



By Electronic and Overnight Mail

May 24, 2006

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Re: Proposed Incidental Take Authorization for the U.S. Navy's Rim of the Pacific (RIMPAC) Training Exercise

Dear Mr. Leathery and Mr. Payne:

On behalf of the Natural Resources Defense Council ("NRDC"), the International Fund for Animal Welfare, Cetacean Society International, the League for Coastal Protection, Ocean Futures Society, Jean-Michel Cousteau, the Humane Society of the United States, the Whale and Dolphin Conservation Society, the Center for Biological Diversity, Oceana, and our millions of members, we write to express our concern over the authorization proposed for the U.S. Navy's Rim of the Pacific ("RIMPAC") exercise. 71 Fed. Reg. 20986 (Apr. 24, 2006).¹ For the numerous reasons set forth below, we urge you to deny the Navy's application.

As you know, RIMPAC is not a routine exercise: it is the largest multinational training event for the Navy's Pacific Fleet, and it involves a staggering array of activities in and around the main Hawaiian Islands. Individually and collectively, many of these activities pose a significant risk to Hawaii's unique environment. Some make use of live ordnance, some require explosives, and still others employ high-intensity, mid-frequency sonar, a technology that has been linked to a growing number of mass mortalities of cetaceans and

¹ We are aware that comments on this proposed harassment authorization may be submitted separately by government agencies, individual scientists, environmental organizations, and the public. The comments that follow do not constitute a waiver of any factual or legal issue raised by any of these organizations or individuals and not specifically discussed herein. We hereby incorporate by reference comments submitted to the Navy on its Draft Supplemental Programmatic Environmental Assessment for the 2006 RIMPAC exercise (available to the public at www.smdcen.us/rimpac06) and on its Draft Environmental Impact Statement for the Undersea Warfare Training Range (available to the public at projects.earthtech.com/USWTR/Public_Involvement/Public_Comments.html).

whose impacts on marine life have been the subject of broad scientific and public concern.² The dangers of mid-frequency sonar are well known in Hawaii. During the 2004 RIMPAC exercise, some 150-200 whales from a species that is rarely seen near shore and had never naturally mass-stranded on Hawaii came into Hanalei Bay, on the island of Kaua’I; and NMFS itself has concluded that naval sonar was a “plausible, if not likely” cause.³ In all, the Navy has proposed to conduct 44 anti-submarine warfare exercises around the islands, each exercise involving one to five sonar vessels plus one or more helicopters and fixed-wing aircraft—for a total of 532 exercise hours condensed into a four-week period. RSPEA at 2-10.

Remarkably, the Navy has asked you to authorize RIMPAC 06 through a rushed process that does not respect the scope of the exercise, the scientific literature on sonar, or the legal standards that apply. It would have you conduct your NEPA review under an environmental assessment rather than an environmental impact statement, despite the impossibility in this case of making a “finding of no significant impact”; and it would have you approve its marine mammal takes through a harassment authorization rather than a regulatory permit, despite a proven risk of whale mortalities that a mere authorization cannot cover. Yet the Navy had two years since the 2004 strandings to do the right thing—to prepare an environmental impact statement (“EIS”), conduct a proper alternatives analysis, and bring its biennial exercise into genuine compliance with the law. It did not, and now it asks your agency to join in its mistake.

From a legal perspective, the only responsible decision would be to deny the Navy’s authorization request outright. That decision would require the Navy to conduct a thorough alternatives analysis, consider the cumulative effects of multiple exercises, and work through long-term problems of mitigation, monitoring, and impact assessment before Hawaii is put through another major event. It would also keep NMFS from independently violating the MMPA and NEPA in the numerous ways that are outlined below. NMFS suggests several times in its proposed authorization that an effective monitoring and mitigation plan will cure its legal problems, but its current plan falls far short of the mark, and some of its problems are simply incurable. We are afraid, given how far the process has come, that NMFS will move forward with an authorization; in that case, we at least urge you to maximize mitigation in accordance with the law. But mainly we urge you to do the right thing by your institution—and by the species you’re entrusted to protect—and reject the Hobson’s choice that the Navy has pressed upon you.

I. THE SUFFICIENCY OF NMFS’ MITIGATION MEASURES

² For a summary of RIMPAC activities, see Navy, Rim of the Pacific (RIMPAC) Programmatic Environmental Assessment 2-1 to 42 (2002) (hereinafter cited as “PEA”); Navy, 2006 Supplement to the 2002 Rim of the Pacific (RIMPAC) Programmatic Environmental Assessment: Revised Preliminary Final 2-3 (Apr. 2006) (hereinafter cited as “RSPEA”).

³ B.L. Southall, R. Braun, F.M.D. Gulland, A.D. Heard, R.W. Baird, S.M. Wilkin, and T.K. Rowles, Hawaiian Melon-Headed Whale (Peponacephala electra) Mass Stranding Event of July 3-4, 2004 at 2 (2006) (NOAA Tech. Memo. NMFS-OPR-31).

In authorizing “take,” whether through a regulatory permit or through a one-year harassment authorization, NMFS has the burden of meeting the MMPA’s high standard for mitigation. Specifically, the agency must prescribe “methods” and “means of effecting the least practicable impact” on marine mammals and set additional “requirements pertaining to the monitoring and reporting of such taking.” 16 U.S.C. §§ 1371(a)(5)(A)(ii), (D)(vi). While NMFS is required to consult with the Department of Defense before making a determination under this provision (*id.*), the “least practicable impact” standard is, in any event, a rigorous one. *NRDC v. Evans*, 279 F.Supp.2d 1129, 1158-64 (N.D. Cal. 2003); *NRDC v. Navy*, 857 F.Supp. 734, 737-39 (C.D. Cal. 1994). As discussed below, it is clear that, in several respects, the MMPA’s mitigation standard has not been met. Nor has the agency prescribed mitigation sufficient to make an affirmative finding of negligible impact, as required by 16 U.S.C. §§ 1371(a)(5)(A)(i), (D)(i)(I).

But NMFS has placed itself under a even greater statutory burden given the inadequate procedures it proposes to follow. Effective mitigation is the basis of both the Navy’s conclusion that RIMPAC will not result in significant environmental impacts (the potential for which requires an EIS) and NMFS’ conclusion that RIMPAC will not seriously injure or kill marine mammals (impacts that could not be authorized except by regulation).⁴ The Navy’s insistence on a rushed process—its failure to do the right thing years ago and engage in a thorough environmental review—means that the bar for mitigation rises even above the MMPA’s rigorous “least practicable impact” standard.

Simply put, NEPA disfavors the use of mitigation to avoid preparation of an EIS. The Council on Environmental Quality, in interpreting its NEPA regulations, has specifically cautioned against using mitigation in this manner, stating that, “[a]s a general rule, . . . agencies should use a broad approach in defining significance and should not rely on the possibility of mitigation as an excuse to avoid the EIS requirement.” 46 C.F.R. 18026, 18038 (March 23, 1981). Courts place a substantial burden on agencies that proceed regardless of this general rule. If an agency relies on mitigation measures, such measures must “constitute an adequate buffer against the negative impacts that may result from the authorized activity.” *Nat’l Parks & Conservation Ass’n v. Babbitt*, 241 F.3d 722, 734 (9th Cir. 2001). They must “render such impacts so minor as to not warrant an EIS.” *Id.* Further, the agency may not speculate that its mitigation measures will suffice to prevent environmental harms. *Found. for N. Am. Wild Sheep v. U.S. Dept. of Agr.*, 681 F.2d 1172, 1179 (9th Cir. 1982). The measures it relies on must be supported by analytical data (*Idaho Sporting Congress v. Thomas*, 137 F.3d 1146, 1151 (9th Cir. 1998)), for uncertainty about their effectiveness only heightens the need to prepare an EIS. *Nat’l Parks & Conservation Ass’n*, 241 F.3d 722 at 735-36.

⁴ Navy, Revised Preliminary Final 2006 Supplement to the 2002 RIMPAC PEA [hereinafter “RSPEA”] at 7-2 to 7-3 (Apr. 2006); 71 Fed. Reg. 20999-20100.

Given the agency's determination to approve RIMPAC under a harassment authorization, its burden under the MMPA is also considerable. Kokechik Fishermen's Association v. Secretary of Commerce, 839 F.2d 795, 801-02 (D.C. Cir. 1988).

In summary, to avoid violating both the MMPA and NEPA, your agency must adopt mitigation that (1) effects the least practicable adverse impact, (2) renders the Navy's impacts "so minor as to not warrant an EIS," (3) is backed by data sufficient to clearly support a Finding of No Significant Impact, (4) ensures that takes do not exceed the MMPA's negligible impact standard, and (5) precludes the risk of serious injury or mortality, which can be authorized only by regulation. NMFS' mitigation measures as proposed do not meet these stringent requirements.

A. Geographic Exclusions

Geographic exclusion has been recognized by the IWC Scientific Committee, by other international bodies, by foreign governments, and by expert commentators as an essential mitigation measure for producers of intense ocean noise.⁵ Its use in this case is absolutely critical given the distances at which impacts are expected and the extraordinary difficulty of monitoring species even within a short distance of a sonar vessel, which typically would be moving through the ocean at rapid speed, as fast as 20-30 knots. NMFS must improve its geographic mitigation.

1. Coastal Exclusion Zone

In its draft authorization, NMFS proposes a coastal exclusion zone for mid-frequency sonar operations that would run 25 km seaward of the 200 m isobath around the Hawaiian islands. 71 Fed. Reg. 20998. While including a coastal exclusion of any kind represents an improvement over the Navy's standard operating procedure, NMFS' exclusion zone does not adequately protect island-associated populations from significant impacts. Aerial survey data indicate that short-finned pilot whales, spotted dolphins, spinner dolphins, and bottlenose dolphins occur in higher densities within 25 nm of shore;⁶ and data from a ship-based study confirm that at least some of these

⁵ See, e.g., International Whaling Commission, 2004 Report of the Scientific Committee at Annex K and § 12.2.5.3; CONAMA [Brazil] -National Environment Council Res. 305 (July 2004) (excluding seismic exploration from Abrolhos Banks to protect humpback whales); Statement of Bono Martinez (3 Nov. 2004) and Resolución 79/2004, 102 Boletín Oficial del Estado 16643-45 (excluding sonar exercises from Canary Islands); Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea, and Contiguous Atlantic Area (ACCOBAMS) Res. 2.16, Adopted at the 2nd Meeting of Parties in Majorca, Spain (2004); IUCN-World Conservation Union, Resolution 53 (Undersea Noise Pollution), Adopted at the 3rd World Conservation Congress in Bangkok, Thailand (2004).

⁶ J. Barlow, Cetacean Abundance in Hawaiian Waters Estimated from a Summer/Fall Survey in 2002, 22 Marine Mammal Science 457-58 (2006) (comparing Barlow's results to Mobley's).

species occur with some frequency within the outer half of that range.⁷ Given the available evidence, an appropriate basic exclusion zone for these species would run 25 nm, rather than 25 km, from the 200 m isobath. NMFS gives no indication that such distances are impracticable for the Navy; indeed, the Royal Australian Navy's guidelines, which include a seasonal zone of 30 nm for sonars operating above at 210 dB re 1 μ Pa, demonstrate the practicability of an exclusion that is almost twice the distance currently proposed.⁸ It is essential, moreover, that the exclusion area be protected with a buffer zone that effectively minimizes species take. During the 2004 mass stranding of melon-headed whales, which appears to have occurred under surface ducting conditions, signals from ships in the Pacific Missile Range Facility, some 40 to 50 km away, peaked above 150 dB re 1 μ Pa at the mouth of Hanalei Bay; mean received levels ran as high as 148 dB re 1 μ Pa. RSPEA at D-3 to D-8. To reduce the impacts of surface ducting within the coastal exclusion zone, the buffer should extend seaward at least 20 nm from the 25 nm boundary.

