



**RECORD OF DECISION
FOR
SURVEILLANCE TOWED ARRAY SENSOR SYSTEM
LOW FREQUENCY ACTIVE
(SURTASS LFA) SONAR
SUPPLEMENTAL ENVIRONMENTAL IMPACT
STATEMENT**



**Department of the Navy
Chief of Naval Operations
August 2007**

DEPARTMENT OF DEFENSE

Department of the Navy

Record of Decision for Surveillance Towed Array Sensor
System Low Frequency Active (SURTASS LFA) Sonar

AGENCY: Department of the Navy, DoD.

ACTION: Notice of Record of Decision.

SUMMARY: The Department of the Navy (DON), after carefully weighing the operational, scientific, technical, and environmental implications of the alternatives considered, announces its decision to employ up to four SURTASS LFA sonar systems with certain geographical restrictions and monitoring mitigation designed to reduce potential adverse effects on the marine environment. This decision, which pertains to the employment of up to four SURTASS LFA sonar systems (as originally analyzed in the Final Overseas Environmental Impact Statement and Environmental Impact

Statement [FOEIS/EIS] for SURTASS LFA Sonar and augmented in the Final Supplemental Environmental Impact Statement [SEIS]), implements the preferred alternative, Alternative 2, identified in the Final SEIS for SURTASS LFA sonar.

Pursuant to 10 U.S.C. 5062, the Navy is required to be trained and equipped for prompt and sustained combat incident to operations at sea. To fulfill this mandate, the Navy provides credible, combat-ready naval forces capable of sailing anywhere, anytime, as powerful representatives of American sovereignty. Fleet readiness is the foundation of the Navy's warfighting capability, and there is a direct link between fleet readiness and training. For the Navy, fleet readiness means essential, realistic training opportunities, in both open-ocean and littoral environments.

The Navy is facing existing and emerging threats from foreign naval forces. For example, several non-allied nations are fielding new, quiet submarines. In order to successfully locate and defend against these threats, our sailors must train realistically with both active and passive sonar. In executing anti-submarine warfare (ASW) missions, sonar is the key to survival for our ships and sailors. The employment of SURTASS LFA will enable the

Navy to meet the clearly defined, real-world national security need for improved ASW capability by allowing Navy Fleet units to reliably detect quieter and harder-to-find foreign submarines underwater at long range, thus providing adequate time to react to and defend against the threat, while remaining a safe distance beyond a submarine's effective weapons range.

In April 2003, the Deputy Assistant Secretary of the Navy for Environment (DASN(E)) directed the Navy to prepare a supplemental EIS to address concerns identified by the U.S. District Court for the Northern District of California in Natural Resources Defense Council (NRDC) v. Evans, No. C-02-3805-EDL (N.D. Cal.), in litigation over the first authorization of the SURTASS LFA system, and to provide additional information. Specifically, the SEIS addresses legislative changes to the Marine Mammal Protection Act (MMPA); addresses deficiencies raised in District Court concerning compliance with the National Environmental Policy Act (NEPA), MMPA, and Endangered Species Act (ESA); provides necessary information to apply for a new five-year rule under the MMPA; analyzes potential impacts for LFA system upgrades; and provides additional information and analyses pertinent to the proposed action.

SUPPLEMENTARY INFORMATION: The text of the Record of Decision (ROD) is provided as follows:

The Department of the Navy (DON), pursuant to Section 102(2)(c) of the National Environmental Policy Act (NEPA) of 1969, 42 U.S.C. Section 4332(2)(c); the regulations of the Council on Environmental Quality (CEQ) that implement NEPA procedures, 40 CFR Parts 1500-1508; 32 CFR Part 775; and Presidential Executive Order (EO) 12114 (Environmental Effects Abroad of Major Federal Actions), announces its decision to continue employment of SURTASS LFA sonar systems with certain geographical restrictions and monitoring mitigation designed to reduce potential adverse effects on the marine environment. This decision, which pertains to the employment of up to four SURTASS LFA sonar systems (as originally analyzed in the FOEIS/EIS for SURTASS LFA Sonar and augmented in the Final SEIS), implements the preferred alternative, Alternative 2, identified in the Final SEIS for SURTASS LFA Sonar.

BACKGROUND AND ISSUES

The United States and its military forces must have the ability to project power decisively throughout the world.

A key factor in the realization of this goal is the protection of United States and allied forward-deployed naval units against the threat of opposing force submarines. There are currently a total of 470 submarines, operational or being built, owned by 40 countries worldwide. Of this number, 257 are diesel-powered submarines. Important technological developments have resulted in more effective submarines currently in operation, and are likely to produce even quieter submarines in the future. The combination of quiet operation and effective weapons gives these submarines a substantial and multifaceted combat capability. When these diesel-powered submarines are in a defensive mode, that is, not required to travel great distances or at high speed, they have a capability nearly equal to that of a modern United States nuclear submarine. Diesel-powered submarines can be readily obtained at a minimal cost by countries and organizations with interests potentially hostile to those of the United States, and, as a result, they pose a significant threat.

Where once the Navy could detect hostile submarines before they could get close enough to launch their weapons, by the 1990's the response time of U.S. forces, against the

quietest threat, had shrunk to mere minutes. To regain the needed response time and thereby protect our forces, the Navy embarked on an extensive research program to develop new technologies to detect submarines at long ranges. Among the technologies investigated were radar, laser, magnetic, infrared, electronic, electric, hydrodynamic, biologic and sonar (high-, mid- and low frequency). These acoustic and non-acoustic technologies were evaluated in the FOEIS/EIS. It was concluded that even though no single technology investigated was effective during all tactical and environmental conditions, the low frequency active (LFA) sonar was the most effective and best available technology for reliable long-range detection during most weather conditions, day or night. This FOEIS/EIS analysis remains valid and is incorporated into the SEIS by reference.

As stated in the FOEIS/EIS and reiterated in the Final SEIS, LFA sonar is an augmentation, or adjunct, to the passive (SURTASS) detection system. Under certain, specific oceanic conditions, passive sonar can provide the detection required. However, under environmental conditions found in many ocean areas (such as high ambient noise levels), passive sonar cannot detect quiet targets. Therefore, passive systems alone cannot detect quiet,

harder-to-find submarines during all conditions, particularly at long ranges.

Purpose of the SURTASS LFA Sonar SEIS

The proposed action herein is the Navy employment of up to four SURTASS LFA sonar systems in the oceanic areas as presented in Figure 1-1 (SURTASS LFA Sonar Systems Potential Areas of Operations) of the FOEIS/EIS for SURTASS LFA Sonar. Based on current operational requirements, exercises using these sonar systems would occur in the Pacific, Atlantic, and Indian oceans, and the Mediterranean Sea. To reduce adverse effects on the marine environment, areas would be excluded as necessary to prevent 180-decibel (dB) sound pressure level (SPL) or greater within specific geographic range of land, in offshore biologically important areas (OBIAs) during biologically important seasons, and in areas necessary to prevent greater than 145-dB SPL at known recreational and commercial dive sites.

The purpose of the SURTASS LFA Sonar SEIS is to: 1) address concerns of the U.S. District Court for the Northern District of California in its 26 August 2003 Opinion and Order in relation to compliance with NEPA, ESA, and MMPA; 2) provide information necessary to apply for a new five-year Rule that would provide for incidental takes

under the MMPA when the current rule expires in 2007, taking into account legislative changes to the MMPA and the need to employ up to four SURTASS LFA sonar systems; 3) analyze potential impacts for LFA system upgrades; and 4) provide additional information and analyses pertinent to the proposed action.

In response to the United States District Court's ruling on the motion for preliminary injunction in NRDC v. Evans, the DASN(E) decided that the purposes of NEPA would be served by supplemental analysis of employing SURTASS LFA sonar systems. On 11 April 2003, the DASN(E) directed the Navy to prepare a SEIS to address concerns identified by the Court, to provide additional information regarding the environment that could potentially be affected by the SURTASS LFA sonar systems, and to provide additional information related to mitigation.

The FOEIS/EIS for SURTASS LFA sonar was completed in January 2001 by the Navy, with the National Marine Fisheries Service (NMFS) as a cooperating agency, in accordance with the requirements of NEPA and Presidential Executive Order (EO) 12114 (Environmental Effects Abroad of Major Federal Actions). The DASN(E) signed the ROD on 16 July 2002 (*Federal Register* (FR) (67 FR 48145)),

authorizing the operational employment of SURTASS LFA sonar systems contingent upon issuance by NMFS of letters of authorization (LOAs) under the MMPA and incidental take statements (ITSS) under ESA for each vessel.

