot be dismissed lightly. The Navy failed, however, to disclose and analyze in its Draft SEIS the potential link between the Navy's use of sonar and explosives and these stranding events, or the multiple other stranding events in the Marianas involving Cuvier's beaked whales, melon-headed whales, and other marine mammal species. *See, e.g.*, Draft SEIS at 3.4-28 (four known dwarf sperm whale strandings in the Mariana Islands), 3.4-30 (three reported false killer whale strandings in Study Area), 3.4-35 (melon-headed whale strandings on Guam in 1980 and 2009), 3.4-38 (stranding of pygmy sperm whale in Study Area).

Overall, the Draft SEIS's failure to take the requisite hard look at the potential for Navy sonar and explosives to provoke stranding events that cause death or injury to marine mammals violates NEPA's command to "insure that [high quality] environmental information is available to public officials and citizens before decisions are made and before actions are taken." 40 C.F.R. § 1500.1(b).

Alternatives

The alternatives section "is the heart of the environmental impact statement." *Id.* § 1502.14. In this section, the Navy must "[r]igorously explore and objectively evaluate all reasonable alternatives," devoting "substantial treatment to each alternative considered in detail ... so that reviewers may evaluate their comparative merits." *Id.* § 1502.14(a), (b). The core purpose of the alternatives analysis is to "sharply defin[e] the issues and provid[e] a clear basis for choice among options by the decisionmaker and the public." *Id.* § 1502.14.

As discussed above, local communities in the Mariana Islands face serious threats from military activities. Accordingly, in the scoping comments we submitted for the SEIS in September 2017, we urged the Navy to consider a range of alternatives that would allow the Navy to carry out its mission while avoiding or, at least, minimizing the impacts on those communities. As noted in our scoping comments, reasonable alternatives include eliminating or severely restricting training and testing activities in locations that would inflict high levels of noise on the civilian population, would restrict access to fishing grounds, would restrict access to beaches used for recreation or subsistence, and/or would disrupt the ability of civilians to travel between islands by air or sea (*e.g.*, to access medical treatment or visit with relatives). The Draft SEIS fails to consider any such alternatives, violating NEPA's command "to permit informed public comment on ... choices or alternatives that might be pursued with less environmental harm." *Lands Council v. Powell*, 395 F.3d 1019, 1027 (9th Cir. 2004).

In our scoping comments, we also urged the Navy to consider alternatives that eliminate—or, at least, severely limit—training and testing activities in biologically sensitive areas. After all, as NOAA has recognized, there is a general consensus among the scientific community that "[p]rotecting important marine mammal habitat is ... the most effective mitigation measure currently available" to reduce the harmful impacts of mid-frequency sonar on marine mammals. Letter from Jane Lubchenco, then-Under Secretary of Commerce for Oceans and Atmosphere, to Nancy Sutley, then-Chair of the Council on Environmental Quality, at 2 (Jan. 19, 2010) (enclosed). We specifically urged the Navy to consider alternatives that impose restrictions on MITT activities in areas identified as likely calving grounds for humpback whales during the winter months when humpbacks are present in the Marianas (December to April).

Unfortunately, the Draft SEIS fails to evaluate any alternative that would prohibit all use of sonar in the two "geographic mitigation areas" proposed for humpbacks—Marpi Reef and Chalan Kanoa Reef—during the few months when humpbacks are present in the Mariana Islands to breed, birth and nurse. Instead, the Draft SEIS examines only a single alternative, in which the Navy would merely report to NMFS the total hours of MF1 surface ship hull-mounted MFA sonar used in these areas. Draft SEIS at I-12, I-20. This proposed "mitigation" does nothing to protect humpbacks.

It is entirely feasible and reasonable for the Navy to consider alternatives that prohibit the use of sonar altogether in these limited portions of the MITT Study Area during the few months when humpbacks are present. The Navy is proposing to establish a "geographic mitigation area" to benefit spinner dolphins in the nearshore waters of Agat Bay, Guam, where MF1 sonar will be prohibited year-round. *Id.* at I-24 to I-26. In Hawai'i, the Navy likewise has prohibited all use of MF1 sonar in the 4-Islands Region Mitigation Area during the winter months when humpbacks are present. U.S. Navy, *Hawaii-Southern California Training and Testing Final EIS/OEIS* at 5-70 to 5-72 (Oct. 2018) (excerpts enclosed). The Navy has no excuse for refusing to consider alternatives involving a similar prohibition in important humpback whale habitat off Saipan.

