

September 26, 2007

Commander, US Pacific Fleet  
Attention: Fleet Environmental Officer,  
Building 251  
Pearl Harbor, HI  
96860

Dear Sir,

I am writing in regards to the Programmatic Environmental Assessment/Overseas Environmental Assessment for Undersea Warfare Exercise within the Hawai'i Range Complex (USWEX EA/OEA). In terms of my background relevant to this issue, I have been studying cetaceans since 1986, have a Ph.D. in Biology (1994), served as a member of the IUCN Cetacean Specialist Group (1992-1998), the Committee of Scientific Advisors for the Society for Marine Mammalogy (1995-2001), and the Marine Mammal Advisory Committee of the Western Pacific Fishery Management Council (2005-present), and have been undertaking research on cetacean populations around the main Hawaiian Islands since 1999. My research in Hawaiian waters has involved examining stock structure, estimating population sizes, and studying diving behavior, ecology and/or social organization of more than 10 species of odontocetes, as well as studies of the diving behavior of humpback whales. I have published a number of papers and reports pertinent to understanding potential impacts of anthropogenic activities on these populations (see [www.cascadiaresearch.org/robin/hawaii.htm](http://www.cascadiaresearch.org/robin/hawaii.htm)).

I have reviewed relevant sections of the USWEX EA/OEA and Finding of No Significant Impact for the USWEX exercises, the After-Action Report from RIMPAC 2006, relevant sections of the HRC DEIS/OEIS, and most publications and reports available on cetacean populations in Hawaiian waters, among other documents. I have a number of concerns regarding the analyses and measures outlined in the USWEX EA/OEA in regards to potential impacts on marine mammal populations, outlined below.

1. The lack of documented strandings associated with prior naval exercises in Hawai'i does not mean no impacts have occurred.

The USWEX EA/OEA bases conclusions on the potential for impacts from future naval exercises in Hawai'i in part on the relative lack of observed impacts from prior naval exercises. Faerber and Baird (2007a, 2007b) address the question of whether the lack of beaked whale strandings in Hawai'i in relation to military exercises mean no impacts have occurred. A number of recent cetacean strandings have been linked to naval exercises, particularly involving mid-frequency sonar. Two species most affected are Cuvier's and Blainville's beaked whales. In 22 years there have been six such strandings in the Canary Islands, yet none have occurred in the Hawaiian Islands, despite the existence of regular naval exercises in the islands and resident populations of both species of beaked whales (McSweeney et al. 2007). The USWEX EA/OEA

and other assessments of potential impacts of ongoing naval exercises in Hawai‘i have used the lack of mass strandings to imply that there have been no past impacts. Faerber and Baird (2007a, 2007b) hypothesize that the likelihood of a dead or moribund beaked whale stranding, and the probability of a stranded animal being detected, differ between the Canary and Hawaiian Islands. They examined near-shore bathymetry, shoreline slope, human population densities, fringing reef presence, ocean currents, sea surface temperature, and the presence of large scavenging sharks. Beaked whale habitat in the two areas were considered to be waters deeper than 650 m, based on analyses of beaked whale habitat use in Hawai‘i (Baird et al. 2006). The Canary Islands have a greater proportion of beaked whale “habitat” (depths >650 m) closer to shore (10.6% versus 6.3% within 3-km of shore), with a steeper slope (avg. slope Canaries -134m/km, Hawai‘i -95 m/km). Hawai‘i is dominated by steeper (>50°) shoreline cliffs (6% of shorelines vs. <1% for Canaries), human population density is 28% of that in the Canaries, and population per kilometer of shoreline is 53% of that in the Canaries. Fringing reefs are common around the main Hawaiian Islands, while such reefs do not form in the Canaries. Suitable habitat closer to shore, more accessible coastlines, lack of fringing reefs, lower water temperature with slower currents, and increased human population densities all suggest moribund or dead beaked whales are more likely to strand and be detected in the Canary Islands than in the Hawaiian Islands. Furthermore, beaked whales appear to inhabit shallower waters in the Canary Islands than in Hawai‘i (Ritter and Bredelau 1999; Baird et al. 2006), thus even disregarding the differences in proportion of deep waters closer to shore noted above, impacted whales in the Canary Islands are likely to be closer to shore and more likely to strand than in Hawai‘i. Faerber and Baird (2007b) conclude that a lack of mass strandings in the Hawaiian Islands cannot be used to indicate a lack of impact.