In order to improve military readiness, the Department of Defense (DoD) asked Congress to amend several provisions of environmental laws as they applied to military training and testing activities. These legislative amendments were provided by Congress as parts of the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2003 (Public Law 107-314) and the NDAA for FY 2004 (Public Law 108-136).

The term "military readiness activity" is defined in NDAA for FY 2003 (16 U.S.C. 703 note) to include all training and operations of the Armed Forces that relate to combat; and the adequate and realistic testing of military equipment, vehicles, weapons and sensors for proper operation and suitability for combat use. NMFS and the Navy have determined that the Navy's SURTASS LFA sonar testing and training operations that are the subject of NMFS's July 16, 2002, Final Rule constitute a military readiness activity because those activities constitute "training and operations of the Armed Forces that relate to combat" and constitute "adequate and realistic testing of

military equipment, vehicles, weapons and sensors for proper operation and suitability for combat use."

The provisions of this act that specifically relate to SURTASS LFA concern revisions to the MMPA and include: 1) amending the definition of "harassment" as it applies to military readiness activities and scientific activities conducted on behalf of the Federal government; 2) defining Level A "harassment" as any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild; 3) defining Level B "harassment" as any act that disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering to a point where the patterns are abandoned or significantly altered; 4) providing a national defense exemption that the Secretary of Defense may invoke not to exceed two years for DoD activities after conferring with the Secretary of Commerce and the Secretary of Interior, as appropriate; 5) requiring/confirming that NMFS's determination of "least practicable adverse impact on species or stock" must include consideration of personnel safety, practicality of implementation, and

impact on the effectiveness of the military readiness activity; and 6) eliminating the "small numbers" and "specified geographic region" requirements from the incidental take permitting process for military readiness activities.

On 31 June 2006 and 23 January 2007, the Deputy Secretary of Defense invoked the national defense exemption under the MMPA for certain mid-frequency sonar activities. Neither of these national defense exemptions applies to SURTASS LFA sonar employment as detailed in the SEIS and this document.

The SEIS focuses on providing additional information regarding the environment that could potentially be affected by employment of SURTASS LFA; providing additional information related to mitigation of the potential impacts of the system; addressing concerns raised by the Court in its August 26, 2003 Opinion and Order on the parties' cross-motions for summary judgment by including additional mitigation and monitoring, additional area alternatives analysis, and analysis of the potential impacts of low frequency (LF) sound on fish; and providing the information necessary to apply for a new five-year rule that would provide for incidental takes under the MMPA, taking into

account the NDAA FY04 amendments to the MMPA for military readiness activities.

Additional SEIS analyses include: 1) updated literature reviews and determination of data gaps, especially for fish, sea turtles, and marine mammals; 2) marine animal LF sound thresholds/impacts based on fish controlled exposure experiments (CEE) and updated literature reviews; 3) LF sound impact analyses including geographic areas, marine mammal impacts under NDAA FY04 definition of "harassment," fish impacts, other listed species' impacts, as required; and 4) mitigation (need for mitigation determined by impact analysis based on new legislation).

The information in the SURTASS LFA sonar FOEIS/EIS remains valid, except as noted or modified in the SEIS. The contents of the FOEIS/EIS are incorporated into the SEIS by reference, except as noted or modified.

SURTASS LFA Sonar System Description

SURTASS LFA sonar is a long-range sonar system that operates in the LF band between 100 and 500 Hertz (Hz). It has both active and passive components. The active component of the system, LFA, is a set of 18 LF acoustic transmitting source elements (called projectors) suspended by cable from underneath an oceanographic surveillance

vessel, such as the Research Vessel (R/V) CORY CHOUEST, USNS IMPECCABLE (T-AGOS 23), and the VICTORIOUS Class (T-AGOS 19 Class). The source level of an individual projector is 215 dB. These projectors produce the active sonar signal or "ping." A "ping," or transmission, can last between 6 and 100 seconds. The time between transmissions is typically 6 to 15 minutes with an average transmission of 60 seconds. Average duty cycle (ratio of sound "on" time to total time) is less than 20 percent. The typical duty cycle, based on historical LFA operational parameters (2003 to 2007), is normally 7.5 to 10 percent. The SURTASS LFA sonar signal is not a continuous tone, but rather a transmission of waveforms that vary in frequency and duration. The duration of each continuous frequency sound transmission is normally 10 seconds or less. The signals are loud at the source, but levels diminish rapidly over the first kilometer. The passive, or listening, component of the system is SURTASS, which detects returning echoes from submerged objects, such as threat submarines, through the use of hydrophones on a receiving array that is towed behind the ship. The SURTASS LFA ship maintains a minimum speed of 5.6 kilometers (km) per hour (kph) (3

knots) through the water to tow the horizontal line hydrophone array.

ALTERNATIVES CONSIDERED

In preparing the SEIS, the Navy considered five alternatives, including alternatives that addressed NEPA deficiencies identified in the District Court's 26 August 2003 opinion, as well as to fulfill the Navy's responsibilities under NEPA with regard to changes in the proposed action. Among other things, the SEIS considers mitigation measures, including coastal standoff restrictions of 22 and 46 km (12 and 25 nm [nautical miles]), seasonal restrictions, the designation of additional OBIAs, and shutdown procedures for schools of fish. The five alternatives considered in the SEIS are as follows: 1) No Action Alternative; 2) Alternative 1—Same as the FOEIS/EIS; 3) Alternative 2 (Preferred Alternative)—Alternative 1 with additional OBIAs; 4) Alternative 3—Alternative 1 with extended coastal standoff distance to 46 km (25 nm); and 5) Alternative 4—Alternative 1 with additional OBIAs, extended coastal standoff distance to 46 km (25 nm), and shutdown procedures for schools of fish.

No Action Alternative: Under this alternative, operational deployment of the active component (LFA) of SURTASS LFA sonar will not occur. The No Action Alternative is the same as the No Action Alternative presented in Subchapter 2.3.1 of the FOEIS/EIS, and the contents are incorporated into the SEIS by reference.

Alternative 1: This alternative is the same as Alternative 1 presented in Subchapter 2.3.2 of the FOEIS/EIS, which is incorporated into Subchapter 2.6.2 of the SEIS by reference. This alternative proposes the employment of SURTASS LFA sonar technology with geographical restrictions to include maintaining SPL below 180 dB within 22 km (12 nm) of any coastline and within the originally designated OBIAs (see Table 2.3 of the FOEIS/EIS and LOAs, as issued) that are outside of 22 km (12 nm). Restrictions for OBIAs are year-round or seasonal, as dictated by marine animal abundances. LFA sound fields will not exceed 145 dB within known recreational and commercial dive sites. Mitigation includes visual, passive acoustic, and active acoustic monitoring to prevent injury to marine animals when employing SURTASS LFA sonar by providing methods to detect these animals within the 180-dB LFA mitigation zone.

Alternative 2 (The Preferred Alternative): This is the Navy's preferred alternative. This alternative is the same as Alternative 1, but with additional OBIAs, including seasonal restrictions, as listed in Table 2-4 of the Final SEIS and the final Rule (50 CFR 184(f)). As noted in the final Rule there are a total of ten. To determine an all-inclusive list of OBIAs within the potential operating areas over the next five years would be impractical because of constantly changing data would require repeated reviews and updates. It is the intention in this SEIS alternative to propose that during the annual LOA process under the new MMPA rule that the Navy evaluate potential OBIAs within the proposed operating areas for each ship and incorporate restrictions, as required, into the LOA applications for NMFS's review and action.

Alternative 3: This alternative is the same as Alternative 1, but with a greater coastal standoff distance. This alternative proposes the employment of SURTASS LFA sonar technology with geographical restrictions to include maintaining SPL to below 180 dB within 46 km (25 nm) of any coastline and within designated OBIAs that are outside of 46 km (25 nm).

Alternative 4: This alternative is the same as Alternative 1, but with additional OBIAs, extended coastal standoff distance to 46 km (25 nm), and shutdown procedures for fish.