Thank you for your consideration of these comments. Please feel free to contact me via email (dhenkin@earthjustice.org) or telephone (808-599-2436, ext. 6614) if you would like to discuss our concerns.

Sincerely,

David L. Henkin
Staff Attorney

DLH/tt
Enclosures

cc: Jolie Harrison, Chief, Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service (via electronic mail)

Full

Published Online: 18 November 2016

Mid-frequency active sonar and beaked whale acoustic activity in the Northern Mariana Islands

The Journal of the Acoustical Society of America **140**, 3413 (2016);
https://doi.org/10.1121/1.4970970

Anne Simonis *and* Bruce Thayre

- Scripps Inst. of Oceanogr., 9500 Gilman Dr., La Jolla, CA 92037-0205, asimonis@ucsd.edu

Erin Oleson

- Pacific Islands Fisheries Sci. Ctr., National Oceanic and Atmospheric Administration, Honolulu,

more...


ABSTRACT

Mid-frequency active (MFA) sonar has been associated with multiple mass stranding events of beaked whales around the world. A recent increase in military training exercises in the Mariana Archipelago corresponds with the presence of MFA sonar in the surrounding waters. We provide a quantitative report on MFA sonar and beaked whale acoustic activity detected on two autonomous acoustic recording packages deployed near Saipan and Tinian from March 2010 through December 2013. There were no detections of MFA sonar at Saipan during the 5-month deployment in 2010. On August 21, 2011, MFA sonar was detected near Saipan concurrent with a stranding event involving two Cuvier's beaked whales (*Ziphius cavirostris*). After one observed day of MFA sonar activity in Saipan and Tinian in 2011, observations increased to 1 month of ongoing activity at Saipan and nearly 3 months ongoing activity at Tinian in 2012. In 2013, MFA sonar events were observed during one day at Saipan and zero days at Tinian. Received levels, sound exposure levels, and temporal descriptions of the MFA sonar events are reported along with detections of beaked whale acoustic activity. Here, we highlight the importance of ongoing passive acoustic monitoring, especially for species like beaked whales that are difficult to visually detect at sea.

UNITED STATES DEPARTMENT OF COMMERCE
The Under Secretary of Commerce
for Oceans and Atmosphere
Washington, D.C. 20230

JAN 19 2010

Ms. Nancy Sutley
Chair, Council on Environmental Quality
730 Jackson Place, NW
Washington, DC 20503

Dear Nancy,

I write to report to you on the National Oceanic and Atmospheric Administration's (NOAA) review of mitigation measures in rules authorizing take of marine mammals incidental to Navy training exercises, and to inform you of the plan with respect to future work with the Navy on possible additional mitigation measures.

As you recall, on January 20, 2009, as the Obama Administration was taking office, NOAA's National Marine Fisheries Service (NMFS) was in the process of publishing a regulation that would establish a framework to authorize the take of marine mammals incidental to the Navy training exercises involving use of mid-frequency active sonar on its ranges along the Atlantic Coast and in the Gulf of Mexico. Earlier in January, NMFS had published similar rules related to the take of marine mammals incidental to Navy training on Navy training ranges in Hawaii and Southern California. This issue has a history of being controversial, and you requested that NOAA conduct a comprehensive review of all mitigation measures applicable to the use of sonar.

NMFS intended the comprehensive review to give the new Administration an opportunity to understand the process used to develop the rules, and also to evaluate the adequacy of the mitigation measures required by the rule. Each rule took months to develop jointly by the Navy and NOAA scientists, with input from the public during a comment process on the proposed rules. For each rule, an Environmental Impact Statement (EIS) was prepared by the Navy and adopted by NOAA regarding Navy training exercises. In addition to the EISs, for each rule, NMFS prepared an Environmental Assessment in which it specifically considered a suite of mitigation measures, many of which had been recommended by members of the public during the public comment process. In those assessments, NMFS evaluated the potential effectiveness and benefit of each possible mitigation measure. Also, as required by the Marine Mammal Protection Act, NMFS reviewed the practicability of each of the mitigation measures in light of the impact on personnel safety, the practicality of implementation, and the impacts on the Navy's ability to achieve its training goals.