2. Offshore Exclusion Areas

NMFS must also exclude offshore areas that may have higher global densities of marine mammals. It is well established that several species of particular concern in this exercise—including Blainville's beaked whales and endangered sperm whales—as certain other marine mammal species tend to congregate around steep-sloping areas, such as seamounts. See, e.g., Baird Comment Letter at 4. There are a number of seamounts around the Hawaiian Islands, including several to the west of the Big Island that rise within 1000 m of the surface; those seamounts that occur within the Navy's operating areas (RSPEA at Fig. 2-1) should be excluded from ASW exercises. Baird Comment Letter at 4. Likewise, NMFS should exclude areas where oceanographic conditions can increase productivity and attract offshore concentrations of animals. In this regard, strong evidence has been presented for exclusion of the offshore area west of the Big Island. The cyclonic eddies that occur there are a regular occurrence, have been recorded in summer, can last several months, result in significant increases (by at least a factor of two) in primary productivity, and have been linked to significant increases in higher trophic species. The exclusion area would include (at least) the western half of Navy modeling area '3' and a substantial portion of modeling area '5'.⁹

⁷ In this survey, bottlenose dolphins and spotted dolphins were sighted beyond 30 km from shore despite a concentration of effort within 30 km. Letter from Robin W. Baird, Ph.D., to Stephen L. Leathery, NMFS [hereinafter "Baird Comment Letter"], at 4 (May 20, 2006).

⁸ Royal Australian Navy "Maritime Exercise Areas Environmental Management Plan," Procedure S-1 (June 9, 2004).

⁹ Id. (citing two papers by Seki et al., 2001 and 2002); M.P. Seki, R. Lumpkin, and P. Flament, Hawaii Cyclonic Eddies and Blue Marlin Catches: The Case Study of the 1995 Hawaiian International Billfish Tournament, 58 J. Oceanography 739, 739-45. According to the authors, the eddies are "n o w h e r e m o r e c o n s p i c u o u s o r s p i n u p m o r e f r e q u e n t l y t h a n i n t h e A l e n u i h a h a C h a n n e l" (id. at 739)—where, of course, the Navy proposes to conduct a chokepoint exercise.

The fact that neither NMFS nor the Navy has undertaken analyses of offshore areas, either to confirm increased densities of marine mammals at the indicated sites or to identify others worthy of mitigation, does not somehow absolve the agencies from excluding areas based on the available evidence. Indeed, NMFS should understand that any uncertainties about the efficacy of excluding these areas from sonar exercises are further reason to prepare a full EIS. Nat'l Parks & Conservation Ass'n, 241 F.3d 722 at 734-35 (requiring Coast Guard to perform EIS on increased shipping traffic in Glacier Bay).

3. Use During Ship Transits

NMFS cannot authorize sonar use during ship transits between exercise areas. It was precisely this type of activity that, according to NMFS' recent report, was a "plausible, if not likely" contributor to the 2004 mass stranding of melon-headed whales in Hanalei Bay.¹⁰ If the agency does not bar sonar use by transiting ships, the Navy would have license to operate the same sonar systems, at the same power levels, in the same areas it was using in 2004. Such an outcome is not tenable under a harassment authorization.

4. Marine Protected Areas ("MPAs")

Executive Order 13158 requires agencies "to avoid harm to the natural and cultural resources that are protected by a MPA." E.O. 13158 (May 26, 2000). The Executive Order defines MPAs broadly to include "any area of the marine environment that has been reserved by Federal, State, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein." Id. NMFS must therefore consider and, "to the maximum extent practicable" (id.), avoid harm to the resources of all federal- and state-designated protected areas—including but not limited to the Hawaiian Islands Humpback Whale National Marine Sanctuary—that are potentially affected by the RIMPAC event.

B. Lowest Practicable Source Level

In its draft authorization, NMFS proposes requiring the Navy to conduct its exercises at "the lowest practicable level, not to exceed 235 dB, except for occasional short periods of time to meet tactical training objectives." 71 Fed. Reg. 20998. While source level reductions are an important requirement, the standard articulated here falls short of what NEPA and the MMPA demand in this instance. First, since the Navy did not model impacts from source levels above 235 dB re 1 μ Pa (RSPEA at 20998), it has effectively failed to assess all reasonably foreseeable impacts as required by NEPA, and NMFS would be in patent violation of both NEPA and the MMPA's negligible impact provision if it authorized such use. Therefore any training with tactical sonar above a nominal source level of 235 dB should be prohibited.

¹⁰ Southall et al., Hawaiian Melon-Headed Whale at 2.

Second, NMFS must consider requiring the Navy to operate at source levels below 235 dB, throughout the exercise or at least in some circumstances. NMFS itself recognizes the considerable value to be gained, under a logarithmic decibel scale, from even a 6 dB reduction in power: the reduction “would reduce the range of potential acoustic effects to about half of its original distance... [which, in turn,] would reduce the area of acoustic effects to about one quarter of its original size.” 71 Fed. Reg. 20988.¹¹ Making such a reduction explicit is necessary given the Navy’s summary dismissal, in the RSPEA (at 2-13), of all other possible alternatives and mitigation measures. See, e.g., Simmons v. U.S. Army Corps of Eng’rs, 120 F.3d 664, 667 (7th Cir. 1997) (an EIS errs when it accepts “as a given” parameters it should have studied and weighed). Since the Navy has effectively ruled out operating its standard tactical sonar below 235 dB, NMFS’ mitigation measure—without further definition—would achieve no real-world mitigation at all.

C. Safety Zone and Shut-Down Procedures

1. Safety Zone Distances

In its draft authorization, NMFS expands the Navy’s safety zone from the anemic distances set forth in its operating procedures. Under ordinary conditions, the Navy would power down its sonar by 6 dB if an animal is detected within 1000 m of an array, power down by 10 dB if detected within 500 m, and shut down if detected within 200 m. In “strong surface ducting conditions,” power-downs and shut-down would occur at 2000 m, 1000 m, and 500 m respectively. 71 Fed. Reg. 20998. These distances—though an improvement over the Navy’s standard procedures—are plainly inadequate.

First, NMFS’ safety zones are inconsistent with the agency’s own 173 dB SEL threshold, which—under what the Navy represents as typical conditions—extends at least 1 km for a 1-second exposure and approximately 4 km for an 8-second exposure. RSPEA at C-17, C-22. In surface ducting conditions, NMFS’ threshold appears capable of extending 5 km for a 1-second exposure. RSPEA at D-3 to D-8. While the Navy does not specify the number of animals significantly affected within various distances from the ship, its methodology suggests that number would grow geometrically (by the square of the radius) as one moves away from the ship, such that a safety zone set at 4 km (for example) could potentially result in 15 times’ fewer takes than a safety zone set at 1 km. We are under no illusions concerning the Navy’s ability to maintain any safety zone with a high rate of success, given the speed at which ships will be traveling; but a wider safety zone clearly holds potential to reduce impacts on marine mammals.

Second, NMFS’ proposal fails to satisfy the MMPA’s “least practicable impact” standard. Given that the Australian Navy has established a safety zone of 4000 yards

¹¹ The Navy is capable of reducing the source level of its standard tactical sonar, while in search mode, by at least 10 dB. See 71 Fed. Reg. 20998. Of course all possible power reductions should be considered.

for sonar systems operating at source levels well below 235 dB re 1 μ Pa, the burden must be on the Navy (and NMFS) to show why shut-down at that distance is impracticable.

In short, NMFS' distances are arbitrary and capricious even by the agency's own 173 dB energy threshold. If adopted, they would violate the MMPA's mitigation standard and would fail to help the agency meet the additional burdens it has taken on itself, in attempting to authorize the exercise through a rushed process.

2. Broader Area Shut-Down

In its draft authorization, NMFS fails to consider requiring shut-down or relocation of exercises under certain conditions that may occur outside the small safety zone around the array; yet this type of mitigation has been required or proposed in other authorizations. Most pointedly, NMFS recently required the U.S. Air Force to relocate its ordnance exercises offshore the Eglin Air Force Base should its fixed-wing aircraft spot any marine mammals or sea turtles within its orbit circle (comprising a radius of least 9.3 km). 71 Fed. Reg. 3475 (Jan. 23, 2006).¹² It is not evident why such a measure is practicable for the Air Force, but not for the Navy. In this case, the need to avoid significant impacts and serious injuries and mortalities only makes the measure more compelling. The Navy should be required to shut down or relocate should it detect beaked whales or aggregations of other species (particularly sperm whales and melon-headed whales) within its monitoring area.

3. Exercise Shut-Down

Presumably, as in previous authorizations, the exercise will be shut down if the Navy's take exceeds the permit's terms. As noted above, this measure cannot be used to evade authorization of serious injury or mortality under the MMPA. Kokechik Fishermen's Association, 839 F.2d at 801-02. Beyond this, however, the measure suffers from lack of clarity, making it difficult for the public to comment on what we know, from the 2004 mass stranding in Hanalei Bay, to be a critical provision in NMFS' authorization. NMFS must clarify (1) under what circumstances shut-down would occur, (2) how third-party observations would figure in that decision, and (3) whether shut-down would affect the immediate exercise (as in 2004) or the entire RIMPAC event. LaFlamme v. F.E.R.C., 852 F.2d 389, 398 (9th Cir. 1988). It is particularly important that its "Communications and Response Protocol" set clear, non-discretionary triggers for the suspension of RIMPAC 2006, given the considerable pressure decision-makers are likely to be under; that the decision to terminate the event is made by NMFS rather than the Navy; and that, considering the limits of NMFS' monitoring plan (Baird

¹² Further, the Minerals Management Service has proposed requiring airgun operators to shut-down their arrays should an aggregation of bowhead whales occur within the 120 dB isopleth. Minerals Management Service, Draft Programmatic Environmental Assessment: Arctic Ocean Outer Continental Shelf Seismic Surveys—2006, at 231 (2006).

Comment Letter at 5), third-party observations from whale-watch operators, independent researchers, and others are taken explicitly into account.

D. Choke-Point Exercises

NMFS cannot authorize the Navy's proposed choke-point exercises under an incidental harassment authorization. As discussed below, there is no dispute that tactical sonar can injure marine mammals and cause them to strand and die; and NMFS acknowledges that the risk of serious injury only intensifies "anytime either steep bathymetry, surface ducting conditions, or a constricted channel is present in addition to the operation of mid-frequency tactical sonar and the presence of cetaceans (especially beaked whales)." 71 Fed. Reg. 20995. The Navy's chokepoint exercises present four out of five conditions for heightened risk: (1) the use of tactical sonar (2) in places where as many as three species of beaked whales can occur, (3) areas with steep bathymetry (4) that offer surface ducting conditions. Id. Propped against this proven risk of injuries and mortalities is a monitoring plan whose efficacy amounts to speculation at best. See Found. for N. Am. Wild Sheep, 681 F.2d at 1179. Indeed, there is considerable evidence on record to indicate that the monitoring methods NMFS has proposed are completely inadequate to the task: detection rates of beaked whales and other cryptic species (whether through ship-based or aerial surveillance) are poor; conditions where the exercises would take place (e.g., the Alenuihaha Channel) are typically windy, making detection improbable; the proposed safety zone is small compared to the potential lethal impact zone for beaked whales and certain other species.¹³ NMFS cannot issue an authorization to selectively cover only those takings that are (or might be) permissible under the MMPA. Kokechik Fishermen's Association, 839 F.2d at 801-02. If NMFS proceeds to authorize these three exercises, it will plainly have violated the law.¹⁴

E. Monitoring

The monitoring that NMFS would require for the vast majority of exercises (41 of 44) scheduled during RIMPAC 2006 consists of nothing more than a single, non-dedicated Navy observer, watching for marine mammals while performing other duties on deck. This

¹³ See, e.g., J. Barlow and R. Gisiner, Mitigating, Monitoring, and Assessing the Effects of Anthropogenic Sound on Beaked Whales, 7 J. Cetacean Res. Manage. (2006, in press) (poor detection rates); Baird Comment Letter at 3-4 (poor monitoring conditions around Hawaii); International Whaling Commission, 2004 Report of the IWC Scientific Committee, Annex K at § 6.4 (2004), J. Hildebrand, K. Balcomb, and R. Gisiner, Modeling the Bahamas Beaked Whale Stranding of March 2000 (2004) (presentation given at the third plenary meeting of the U.S. Marine Mammal Commission Advisory Committee on Acoustic Impacts on Marine Mammals, 29 July 2004), D.S. Houser, R. Howard, and S. Ridgway, Can Diving-Induced Tissue Nitrogen Supersaturation Increase the Chance of Acoustically Driven Bubble Growth in Marine Mammals? 213 Journal of Theoretical Biology 183, 190 (2001), Southall et al., Hawaiian Melon-Headed Whale at 37-42, and RSPEA at D-3 to D-8 (indicating potential for serious injury, strandings, and mortality at isopleths of 160-165 dB and below).