Evaluation of Alternatives

Each alternative was evaluated and compared against the others in terms of fulfillment of the Navy's validated need for reliable detection of quieter and harder-to-find underwater submarines at long range, and the potential for environmental impacts. The word "employment" as used in this context means the use of SURTASS LFA sonar during routine training and testing, as well as the use of the system during military operations, and constitutes a military readiness activity as defined in the NDAA. "Employment" does not apply to the use of the system in armed conflict or direct combat support operations, nor during periods of heightened threat conditions, as determined by the National Command Authorities (President and Secretary of Defense or their duly designated alternates or successors).

The following conclusions are supported by the analyses addressing the operations of up to four SURTASS LFA sonar systems in the FOEIS/EIS, which are incorporated by

reference herein except as noted or modified; and the supplementary analyses undertaken in the SEIS, which also encompass the at-sea operations of up to four systems.

No Action Alternative: In summary, the No Action Alternative would avoid all environmental effects of employment of the active component (LFA) of SURTASS LFA sonar. It does not, however, support the Navy's stated priority ASW need for long-range detection of potentially hostile submarines. The implementation of this alternative would allow potentially hostile submarines to clandestinely threaten U.S. Fleet units and land-based targets. Without this long-range surveillance capability, the reaction times to enemy submarines would be greatly reduced and the effectiveness of close-in, tactical systems to neutralize threats would be seriously, if not fatally, compromised.

Alternative 1: Under Alternative 1, as was concluded in the FOEIS/EIS, the potential impact on any stock of marine mammals from injury is considered to be negligible, and the effect on the stock of any marine mammal from significant change in a biologically important behavior is considered to be minimal. Any momentary behavioral responses and possible indirect impacts to marine mammals due to potential impacts on prey species are considered not

to be biologically significant effects. Any auditory masking in mysticetes, odontocetes, or pinnipeds is not expected to be severe and would be temporary. Further, the potential impact on any stock of fish, sharks or sea turtles from injury is also considered to be negligible, and the effect on the stock of any fish, sharks or sea turtles from significant change in a biologically important behavior is considered to be negligible to minimal. Any auditory masking in fish, sharks or sea turtles is expected to be of minimal significance and would be temporary if it does occur.

Alternative 2 (the preferred alternative): Under Alternative 2, additional geographical restrictions over and above the chosen alternative from the FOEIS/EIS would be levied on SURTASS LFA sonar operations through the inclusion of more OBIAs. The general summary provided in the above paragraph for Alternative 1 would also apply to this alternative. Potential impacts to marine animals from SURTASS LFA sonar operations from this alternative would be slightly decreased when compared to Alternative 1.

Alternative 3: Under Alternative 3, additional geographical restrictions would be levied on SURTASS LFA sonar operations through the increase in the coastal

standoff range from 22 km (12 nm) to 46 km (25 nm). The general summary provided in the above paragraph for Alternative 1 would also apply to this alternative. Based on the analysis of the risk areas and the potential impacts to marine animals, increasing the coastal standoff range does decrease exposure to higher received levels (RLs) for the concentrations of marine animals closest to shore; but does so at the expense of increasing exposure levels for shelf break species and pelagic species.

Alternative 4: Under Alternative 4, the additional geographical restrictions of both Alternative 2 (additional OBIAs) and Alternative 3 (increase in coastal standoff range from 22 km [12 nm] to 46 km [25 nm]), plus shutdown procedures for schools of fish would be combined. The general summary provided for Alternative 1 above also applies here, as do the results from Alternative 2 regarding additional OBIAs and Alternative 3 regarding the increased standoff range. Recent scientific results from fish CEEs with LFA signals indicate that the opportunity for a fish or a school of fish to be exposed to SPLs from SURTASS LFA sonar transmissions that could cause harm is negligible. Therefore, it is not necessary to add mitigation protocols specifically for schools of fish.

ENVIRONMENTAL IMPACTS

In the SURTASS LFA Sonar FOEIS/EIS, the Navy analyzed the potential impacts of the employment of up to four SURTASS LFA sonar systems, with certain geographical restrictions and monitoring mitigation designed to reduce potential adverse effects on the marine environment, in several resource areas. Among the resource areas covered were impacts upon marine mammals, fish and sea turtles, human divers and swimmers, commercial and recreational fishing, whale watching and marine mammal research and exploration activities. This ROD summarizes the potentially significant, but mitigable impacts associated with the decision and the implementation of the selected alternative. The Navy also considered the selected action's potential for indirect effects and cumulative impacts, and ensured consistency with federal policies addressing environmental justice (E.O. 12898) and protection of children from environmental health and safety risks (E.O. 13045).

The main areas of impact analysis concerned the potential impact of LF sounds upon marine life and human divers. The initial analytical process utilized in

preparation of the FOEIS/EIS first conducted a scientific literature review to determine data gaps. Next, scientific screening of marine animal species for potential sensitivity to LF underwater sound was undertaken. Following these steps, scientific research and the estimation of the potential for effects from LF sound on marine mammals and humans in water was conducted. The research on marine mammals led to the development of a method for quantifying risk to marine mammals. Next, underwater acoustic modeling was conducted. These elements combined to produce an estimation of marine mammal stocks potentially affected. Similar methodologies were used to provide estimations of potential injuries to fish and sea turtles. Finally, geographic restrictions and monitoring mitigation were established to minimize the potential for effects to a negligible level.

Specifically with regard to marine mammals, the analysis of potential impacts contained in the FOEIS/EIS was developed based on a literature review, the results of the Navy's Low Frequency Sound Scientific Research Program (LFS SRP) and underwater acoustical modeling. The potential impacts considered were for injury and/or significant change to biologically important behaviors.

Biologically important behaviors are those related to activities essential to the continued existence of a species, such as feeding, migrating, breeding and calving.

Initially, it was determined there was potential for injurious effects within short ranges from the SURTASS LFA sonar. This area was designated as the LFA Mitigation Zone and covers a volume of water ensonified to a level at or above 180 dB (SPL) by the SURTASS LFA sonar transmit array. Under normal operating conditions, this zone will normally vary between the ranges of 0.75 to 1.0 km (0.40 to 0.54 nm) from the source array, ranging over a depth of approximately 87 to 157 m (285 to 515 ft). (The center of the array is at a typical depth of 122 m [400 ft]).

For the purposes of the SURTASS LFA sonar analyses presented in the FOEIS/EIS, all marine mammals exposed to RLs at or above 180 dB were evaluated as if they were injured. The above analysis in the SURTASS LFA sonar FOEIS/EIS remains valid and is incorporated into the SEIS by reference, except as noted or modified. For the purposes of the SURTASS LFA sonar analysis presented in the Final SEIS and this ROD, an animal will have to be within the 180-dB sound field during transmission for injury to occur. The probability of this occurring is negligible

because of the tripartite monitoring (visual, passive acoustic and active acoustic) that will be used whenever the SURTASS LFA sonar is transmitting. (See "Mitigation" below for further details.)

Under the selected alternative, the potential impact on any stock of marine mammals from injury is considered negligible, and the potential effect on the stock of any marine mammal from significant change in a biologically important behavior is considered minimal. However, because there is some potential for incidental takes, the Navy is requesting LOAs under the MMPA for each SURTASS LFA sonar system from NMFS for the taking of marine mammals incidental to the employment of SURTASS LFA sonar during training, testing and routine military operations, which constitute military readiness activities. The Final Rule and regulations governing the issuance of the LOAs authorizing the taking of marine mammals incidental to SURTASS LFA sonar (Docket No. 070703226-7461-02) were approved on 14 August 2007, effective from 16 August 2007 through 15 August 2012. In the Final Rule, NMFS determined that the incidental taking of marine mammals resulting from SURTASS LFA sonar operations would have a negligible impact on the affected marine mammal species or stocks over the 5-

year period of LFA sonar operations covered by the Final Rule and would not have an unmitigable adverse impact on the availability of such marine mammals for subsistence uses as identified in MMPA section 101(a)(5)(A)(i), 16 USC 1371(a)(5)(A)(i).

The Navy has also consulted with NMFS under Section 7 of the ESA concerning the possible incidental taking of listed species, including marine mammals, sea turtles, and fish. In a Biological Opinion dated 14 August 2007, NMFS indicated that employment of the SURTASS LFA sonar as described by Alternative 2 of the Final SEIS and implemented by this ROD may adversely affect, but is not likely to jeopardize the continued existence of affected endangered and threatened species.