In the Environmental Assessments, NMFS also identified the relevant uncertainties regarding the impacts of the proposed training on marine mammals. Two are worth highlighting. One involves lack of knowledge about the mechanisms whereby some species of marine mammals, particularly beaked whales, are adversely affected by mid-frequency active sonar. The other concerns the difficulties of limiting the impact of active sonar where the mitigation efforts depend on visual sighting of whales. The ongoing mitigation efforts, in our view, must do more

to address both of these uncertainties. NMFS included adaptive management provisions in the rules as a mechanism for improving the effectiveness of mitigation, as appropriate. NMFS also required the Navy to provide after-action reports following each exercise, which NMFS will monitor and use to modify mitigation measures, as appropriate. Thus, there are some mechanisms already in place to improve mitigation measures in the long run as new information becomes available.

In the short run, as a result of our findings in this review, NOAA will undertake three specific activities to address the issue of whether there are areas of biological significance impacted by these permitted activities and others undertaken under permits from NMFS (such as oil and gas exploration). First, NMFS, in concert with other civilian agencies (e.g., Minerals Management Service), would like to reinitiate comprehensive aerial cetacean and sea turtle surveys (i.e., multipurpose surveys). I will encourage the Navy to be part of the planning process for these new surveys, and to support their implementation. These surveys will provide not only fine-scale density estimates of whales in particularly sensitive or otherwise important areas (e.g., the ranges), but also provide improved population estimates supporting listing decisions and activities of take reduction teams.

Second, NMFS will conduct a workshop to develop a plan for estimating a comprehensive sound budget for the oceans. We will invite the Navy and other agencies to take part. There is currently a great deal of concern that a variety of human sources of marine sound (e.g., vessel traffic, seismic activity, sonar, and construction activities) are acting in a cumulative way to degrade the environment in which sound-sensitive animals communicate. There are no comprehensive baselines with which to measure the cumulative sound impacts such as increased military vessel traffic and emitted sound, e.g., in the ranges.

Third, NMFS will organize another workshop this year to learn more about marine mammal "hot spots." The Navy and NMFS have made substantial investments in models of existing whale distribution and environmental data to predict abundance and distribution of whales and other mammals in specific locations. As part of this focus, the workshop will evaluate these models, developed primarily for the Northwest Atlantic and the California Current and eastern tropical Pacific, and assess their general applicability. Such models, if verified, have great potential to assist in the design of appropriate mitigation measures that are effective and efficient. Protecting important marine mammal habitat is generally recognized to be the most effective mitigation measure currently available.

In addition, there are ongoing activities that NMFS will be conducting with the Navy because they are required by the permits that have been issued. For example, NMFS has required that the Navy convene a workshop to review and modify, as appropriate, the monitoring measures included in the regulations. This workshop is scheduled for 2011 to give agencies time to gain experience with the rules, to collect information for analysis at the workshop, and to identify any needed changes to improve the monitoring program. NMFS and the Navy have agreed to conduct a pre-workshop in 2010 to allow the public an opportunity to provide input and prepare for the 2011 workshop.

All of the planned workshops should lead to substantial new information related to improved mitigation strategies for military activities that would be implemented through the adaptive management provisions of the permits. Based on the information developed in these workshops, I will encourage NMFS and the Navy and other permittees to address the uncertainties identified above and to evaluate additional methods to reduce further any adverse effects on marine mammals resulting from the Navy's training exercises or other activities that may impact marine mammals or other protected resources.

In addition, NMFS included in various final rules, a requirement that the Navy develop an integrated comprehensive monitoring program, which it recently completed and will go into effect immediately. Any changes to the monitoring program will be made during workshops with NMFS and Navy. NMFS will also continue to work with the Navy to develop and implement new tools to characterize and predict areas that are important to marine mammals in the context of developing associated measures, as appropriate, to reduce impacts to marine mammals in these important areas while allowing the Navy to meet its training goals. In several rules, NMFS required the Navy to enter into a Memorandum of Agreement requiring the Navy to assist NMFS with investigations of strandings of marine mammals. NMFS is working with the Navy to complete this Agreement as soon as possible. NMFS will recommend that the Navy further focus on, develop, and implement technologies that enhance marine mammal detection capabilities (such as passive acoustic detection on instrumented ranges) to allow for both a better understanding of marine mammal activities in the presence of military training as well as, potentially, more effective implementation of mitigation measures.

