30 May 2001

Donna Wieting, Chief
Marine Mammal Conservation Division
Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, Md 20910-3226

SUBJECT: Navy Request for Permit to Take Marine Mammals Incidental to Operating SURTASS LFA Sonar System

Although my 6 pages of comments in a letter to you, "Navy SURTASS LFA Sonar OEIS/EIS", dated 15 November 1999, include the important issues that the LFAS is not a reliable or survivable system, and can injure humans at acoustic levels below what the Navy erroneously claims as safe; I will confine my remarks to issues of LFAS relating to marine mammals.

In a letter to Joe Johnson of the Navy LFA Program, dated 23 Feb 2001, Ken Balcomb presented irrefutable evidence that the resonance frequency of airspace in cetaceans was the major factor, not auditory impact alone, in the deaths of mass stranding whales and a dolphin in the Bahamas during naval sonar operations. Ken Balcomb is a highly respected whale biologist who has been studying a group of beaked whales in the Bahamas for many years and has identified about 35 of them.

In Balcomb's own words: "The killing is largely due to resonance phenomena in the whales' cranial airspaces that are tearing apart delicate tissues around the brains and ears. This is an entirely separate issue from auditory thresholds and traumas that the Navy has fixated upon. ".... "in 1998 NATO and the US Naval Undersea Warfare Center had already calculated the resonance frequency of airspaces in Cuvier's beaked whales to be about 290 Hz at 500 meters depth which is almost precisely the middle frequency of LFA (100-500 Hz) described in the OEIS/EIS! That information is quite important, with specific references to Tech Report 3 of the DOEIS/EIS, wherein there are several citations of Navy sponsored

studies that clearly demonstrated vestibular dysfunction (eg. dizziness, vertigo) and lung hemorrhage, etc. in lab animals exposed to LFA at their lung resonance frequency. In other words, the Navy has sufficient information available to know there is at least theoretically a very serious problem to whales from LFA for even brief periods of time"

Balcomb concluded from the ship sonar types (dB, etc) and stranding pattern (large area) of the whales, "that the whales in the Bahamas incident were adversely and lethally impacted by sonar at received levels well below the 180 dB re 1uPa considered "safe" for whales, and this was due to the aforementioned resonance problem".

"This sonar impact at received levels well below 180 dB is likewise well documented in the Greek incident. The first whale to strand did so 40 km from the ship one hour after the acoustic trials commenced. If one takes into account how fast a beaked whale can swim (about 15 km per hour, maximum) it must have been at least 25 km from the ship when the first of its 238 four-second pings was transmitted! At that distance the RL was calculated by the Navy to about 150 dB! The Bioacoustics Panel overlooked this important bit of evidence of RL for impact".

..."clearly, the impact of such sonars on these animals is occurring at significant distances well beyond the current mitigation distance (1-2.2 km) used by the Navy. Thus impact distances can be easily calculated, and they are more like 20 to 100 km, and more -- well over the horizon of shipboard observers."

Of the 7 known mixed-species mass stranding involving beaked whales, all 7 occurred over the last 30 years while naval maneuvers were conducted nearby.

In March 2001, NOAA Fisheries issued a status report on the Bahamas stranding of beaked whales. The NOAA lead team investigating the unusual Bahamas whale mass stranding has reached no final conclusions. Experiments relating the sonars to the strandings will not be completed for another year. "The scientific investigation is an ongoing high priority for both NOAA Fisheries and the US Navy". Thus, it is evident that the Navy request for a take permit should be postponed/withdrawn, at the very least, until more research and calculations on cetacean resonance frequency of airspaces can be completed.

However, there are other issues that should require permanent denial of a take permit for LFAS:

(a) Contrary to their claims, the Navy cannot predict received level (RL) of acoustic dBs at any range and depth in real time during operational deployment. As I commented in my 15 November 1999 letter:

"The factors affecting sound propagation in the ocean are both dynamic in time and space regarding ocean water conditions; and complex regarding bottom typography, rock/sediment type and thickness. As the sound source level is constantly moving, the range and angle of incidence of the sound transmission on the ocean bottom is constantly changing, thus bottom absorption, reflection and refraction are also constantly changing. And consequently so are ocean surface reflections and refractions. Sound transmission channeling is not predictable in the Navy's over-simplified theoretical models.

The complex dB pattern of the bottom-bounce transmission mode is especially well illustrated in topographically complex sites, such as Site #8 near San Nicholas Island in coastal Southern California, shown in OEIS/EIS Technical Report 2. The Site #8 acoustic model also shows a near range (about 2-4 nmi) acoustic shadow zone (very low to zero dB) what would mislead any visual observer regarding behavioral impacts on marine mammals at the ocean surface and would also register no change on the passive acoustic monitoring system. Yet at ranges and depths farther for the acoustic source, RL are amplified causing complex patterns over relatively short distances of high RL at depth and a high RL zone near the ocean surface ranging many nmi (16-18 nmi in the Site #8 example). Thus both deep diving and shallow diving marine mammals can be injured and/or harassed at many nmi from the acoustic source."

The Bahamas incident supports the Navy's inability to determine RLs. Thus any of its claimed mitigation-of-harm to marine mammals is invalid.

(b) The Navy's very short time-period experiments re auditory and immediate behavioral responses of just a few whale species is totally inadequate to assess the long-term impact of LFAS on marine mammals and other marine life. Also, the Navy wants to operate LFAS at acoustic levels 1000 or more times greater than levels at which its own tests were performed. Totally unacceptable!

(c) The permit to 'take' (harass, injure, kill) marine mammals specifies that it be a "small number" and have a "negligible " impact on the species taken. The Navy's LFAS can't meet these requirements. The taking of just one marine mammal is not "negligible" for some endangered species, such as the Right Whale and Hawaiian monk seal. Regardless of how "small number" is determined (per cent of species population? -- total? regional?), the Navy cannot limit the number of marine mammals killed because it plans to operate over 80% of the oceans for decades, and it cannot control RL as a function of range or depth. Over time, large numbers of marine mammals will be eliminated. In fact, in regions of special interest for surveillance, LFAS will decimate marine mammals in a relatively short time. So entire regional populations will be eradicated. That is a very high and significant number of takes !

(d) The Navy's permit would have an exception for times of "heightened tension" when it would operate LFAS without any restrictions at all. Essentially, if LFAS is permitted to operate, it can do as it pleases because it will hide behind the cloak of "classified" if anyone tries to challenge its destruction of the marine ecology.

NMFS/NOAA Fisheries has the responsibility to protect marine mammals under the Marine Mammal Protection Act. It would be a violation of this mandate to condone LFAS which is capable of, not only short range, but also long range injury and death to marine mammals. Much more research needs to be done on the impact of acoustic transmissions, especially resonance frequencies of airspace, on marine mammals and other marine animals.

I strongly urge NMFS to deny the Navy's request for a LFAS permit to take marine mammals !

Sincerely,

Deane Oberste-Lehn

Deane Oberste-Lehn, PhD
Research Scientist
P.O. Box 369
Menlo Park, CA 94026