Potential Impacts to Fish

The U.S. District Court in NRDC v. Evans, in its Opinion and Order on the parties' cross-motions for summary judgment, found the FOEIS/EIS lacking because the Navy failed to adequately consider potential impacts to fish. In order to determine the effects of SURTASS LFA sonar on fish, the Navy sponsored independent research with the University of Maryland to examine whether exposure to high-intensity LF sonar, such as the Navy's SURTASS LFA sonar,

would affect fish. This study examined the effect of LFA on hearing, the structure of the ear, and selected non-auditory systems in rainbow trout (*Oncorhynchus mykiss*) and channel catfish (*Ictalurus punctatus*) and included observations of fish behavior before, during, and after sound exposure (Popper et al., 2007; Popper et al., 2005; Halvorsen et al., 2006).

Since the SURTASS LFA sonar FOEIS/EIS was completed in 2001, there have been a small number of useful studies on the potential effects of underwater sound on fish, including sharks. While other studies examined the effects of sounds using pure tones for much longer duration than the SURTASS LFA sonar signals, the University of Maryland study (funded by the Navy to provide data for the SEIS) is the only study specifically designed to determine the potential effects of SURTASS LFA sonar on fish. Thus, with the caveat that so far only a limited number of species have been examined in this study, the investigations found little or no effect of high intensity LF sounds, and there was no mortality as a result of LF sound exposure, even when fish were observed for days post-exposure.

The Fish CEE examined the effect of LFA on hearing, the structure of the ear, and select non-auditory systems in

the rainbow trout (*Onchorynchus mykiss*) and channel catfish (*Ictalurus punctatus*). Bony fish with specializations that enhance their hearing sensitivity have been referred to as hearing specialists, whereas those that do not possess such capabilities are called non-specialists, or generalists. Because the rainbow trout (a hearing generalist) is of the same genus, with similar, if not identical, ears and hearing sensitivity, they can be used as "reference species" to determine the potential effects on other salmonid and, more generally, on other hearing generalists. Channel catfish were selected for the CEE to be reference species for hearing specialists. The rainbow trout and the channel catfish are excellent reference species for fish that do not hear well (trout) and those that do hear well (catfish).

Several findings from this study on rainbow trout and channel catfish (Popper et al., 2005; Halvorsen et al., 2006; Popper et al., 2007) are significant for purposes of assessing SURTASS LFA's likely impact on fish. These include: 1) no fish deaths as a result of exposure to the experimental source signals; 2) despite the high level of sound exposure (193 dB RL at the fish), no gross pathological effects (visible tissue injury or damage) or

microscopic effects as determined through histopathology on all major body tissues (brain, swim bladder, heart, liver, gonads, blood, etc.) with no differences being found among sound-exposed fish, controls, or baseline animals; 3) no short- or long-term effects on ear tissue with the sensory cells of the ears of both species remaining healthy and intact both immediately post-exposure and 96 hours after the end of exposure; 4) no difference in fish behavior after sound exposure versus behavior prior to the tests; and 5) catfish and some specimens of rainbow trout showed 10-20 dB of hearing loss immediately after exposure to the LFA sound when compared to baseline and control animals, but their hearing appeared to return to normal, or close to normal, within about 24 hours for catfish and about 48 hours for the rainbow trout. Other rainbow trout showed minimal or no hearing loss.

Fish were exposed in these experiments to a received sound level of 193 dB (RL), a level that is only found within about 200 m (656 ft) of the SURTASS LFA source array. Thus, the likelihood of exposure to a sound level of 193 dB (RL) or a higher is extremely small. The volume of the ocean ensonified by a single SURTASS LFA sonar

source at 193 dB RL or higher is very small compared to the size of typical fish or fish school ocean habitats.

The LFA sound used in the study represents a "worst-case" exposure. The exposures during the experiments were most likely substantially greater than any exposure a fish might encounter in the wild. In the study described here, each fish received three 108-second exposures to high-level LFA sound. However, under normal circumstances, the SURTASS LFA sonar source is on a moving ship. A fish in one location can only receive maximum ensonification for a few seconds (depending on ship speed and whether the fish is moving or not, and its direction of motion and speed). As the SURTASS LFA vessel approaches and moves away from the fish, the sound level to which the fish is exposed would be much lower. Since exposure at maximum levels did not cause physical damage to fish, and at most caused a temporary limited hearing loss, it is unlikely that a shorter exposure would result in any measurable hearing loss or non-auditory damage to fish.

To quantify the possible effect of SURTASS LFA sonar on fisheries catches, an analysis of typical SURTASS LFA sonar operations in a region off the Pacific Coast of the U.S. was presented in the FOEIS/EIS Subchapter 4.3.1 for the

NMFS Fisheries Resource Region–Pacific Coast, defined here to encompass the area from the Canadian to Mexican border, from the shoreline out to 926 km (500 nm). The Final SEIS updates this analysis at Comment 4.1.20. The FOEIS/EIS analysis concluded that the percentage of fisheries catch potentially affected would be negligible compared to fish harvested commercially and recreationally in the region. The Final SEIS confirms that this conclusion remains valid.

Potential Impacts to Sea Turtles

It is unlikely that a significant portion of any sea turtle stock will experience adverse effects on movements, migration patterns, breathing, nesting, breeding, feeding, or other normal behaviors. Sea turtles could be affected if they are inside the LFA mitigation zone (180-dB sound field) during a SURTASS LFA sonar transmission. The SEIS Subchapter 4.2.6 updates the FOEIS/EIS analysis, focusing on the potential impacts to individual sea turtles and the issue of potential impact to sea turtle stocks. To quantify the potential impact on sea turtle stocks, the analysis provided in the FOEIS/EIS was updated based on more current information for leatherback sea turtles in the Pacific Ocean. Leatherbacks were chosen for this analysis because they are the largest, most pelagic, and most widely

distributed of any sea turtle found between 71 degrees N and 47 degrees S latitude, inhabit the oceanic zone, and are capable of transoceanic migrations. They are rarely found in coastal waters and are deep, nearly continuous divers with usual dive depths around 250 m (820 ft). Based on a conservative estimate of 20,000 leatherback sea turtles for the Pacific basin, the possible number of times a leatherback could be within the 180-dB sound field of a SURTASS LFA sonar vessel during transmissions was estimated to be less than 0.2 animals per year per vessel. Therefore, the potential for SURTASS LFA sonar operations to impact leatherback sea turtle stocks is negligible, even when up to four systems are considered.

In the unlikely event that SURTASS LFA sonar operations coincide with areas of high sea turtle activities, the narrow bandwidth of the SURTASS LFA sonar active signal (approximately 30 Hz bandwidth), the fact that the ship is always moving (coupled with low system duty cycle [estimated 7.5 percent], which means sea turtles would have less opportunity to be located in the LFA mitigation zone during a transmission), and the monitoring mitigation incorporated into the alternatives (visual and active

acoustic [HF] monitoring) would minimize the probability of impacts on animals in the vicinity.

Potential Impacts to Marine Mammals

The types of possible effects on marine mammals from SURTASS LFA sonar operations can be broken down into non-auditory injury (such as tissue damage and acoustically mediated bubble growth), permanent loss of hearing, temporary loss of hearing, behavioral change, and masking. The analyses of these potential impacts were presented in the SURTASS LFA sonar FOEIS/EIS. Updated literature reviews and research results indicate that there are no new data that contradict any of the assumptions or conclusions in the FOEIS/EIS; thus, its findings regarding potential impacts on marine mammals remain valid and are incorporated into the SEIS by reference except as noted or modified.

The potential effects from SURTASS LFA sonar operations on any stock of marine mammals from injury (non-auditory or permanent loss of hearing) are considered negligible, and the potential effects on any stock of marine mammals from temporary loss of hearing or behavioral change (significant change in a biologically important behavior) are considered minimal. Any auditory masking in marine mammals due to

SURTASS LFA sonar signal transmissions is not expected to be severe and would be temporary.

The FOEIS/EIS provided detailed risk assessments of potential impacts to marine mammals covering the major ocean regions of the world: North and South Pacific Oceans, Indian Ocean, North and South Atlantic Oceans, and the Mediterranean Sea. The 31 acoustic modeling sites in the FOEIS/EIS represented the upper bound of impacts (both in terms of possible acoustic propagation conditions, and in terms of marine mammal population and density) that could be expected from operation of the SURTASS LFA sonar system because of the conservative assumptions used in the FOEIS/EIS are still valid. These assumptions are found in the FOEIS/EIS pp. 1-33 to 1-35 and 4.2-3 and in the SEIS p. 4-37 to 4-39. Moreover, there are no new data that contradict any of the assumptions or conclusions made in the FOEIS/EIS. Thus, it is not necessary to reanalyze the potential acoustic impacts in the SEIS.