Moreover, consistent with our legal and scientific mandates, I have directed NMFS to ensure thorough reviews of the Navy's after-action reports are conducted to identify opportunities for strengthening mitigation measures; to process and integrate new information from population assessments, interagency biological response studies, and other sources into its decision making framework; and to take advantage of the adaptive mechanisms in the regulations and annual authorizations to optimize the mitigation measures that are in place for protection of marine mammal species or stocks.

Finally, as part of a settlement agreement in litigation regarding the effects of sonar training on marine mammals, the Navy and the Natural Resources Defense Council (NRDC) have begun to meet and confer to resolve outstanding differences concerning marine mammal mitigation measures. NOAA participated in the first discussion, and is committed to playing an active role in future meetings. I have met with both the Navy and NRDC over the past several months, and I have developed an understanding of the issues and of their respective positions. I believe NOAA's participation will enhance these discussions, and can help to resolve the differing views among the parties. My expectation is that the parties will identify areas of scientific disagreement and uncertainty, and will engage in a healthy debate concerning how to ensure the Navy's training activities minimize, to the least practicable impact, adverse effects on marine mammal species or stocks. I also expect the Navy to be open to new ideas and approaches to mitigation that are supported by the best available science.

At this point, NOAA's review has concluded, but our work on these issues will continue. In addition to the actions outlined above, NMFS will continue to work with the Navy, and in the event specific problems are identified, NMFS will aggressively seek appropriate solutions.

Sincerely,

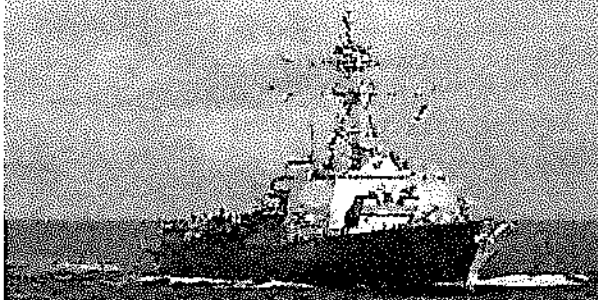
Jane Lubchenco, Ph.D.
Under Secretary of Commerce
for Oceans and Atmosphere

HAWAII-SOUTHERN CALIFORNIA TRAINING AND TESTING EIS/OEIS

UNITED STATES DEPARTMENT OF THE NAVY

FINAL OCTOBER 2018

VOLUME 3



5.4.2 Mitigation Areas for Marine Mammals in the Hawaii Range Complex

As described in Table 5.4-2 and shown in Figure 5.4-3, the Navy will implement mitigation within mitigation areas in the Hawaii Range Complex to, in combination with procedural mitigation, effect the least practicable adverse impact on marine mammal species or stocks and their habitat and to provide additional mitigation for ESA-listed marine mammal species. A description, biological assessment, and map of each area the Navy assessed is provided in Appendix K (Geographic Mitigation Assessment). This section presents a summary of the mitigation that will be implemented within mitigation areas in the Hawaii Range Complex based on the biological and operational assessment in the appendix.