¹⁴ One alternative would allow the Navy to simulate choke-point scenarios within the Pacific Missile Range Facility.

level of monitoring is clearly inadequate. It is well established that single, non-dedicated observers—even if well-trained—spot only a fraction of the marine mammals that multiple, dedicated observers do.¹⁵ And the exclusive focus on ship-based visual monitoring neglects several other methods, such as passive acoustic monitoring, that can boost effectiveness for some species. As it stands—given the fast pace of the Navy’s exercises, the difficulty of spotting cryptic species on the surface, the typically windy conditions around Hawaii, the prevailing direction of currents, and the presence of scavengers—NMFS’ monitoring plan is unlikely to detect unexpected impacts. Baird Comment Letter at 5. Not only does it fail to satisfy the MMPA’s “least practicable impact” standard, but it also falls far short of ensuring “that no mortality or serious injury leading to mortality occurs.” Cf. 71 Fed. Reg. 20997.

NMFS should consider adding the following monitoring methods, inter alia, in support of mitigation:

- (1) Passive acoustic monitoring—Under the proposed authorization, passive acoustics would be required only of submarines using mid-frequency sonar; the only times surface ships might be compelled to use it are during periods of low visibility. 71 Fed. Reg. 20997, 20998. The Navy appears capable of passive monitoring through its submarines and range instrumentation (on the Pacific Missile Range Facility), and other platforms, such as autonomous hydrophones, could presumably be made available as well.¹⁶ Given the presence in the exercise area of endangered sperm whales—a deep-diving species that is far easier to detect acoustically than visually—and other vocalizing species, NMFS should require the use of passive acoustic monitoring throughout RIMPAC.
- (2) Suspension of acoustic exercises outside daylight hours and during periods of low visibility;¹⁷
- (3) Use of at least two dedicated shipboard observers, as NMFS proposes for the Navy’s choke-point exercises (71 Fed. Reg. 20999);
- (2) Mandatory use of aerial surveys and ship-based surveys before, during, and after exercises, given their wide impact radius, the rapid speed of the Navy’s vessels, and

¹⁵ C.J. Stone, The Effects of Seismic Activity on Marine Mammals in UK Waters, 1998-2000, at 34-35 (2003) (JNCC Report No. 323); Barlow and Gisiner, Mitigating, Monitoring, and Assessing, 7 J. Cetacean Res. Manage. in press.

¹⁶ 71 Fed. Reg. 20997 (submarines); S. Jarvis and D. Moretti, Passive Detection and Localization of Transient Signals from Marine Mammals Using Widely Spaced Bottom Mounted Hydrophones in Open Ocean Environments, in Listening to Fish: Passive Acoustic Applications in Marine Fisheries—Conference Proceedings 109-21 (2002) (range instrumentation). See also Letter from Roger L. Gentry, Ph.D., to Keith Jenkins, Naval Facilities Engineering Command Atlantic, Navy (Dec. 21, 2005) (recommending use of range instrumentation to track marine mammals on Navy’s Undersea Warfare Training Range).

¹⁷ Incredibly, NMFS does not even require nighttime suspension for the Navy’s proposed choke-point exercises. Cf. 71 Fed. Reg. 20999.

the low probability of detecting injured or dead animals onshore (Baird Comment Letter at 5);

- (3) Third-party monitoring, beyond the limited monitoring proposed for the choke-point exercises (71 Fed. Reg. 20999); and
- (6) Establishment of a public “hotline” to report marine mammal strandings or other unusual behavior during the RIMPAC event, to be incorporated into the agencies’ “Communications and Response Protocol” (71 Fed. Reg. 20999).

F. Long-Term Research

The Navy and NMFS are mandated, under the alternatives analysis provision of NEPA and the mitigation provision of the MMPA, to consider alternative sites for the RIMPAC exercise as well as geographic exclusions. NRDC v. Navy, 857 F.Supp. at 737-40. Toward this end, and following its own precedent in the SURTASS LFA authorization, NMFS should require the Navy to fund distribution and abundance and population research in the Hawaiian Operations Area and elsewhere, sufficient to support a meaningful geographic alternatives analysis for future RIMPAC exercises.¹⁸ Given concerns about funding independence that have been expressed by some members of the marine mammal community—including the National Research Council—NMFS should require that monies be administered through an independent agent, such as the National Fish and Wildlife Foundation (“NFWF”).¹⁹ While such a program would not cure the agencies’ legal violations in the present case, it makes those violations considerably less likely to recur.

G. Reductions in Activity

As noted below, the Navy’s stated purpose in conducting RIMPAC is to “implement a selected set of exercises that is combined into a sea control/power projection fleet training exercise in a multi-threat environment,” and to “demonstrate the ability of a multinational force to communicate and operate in simulated hostile scenarios.” .” DSPEA at A-1 (FONSI for 2002 PEA); PEA at 1-2. Yet this summary statement does not sufficiently justify the precise number of exercises that have been proposed: that is, 44 antisubmarine warfare exercises, as opposed to 30 or 20. See, e.g., Simmons, 120 F.3d at 667. Given NMFS’ manifest need, for all the reasons discussed above, to bring the Navy’s takes

¹⁸ In issuing the SURTASS LFA permit, NMFS relied for its determination in part on the Navy’s commitment to a long-term research program, budgeted at \$1 million per annum. 71 Fed. Reg. 46782.

¹⁹ The 2000 National Research Council panel explicitly recommended that an agency with greater independence manage federal research on ocean noise, making the following observation: “Sponsors of research need to be aware that studies funded and led by one special interest are vulnerable to concerns about conflict of interest. For example, research on the effects of smoking funded by [the National Institutes of Health] is likely to be perceived to be more objective than research conducted by the tobacco industry.” NRC, Marine Mammals and Low-Frequency Sound 84 (2000). See also L. Weigart, H. Whitehead, L. Rendell, and J. Calambokidis, Signal-to-Noise: Funding Structure Versus Ethics as a Solution to Conflict-of-Interest: Response to ‘Resonance and Dissonance: Science, Ethics, and the Sonar Debate.’ Marine Mammal Science 20:898-899, 21 Marine Mammal Science 175-77 (2005).

unequivocally within the limits of NEPA and MMPA, it should require a substantial reduction in the number of sonar exercises.

II. NMFS' COMPLIANCE WITH THE MARINE MAMMAL PROTECTION ACT

The Marine Mammal Protection Act was adopted more than thirty years ago to ameliorate the consequences of human impacts on marine mammals. Its goal is to protect and promote the growth of marine mammal populations “to the greatest extent feasible commensurate with sound policies of resource management” and to “maintain the health and stability of the marine ecosystem.” 16 U.S.C. § 1361(6). A careful approach to management was necessary given the vulnerable status of many of these populations (a substantial percentage of which remain endangered or depleted) as well as the difficulty of measuring the impacts of human activities on marine mammals in the wild. 16 U.S.C. § 1361(l), (3). “[I]t seems elementary common sense,” the House Committee on Merchant Marine and Fisheries observed in sending the bill to the floor, “that legislation should be adopted to require that we act conservatively—that no steps should be taken regarding these animals that might prove to be adverse or even irreversible in their effects until more is known. As far as could be done, we have endeavored to build such a conservative bias into the [Marine Mammal Protection Act].” Report of the House Committee on Merchant Marines and Fisheries, reprinted in 1972 U.S. Code Cong. & Admin. News 4148.

The heart of the MMPA is its so-called “take” provision, a moratorium on the harassing, hunting, or killing of marine mammals. 16 U.S.C. § 1362(13). Under the law, NMFS may grant exceptions to the take prohibition, provided it determines, using the best available scientific evidence, that such take would have only a negligible impact on marine mammal populations or stocks. There are two types of general exemptions available through the MMPA for activities that incidentally “take” marine mammals: permits and incidental harassment authorizations. Until 1994, the only exemptions available under the Act were permits, which require the wildlife agencies to promulgate regulations specifying permissible methods of taking. In 1994, however, the MMPA was amended to provide a streamlined mechanism by which proponents, such as the Navy, can obtain authorization for projects whose takings are by incidental harassment only. 16 U.S.C. § 1371(a)(5)(D). Regardless of which process is used, NMFS must prescribe “methods” and “means of effecting the least practicable impact” on protected species as well as “requirements pertaining to the monitoring and reporting of such taking.” 16 U.S.C. §§ 1371(a)(5)(A)(ii), (D)(vi).

As discussed above, NMFS' proposal fails in several ways to satisfy the MMPA's mitigation standard. But the authorization, if adopted, would violate the law in several other critical ways:

A. Incidental Harassment Authorization

As noted above, the streamlined process that Congress created, in 1994, for authorizing take of marine mammals applies only to activities that harass marine mammals, and not

those that can seriously injure or kill them. 16 U.S.C. § 1371(a)(5)(D)(i). NMFS admits that the sonar systems used in RIMPAC 2006 could cause mortalities and serious injury in marine mammals, especially beaked whales, yet it defends its decision to proceed under a harassment authorization on the grounds that the agency's mitigation and monitoring plan virtually eliminates the risk of death (71 Fed. Reg. 21002). Not only are these positions unsupported by any factual evidence in the authorization itself, they are flatly contradicted by numerous documents in the available record.

Beaked whales are considered a cryptic species, as they spend the vast majority of their time diving deep underwater, for periods regularly approaching one hour and sometimes exceeding 80 minutes. It is therefore difficult to sight them even under the most favorable conditions. According to the best available data, only 7% of Cuvier's beaked whales and 11% of Mesoplodon whales occurring directly on the trackline of an aerial survey are detected by trained biologists working in low sea states.²⁰ For ship-based surveys, the results are somewhat higher—some 23% of Cuvier's beaked whales and 45% of Mesoplodon whales occurring directly on the trackline are detected—but that assumes three dedicated biologists on task. *Id.* Because of the very different conditions that prevail, ship-based monitoring for mitigation purposes will detect fewer than 2% of beaked whales occurring directly on the trackline, and the probability detecting a whale even 1 km from the ship effectively drops to zero. *Id.* If anything, conditions for RIMPAC are unfavorable: as noted above, waters around the main Islands are typically windy,²¹ particularly in some of the areas chosen for the Navy's choke-point exercises (Baird Comment Letter at 3-4), and vessels will be ranging over wide areas and traveling at high speeds.²² Surveillance during the Navy's three choke-point exercises cannot overcome these problems, and its 41 other exercises would have only a single non-dedicated observer on board. The idea that NMFS' proposed monitoring scheme would prevent lethal exposures to beaked whales—which may be diving as a boat approaches at high speed—would therefore be insupportable even if those exposures occurred only within a kilometer of the vessel. But the best available scientific evidence indicates that mid-frequency sonar can cause beaked whale mortality out to the 160 dB isopleth and possibly beyond, an area that lies well outside the Navy's safety zone.²³

²⁰ Barlow and Gisiner, Mitigating, Monitoring, and Assessing, 7(3) J. Cetacean Res. Manage. (in press).