Under the MMPA Rule, the Navy must apply for annual LOAs. In these applications, the Navy projects where it intends to operate for the period of the annual LOAs and provides NMFS with reasonable and realistic risk estimates for marine mammal stocks in the proposed areas of

operation. The LOA application analytical process utilizes a conservative approach by integrating mission planning needs and a cautious assessment of the limited data available on specific marine mammal populations, seasonal habitat and activity. Because of the incorporation of conservative assumptions, it is likely that the aggregate effect of such assumptions is an overestimation of risk – a prudent approach for environmental conservation when there are data gaps and other sources of uncertainty. The total annual risk for each stock of marine mammal species is estimated separately for each mission area. Specific marine mammals stocks are, in most cases, common to multiple mission areas. Therefore, the annual risk estimates for each stock is determined by summing these estimates across mission areas. The annual risk estimates for each stock, for each species, is then examined. Based on this approach, the total annual estimated risks (upper bound) for marine mammal stocks are provided in the applications for LOAs. This risk assessment approach and the conservative assumptions are discussed in the SEIS p. 4-37 to 4-51.

Information on how the density and stock/abundance estimates are derived for the selected mission sites is

provided in the LOA applications. These data are derived from current, available published source documentation, and provide general area information for each mission area with species-specific information on the animals that could potentially occur in that area, including estimates for their stock/abundance and density.

NMFS Interim Operational Restrictions

In the SURTASS LFA Sonar Final Rule under the MMPA (67 FR 46785), NMFS added interim operational restrictions, including the establishment of a 1-km (0.54-nm) buffer shutdown zone outside of the 180-dB LFA mitigation zone and limiting the operational frequency of SURTASS LFA sonar to 330 Hz and below.

The 1-km (0.54 nm) buffer zone interim operational restriction has proven to be practical under the current operations, but the analysis in the SEIS demonstrates that it did not perceptibly change the potential for adverse impacts below 180-dB RL. The differences in the number of animals affected were insignificant. Thus, the removal of this interim operational restriction would not appreciably change the percentage of animals potentially affected. However, NMFS has again included the 1-km buffer zone in

its rule for SURTASS LFA sonar to further protect against marine mammals entering the 180 dB isopleth

When the LFA Rule was promulgated by NMFS in July 2002, the potential for LFA, and sonar in general, to cause resonance-related injury in marine mammals above 330 Hz was an open issue. NMFS, therefore, added an interim operational restriction to the LFA Rule and associated LOAs limiting LFA operations to 100 to 330 Hz thus precluding the use of the system between 330 and 500 Hz. For the SURTASS LFA sonar systems installed onboard the R/V CORY CHOUEST and USNS IMPECCABLE, this interim restriction was feasible. However, the frequency requirements for the Compact LFA (CLFA) to be installed onboard the smaller VICTORIOUS Class (T-AGOS 19 Class) vessels are somewhat higher, but still within the original 100 to 500 Hz range originally stated in the FOEIS/EIS. Moreover, analyses sponsored by the Navy (Cudahy and Ellison, 2002; Laurer et al., 2002), reports on two workshops on acoustic impacts (DOC, 2002; Cox, et al., 2006), and the National Research Council (NRC) Ocean Studies Board (NRC, 2005) support the conclusion that resonance from LFA operations is not a reasonably foreseeable impact, given the empirical and documentary evidence that resonance and/or tissue damage

from LFA transmissions are unlikely to occur in marine mammals in the frequency range 330 to 500 Hz within or outside of the LFA mitigation zone. After conducting a full review of resonance in its Final SEIS, the Navy concluded, and NMFS agrees, that effects from resonance are unlikely and that there is no need to retain the 330-Hz restriction.

Proposed Modifications to Mitigation

The Court found the FOEIS/EIS lacking because the Navy: 1) should have considered training in areas that present a reduced risk of harm to marine life and the marine environment when practicable; 2) should have further considered extending the shutdown procedures beyond marine mammals and sea turtles to schools of fish; 3) failed to adequately consider potential impacts to fish; and 4) raised the question concerning the inclusion of requirements for additional monitoring and mitigation through the use of aircraft or small observational craft prior to operating close to shore. I will address each of these areas.

Training in areas of reduced risk: Identifying a potential SURTASS LFA sonar operating area that is particularly devoid of marine life and that also meet the

military readiness requirements is not straightforward. The reason that certain areas are believed to have minimal marine mammal activity could very well be because of gaps in animal distribution, abundance and density data there. It is more feasible to identify areas of high marine life concentrations and avoid those areas when practicable, rather than attempting to identify areas purportedly devoid of marine life. This sensitivity/risk process is the methodology applied to SURTASS LFA sonar operations.

The process starts with identifying the Navy's ASW requirements to be met by SURTASS LFA sonar based on mission areas proposed by the Chief of Naval Operations (CNO) and Fleet commands. Thereupon, available published data for the proposed mission area are collected, collated, reduced and analyzed with respect to marine mammal populations and stocks, marine mammal habitat and seasonal activities (biologically significant behavior as described in FOEIS/EIS p. 2-11), and marine mammal behavioral activities. Utilizing the best available scientific data, estimates are made by highly-qualified marine biologists, based on known data for like species and/or geographic areas, and known marine mammal seasonal activity. If marine mammal densities prove to be high and/or sensitive

animal activities are expected, the mission areas are changed and/or refined and the process is re-initiated for the modified area. Next, standard acoustic modeling and risk analysis are performed, taking into account spatial, temporal or operational restrictions. The Navy applies the standard mitigation measures and calculates the risk estimates for each marine mammal stock in the proposed mission area. The Navy then determines whether the proposed mission area meets the terms of the Final Rule. If not, the proposed mission area is changed or refined, and the process is re-initiated. Once this annual risk assessment process is completed, then in my view the Navy has identified and selected mission areas of reduced risk.

Potential injury to fish: The Court found the FOEIS/EIS lacking because the Navy failed to adequately consider potential impacts to fish. In addition to carefully considering the fish studies identified by the Court, the Navy sponsored independent research, as discussed above, which addressed the specific issue of potential impacts to fish from SURTASS LFA sonar. In my opinion, this research, when combined with other relevant information, is enough to permit an informed decision on the issue of impacts to fish.

Modification of shutdown procedures for schools of fish: As discussed above, a fish would have to be extremely close to the SURTASS LFA array to be exposed to sounds arguably intense enough to cause injury. In addition, because the SURTASS LFA vessel travels at an average speed of 5.6 kph (3 knots) and fish travel at typical speeds of 5.6 kph (3 knots) (e.g., herring, pike, carp) up to maximum speeds of 74 to 93 kph (40 to 50 knots) (e.g., tuna, swordfish), the chance of a fish being close enough to be exposed to such sound is extremely small. For these reasons, I have concluded that modifying the current SURTASS LFA sonar shutdown protocols specifically to address schools of fish is not necessary.

Pre-operational surveys: The SEIS evaluated the feasibility of pre-operational aerial and small boat surveys for SURTASS LFA operations based on the following factors: 1) weather conditions, 2) time of day, 3) availability of small boats or small aircraft, 4) proximity to hostile territory, 5) sea state, 6) logistics, 7) overall safety considerations, and 8) national security. The SEIS concludes that such surveys are not feasible because they are not practicable, not effective, may increase the harassment of marine mammals, and are not safe

for the personnel who would be involved in them. In its comments on the Draft SEIS, the Marine Mammal Commission concurred that carrying out small boat or aerial surveys immediately before and during SURTASS LFA sonar operations in the various offshore training areas would not be a practical mitigation option.

Marine Mammal Strandings

There is no record of SURTASS LFA sonar ever being implicated in any stranding of marine mammals since LFA prototype systems first began operations in the late 1980s. The logical conclusion that LFA sonar is not related to marine mammal strandings is supported by the 2004 Workshop on Understanding the Impacts of Anthropogenic Sound on Beaked Whales convened by the Marine Mammal Commission (Cox et al., 2006) and the International Coalition for the Exploration of the Sea (ICES) Ad-Hoc Group on the Impacts of Sonar on Cetaceans and Fish (AGISC) (ICES, 2005). ICES AGISC concluded that no strandings, injury, or major behavioral change has yet to be associated with the exclusive use of LF sonar. SURTASS LFA sonar has been operated for almost five years in the northwestern Pacific Ocean, with mitigation similar to the measures identified herein, without any reports of marine mammal injuries or

strandings occurring spatially or temporally coincident with the systems' use.