Table 5.4-2: Mitigation Areas in the Hawaii Range Complex

Mitigation Area Description
Stressor or Activity • Sonar • Explosives • Vessel strikes
Resource Protection Focus • Marine mammals
Mitigation Area Requirements • **Hawaii Island Mitigation Area (year-round):** – The Navy will not conduct more than 300 hours of MF1 surface ship hull-mounted mid-frequency active sonar or 20 hours of MF4 dipping sonar, or use explosives that could potentially result in takes of marine mammals during training and testing. Should national security present a requirement to conduct more than 300 hours of MF1 surface ship hull-mounted mid-frequency active sonar or 20 hours of MF4 dipping sonar, or use explosives that could potentially result in the take of marine mammals during training or testing, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include the information (e.g., sonar hours or explosives usage) in its annual activity reports submitted to NMFS. • **4-Islands Region Mitigation Area (November 15 – April 15 for active sonar; year-round for explosives):** – The Navy will not use MF1 surface ship hull-mounted mid-frequency active sonar or explosives that could potentially result in takes of marine mammals during training and testing. Should national security present a requirement to use MF1 surface ship hull-mounted mid-frequency active sonar or explosives that could potentially result in the take of marine mammals during training or testing, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include the information (e.g., sonar hours or explosives usage) in its annual activity reports submitted to NMFS. • **Humpback Whale Special Reporting Areas (December 15 – April 15):** – The Navy will report the total hours of surface ship hull-mounted mid-frequency active sonar used in the special reporting areas in its annual training and testing activity reports submitted to NMFS. • **Humpback Whale Awareness Notification Message Area (November – April):** – The Navy will issue a seasonal awareness notification message to alert ships and aircraft operating in the area to the possible presence of concentrations of large whales, including humpback whales. – To maintain safety of navigation and to avoid interactions with large whales during transits, the Navy will instruct vessels to remain vigilant to the presence of large whale species (including humpback whales), that when concentrated seasonally, may become vulnerable to vessel strikes. – Platforms will use the information from the awareness notification message to assist their visual observation of applicable mitigation zones during training and testing activities and to aid in the implementation of procedural mitigation.

5.4.2.1 Summary of Mitigation Area Assessment

The Navy developed the mitigation areas identified in Table 5.4-2 to help avoid or reduce impacts from the Proposed Action on marine mammals in areas that the best available science suggests are important to one or more species of marine mammals for reproduction (seasonally) or occurrence as a small or resident population (year-round). As described in Appendix K (Geographic Mitigation Assessment), implementing additional mitigation in the Hawaii Range Complex beyond what is described in Table 5.4-2 would be impractical due to implications for safety, sustainability, and the Navy's ability to continue meeting its mission requirements. The appendix presents details on how each area was developed (e.g., known high-use areas of Main Hawaiian Islands insular false killer whales, habitat for the small and resident population of the Kohala resident stock of melon-headed whales) and the mitigation benefits they provide. In summary, the mitigation areas in the Hawaii Range Complex will help the Navy avoid or reduce potential impacts on one or more marine mammal species or stocks and their habitat (as well as other species that occur within the areas, such as sea turtles), such as:

- **Hawaii Island Mitigation Area.** This new mitigation will avoid or reduce potential impacts from mid-frequency active sonar and explosives on marine mammals within the mitigation area, which the best available science suggests contains important habitat for numerous small and resident populations (including Blainville's beaked whales, bottlenose dolphins, Cuvier's beaked whales, dwarf sperm whales, false killer whales, melon-headed whales, pantropical spotted dolphins, pygmy killer whales, rough-toothed dolphins, short-finned pilot whales, and spinner dolphins), important seasonal reproductive habitat for humpback whales, and critical habitat for Hawaiian monk seals.
- **4-Islands Region Mitigation Area and Humpback Whale Special Reporting Areas.** By expanding the boundaries and season of the existing mitigation area (which was known in Phase II as the Humpback Whale Cautionary Area), the Navy will further enhance protections for humpback whales from mid-frequency active sonar in the mitigation area. In particular, new data indicates that the area north of Maui and Molokai is associated with high humpback whale densities. Expanding this mitigation area will also help the Navy avoid or reduce impacts on Main Hawaiian Islands insular false killer whales, which are listed as endangered under the ESA and have been shown to have high occurrence in this area. By adding new requirements pertaining to explosives, the Navy will further avoid or reduce potential impacts on marine mammals from explosives year-round. Overall, the mitigation will avoid or reduce potential impacts from mid-frequency active sonar and explosives within the mitigation area on humpback whales (which the best available science suggests contains important seasonal reproductive habitat), numerous small and resident marine mammal populations (including bottlenose dolphins, false killer whales, pantropical spotted dolphins, and spinner dolphins), and Hawaiian monk seals. Continuing to report the total hours of surface ship hull-mounted mid-frequency active sonar used in the Humpback Whale Special Reporting Areas from December 15 through April 15 will aid the Navy and NMFS in analyzing the effectiveness of mitigation in these areas during the adaptive management process. The Humpback Whale Special Reporting Areas contain the Humpback Whale National Marine Sanctuary plus a 5-km buffer around the sanctuary, excluding the Pacific Missile Range Facility.
- **Humpback Whale Awareness Notification Message Area.** This mitigation will further help avoid or reduce potential impacts from vessel strikes and training and testing activities on humpback whales within the Hawaii Range Complex, which contains important seasonal reproductive habitat.