²¹ J. Barlow, Cetacean Abundance in Hawaiian Waters, 22 Marine Mammal Science at 453 (reporting that less than 10% of the 17000 km surveyed took place in optimal conditions of Beaufort 2 or less).

²² The shore-based surveillance proposed for some of the Navy's choke-point exercises are also problematic. See Baird Comment Letter at 3-4.

²³ International Whaling Commission, 2004 Report of the IWC Scientific Committee, Annex K at § 6.3 (2004); K.C. Balcomb and D.E. Claridge, A Mass Stranding of Cetaceans Caused by Naval Sonar in the Bahamas, 8(2) Bahamas Journal of Science 1 (2001); Hildebrand *et al.*, Modeling the Bahamas Beaked Whale Stranding; Houser *et al.*, Can Diving-Induced Tissue Nitrogen Supersaturation, 213 Journal of Theoretical Biology at 190). See also Southall *et al.*, Hawaiian Melon-Headed Whale at 37-42; RSPEA at D-3 to D-9; 71 Fed. Reg. 20990.

NMFS ties itself in knots, trying to avoid the conclusion that marine mammals may die. Equivocating at first, it proposes that all beaked whale impacts would be counted as non-lethal “Level A” injury rather than as serious injury and mortality (71 Fed. Reg. 20995); by the end, it has denied that any “Level A” injury would occur (71 Fed. Reg. 21002). The agency offers no basis for concluding that all of these injuries would amount to “Level A” harassment; indeed, such a conclusion runs counter to the strandings record and the prevailing literature, which NMFS acknowledges in its notice. 71 Fed. Reg. 20994.²⁴ The inconsistencies within the proposed authorization (and the RSPEA) underscore what has happened here: a post-hoc rationalization to justify use of an inappropriate process. See Kokechik Fishermen’s Association, 839 F.2d at 801-02.²⁵

B. Negligible Impact

NMFS can authorize exceptions to the take moratorium only upon making an affirmative finding that an activity will have no more than a “negligible impact” on a species or stock. 16 U.S.C. §§ 1371(a)(5)(A)(i), (D)(i)(I). “Negligible impact” has been further defined by the agency as one “that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival” (50 C.F.R. § 216.103); or, as the agency translates, one that is “not likely to reduce annual rates of adult survival or recruitment” (71 Fed. Reg. 21003). In its proposed authorization, NMFS argues repeatedly that, based on its analysis of “the behavioral disturbance levels in comparison to the overall population” and on the mitigation measures it has proposed, RIMPAC exercises would have no more than a negligible impact on Hawaii’s marine mammal populations. 71 Fed. Reg. 20996, 20999, 21002, 21003. But for numerous reasons it has no basis to make the affirmative determination that is required.

1. Beaked whales²⁶

NMFS has no basis to determine that impacts on beaked whales would be negligible. The Navy, in its RSPEA, counts each beaked whale take as a non-lethal injury. Even if one puts aside, for the moment, the impropriety of converting a record of severe injuries, strandings, and mortalities into recoverable damage, the sheer number of calculated injuries (more than 3000 between three species, affecting over 16% of each population, 71 Fed. Reg. 20989) begs the question, at the very least, of whether an effect on the stocks’ survival or reproduction has occurred. It seems likely that these numbers are what prompted NMFS to change its mind and conclude that its mitigation plan would preclude even the “Level A” injuries that it earlier said it would count. 71 Fed. Reg. 20995, 21002. Again, we note that NMFS cannot rely on unsupported statements about mitigation, particularly those that contradict the established record, to

²⁴ For a partial list of relevant literature, see the section below on the “Injury Threshold” and the section of NRDC’s DEIS Comment Letter on “Strandings and Mortalities Associated with Mid-Frequency Sonar.”

²⁵ Many of these points apply to certain other species, such as melon-headed whales, for which there is a proven risk of mortality.

²⁶ Many of these points may also apply to other species, such as melon-headed whales.

support a negligible impact determination. See, e.g., Nat'l Parks & Conservation Ass'n, 241 F.3d 722 at 733-35.

2. Other populations

Nor can NMFS make a negligible impact determination for other populations. Even accepting the Navy's analysis, the percentages of stocks and populations taken are extraordinarily high and do not bear out a conclusion of negligible impact. For example, the Navy estimates that as many as 38% of Hawaii's fin whales (which are endangered), 51% of its false killer whales (which are considered a strategic stock under the MMPA),²⁷ and (effectively) 100% of its spinner dolphins would be taken. Even adjusting by 16% (as NMFS requires to account for multiple exposures of individual animals, 71 Fed. Reg. 21002), the percentages remain high, comprising some 31% of fin whales, 42% of false killer whales, and 86% of spinner dolphins. By comparison, it has been recognized that harassment of more than 12% of at least very small populations "could have a serious impact, affecting their reproduction and survival." NRDC v. Evans, 279 F.Supp.2d at 1158 (requiring enhancement of Navy's mitigation measures for sonar system, beyond 12nm coastal exclusion zone and tripartite monitoring measures). As with beaked whales, these levels of take beg the question of whether negligible impacts would occur—a question that cannot be answered with mere speculation.²⁸

To make matters worse, the Navy's numbers do not take account of the best scientific evidence on local population structure, which indicates that some marine mammal populations (at least short-finned pilot whales, false killer whales, bottlenose dolphins, and spinner dolphins, and potentially others) around the main Hawaiian islands are reproductively distinct from conspecifics in the tropical Pacific.²⁹ As a result, the Navy

²⁷ J.C. Carretta, K.A. Forney, M.M. Muto, J. Barlow, J. Baker, B. Hanson, and M.S. Lowry, U.S. Pacific Marine Mammal Stock Assessments: 2005 at 227-31 (2006).

²⁸ For example, while NMFS acknowledges that stressful sounds can suppress pre-ovulatory luteinizing hormones and thus inhibit reproduction, it dismisses the possibility of population-level impacts on the mere suggestion that some animals within a species will be more sensitive to stress than others. 71 Fed. Reg. 20999.

²⁹ K.R. Andrews, L. Karczmarski, W.W.L. Au, S.H. Rickards, C.A. Vanderlip, and R.J. Toonen, Patterns of Genetic Diversity of the Hawaiian Spinner Dolphin (Stenella longirostris), Atoll Research Bulletin (2006, in press); R.W. Baird, A.M. Gorgone, A.D. Ligon, and S.K. Hooker, Mark-Recapture Abundance Estimate of Bottlenose Dolphins (Tursiops truncatus) Around Maui and Lanai, Hawaii, During the Winter of 2000/2001 (2001) (report prepared for NMFS under Contract #40JGNF000262); R.W. Baird, A.M. Gorgone, and D.L. Webster, An Examination of Movements of Bottlenose Dolphins between Islands in the Hawaiian Island Chain (2002) (report prepared for NMFS under Contract #40JGNF110270); R.W. Baird, D.J. McSweeney, D.L. Webster, A.M. Gorgone, and A.D. Ligon, Studies of Odontocete Population Structure in Hawaiian Waters: Results of a Survey through the Main Hawaiian Islands in May and June 2003 (2003) (report prepared for NMFS under Contract #AB133F-02-CN-0106); R.W. Baird, G.S. Schorr, D.L. Webster, S.D. Mahaffy, A.B. Douglas, A.M. Gorgone, and D.J. McSweeney, A Survey for Odontocete Cetaceans off Kaua'i and Ni'ihau, Hawai'i, during October and November 2005: Evidence for Population Structure and Site Fidelity (2006) (report prepared for NMFS under Order #AB133F05SE5197); S.J. Chivers, R.G. LeDuc, and R.W. Baird, "Hawaiian Island Populations of False Killer Whales and Short-Finned Pilot Whales Revealed

has significantly overestimated the size of these populations and significantly underestimated the percentages that would be taken. Baird Comment Letter at 2-3.

3. General

As discussed below in the section on NEPA compliance, the Navy's impact assessment—particularly its thresholds and modeling—runs counter to the best available scientific evidence, and NMFS has no grounds for supposing, as it does (71 Fed. Reg. 20996) that the Navy's take numbers are overestimated. One of the most glaring errors in the Navy's model is its treatment of cumulative impacts: for not only does the Navy (as discussed above) fail to address the problem of high take levels with anything other than speculation, it also fails (as discussed below) to tabulate cumulative takes from future RIMPAC exercises or even from other elements of the RIMPAC 2006 event. Given this major defect, it is illegal for NMFS to determine that the application submitted by the Navy is "complete" and that it includes "sufficient information... regarding the environmental impact of the proposed activity" (50 C.F.R. §§ 216.33(c)(2)(i), (v)). For all these reasons, NMFS cannot make an affirmative finding of negligible impact.

C. Scope of Authorization

It is established that NMFS cannot selectively authorize only some of the marine mammal takes resulting from an activity, while letting other foreseeable takes occur under civil penalty. Kokechik Fisherman's Association, 839 F.2d at 801-02. Yet here the agency, in its review of RIMPAC 2006, proposes to authorize only those takes that are directly attributable to the Navy's antisubmarine warfare exercises, leaving aside reasonably foreseeable impacts from a host of other RIMPAC activities: Air-to-Surface Missile Exercises (ASMEX), Surface-to-Air Missile Exercises (SAMEX), Surface-to-Surface Missile Exercises (SSMEX), Mine Countermeasures (MCM) Exercises, Strike Warfare Exercises (STWEX), Gunnery Exercises (GUNNEX), Sinking Exercise (SINKEX), and others. RSPEA at 2-3. These activities are closely interwoven with the sonar exercises under consideration and are not severable from them: they involve the same actor, the same populations of animals, the same planning process, and the same NEPA documentation prepared under the same programmatic review; and many of them (such as those using ordnance) have potential for acoustic impacts as well. See 42 C.F.R. 1508.18. Furthermore, at least some of them, such as Navy's Gunnery Exercises, appear similar or identical to military activity that has required authorization and substantial mitigation in the past. See, e.g., 71 Fed. Reg. 3474, 3474-3484 (authorization of gunnery exercises off Eglin Air Force Base). Should the Navy conduct any of those exercises without a permit, it would be acting in violation of the MMPA; and NMFS would be in violation both for

by Genetic Analyses," in Abstracts of the 15th Biennial Conference on the Biology of Marine Mammals, 14-19 December 2003, Greensboro, North Carolina 32 (2003); K. Martien, R.W. Baird, and K. Robertson, Population Structure of Bottlenose Dolphins around the Main Hawaiian Islands (2005) (paper presented to the Pacific Scientific Review Group, January 2005).

selectively authorizing take and for illegally determining that the Navy's application was complete. 50 C.F.R. §§ 216.33(c)(2)(i).

III. NMFS' COMPLIANCE WITH THE NATIONAL ENVIRONMENTAL POLICY ACT

Enacted by Congress in 1969, NEPA establishes a national policy to "encourage productive and enjoyable harmony between man and his environment" and "promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man." 42 U.S.C. § 4321. In order to achieve its broad goals, NEPA mandates that "to the fullest extent possible" the "policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with [NEPA]." 42 U.S.C. § 4332. As the Supreme Court explained,

NEPA's instruction that all federal agencies comply with the impact statement requirement – and with all the requirements of § 102 – "to the fullest extent possible" [cit. omit.] is neither accidental nor hyperbolic. Rather the phrase is a deliberate command that the duty NEPA imposes upon the agencies to consider environmental factors not be shunted aside in the bureaucratic shuffle.

Flint Ridge Development Co. v. Scenic Rivers Ass'n, 426 U.S. 776, 787 (1976).