Cumulative Impacts

The potential cumulative impact issue associated with SURTASS LFA sonar operations is the addition of underwater sound to oceanic ambient noise levels, which in turn could have impacts on marine animals through the potential to cause masking and stress. Masking has the potential to increase marine animals' susceptibility to other impacts, such as bycatch and ship strikes. Anthropogenic sources of ambient noise that are most likely to have contributed to increases in ambient noise levels are commercial shipping, offshore oil and gas exploration and drilling, and naval and other use of sonar (ICES, 2005).

In a recent analysis for the Policy on Sound and Marine Mammals: An International Workshop sponsored by the Marine Mammal Commission (U.S.) and the Joint Nature Conservation Committee (UK) in 2004, Dr. John Hildebrand provided a comparison of anthropogenic underwater sound sources by their annual energy output. This analysis was subsequently published in *Marine Mammal Research: Conservation beyond Crisis* (Hildebrand, 2005). The actual percentage of the total anthropogenic acoustic energy budget added by each

LFA source is estimated to be 0.5 percent per system (or less), when other man-made sources are considered (Hildebrand, 2005). When combined with the naturally occurring and other man-made sources of noise in the oceans, LFA barely contributes a measurable portion of the total acoustic energy. This and the LFA low duty cycle (normally 7.5 to 10 percent) support the conclusion that the operation of up to four SURTASS LFA systems will not be expected to significantly add to oceanic ambient noise.

Because LFA transmissions are intermittent and will not significantly increase anthropogenic oceanic noise, cumulative impacts and synergistic effects from the proposed four SURTASS LFA sonar systems for masking and stress are not a reasonably foreseeable significant adverse impact on marine animals. Therefore, cumulative impacts and synergistic effects that would lead to injury or lethal takes of marine animals from masking, including bycatch and ship strikes, are not a reasonably foreseeable significant adverse impact on marine animals from exposure to LFA.

In view of the fact that there are major differences in signal characteristics of LFA, MFA, and seismic air guns, there is negligible chance of producing a "synergistic" sound field. It is also unlikely, under any circumstances,

that LFA sources, if operated in proximity to each other would produce a sound field so complex that marine animals would not be able to escape.

In the analysis of the potential for socioeconomic impacts to commercial and recreational fisheries, other recreational activities, and research and exploration activities, it was concluded that there would be no substantial effects from implementation of the alternatives under consideration. Therefore, socioeconomic cumulative impacts and synergistic effects are not reasonably foreseeable.

Given the information provided in the Final SEIS, Subchapter 4.6, the potential for cumulative impacts and synergistic effects from the operations of up to four SURTASS LFA sonars is considered to be small and has been addressed by limitations proposed for employment of the system (i.e., geographical restrictions and monitoring mitigation). Even if considered in combination with other underwater sounds, such as commercial shipping, other operational, research, and exploration activities (e.g., acoustic thermometry, hydrocarbon exploration and production), recreational water activities, and naturally-occurring sounds (e.g., storms, lightning strikes, subsea

earthquakes, underwater volcanoes, whale vocalizations, etc.), the SURTASS LFA sonar systems do not add appreciably to the underwater sounds to which fish, sea turtle and marine mammal stocks are exposed. Moreover, SURTASS LFA sonar will cause no lethal takes of marine mammals. Therefore, cumulative impacts and synergistic effects of the operation of up to four SURTASS LFA sonar systems are not reasonably foreseeable.

MITIGATION

All practicable means to avoid or minimize environmental harm have been adopted through the incorporation of mitigation measures into operation of the SURTASS LFA sonar. The objective of these mitigation measures is to avoid injury to marine mammals and sea turtles near the SURTASS LFA sonar source and to recreational and commercial divers in the marine environment. The mitigation measures are the same as those presented in the FOEIS/EIS and present MMPA Rule except for additional OBIAs as noted in Table 2-4 of the Final SEIS and the final Rule (50 CFR 184(f)). Mitigation measures involve both geographic restrictions and operational measures. Geographic restrictions include limiting the

SURTASS LFA sonar-generated sound field to a maximum of 145 dB (RL) in the vicinity of known recreational or commercial dive sites; limiting the SURTASS LFA sonar-generated sound field to below 180 dB (RL) within 22 km (12 nm) of any coastlines (including islands). In its final Rule, NMFS has added a 1-km (0.5-nm) buffer to the offshore areas outside this zone that have been determined to be OBIA's.

Accordingly, the final rule requires the Navy to ensure SPLs do not exceed 180 dB (re 1 microPa(rms)) at a distance of 1 km (0.5 nm) seaward of the outer perimeter of the OBIA. This measure will limit SPLs within OBIA to less than approximately 174 dB. The Navy is required to estimate SURTASS LFA SPLs prior to and during operations to provide the information necessary to modify operations, including the delay or suspension of transmissions, in order not to exceed the 145-dB and 180-dB sound field criteria.

Additionally, monitoring will take place during operations to prevent injury to marine animals. This monitoring will take three forms. First, visual monitoring for marine mammals and sea turtles will be conducted from the vessel during daylight hours by personnel trained to detect and identify marine mammals and sea turtles.

Monitoring will begin 30 minutes before sunrise for ongoing missions or 30 minutes before SURTASS LFA sonar is deployed and continue until 30 minutes after sunset or until the SURTASS LFA sonar have been recovered. Second, passive acoustic monitoring using the SURTASS array will listen for sounds generated by marine mammals as an indicator of their presence when SURTASS is deployed. Finally, active acoustic monitoring will take place using the High Frequency Marine Mammal Monitoring (HF/M3) sonar, which is a Navy-developed, enhanced high frequency commercial sonar to detect, locate, and track marine mammals that may pass close enough to the SURTASS LFA sonar's transmit array to enter the 180-dB sound field (LFA mitigation zone). HF/M3 sonar monitoring will begin 30 minutes before the first SURTASS LFA sonar transmission of a given mission is scheduled to commence and continue until transmissions are terminated. Whenever a marine mammal or sea turtle is detected within the LFA mitigation zone (180-dB sound field) or within the 1-km buffer zone beyond the LFA mitigation zone (operational restriction per NMFS Final Rule), the Officer in Charge will order the immediate delay or suspension of SURTASS LFA sonar transmissions, until the animal is determined to have moved beyond the buffer zone.

The startup of the HF/M3 sonar will involve a ramp-up from a source level of approximately 180 dB to ensure there is no inadvertent exposure of local animals to RLs of 180 dB and above. If the operating area is found to be clear, the source level will be increased in 10-dB steps until full power (if required) is attained, at which time the operator will adjust the HF/M3 sonar controls as necessary to optimize system performance. The HF/M3 sonar and its operating protocols were designed to minimize potential effects on marine animals.

The HF/M3 sonar operates with a similar power level (220 dB), signal type and frequency (30 to 40 kilohertz [kHz]) as high frequency "fish finder" type sonars used worldwide by both commercial and recreational fishermen. The HF/M3 sonar is located near the top of the SURTASS LFA sonar vertical line array. Its computer terminal for data acquisition, processing and display is located in the SURTASS Operations Center. The general characteristics of the HF/M3 sonar are provided in Subchapter 2.3.2.2 of the FOEIS/EIS.

Analysis and testing of the HF/M3 sonar operating capabilities indicate that this system substantially increases the probability of detecting marine mammals that

may pass close enough to the SURTASS LFA sonar's transmit array to enter the 180-dB sound field (LFA mitigation zone) and provides excellent monitoring capability (particularly for medium to large marine mammals) beyond the LFA mitigation zone, in the 1-km buffer zone. The system's ability to detect marine mammals of various sizes has been verified in several sea trials. Testing of the HF/M3 sonar, as documented in the FOEIS/EIS and the Final SEIS, has demonstrated a probability of detection above 95 percent within the LFA mitigation zone for most marine mammals.

Long Term Monitoring (LTM) Program

The LTM program consists of two parts. First are NMFS-directed reports under the Final Rule. These reports will provide the necessary information for assessments of whether any taking of marine mammals occurred within the SURTASS LFA mitigation zone during operations based upon data from the monitoring mitigation (visual, passive acoustic, active acoustic). Data analysis from the LTM and post-operation acoustic modeling will provide post-mission estimates of any incidental harassment takes. The second part of the LTM program involves long-term independent

scientific research efforts on topics designed to fill data gaps and further the overall understanding of the effects of anthropogenic sound and noise on the marine environment.