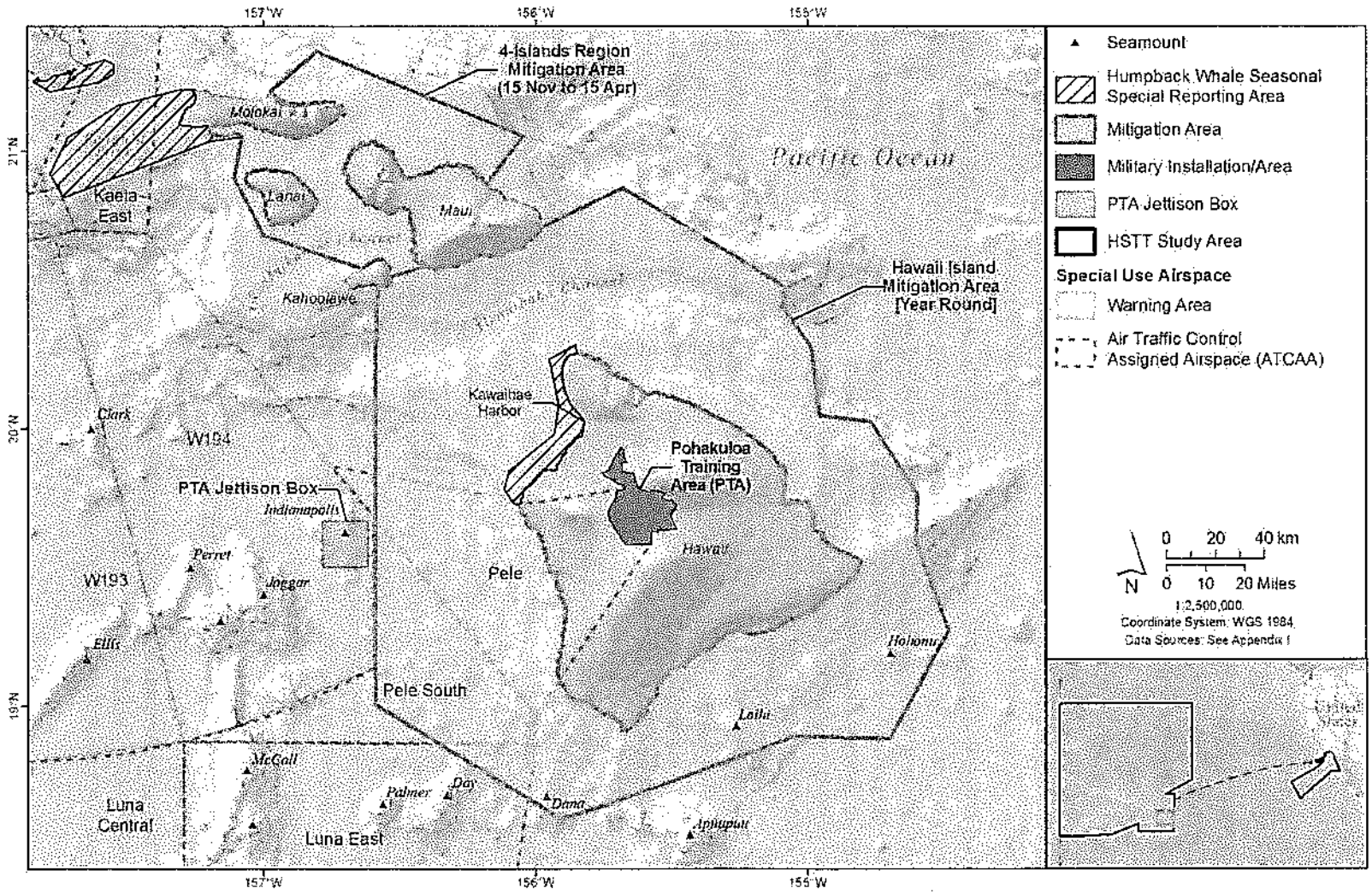


Figure 5.4-3: Marine Mammal Mitigation Areas in the Hawaii Range Complex

Notes: HSTT = Hawaii-Southern California Training and Testing

Aquatic Mammals 2019, 45(2), 125-232, DOI 10.1578/AM.45.2.2019.125

Marine Mammal Noise Exposure Criteria: Updated Scientific Recommendations for Residual Hearing Effects