Central to NEPA is its requirement that, before any federal action that "may significantly degrade some human environmental factor" can be undertaken, agencies must prepare an environmental impact statement. Steamboaters v. F.E.R.C., 759 F.2d 1382, 1392 (9th Cir. 1985) (emphasis in original). The fundamental purpose of an EIS is to force the decision-maker to take a "hard look" at a particular action – at the agency's need for it, at the environmental consequences it will have, and at more environmentally benign alternatives that may substitute for it – before the decision to proceed is made. 40 C.F.R. §§ 1500.1(b), 1502.1; Baltimore Gas & Electric v. NRDC, 462 U.S. 87, 97 (1983). The law is clear that the EIS must be a pre-decisional, objective, rigorous, and neutral document, not a work of advocacy to justify an outcome that has been foreordained.

In nearly every respect, the Navy's RSPEA fails to meet the high standards of rigor and objectivity established under NEPA, and NMFS would violate the law in adopting it.³⁰

A. Finding of No Significant Impact

NMFS proposes to authorize the Navy's marine mammal "takes" under an environmental assessment rather than under an environmental impact statement. This position is simply

³⁰ The following section addresses some of the major violations inherent in NMFS' adoption of the Navy's RSPEA. For a more exhaustive treatment, see our comment letter on the Navy's draft SPEA. Letter from Joel R. Reynolds and Michael D. Jasny, NRDC, to Commander, U.S. Pacific Fleet, Navy [hereinafter "NRDC Comment Letter"] at 6-57 (February 21, 2006). Our February 2006 comment letter is hereby incorporated by reference.

inconsistent with the requirements of NEPA. As noticed above, NEPA requires federal agencies to prepare an EIS for any major federal action “significantly affecting the quality of the human environment.” 42 U.S.C. § 4332(2)(C). Significant effects need not be certain to occur to trigger the EIS requirement—rather, “an EIS must be prepared if ‘substantial questions are raised as to whether a project . . . may cause significant degradation of some human environmental factor.’” Idaho Sporting Congress v. Thomas, 137 F.3d 1146, 1149 (9th Cir. 1998) (quoting Greenpeace Action v. Franklin, 14 F.3d 1324, 1332 (9th Cir. 1992)).

The Council on Environmental Quality (“CEQ”) has enacted regulations to ensure compliance with NEPA. These regulations “are binding on all federal agencies and provide guidance to the courts for interpreting NEPA requirements.” Or. Natural Res. Council v. United States Forest Serv., 834 F.2d 842, 847 n. 5 (9th Cir. 1987). In determining whether a proposed action “significantly” affects the environment and thus requires an EIS, CEQ regulations lay out ten factors for federal agencies to consider. 40 C.F.R. § 1508.27(b). Any one of these factors, standing alone, is sufficient to require preparation of an EIS. Ocean Advocates v. United States Army Corps of Eng’rs, 402 F.3d 846, 865 (9th Cir. 2005). In this case, at least the following seven factors strongly suggest that preparation of an EIS is required:

- (1) Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas;
- (2) The degree to which the effects on the quality of the human environment are likely to be highly controversial;³¹
- (3) The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks;
- (4) The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration;³²

³¹ Aside from the public comments submitted on RIMPAC and on the Navy’s Undersea Warfare Training Range off North Carolina, see, e.g., Marc Kaufman, Whales’ Plight Revives Sonar Theory, Washington Post, July 11, 2004 at A1; Jan TenBruggencate in Whale Dies after Pod Returns to Sea, Honolulu Advertiser, July 7, 2004; Marc Kaufman, Sonar Used before Whales Hit Shore, Aug. 31, 2004 at A3; William Cole, Sonar “Likely” Factor in Stranding, Honolulu Advertiser, Apr. 28, 2006; Audrey McAvoy, Sonar May Be Linked to Stranding of Whales, AP Wire, Apr. 28, 2006 (picked up by over 100 news outlets domestically and internationally); Marc Kaufman, Sonar Called Likely Stranding Cause, Washington Post, Apr. 28, 2006; Editorial, Move Sonar Exercises to Low-Risk Waters, Honolulu Star-Bulletin, May 1, 2006; Lester Chang, Battle Lines Drawn over Use of Sonar, The Garden Island, Apr. 30, 2006; Telecast, Good Morning Hawaii, KITV-Honolulu, May 23, 2006 (reporting on protest of RIMPAC led by Pacific Whale Foundation); Letters to Editor, Maui News, May 22, 2006 (containing two letters to the editor opposing RIMPAC).

(5) Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts;

(6) The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973; and

(7) Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

42 C.F.R. § 1508.27. It should be clear, under this rubric, that RIMPAC presents the potential for significant adverse impacts on the marine environment. NMFS cannot authorize the exercise absent a full EIS.

B. Statement of Purpose and Need

It is a fundamental requirement of NEPA that agencies preparing an EIS specify their project's "purpose and need." 40 C.F.R. § 1502.13. Not any statement of purpose and need will suffice: "An agency cannot define its objectives in unreasonably narrow terms" so as to exclude consideration of reasonable alternatives. City of Carmel-by-the-Sea v. United States Dep't of Transp., 123 F.3d 1142, 1155 (9th Cir. 1997) (citing Citizens Against Burlington, Inc. v. Busey, 938 F.2d 190, 196 (D.C. Cir. 1991)). Instead, the statement must reflect the agency's core aim without foreclosing reasonable alternatives. Id.

Here, the Navy's stated purpose is "to implement a selected set of exercises that is combined into a sea control/power projection fleet training exercise in a multi-threat environment," and to "demonstrate the ability of a multinational force to communicate and operate in simulated hostile scenarios." RSPEA at A-1 (FONSI for 2002 PEA); PEA at 1-2. These statements contain no language that would justify the narrow alternatives analysis that the Navy performs in its 2002 Programmatic EA and in the supplemental documents that depend on it.³³ As the language is somewhat opaque, however, we would remind the Navy that its statement of purpose must allow meaningful review. "The existence of a viable but unexamined alternative renders an environmental impact statement inadequate," Idaho Conservation League v. Mumma, 956 F.2d 1508, 1519 (9th Cir. 1992), and an EIS

³² See Letter from B.J. Penn, Assistant Secretary of the Navy, to Conrad C. Lautenbacher, Jr., NOAA Administrator, at 2-3 (Aug. 5, 2005); Letter from Conrad C. Lautenbacher, Jr., NOAA Administrator, to B.J. Penn, Assistant Secretary of the Navy, at 1 (Aug. 22, 2005).

³³ The inadequacy of the Navy's alternatives analysis is discussed below at section II(G).

(or EA) errs when it accepts “as a given” parameters that it should have studied and weighed. Simmons, 120 F.3d 664, 667 (7th Cir. 1997).

C. Alternatives Analysis

At bottom, an EIS must “inform decision-makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment.” 40 C.F.R. § 1502.1. This requirement has been described in regulation as “the heart of the environmental impact statement.” Id. § 1502.14. The agency must therefore “[r]igorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated.” Id. § 1502.14(a). Consideration of alternatives is required by (and must conform to the independent terms of) both sections 102(2)(C) and 102(2)(E) of NEPA.

Here the Navy considers three alternatives for review: the proposed action, the proposed action “as limited to previously analyzed locations and activities,” and the no-action alternative. RSPEA at 2-12. There are at least three broad problems, however, with this approach.

First, the Navy’s failure to meaningfully consider more than just the “No-Action” alternative (DSPEA at 2-12) is plainly illegal under NEPA. 40 C.F.R. §1502.14. Here the Navy’s last-minute addition, the proposed action “as limited to previously analyzed locations and activities,” is effectively identical to the proposed action, for while it addresses the relocation of the Non-Combatant Evacuation Operation (a minor issue that occupies all of one-and-one-pages of analysis), it does not propose any alternatives for the antisubmarine warfare exercises that are virtually the exclusive focus of the Navy’s supplemental EA. An agency cannot limit its analysis to alternatives that skew its decision or lead effectively to the desired result. See, e.g., California v. Block, 690 F.2d 753, 768 (9th Cir. 1982); NRDC v. Evans, 279 F.Supp.2d 1129, 1664-66 (9th Cir. 2003); Massachusetts v. Clark, 594 F. Supp. 1373 (D. Mass. 1984). Yet that is precisely what the Navy has done here.

Second, the Navy fails to consider alternative sites for RIMPAC, either within the existing Hawaiian Islands Operating Area or in another location. Indeed, the Navy provides absolutely no rationale in any of its NEPA documents for why the exercise must be conducted precisely where and when it says.³⁴ Yet avoiding concentrations of vulnerable and endangered species and high abundances of marine life is perhaps the most critical step the Navy can take in reducing impacts, and a “hard look” at geographical alternatives is plainly required by NEPA and other laws. NRDC v. Evans, 279 F.Supp.2d at 1664-66;

³⁴ It is worth noting, in any case, that factors of mere convenience and cost alone cannot dictate an agency’s choice of alternatives to evaluate in an EIS. An agency must discuss all reasonable alternatives—those that will accomplish the purpose and need of the agency and are practical and feasible—not simply those it finds most convenient. 40 C.F.R. § 1502.14.

NRDC v. Navy, 857 F.Supp. at 734. Because the Navy has failed to undertake an alternatives analysis that allows it to make an informed siting choice, the RSPEA and its predecessors are fundamentally inadequate.

Third, even aside from the omission of reasonable alternative locations, the Navy fails to consider alternatives of any other kind. RSPEA at 2-13. While the question of proper siting is crucial, it is not the only factor that must be considered in identifying other, less harmful ways to fulfill the Navy's purpose. Indeed, it appears that many reasonable alternatives—beginning with the mitigation measures that NMFS has proposed—are missing from the Navy's analysis that might fulfill that purpose while reducing harm to marine life and coastal resources. Many such measures are employed by other countries in their sonar exercises and even by the U.S. Navy in other contexts; and there are many others that should be considered, many of which are discussed in the mitigation section above. Such measures are reasonable means of reducing harm to marine life and other resources on the proposed range, and their omission from the alternatives analysis renders that analysis inadequate.³⁵

In sum, the RSPEA omits from its analysis reasonable alternatives—with regard to both the siting of the range and other operational choices—that might achieve the Navy's core aim while minimizing environmental harm. These omissions are all the more unreasonable given the long period during which the Navy has worked on this document and its predecessors. For these reasons, we urge NMFS not to adopt the alternatives analysis in the Navy's RSPEA. 40 C.F.R. § 1502.1.

D. Scope of Review

Although it calls its document a Supplemental Programmatic Environmental Assessment, the Navy suggests at points that its analysis of "extraterritorial" activities, those activities that would take place outside U.S. territorial waters, was prepared under the authority of Executive Order 12114 rather than under NEPA. RSPEA at 3-4. The Navy's position on the scope of review is inconsistent with the statute. See, e.g., Environmental Defense Fund v. Massey, 968 F.2d 528 (D.C. Cir. 1994) and NRDC v. Navy, No. CV-01-07781, 2002 WL 32095131 at *9-12 (C.D. Cal. Sept. 19, 2002). For NMFS, adopting such a position is clearly insupportable, given inter alia that the federal action to which its NEPA review applies, the decision to authorize RIMPAC 2006, takes place entirely within the territory of the United States. NMFS should indicate its derogation from the Navy's RSPEA on this point.

³⁵ In this respect, the RSPEA stands in contrast to a Draft Supplemental EIS recently published by the Navy analyzing the use of another type of high-intensity active sonar known as SURTASS LFA (or LFA). See Navy, Draft Supplemental Environmental Impact Statement for SURTASS LFA Sonar (2005). That Draft EIS analyzes five alternatives and includes, within those alternatives, consideration of a variety of mitigation measures for the use of LFA sonar, including seasonal variations, visual monitoring for marine mammals and sea turtles, passive acoustic monitoring for marine mammals, active acoustic monitoring, and shutdown procedures. Id. at 2-10 to 2-14.