In addition, a lack of sightings of dead floating whales or dolphins in monitoring efforts does not indicate that animals have not been killed. Most species of whales and dolphins (with the exception of sperm whales and right whales) usually sink upon death. If animals die in shallow water, decomposition processes may eventually result in the carcass re-floating (where it has a chance of being detected). In deep waters, however, increased hydrostatic pressure and differences in gas solubility may prevent carcasses from re-floating (Allison et al. 1991). Given that beaked whales and other potentially at risk species typically inhabit deep waters in Hawai‘i, if an individual is killed the carcass may not re-float where it could be detected. Also, there have been a number of cases where large sharks in Hawaiian waters have been observed either consuming dead humpback whales shortly after they have died or following moribund humpback whales; the presence of such large scavenging sharks in Hawaiian waters reduces the likelihood that dead or moribund medium-sized whales or dolphins would float long enough to strand on a beach or make it to a beach if injured or in distress.

2. The use of a 190 dB threshold for behavioral effects or potentially mortality of beaked whales is not supported by available information.

Modeling and controlled exposure experiments show that the sound level required to trigger behavioral response is much lower than the behavioral threshold adopted by the Navy (190 dB) and NMFS (173 dB). Controlled playbacks with killer whales in Norway that were tagged and exposed to mid-frequency sonar signals demonstrated that individuals displayed unusual diving patterns, ceased feeding and fled the ensonified area at received levels near 150 dB (Kvadsheim et al. 2007). Modeling of the predicted sound exposures of beaked whales associated with the 2000 stranding event in the Bahamas (Balcomb and Claridge 2001) suggest that stranded animals received sound pressure levels of between 145 and 169.3 db (Hildebrand

and Balcomb 2004; Balcomb 2006), suggesting that at least in the case of beaked whales, such sound pressure levels may result in mortality, not just “Level B” harassment.

3. Mitigation measures outlined are ineffective at detecting long-diving and cryptic species.

The USWEX EA/OEA assumes that the measures it proposes will mitigate impacts on marine mammals. The “protective measures related to acoustic effects” (Section 5.1) outlined primarily involve a combination of visual and passive acoustic detection methods for the presence of marine mammals around vessels operating mid-frequency active sonar. However, a number of species of odontocetes found in Hawaiian waters dive for extended periods. For example, Blainville's and Cuvier's beaked whales have been documented diving for periods of up to 83 and 94 minutes, respectively (Baird et al. 2006, Baird unpublished), and regularly dive for periods of 50-60 minutes. Short-finned pilot whales may dive for periods of up to 27 minutes in Hawai‘i (Baird unpublished), and dwarf and pygmy sperm whales dive for extended periods (>10 minutes). According to the best available estimates, fewer than 2% of beaked whales would likely be detected by visual observations as outlined in the USWEX EA/OEA, even when directly on the ship's trackline (Barlow and Gisiner 2006). The detection rate would approach zero for beaked whales occurring one km away (Barlow and Gisiner 2006). The USWEX EA/OEA suggest that monitoring by passive sonar would allow detection of cetaceans, however the probability of locating all or most toothed whales through passive acoustic monitoring is extremely low. There is currently no information available on the sounds produced by some species of Hawaiian odontocetes (e.g., dwarf sperm whales) so it would be impossible to train passive sonar operators to detect these sounds. No information is available on the proportion of time individuals of most species spend producing sounds, of the sound pressure levels of vocalizations (and thus the potential distance at which they might be detected), or on the depths at which sounds are produced (some species, such as beaked whales, may only vocalize at depth). Information presented in the RIMPAC 2006 After Action Report documents the ineffectiveness of the Navy's passive acoustic monitoring. In this report it is noted that there were 29 instances where marine mammals were detected, 28 visually (at least 20 from ships) and only one acoustically. The fact that there was only a single acoustic detection and at least 20 ship-based visual detections indicates that passive acoustics are unlikely to be an effective means of monitoring marine mammal presence (and thus mitigating impacts) around naval vessels in Hawai‘i. Given that passive acoustics are the primary method the Navy intends to use to detect marine mammals at night (and thus mitigate impacts), impacts at night will be impossible to avoid.