Brandon L. Southall,[1,2] James J. Finneran,[3] Colleen Reichmuth,[2] Paul E. Nachtigall,[4] Darlene R. Ketten,[5,6] Ann E. Bowles,[7] William T. Ellison,[8] Douglas P. Nowacek,[9,10] and Peter L. Tyack[5,11]

[1]*Southall Environmental Associates, Inc., 9099 Soquel Drive #8, Aptos, CA 95003, USA*
E-mail: Brandon.Southall@sea-inc.net
[2]*Institute of Marine Sciences, Long Marine Laboratory, University of California, Santa Cruz, Santa Cruz, CA 95060, USA*
[3]*U.S. Navy Marine Mammal Program, Space and Naval Warfare Systems Center Pacific, Code 71510, 53560 Hull Street, San Diego, CA 92152, USA*
[4]*Hawaii Institute of Marine Biology, University of Hawaii, 46-007 Lilipuna Road, Kaneohe, HI 96744, USA*
[5]*Woods Hole Oceanographic Institution, Woods Hole, MA 02543, USA*
[6]*Harvard Medical School, Department of Otology and Laryngology, Boston, MA 02114, USA*
[7]*Hubbs-SeaWorld Research Institute, 2595 Ingraham Street, San Diego, CA 92109, USA*
[8]*Marine Acoustics, Inc., 2 Corporate Place, Middletown, RI 02840, USA*
[9]*Nicholas School of the Environment, Duke University Marine Laboratory, Beaufort, NC 28516, USA*
[10]*Pratt School of Engineering, Duke University, Durham, NC 27708, USA*
[11]*Sea Mammal Research Unit, Scottish Oceans Institute, University of St Andrews, St Andrews, Fife KY16 8LB, Scotland*

This publication is dedicated with great respect and admiration to Dr. Jeanette Thomas who was an original panel member, valued colleague, and dear friend. Jeanette was a champion of marine mammal science who set higher standards for all in terms of scholarship, integrity, and professionalism. She was a stellar role model, particularly for young women in science; an insightful editor; and a dedicated professor and mentor. She will ever continue to inspire us.

Abstract

This article evaluates Southall et al. (2007) in light of subsequent scientific findings and proposes revised noise exposure criteria to predict the onset of auditory effects in marine mammals. Estimated audiograms, weighting functions, and underwater noise exposure criteria for temporary and permanent auditory effects of noise are presented for six species groupings, including all marine mammal species. In-air criteria are also provided for amphibious species. Earlier marine mammal hearing groupings were reviewed and modified based on phylogenetic relationships and a comprehensive review of studies on hearing, auditory anatomy, and sound production. Auditory weighting functions are derived for each group; those proposed here are less flattened and closer to audiograms than the Southall et al. M-weightings. As in Southall et al., noise sources are categorized as either impulsive or non-impulsive, and criteria use multiple exposure metrics to account for different aspects of exposure. For continuous (non-impulsive) noise sources, exposure criteria are given in frequency-weighted sound exposure level (SEL, given in units relative to 1 μPa^2-s or (20 μPa^2)-s for water and air, respectively). Dual exposure metrics are provided for impulsive noise criteria, including frequency-weighted SEL and unweighted peak sound pressure level (SPL, given in units relative to 1 µPa or 20 µPa for water and air, respectively). Exposures exceeding the specified respective criteria level for any exposure metric are interpreted as resulting in predicted temporary threshold shift (TTS) or permanent threshold shift (PTS) onset. Scientific findings in the last decade provide substantial new insight but also underscore remaining challenges in deriving simple, broadly applicable quantitative exposure criteria for such diverse taxa. These criteria should be considered with regard to relevant caveats, recommended research, and with the expectation of subsequent revision.

Key Words: hearing, marine mammals, noise exposure, TTS, PTS, weighting, criteria

Hawaiian Melon-headed Whale *(Peponacephala electra)* Mass Stranding Event of July 3-4, 2004

Brandon L. Southall, Robert Braun, Frances M.D. Gulland, Ashley D. Heard, Robin W. Baird, Sarah M. Wilkin, and Teri K. Rowles

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

NOAA Technical Memorandum NMFS-OPR-31
April 2006