E. Impact Assessment

Fundamental to satisfying NEPA's requirement of fair and objective review, agencies must ensure the "professional integrity, including scientific integrity," of the discussions and analyses that appear in environmental impact statements. 40 C.F.R. § 1502.24. To this end, they must make every attempt to obtain and disclose data necessary to their analysis. The simple assertion that "no information exists" will not suffice; unless the costs of obtaining the information are exorbitant, NEPA requires that it be obtained. See 40 C.F.R. § 1502.22(a). Agencies are further required to identify their methodologies, indicate when necessary information is incomplete or unavailable, acknowledge scientific disagreement and data gaps, and evaluate indeterminate adverse impacts based upon approaches or methods "generally accepted in the scientific community." 40 C.F.R. §§ 1502.22(2), (4), 1502.24. Such requirements become acutely important in cases where, as here, so much about a program's impacts depend on newly emerging science. Finally, and crucially, the law requires agencies to evaluate all "reasonably foreseeable" impacts. 42 C.F.R. § 1502.22.

In this case, the Navy's assessment of impacts on marine mammals is consistently undermined by its failure to meet these fundamental responsibilities of scientific integrity, methodology, investigation, and disclosure. NMFS has insisted on lowering the Navy's threshold for significant behavioral change and notes several times, in its proposed authorization, that its adoption of the Navy's analysis is sui generis—in some respect an appropriate response, given the inadequate time for review. Yet the agency appears to endorse some elements of the Navy's analysis without qualification, and it proposes to adopt the RSPEA as its own NEPA document in approving the Navy's request. In this, NMFS, too, would violate the law.

1. Thresholds of Injury, Hearing Loss, and Significant Behavioral Change

At the core of the agencies' assessment of acoustic impacts are the thresholds they have established for physical injury, hearing loss, and significant behavioral harassment, the levels above which meaningful effects on marine mammals are found to occur. Previous environmental reviews of non-impulsive sources of sound have generally calibrated these thresholds to sound pressure levels, or SPLs, the amount of pressure received by a marine animal at a discrete moment in time, usually the duration of a sound wave. For the Navy's new wave of environmental reviews, it has used a somewhat different measurement: energy flux density level, or "EL," which integrates the amount of energy flowing through an area over time. In theory, the use of ELs (at least as a supplement to sound-pressure levels) has merit, but there are gross problems with their application here. We strongly recommend that NMFS qualify its support of the Navy's impact thresholds.

a. Injury Threshold

The Navy fixes its highest threshold of 215 dB re 1 $\mu\text{Pa}^2\text{s}$ —which it considers the ground floor for physical injury—on the amount of energy necessary to induce permanent hearing loss (or “threshold shift”) in marine mammals. Beneath this decision lies an assumption that the tissues of the ear are “the most susceptible to the physiological effects of sound,” and, indeed, a few paragraphs from a related environmental review are spent in an effort to set aside other types of injury that have been identified or observed.³⁶ In its proposed authorization, however, NMFS pointedly disagrees with the Navy’s position. As NMFS observes, “some marine mammals may react to mid-frequency sonar, at received levels lower than those thought to cause direct physical harm, with behaviors that may, in some circumstances, lead to physiological harm, stranding, or, potentially, death.” 71 Fed. Reg. 20990. Yet NMFS proposes to adopt the Navy’s threshold for injury, relying in part on an unsubstantiated claim about its monitoring plan (see the section below on “Incidental Harassment Authorization”). For this and other reasons, its action would be arbitrary and capricious.

First, the RSPEA disregards data gained from actual whale mortalities. The best available scientific evidence, as reported by the IWC’s Scientific Committee, indicates that the whales beached in the Bahamas stranding were exposed to no more than 160-65 dB re 1 μPa of mid-frequency sonar for 30 seconds.³⁷ A further modeling effort, undertaken in part by the Office of Naval Research, suggests that the mean exposure level of beaked whales, given their likely distribution in the Bahamas’ Providence Channels, was lower than 140 dB re 1 μPa .³⁸ Factoring in duration, then, evidence of actual sonar-related mortalities would compel an EL no greater than 174 dB re 1 $\mu\text{Pa}^2\text{s}$, at least for some beaked whales, and possibly much lower. A recent tagging study has found that Cuvier’s beaked whales disrupt their dives in response to shipping noise at 136 dB (or 160 dB re 1 $\mu\text{Pa}^2\text{s}$), and sonar is likely to affect the species more acutely.³⁹

Second, the Navy—and NMFS, in its proposed authorization—fail to take proper account of published research on bubble growth in marine mammals, which separately indicates the potential for injury and death at levels far lower than the Navy proposes. According to a series of published, peer-reviewed articles (based both on accepted theoretical methods and on experimental research), gas bubbles

³⁶ Navy, Draft Overseas Environmental Impact Statement/ Environmental Impact Statement Undersea Warfare Training Range [hereinafter “DEIS”] 4.3-8 (2005). As has been noted, impact thresholds for the RIMPAC threshold were originally developed by the Navy for its east-coast Undersea Warfare Training Range; and, indeed, by way of explaining its methodology for RIMPAC, the Navy explicitly refers the reader to the DEIS it prepared for the east-coast range. RSPEA at C-1. Accordingly, the NEPA section of this comment letter will frequently make reference to pages in the Navy’s DEIS.

³⁷ International Whaling Commission, 2004 Report of the Scientific Committee, Annex K at § 6.3.

³⁸ Hildebrand et al., Modeling the Bahamas Beaked Whale Stranding of March 2000.

³⁹ Letter from Natacha Aguilar Soto, La Laguna University, Canary Islands, to Keith Jenkins, Naval Facilities Engineering Command Atlantic, Navy at 3-4 (Jan. 27, 2006) (citing work in press).

could be activated in supersaturated marine mammal tissue on brief exposure to sounds of 150 dB (RMS) re 1 μ Pa or lower and then grow significantly, causing injury, as the animal rises toward the surface.⁴⁰ That work is supported by a number of other studies, also published in leading, peer-reviewed journals, demonstrating through anatomical evidence that *in vivo* bubble growth can occur in a variety of marine mammal species, from sperm whales to beaked whales to Risso's dolphins.⁴¹ And this is not even to mention the investigation of the 2002 Canary Islands strandings, whose findings concerning fat and gas emboli were recently published at length in another major journal.⁴² NMFS argues, in its avoidance of the issue, that the evidence supporting bubble growth is debatable and that the theory therefore deserves "no special treatment" (71 Fed. Reg. 20991); but this characterization simply elides the numerous published, peer-reviewed papers—in dive behavior, veterinary pathology, and molecular biology—that support it, and disregards the recognition bubble growth has received from expert panels, such as the one convened in 2004 by the Marine Mammal Commission to review sonar-related strandings.⁴³

In any case, the law requires agencies to evaluate all "reasonably foreseeable" impacts, which, by definition, includes "impacts which have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason." 42 C.F.R. § 1502.22. The scientific literature supporting bubble growth rises far above this standard, and the Navy's failure to incorporate it into its impact model is arbitrary and capricious.

⁴⁰ D. Houser, Can Diving-Induced Tissue Nitrogen Supersaturation, 213 *Journal of Theoretical Biology* at 190; L.A. Crum, M.R. Bailey, J. Guan, P.R. Hilmo, S.G. Kargl, T.J. Matula, and O.A. Sapozhnikov, Monitoring Bubble Growth in Supersaturated Blood and Tissue ex vivo and the Relevance to Marine Mammal Bioeffects, 6(3) *Acoustics Research Letters Online* 214 (2005) See also J.R. Potter, A Possible Mechanism for Acoustic Triggering of Decompression Sickness Symptoms in Deep-Diving Marine Mammals (paper presented at the IEEE International Symposium on Underwater Technology 2004, Taipei, Taiwan, April 2004).

⁴¹ M.J. Moore and G.A. Early, Cumulative Sperm Whale Bone Damage and the Bends, 306 *Science* 2215 (2004); P.D. Jepson, R. Deaville, I.A.P. Patterson, A.M. Pocknell, H.M. Ross, J.R. Baker, F.E. Howie, R.J. Reid, A. Colloff, and A.A. Cunningham, Acute and Chronic Gas Bubble Lesions in Cetaceans Stranded in the United Kingdom, 42 *Veterinary Pathology* 291 (2005).

⁴² A. Fernández, J.F. Edwards, F. Rodríguez, A. Espinosa de los Monteros, P. Herráez, P. Castro, J.R. Jaber, V. Martín, & M. Arbelo, 'Gas and Fat Embolic Syndrome' Involving a Mass Stranding of Beaked Whales (Family Ziphiidae) Exposed to Anthropogenic Sonar Signals, 42 *Veterinary Pathology* 446 (2005).

⁴³ T.M. Cox, T.J. Ragen, A.J. Read, E. Vos, R.W. Baird, K. Balcomb, J. Barlow, J. Caldwell, T. Cranford, L. Crum, A. D'Amico, G. D'Spain, A. Fernández, J. Finneran, R. Gentry, W. Gerth, F. Gulland, J. Hildebrand, D. Houser, T. Hullar, P.D. Jepson, D. Ketten, C.D. MacLeod, P. Miller, S. Moore, D. Mountain, D. Palka, P. Ponganis, S. Rommel, T. Rowles, B. Taylor, P. Tyack, D. Wartzok, R. Gisiner, J. Mead, & L. Benner, Report of a Workshop to Understand the Impacts of Anthropogenic Sound on Beaked Whales 2 (in press) (noting particular plausibility of gas-bubble disease as one of 2 major findings of workshop).

Third, the numbers do not reflect other non-auditory physiological impacts, as from stress and from chronic exposure during development, which are discussed further among “Other Impacts on Marine Mammals” (below).

Fourth, the Navy’s exclusive reliance on energy flux density as its unit of analysis does not take other potentially relevant acoustic characteristics into account. For example, an expert group commissioned by the Office of Naval Research in 2003 to provide recommendations on mitigation suggested that peak power may matter more to beaked whale mortalities than integrated energy.⁴⁴ Reflecting this uncertainty, the Navy should establish a dual threshold for marine mammal injury.

Fifth, the Navy’s threshold is called into question by a white paper generated and heavily relied on by the Navy in its environmental review of SURTASS LFA. That paper summarized the results of tests on small terrestrial mammals that had been submerged just beneath the water surface and exposed to low-frequency sound. According to those tests, resonance damage could occur on exposure to 5 minutes of sound of 180 dB re 1 μPa (or approximately 205 dB re 1 $\mu\text{Pa}^2\cdot\text{s}$), and the “onset” of transluminal damage and tissue shearing at 190 dB re 1 μPa (duration is not indicated).⁴⁵ It was on this basis that the Navy established a 180 dB sound-pressure threshold for injury for the LFA system. The DSPEA gives no consideration as to whether mid-frequency sound might produce the same results, and no indication why it is not therefore, on this basis alone, setting the EL at 205 dB re 1 $\mu\text{Pa}^2\cdot\text{s}$ or below. Cf. DEIS at 4.3-20 to 21.

b. Temporary Hearing Loss Threshold

The RSPEA sets its threshold for temporary hearing loss, or “threshold shift” (“TTS”), at 195 dB re 1 $\mu\text{Pa}^2\cdot\text{s}$. RSPEA at 4-4. It bases this threshold on a synthesis of studies on two species of cetaceans, bottlenose dolphins and beluga whales, conducted by the Navy’s SPAWAR laboratory in San Diego and by researchers at the University of Hawaii. DEIS at 4.3-12 to 15.

First, the Navy’s extrapolation of data from bottlenose dolphins and belugas to all cetaceans is not justifiable. Given the close association between acoustic sensitivity and threshold shift, such an approach must presume that belugas and bottlenose dolphins have the best hearing sensitivity in the mid-frequencies of any cetacean. Yet, harbor porpoises and orcas (for example) are more sensitive over part of the mid-frequency range than are the two species in the SPAWAR and Hawaii studies.⁴⁶ Indeed, bottlenose dolphins may be precisely the wrong species to use as

⁴⁴ H. Levine, Active Sonar Waveform 27 (2004) (JASON Group Rep. JSR-03-200).