Reporting

During routine operations of SURTASS LFA sonar, technical and environmental data will be collected and recorded. As part of the LTM Program and as stipulated in the MMPA Final Rule/LOA, the following reports are required. First, a mission report will be provided to NMFS on a quarterly basis with the report including all active-mode missions that have been completed 30 days or more prior to the date of the deadline for the report. Second, the Navy will submit an annual report to NMFS summarizing the mission reports and analyzing any SURTASS LFA impacts on marine mammals during the period of the LOA. Finally, the Navy is required to provide a final comprehensive report analyzing any impacts of SURTASS LFA sonar on marine mammal stocks during the 5-year period of the regulations.

Navy-Sponsored Research

NMFS's initial Final Rule (67 FR 46785) included recommendations for the conduct of additional research

activities to help increase the knowledge of marine mammal species and the determination of levels of impacts from potential takes. In addition, because of the Court's concerns about potential impacts on fish, the Navy sponsored independent research through a fish CEE as described above.

The Office of Naval Research (ONR) sponsors significant research to study the potential effects of its activities on marine mammals. The Navy spends on average \$10M to \$14M annually on marine mammal research at universities, research institutions, federal laboratories, and private companies. In 2004 and 2005, Navy-funded research produced approximately 65 peer-reviewed articles published in professional journals based on ONR sponsored research. Publication in open professional literature thorough peer review is the benchmark for the quality of the research. This ongoing marine mammal research includes work on hearing and hearing sensitivity, auditory effects, dive and behavioral response models, noise impacts, beaked whale global distribution, modeling of beaked whale hearing and response, tagging of free ranging marine animals at-sea, and radar-based detection of marine mammals from ships. These studies, though not specific to LFA operations, are

crucial to the overall knowledge base on marine mammals and the potential effects from underwater anthropogenic noise.

In addition, ONR and the Strategic Environmental Research and Development Program (SERDP) have funded the development and fieldwork for sound-and-orientation recording tags (DTAGs), which have been successfully attached with suction cups to beaked whales and sperm whales (Tyack et al., 2006). In particular, these data are providing tremendous amounts of information on the movement and diving behavior of beaked whales, both of which are important to know in order to understand the acoustic exposure to which the animals may be subjected.

Under the current NMFS Rule, the Navy was required to conduct research in accordance with 50 CFR § 216.185(e) and the LOAs, as issued. As demonstrated in Table 2-5 for the Final SEIS, the Navy has and is continuing to meet these recommended research requirements (67 FR 46782). A 2007-2008 deep-diving odontocetes behavioral response study (BRS) will commence on or about 15 August 2007 to determine the potential effects of LFA, MFA, and seismic sources on beaked whales and other deep diving odontocetes at an estimated cost of \$3M per year.

SUMMARY OF PUBLIC INVOLVEMENT

The public participation program for the SURTASS LFA Sonar SEIS began with publication of a Notice of Intent (NOI) to prepare a supplemental analysis in the Federal Register on July 28, 2003 (68 FR 44311).

Commencing in early November 2005, copies of the Draft SEIS were distributed to agencies and officials of federal and state governments, citizen groups and associations, and other interested parties. A Notice of Availability (NOA) was published in the Federal Register (70 FR 68443). The Draft SEIS was made available for review at 17 public libraries located in many coastal states including Hawaii. A copy of the Draft SEIS was also available on the SURTASS LFA Sonar Internet website (<http://www.surtass-lfa-eis.com>).

During the 90-day public comment period on the Draft SEIS, public hearings were conducted in Washington, DC; San Diego, California; and Honolulu, Hawaii. Notifications for the public hearings were published in the Federal Register and in local newspapers. The hearings were conducted in accordance with NEPA requirements and comments became part of the record.

During the comment period, which ended on February 10, 2006, the Navy received a total of 97 comments from government agencies, organizations, and individuals. In addition, no statements were presented at the December 1, 2005, public hearing in Washington, DC; 3 statements were presented at the December 3, 2005, public hearing in San Diego, CA; and 11 statements were presented at the December 5, 2005, public hearing in Honolulu, HI.

All comments received were categorized into broad issues based on the organization of the SEIS. These issues were further subdivided into more specific comments/questions. Responses to these comments/questions were then drafted and reviewed for scientific and technical accuracy and completeness. The Navy's responses also identify cases in which a specific comment generated a revision to the Draft SEIS, or when the existing text of the Final SEIS is deemed an adequate response to a comment, the appropriate chapter, subchapter, and/or appendix is identified. Comment submissions, written hearing transcripts and statements have been included in Volume 2 of the Final SEIS.

In April 2007, copies of the Final SEIS were distributed to agencies and officials of federal, state,

and local governments, citizen groups and associations, and other interested parties. On May 4, 2007, the U.S. EPA published the NOA for the SURTASS LFA Sonar Final SEIS in the Federal Register (72 FR 25302). The Final SEIS was also made available for review at 17 public libraries located in many coastal states, including Hawaii.

The SURTASS LFA Sonar Final SEIS is available on the SURTASS LFA Internet website (<http://www.surtass-lfa-eis.com>) for information purposes and will remain so for at least 60 days after publication of the ROD in the Federal Register.

COMMENTS ON THE FINAL SEIS

The Navy received one comment letter on the Final SEIS from NOAA. The Navy has considered these comments.

NOAA supports the need to deploy SURTASS LFA system in oceanic areas while minimizing the environmental effects of these activities, and supports the Navy's preferred alternative. NOAA requests that additional consideration be given to adding two other areas to the list of OBIAs.

Under the current and proposed SURTASS LFA Regulation, NMFS designates additional OBIAs, not the Navy. Nominations for designation of biologically important

marine mammal areas must provide information to NMFS as delineated in 50 CFR 216.191(b) to include detailed information on the biology of the marine mammals in the proposed area. The requests for consideration of Davidson Seamount and the Papahānaumokuālea Marine National Monument for status as OBIAAs did not meet these requirements.

The first of these additional areas is the Davidson Seamount. In its comments on the Final SEIS (RTC 4.7.1), NOAA requested that the Navy consider adding Davidson Seamount to the list of OBIAAs because it is an important feeding ground for sperm whales along the California coast and is close to the OBIA established for the Monterey Bay National Marine Sanctuary. Under the current and proposed regulations, the Navy must provide annual applications to NMFS for LOAs for each ship's operations for the upcoming year. These annual applications to NMFS for SURTASS LFA sonar LOA renewals use a sensitivity / risk assessment process to assess potential impacts to marine mammals. This process is discussed above and in the SEIS p. 4-37 to 4-51. If in the future the Navy's applications include the Davidson Seamount, the above analytical process using the current literature available on marine mammal seasonal abundances and densities will be utilized to determine the

potential for SURTASS LFA operations to affect marine mammal stocks. The Navy will operate SURTASS LFA sonar under all mitigation requirements of the Final SEIS, the Final Rule, and this document. Therefore, the Navy has determined that Davidson Seamount has adequate protection under the current and proposed regulations.

The other area NOAA asked the Navy to consider adding as an OBIA was the Papahānaumokuālea Marine National Monument. With respect to this Monument, the Navy fully understands its obligations under Executive Order 13178 (Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve), Executive Order 13196 (Final Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve), and the Presidential Proclamation establishing the Northwestern Hawaiian Islands Marine (Papahānaumokuālea) National Monument. If in the future the Navy's annual LOA applications include the Papahānaumokuālea Marine National Monument, the above analytical process using the current literature available on marine mammal seasonal abundances and densities will be utilized to determine the potential for SURTASS LFA operations to affect marine mammal stocks. The Navy will operate SURTASS LFA sonar under all mitigation requirements of the Final SEIS, the Final Rule,

and this document. Therefore, the Navy has determined that the potential future military readiness activities involving SURTASS LFA sonar within the Papahānaumokuālea Marine National Monument provide adequate protection under the requirements of the Presidential Proclamation for Armed Forces Actions, this document, and the current and proposed regulations under the MMPA.