4. The USWEX EA/OEA does not fully take into account evidence of population structure when assessing risks to populations.

Understanding and predicting the impacts of anthropogenic activities on protected species such as marine mammals requires knowledge of population structure. If populations are fragmented into a number of smaller demographically isolated units, and some of these units are more exposed to anthropogenic activities, the impacts of anthropogenic activities on populations may be greater than otherwise predicted. In Hawaiian waters, population structure has been examined for only four species of odontocetes: false killer whales, short-finned pilot whales, bottlenose dolphins, and spinner dolphins. Genetic evidence from all four of these species indicates the presence of demographically-isolated island-associated populations (Andrews et al. 2006; Chivers et al. 2003, 2007; Martien et al. 2005). Given the high levels of site fidelity that have been documented for melon-headed whales, pygmy killer whales, Blainville's beaked

whales, Cuvier's beaked whales, and rough-toothed dolphins (Huggins et al. 2005; McSweeney et al. 2005, 2007; Webster et al. 2005), it is likely that if sufficient genetic samples were available from these populations there would be similar evidence of demographically isolated island-associated populations. As such, instead of potentially impacting a small proportion of a number of widely-ranging populations of odontocetes, naval exercises around the main Hawaiian Islands have the potential to impact a large proportion of individuals in a number of relatively small island-associated populations. High levels of site fidelity documented from photo-identification suggest that if individuals were killed or displaced due to anthropogenic activities re-colonization from other populations would not occur quickly.

5. Data collected as part of the marine mammal exercise monitoring plan should be used to assess the effectiveness of the monitoring effort.

The USWEX EA/OEA notes that there will be an evaluation of the monitoring program's ability to detect whales but no information is presented on how this will be done. Information presented in the RIMPAC After Action Report was insufficient to assess the efficacy of the visual monitoring, because no information was presented on the number of hours of visual monitoring that was undertaken and the total number of vessels/observers monitoring. To assess the efficacy of such visual monitoring, information on effort (number of vessels, number of observers, number of hours observed, and sea conditions during observations), and the number of sightings of each species must be recorded and reported. This would allow independent assessment of the efficacy of the monitoring, by comparing sighting rates (by species) to independent survey data from the Hawaiian Islands, to estimate what proportion of marine mammals in the operating area the observers are detecting.

6. Survey and monitoring programs must be tailored for the specific biological circumstances of the Hawaiian Islands.

Section 5.1.3 notes that a recommended approach for surveys and analyses necessary to establish a baseline of protected species distribution and abundance, and monitor for changes in populations that might be attributed to ASW, is being developed for the Atlantic Fleet Undersea Warfare Training Range and may be used for implementing similar programs in the Hawaiian Islands. Monitoring programs for cetaceans typically involve large scale vessel surveys to estimate abundance using line-transect methods. While such methodology may be the most appropriate under some circumstances, in Hawaiian waters a combination of high species diversity, low densities, and the presence of a number of cryptic or difficult-to-identify species result in a variety of limitations to using large scale vessel surveys for assessing abundance or monitoring trends (Baird 2007). Given evidence for small island-associated populations of most species of odontocetes in Hawai'i, population estimation using mark-recapture methods will result in more precise estimates and thus will have a greater likelihood of allowing for examination of trends in abundance.

Sincerely,



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