⁴⁵ E. Cudahy and W.T. Ellison, A Review of the Potential for in vivo Tissue Damage by Exposure to Underwater Sound (2002) (forwarded to Chief of Naval Operations by Naval Submarine Medical Research Laboratory on Mar. 12, 2002).

⁴⁶ Richardson et al., Marine Mammals and Noise at 209.

an indicator species, as some recent studies suggest they may possess gain-control mechanisms while other species, like beaked whales, do not.⁴⁷ Finally, the animals in the studies may not represent the full range of variation even within their own species, particularly given their age and situation (the SPAWAR animals, for example, are housed in a noisy bay and the bottlenose dolphins have varying degrees of hearing loss).⁴⁸

Second, the small size of the data set generated by the studies leads the Navy and NMFS to some arbitrary interpretations. For example, the Navy effectively excludes the results of one study that found threshold shift originating in a bottlenose dolphin at 190 re 1 $\mu\text{Pa}^2\text{s}$, which is a full 5 dB re 1 $\mu\text{Pa}^2\text{s}$ below its proposed standard. DEIS at 4.3-12 to 13. The basis for this exclusion is the equal energy hypothesis: if you assume that the threshold for hearing loss decreases by a constant amount as the duration of a sound increases, you can fit a straight line connecting the data points that the studies have produced. Yet where the line falls can remain somewhat arbitrary given the small number of points on the chart. In this case, the Navy relied for its line-drawing on a single data point, from a single subject, lying at a distance from the main data cluster (Nachtigall *et al.* 2003b); alternatively, it might have dropped the line about 5 dB lower, which would have brought it closer to a second cluster, made of multiple data points from multiple subjects. See DEIS at Fig. 4.3-5. That choice would have fit the data just as well (or better) and would have had the advantage of being marginally more conservative—⁴⁹ yet there is no justification in the Navy's USWTR DEIS for the choice it made. The RSPEA's assumption of a 195 re 1 $\mu\text{Pa}^2\text{s}$ threshold is arbitrary and capricious.

Third, in its USWTR DEIS the Navy doesn't consider pinniped data because they are said not to normally occur within the range; but this rationale would not hold for the RIMPAC exercise given that two species, the Northern elephant seal and the critically endangered Hawaiian monk seal, occur within the sites that the Navy has proposed, and indeed the Navy predicts that one monk seal would be exposed to sound exceeding the hearing loss threshold. RSPEA at 4-15.

c. Permanent Hearing Loss Threshold

⁴⁷ Letter from Douglas P. Nowacek, Ph.D., Florida State University, to Keith Jenkins, Naval Facilities Engineering Command Atlantic, Navy 3-4 (undated comments on the Navy's Undersea Warfare Training Range DEIS) (citing several studies on bottlenose dolphins, beaked whales, and Microchiropteran bats).

⁴⁸ The Navy's interpretation of the data do not make any allowances for these conditions. Letter from David Mann, Ph.D., University of South Florida, to Keith Jenkins, Naval Facilities Engineering Command Atlantic, Navy 1 (Nov. 2, 2005)

⁴⁹ That is, it would (appropriately) capture more of the TTS that had actually been observed in the subject animals. See Letter from David Mann, Ph.D., University of South Florida, to Keith Jenkins, Naval Facilities Engineering Command Atlantic, Navy 1 (Nov. 2, 2005) (observing that conservative interpretation of data would place sound level "at least as low as 190 re 1 $\mu\text{Pa}^2\text{s}$, and possibly even lower").

The Navy sets its threshold for permanent hearing loss at 20 dB above its temporary hearing loss threshold, or 215 dB re 1 $\mu\text{Pa}^2\cdot\text{s}$. As discussed above, the use of permanent hearing loss as a bellwether for injury is contradicted by the available science and is inconsistent with NMFS' own analysis. But the Navy's threshold is arbitrary even with respect to permanent hearing loss.

First, because the Navy's threshold for permanent hearing loss is geared to its standard for temporary hearing loss, and because, for the reasons given above, the latter is set too high, the former should be lowered accordingly.

Second, the Navy's calculation of permanent threshold shift (which it equates to the onset on injury) appears to be based on an improper model. A recent study of threshold shift in pinnipeds found that the amount of hearing loss an animal experiences does not increase linearly with the energy it receives. As the energy intensifies, its rate of hearing loss increases, to such a degree that projections of permanent threshold shift according to traditional, linear models are likely to result in underestimates of harm.⁵⁰ Given the uncertainties presented by this study, the Navy should lower its estimate of auditory injury.⁵¹

d. Threshold of Significant Behavioral Change

The Navy's originally set its threshold for behavioral harassment, the point at which significant behavioral change would occur, at 190 dB re 1 $\mu\text{Pa}^2\cdot\text{s}$, just 5 dB (EL) below the onset of TTS. This level was based on a remarkably partial and idiosyncratic reading of the available literature and, when propounded in the Navy's DEIS for its Undersea Warfare Training Range off North Carolina, elicited strong, indeed overwhelming objection from a number of leading researchers. NMFS rightfully challenged the Navy on this score, indicating in its own comments on the range why the Navy's threshold was insupportable, and insisted that the Navy adopt an alternative threshold of 173 dB re 1 $\mu\text{Pa}^2\cdot\text{s}$ for its RIMPAC analysis.⁵² Unfortunately, NMFS' alternative is itself inconsistent with the scientific literature, with the same scientific opinion that objected to the Navy's threshold, and, indeed, with its own argument.

First, the best available science indicates that NMFS' threshold significantly underestimates the impact zone. NMFS itself—in an excellent and detailed review

⁵⁰ D. Kastak, B.L. Southall, R.J. Schusterman, C.R. Kastak, Underwater Temporary Threshold Shift in Pinnipeds: Effects of Noise Level and Duration, 118 *Journal of the Acoustical Society of America* 3154, 3161 (2005).

⁵¹ See Letter from Thomas Götz, University of St. Andrews, Scotland, to Keith Jenkins, Naval Facilities Engineering Command Atlantic (undated).

⁵² Letter from Rodney F. Weiher, Ph.D., NEPA Coordinator, NOAA, to Keith Jenkins, Naval Facilities Engineering Command Atlantic [hereinafter "NOAA Comment Letter"] (Jan. 30, 2006).

of some of the leading data—observes that “profound” behavioral responses to signals similar to mid-frequency naval sonar have been reported in wild marine mammals at lower levels. NMFS Comment Letter at 2-4. And a number of experts commenting on the Navy’s analysis concluded that significant behavioral responses have been demonstrated, in a controlled exposure experiment, to occur at energy levels as low as 154 dB re 1 $\mu\text{Pa}^2\cdot\text{s}$.⁵³ Based on this record, NMFS’ 173 dB threshold is not supportable.

Second, in arriving at its alternative threshold, NMFS relies on the Navy’s captive animal studies, basing its number on the 25th percentile for significant behavioral change. This approach is insupportable. Marine mammal scientists have long recognized the deficiencies of using captive subjects in behavioral experiments. The problem is exacerbated further by the fact that the subjects in question, roughly two belugas and five bottlenose dolphins, are highly trained animals that have been working in the Navy’s research program in the SPAWAR complex for years.⁵⁴ Indeed, the disruptions observed by Navy scientists, which included pronounced, aggressive behavior (“attacking” the source) and avoidance of feeding areas associated with the exposure, occurred during a research protocol that the animals had been rigorously instructed to complete.⁵⁵ For these reasons and others, scientists commenting on Navy’s Undersea Warfare Training Range unanimously objected to the use of the captive animal studies for this purpose, describing them as “poor for studying behavioral disruption,” noting that “very little can be deduced from [them] with applicability to wild animals,” and suggesting that the Navy’s analysis from these data “would not stand up to peer review.”⁵⁶ Basing this crucial standard on such a study makes NMFS’ selection arbitrary and capricious.

⁵³ Letter from Peter L. Tyack, Woods Hole Oceanographic Institution, to Keith Jenkins, Naval Facilities Engineering Command Atlantic, Navy 3 (undated comments on the Navy’s Undersea Warfare Training Range DEIS); Letter from Mark Johnson, Ph.D., Woods Hole Oceanographic Institution, to Keith Jenkins, Naval Facilities Engineering Command Atlantic, Navy 3 (Jan. 27, 2006); Letter from Douglas P. Nowacek, Ph.D., Florida State University, to Keith Jenkins, Naval Facilities Engineering Command Atlantic, Navy 3 (undated comments on the Navy’s Undersea Warfare Training Range DEIS). The study in question is D.P. Nowacek, M.P. Johnson, and P.L. Tyack, North Atlantic Right Whales (*Eubalaena glacialis*) Ignore Ships but Respond to Alerting Stimuli, 271 Proceedings of the Royal Society of London, Part B: Biological Sciences 227 (2004). See also Letter from Peter L. Tyack at 3 (noting that several studies have reported strong responses in porpoises to Constant Frequency or Frequency Modulated signals at far lower levels).

⁵⁴ See, e.g., S.H. Ridgway, D.A. Carder, R.R. Smith, T. Kamolnick, C.E. Schlundt, and W.R. Elsberry, Behavioral Responses and Temporary Shift in Masked Hearing Threshold of Bottlenose Dolphins, *Tursiops truncatus*, to 1-Second Tones of 141 to 201 dB re 1 μPa (1997) (SPAWAR Tech. Rep. 1751, Rev. 1).

⁵⁵ C.E. Schlundt, J.J. Finneran, D.A. Carder, and S.H. Ridgway, Temporary Shift in Masked Hearing Thresholds of Bottlenose Dolphins, *Tursiops truncatus*, and White Whales, *Delphinapterus leucas*, after Exposure to Intense Tones, 107 Journal of the Acoustical Society of America 3496, 3504 (2000).

⁵⁶ See, e.g., Letter from Peter L. Tyack, Woods Hole Oceanographic Institution, to Keith Jenkins, Naval Facilities Engineering Command Atlantic, Navy 2 (undated comments on the Navy’s Undersea Warfare Training Range DEIS); Letter from Mark Johnson, Ph.D., Woods Hole Oceanographic Institution, to Keith Jenkins, Naval Facilities Engineering Command Atlantic, Navy 3 (Jan. 27, 2006); Letter from Douglas P. Nowacek, Ph.D., Florida State University, to Keith Jenkins, Naval Facilities Engineering Command Atlantic,

Third, the agencies' exclusive reliance on ELs in setting a behavioral threshold is misplaced. Energy flux density standards were originally developed for use in audiology; when applied to behavior, a context in which sensitization and habituation can occur and in which impacts may not scale linearly over time, their value is substantially limited. It is therefore appropriate for the Navy to set dual thresholds for behavioral effects, one based on ELs and one based on sound pressure levels (SPLs). Indeed, that is what has been recommended for NMFS' own acoustic criteria.⁵⁷ For the Navy and NMFS to do otherwise would be arbitrary and capricious.

2. Strandings and Mortalities Associated with Mid-Frequency Sonar

Over the last five years, the association between military active sonar and whale mortalities has become a subject of considerable scientific interest and concern. That interest is reflected in the publication of numerous papers in peer-reviewed journals, in reports by inter-governmental bodies such as the IWC's Scientific Committee, and in evidence compiled from a growing number of mortalities associated with sonar. NMFS' discussion of these issues in its proposed authorization (71 Fed. Reg. 20994-20995), while brief, is considerably better than the Navy's in the RSPEA, which capriciously (1) denies the potential for beaked whale mortalities during the RIMPAC exercise, (2) dismisses the potential for sonar to injure whales at sea, (3) insists that beaked whale mortality cannot occur absent five "contributory factors" present during the Bahamas 2000 mass strandings in the Bahamas, (4) fails to consider the potential for strandings and mortalities in other species of cetaceans, (5) fails even to consider the larger set of stranding events that have been linked to sonar use or naval exercises, and (6) analyzes the 2004 Hanalei Bay strandings in a manner that is wholly inconsistent with NMFS' technical report.⁵⁸ As discussed elsewhere in this letter, NMFS' own analysis is problematic primarily in its conclusions about the injury threshold and in its treatment of the potential for injury at sea (71 Fed. Reg. 20995, 21002), which do not reflect the best available science and violate NEPA. 42 C.F.R. § 1502.22 (requiring agencies to evaluate all "reasonably foreseeable" impacts). Beyond this, of course, NMFS' discussion cannot cure the Navy's treatment of the issue in the RSPEA.

3. Modeling of Acoustic Impacts

Navy 4 (undated comments on the Navy's Undersea Warfare Training Range DEIS). Even NMFS observes that "pure tone exposures in laboratory conditions differ physically in several substantive ways from received tactical sonar signals in real-world conditions." NMFS Comment Letter at 3.

⁵⁷ B. Southall, NMFS, Noise Exposure Criteria: Structure of the Matrix at sl. 5 (2004) (presentation given by NMFS' Acoustic Criteria Panel at the Third Plenary of the Marine Mammal Commission Advisory Committee on Acoustic Impacts on Marine Mammals, San Francisco, Cal., 28-30 Apr. 2004).

⁵⁸ For a detailed discussion, see NRDC Comment Letter at 18-33.

The Navy bases its calculation of marine mammal impacts on a series of models. Its CASS/GRAB model determines received levels of sound within a limited distance of a sonar array; its MATLAB model converts those received levels into energy levels; its MMEM model translates the Navy's energy levels into a graph of where marine mammal "take" will occur; and its Take Estimation Model model calculates the number of animals (and therefore the number of "takes") within the area of harm. RSPEA at C-1 to 24. In other words, the four models estimate the amount of energy received at each point (or "cell") within the immediate area of an exercise and then estimate the number of animals that would therefore suffer injury or disruption.

It is difficult to fully gauge the accuracy and rigor of these models with the paucity of information that the RSPEA provides. They have not previously been used in the Navy's environmental reviews of acoustic activities, or at least not in those that have been opened to public comment, and, as a group, they appear to differ significantly from other systems, like AIM, that have been used in other contexts to model impacts from both mid-frequency and low-frequency sonar.⁵⁹ Given the importance of these models to the Navy's analysis, they must be made available to the public.⁶⁰ But even from the limited description in the RSPEA, it is clear that they are deeply flawed. NMFS acknowledges that while some of the assumptions made by the Navy are conservative, others are not. 71 Fed. Reg. 20996. We believe NMFS is mistaken, however, in claiming that the Navy's take numbers are overestimates. Among the non-conservative assumptions that are implicit in the model:⁶¹

- (1) As discussed above, the thresholds established for injury, hearing loss, and significant behavioral change are inconsistent with the available data and are based, in part, on assumptions not acceptable within the field.
- (2) The Navy does not properly account for reasonably foreseeable reverberation effects (as in the Haro Strait incident),⁶² giving no indication that its modeling sufficiently represents areas in which the risk of reverberation is greatest (RSPEA at C-12);
- (3) The Navy does not appear to have modeled for surface ducting (see C-1 to C-24), a reasonably foreseeable event that can significantly enhance propagation in the upper layers of the water column and that seems to have occurred during the 2004 mass stranding in Hanalei Bay (D-3 to D-8);

⁵⁹ See, e.g., Navy, Final Overseas Environmental Impact Statement and Environmental Impact Statement for SURTASS LFA at 4.2-31 to 38 (includes modeling for beaked whales and right whales in Onslow Bay); Hildebrand et al., Modeling the Bahamas Beaked Whale Stranding.

⁶⁰ See discussion below at section III(G) ("Project Description and Meaningful Public Disclosure").

⁶¹ For a more detailed discussion, see NRDC Comment Letter at 33-37.

⁶² NMFS, Assessment of Acoustic Exposures on Marine Mammals in Conjunction with USS Shoup Active Sonar Transmissions in the Eastern Strait of Juan de Fuca and Haro Strait, Washington, 5 May 2003 (2005).

- (4) The Navy's modeling excludes most of the active acoustic systems that it plans to use during RIMPAC, such as helicopter dipping sonar, active sonobuoys, torpedoes, acoustic device countermeasures, training targets, and range sources;
- (5) The model fails to consider the possible synergistic effects of using multiple sources, such as ship-based sonars, in the same exercise, which can significantly alter the sound field, and fails to consider the combined effects of multiple exercises, which, as NMFS indicates, may have played a role in the 2004 Hanalei Bay strandings;⁶³
- (6) The Navy's analysis of marine mammal distribution and abundance does not incorporate recent data (as summarized in Baird Letter at 2-3) that suggests greater densities and smaller population sizes for certain species; and
- (7) The model, in assuming that every whale encountered during an exercise is essentially a new whale, does not address the cumulative impacts on the breeding, feeding, and other activities of species and stocks, either during the RIMPAC 2006 event or during the successive biennial RIMPAC exercise.

The Navy must make substantial changes if its modeling is to meet the "scientific integrity" standard prescribed by NEPA. 42 C.F.R. § 1502.24.

F. Cumulative Impacts

In order to satisfy NEPA, an EIS must include a "full and fair discussion of significant environmental impacts." 40 C.F.R. § 1502.1. It is not enough, for purposes of this discussion, to consider the proposed action in isolation, divorced from other public and private activities that impinge on the same resource; rather, it is incumbent on the Navy to assess cumulative impacts as well, including the "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future significant actions." *Id.* § 1508.7. Thus, for example, it will be necessary to consider the impacts of the proposed exercise alongside those of existing naval activities in the region, including the operations area in which the range would reside, as well as those of industrial and commercial activities such as fishing, shipping, and geophysical research.⁶⁴

As it stands, the RSPEA does not consider cumulative impacts for any species other than marine mammals, even where such impacts could affect protected species as well; and, as for marine mammals, it says little more than that the behavioral harassment it predicts for the exercise would necessarily be short-term in nature. RSPEA at 4-23. The Navy also

⁶³ Southall et al., Hawaii Melon-Headed Whale at 31, 45.

⁶⁴ In the 2005 Energy Policy Act, Congress mandated that the Minerals Management Service conduct an offshore inventory for oil and gas throughout the entire outer continental shelf of the United States, a process that could well extend high-energy seismic exploration to Hawaii. Energy Policy Act of 2005, Pub. L. No. 109-58, §357, 119 Stat. 594, 720. The Navy must evaluate the cumulative impacts stemming from this additional acoustic activity.

offers the bromide that mitigation will preclude any significant or long-term impacts on marine mammals and the marine environment. Not only are both statements factually insupportable given the lack of any population analysis or quantitative assessment of long-term effects in the RSPEA (and the numerous errors in the Navy's thresholds and modeling)—but they misapprehend the definition of “cumulative impact,” which, according to NEPA's regulations, “can result from individually minor but collectively significant actions taking place over a period of time.” 42 C.F.R. § 1508.7. The fact that the RSPEA is nominally a supplement to an earlier programmatic environmental assessment does not cure the problem, since a proper cumulative impact analysis was not performed in the initial document and, in any case, does not reflect the significant new information that occasions the Navy's reanalysis of acoustic impacts this year.

In short, NMFS must (a) consider cumulative impacts on species such as fish, at least insofar as those impacts affect marine mammals, (b) assess the potential for synergistic adverse effects, as from noise in combination with ship-strikes,⁶⁵ (c) properly assess the cumulative impacts of holding biannual RIMPAC exercises in the same areas off Hawaii, and (d), even if NMFS finds that the impacts of present and future RIMPAC exercises are likely to be small, consider whether individual naval exercises in the Hawaiian Islands Operating Area and other activities could combine with RIMPAC to produce a significant effect.

G. Project Description and Meaningful Public Disclosure

Disclosure of the specific activities contemplated by the Navy is essential if the NEPA process is to be a meaningful one. See, e.g., LaFlamme, 852 F.2d at 398 (noting that NEPA's goal is to facilitate “widespread discussion and consideration of the environmental risks and remedies associated with [a proposed action]”).

With regard to noise-producing activities, for example, the Navy must describe source levels, frequency ranges, duty cycles, and other technical parameters relevant to determining potential impacts on marine life. The RSPEA and its predecessors provide some of this information, indicating, for example, the nominal source level of the SQS-53 system, which is deployed on surface ships. RSPEA at 2-10. But it fails to disclose any information about helicopter dipping sonar, active sonobuoys, acoustic device countermeasures, training targets, or range sources that would be used during the exercise; and, even with respect to the SQS-53 system, refrains from giving any indication of platform speed, pulse length, repetition rate, beam widths, or operating depths—that is, most of the data that the Navy presumably used in modeling acoustic impacts. RSPEA at 2-10 to 11. Without this information, the process will be a charade, with the public guessing at the nature of the activities proposed for their own backyard.

⁶⁵ The 2004 Report of the IWC's Scientific Committee emphasizes the importance of evaluating the synergistic impacts of ocean noise and other stressors, such as toxins. IWC, 2004 Report of the IWC Scientific Committee, Annex K at § 6.4 and App. 2 (noting studies of terrestrial animals that demonstrate significant adverse synergistic effects).

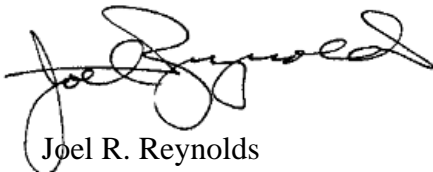
Just as important, the Navy has not released or offered to release any of the modeling systems (CASS/GRAB, MATLAB, MMEM, or the Take Estimation Model) it used to calculate acoustic harassment and injury.⁶⁶ These models must be made available to the public, including the independent scientific community, for public comment to be meaningful under NEPA and the Administrative Procedure Act. 42 C.F.R. §§ 1502.9(a), 1503.1(a) (NEPA); 5 U.S.C. § 706(2)(D) (APA). And guidelines adopted under the Data (or Information) Quality Act also require their disclosure. The Office of Management and Budget's guidelines require agencies to provide a "high degree of transparency" precisely "to facilitate reproducibility of such information by qualified third parties" (67 Fed. Reg. 8452, 8460 (Feb. 22, 2002)); and the Defense Department's own data quality guidelines mandate that "influential" scientific material be made reproducible as well.⁶⁷

We drew the Navy's attention to these issues in our February 2006 comment letter, responding to the Navy's draft SPEA, and urged the Navy to contact us immediately to discuss how to make this critical information available. It has not done so.


IV. CONCLUSION

For the reasons set forth above, we urge NMFS to deny the Navy's application for an incidental harassment authorization for RIMPAC 2006. A project of this magnitude and complexity—with its cumulative impacts, its profound controversy, its demonstrated potential for serious harm—must go through the careful, deliberate environmental review that Congress intended.

Very truly yours,



Joel R. Reynolds
Senior Attorney



Michael D. Jasny
Senior Consultant

Cc: Sen. Daniel Inouye

⁶⁶ Any internal reports that the Navy relies on in determining species distribution and abundance must be released as well.

⁶⁷ Navy, Ensuring the Quality of Information Disseminated to the Public by the Department of Defense: Policy and Procedural Guidance § 3.2.3.1 (Feb. 10, 2003). The Defense Department defines "influential" to mean "that the Component can reasonably determine that dissemination of the information will have or does have clear and substantial impact on important public policies or important private sector decisions"—which is clearly the case here, in what may be the Navy's first NEPA review of mid-frequency sonar exercises. See Ensuring the Quality of Information Disseminated to the Public by the Department of Defense: Definitions § 3 (Feb. 10, 2003).

Steve Leathery and Michael Payne
May 24, 2006
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Sen. Daniel Akaka
Rep. Neil Abercrombie
Rep. Ed Case