NOAA Comments on Invertebrates:

Comment 1: In future environmental analyses Navy should consider those species with statocysts that function similar to otoliths in vertebrates and have acoustic impedance that are different from water. Lovell et al. (2005) and Lovell et al. (2006) published papers on prawn hearing indicating that they can detect frequencies from the 100 Hz up to 3,000 Hz.

Response: Information was presented on decapod and cephalopod ability to sense LF sound, including discussion of statocysts in the Final SEIS Subchapter 3.2.1.1 and Response to Comment 3.2.5. The papers by Lovell et al. (2005) and Lovell et al. (2006) on prawn hearing were not reviewed in the SEIS. However, these papers confirm the statement in the SEIS that cephalopods and decapods are known to sense LF sound. Lovell et al. (2005) examined the

hearing ability of the prawn *Palaemon serratus* with Auditory Brainstem Response techniques. The resultant audiogram shows the hearing sensitivities between approximately 105 dB re 1 micro Pascal (Pa at 100 Hz (the lowest frequency tested) of), 112 dB re 1 micro Pa at 500 Hz, and 131 dB re 1 micro Pa at 3 kHz. This hearing ability appears to approximate that of a non-specialist fish (Lovell et al. 2005). The experimenters were very careful in the production and calibration of the sound field in this experiment. The authors conclude that the prawns are sensitive to particle motion associated with sounds from at least 100 Hz to 3 kHz.

It is important to note that net particle motion is associated with the near-field of a sound source. At a short distance from the source, there is no more net particle motion and only a pressure wave. It is not clear from this study whether the prawns detect the net particle motion or the pressure wave. Therefore it is possible that their hearing ability would be degraded in the far field of a source.

The SEIS stated that while the overall data on decapod and cephalopod hearing are still very limited, they do suggest that some may not hear well, if they hear at all.

The results from the Lovell et al. studies add valuable data to help fill this gap demonstrating that prawns do hear at frequency ranges between 100 Hz and 3 kHz with thresholds above 100 dB based on sensitive to particle motion associated with sounds. The results of these recent papers do not change the conclusions of the SEIS that decapods and cephalopods would have to be within a few tens of meters from the source to be affected.

Comment 2: Since some species of corals (i.e., elkhorn and staghorn) and the white abalone are either designated as a threatened or endangered species, in future environmental analyses the Navy should mention these species and state whether or not the use of SURTASS LFA sonar would cause any impacts.

Response: As stated in the Final SEIS Subchapter 3.2.1, in order for there to be a potential impact on a species from SURTASS LFA, the distribution of that species must overlap the SURTASS LFA sonar geographic sphere of acoustic influence. None of the species cited meet that criterion. The elkhorn coral extends from the surface to about 5 m (16 ft) depth and the staghorn zone extends from about 7 to 15 m (23 to 49 ft) depth (Acropora Biological Review Team, 2005). The white abalone is most abundant

between 25-30 m (82-98 ft) depth (NMFS, 2006). SURTASS LFA sonar operations will be conducted over 22 km (12 nm) from coastlines including islands. As stated in Final SEIS RTC 4.7.14d, the Navy will rarely, if ever, conduct LFA operations in water shallower than 200 m (656 ft). This is based on the physical limitations due to the lengths of both the vertical and horizontal arrays. Therefore, these species are not expected to be affected by SURTASS LFA sonar.

NOAA Comments on Fish:

Comment 1: The Final SEIS (Page ES-12) states "First, the sound level to which fish were exposed in these experiments was 193 dB RL, a level that is only found within about 200 m (656 ft) of the SURTASS LFA source array. Thus, the likelihood of exposure to this or a higher sound level is extremely small." There is no evidence provided in the Final SEIS to support the statement that the likelihood of a fish occurring within 200 m of the LFA array is extremely small, especially since there are no mitigation or detection measures being considered for fishes.

Response: The support for this statement is provided in the Final SEIS Subchapter 4.1.1.6, Final SEIS Response

to Comment 4.1.20 and the FOEIS/EIS Subchapter 4.3.1.1. which provides an analysis supporting the conclusion that the potential for effects on pelagic fish stocks are very small. This analysis was based on the potential for pelagic fish to be exposed to 180 dB or greater sound field. Stock size was based on reported fisheries landings averaged over a three years period. This analysis is conservative because it addresses the likelihood of a fish being exposed to 180 dB, whereas the recent Fish CEE, described above, specifically addressed the potential for injury to fish from SURTASS LFA sound concluding that there would be only minimal impact even at 193 dB RL. The above analysis is based on overall pelagic fish stocks and not on individual fish or localized schools.

Comment 2: The Final SEIS (Page ES-12) states "Since exposure at maximum levels did not cause damage to fish, and only what appears to be a temporary limited hearing loss, it is unlikely that a shorter exposure would result in any measurable hearing loss or non-auditory damage to fish." There is no scientific evidence presented in the Final SEIS to support this statement. The Fish CEE did not test exposures less than 324 seconds in duration. The definition of "shorter exposures" is not supplied.

Asymptotic threshold shifts, with increasing durations of noise exposure, have been demonstrated in hearing specialist fish species (e.g., Scholik and Yan 2001; Smith et al. 2004a). Thus, it is possible that exposure to a shorter duration of sound could result in hearing loss similar to longer durations. There is no scientific basis to definitively state something is unlikely to occur if it was never tested.

Response: If a signal played for a known duration produced no non-auditory damage and no permanent hearing loss in fish, but only a temporary limited hearing loss, it is reasonable to assume that a signal with the same characteristics and the same decibel received level, but for a shorter duration would produce, at most, the same effect (temporary limited hearing loss) and, more likely, a lesser effect; but it would certainly not produce a greater effect. The exposures during the experiments were most likely substantially greater than any exposure a fish might encounter in the wild. In the LFA fish study described here, each fish received three 108-second exposures to high-level LFA sound at 193 dB SPL separated by a nine-minute silent period, thus a total exposure of 324 seconds during a period of over 23 minutes. Shorter exposures

refer to those less than 193 dB SPL for 108 seconds. Since there was no injury and only minor temporary limited hearing loss at very long signal durations, there is no reason to believe that shorter duration signals of the same type used in the experiment would result in greater effects on fish. Moreover, fish would only be exposed to the maximum signal levels used in the study, 193 dB re 1 microPa (RMS), for a few seconds at most since the fishes and the LFA vessels are moving.

While asymptotic threshold shifts, with increasing durations of noise exposure, have been demonstrated in hearing specialist fish species (e.g., Scholik and Yan 2001; Smith et al. 2004a), these studies were for much longer durations than the total 324 second exposure of the LFA fish study. The threshold shifts reported by Scholik and Yan (2001) and Smith et al. (2004a) were for hearing specialists. One of the species utilized in the LFA fish study was the catfish, also a hearing specialist that showed relatively little hearing loss. Therefore, the much shorter exposures in the LFA study, and even shorter potential for exposure for fish in the wild, clearly show that asymptotic threshold shifts from LFA signals is highly unlikely, if at all.

Comment 3: The listing of threatened and endangered fish stocks in the Final SEIS is missing some species (e.g., smalltooth sawfish). The Final SEIS also states that there are no elasmobranch species protected under the ESA. This is incorrect because the smalltooth sawfish was designated as endangered in 2003. The Final SEIS (Page 3-20) states, "As noted above, fish species are listed as endangered, threatened or protected in fresh water, estuarine or near-shore waters habitats, where SURTASS LFA sonar would not operate." The term "near-shore" is not defined in the document. The Gulf sturgeon Suwannee River Critical habitat includes areas in federal waters and in future environmental analyses Navy should reconsider whether additional analyses of impacts to this species should be conducted. Furthermore, the smalltooth sawfish is also primarily found in state waters but not exclusively. Thus, in future environmental analyses Navy should consider whether or not SURTASS LFA operations would impact these species.

Response: The Navy will considered the potential effects to all listed fish species including the smalltooth sawfish and Gulf sturgeon as a result of future proposed actions as appropriate. The analysis in the SEIS was

appropriate for the proposed deployment of SURTASS LFA sonar. Based on information from the NOAA Fisheries Office of Protected Resources website, sawfish species inhabit shallow coastal waters of tropical seas and estuaries, and are often found in sheltered bays, on shallow banks, and in estuaries or river mouths. The current range of the smalltooth sawfish is peninsular Florida. They are relatively common only in the Everglades region at the southern tip of the state.

As stated in the Final SEIS, the Gulf sturgeon inhabits fresh water, estuaries or near shore habitats. In the area of the Suwannee River critical habitat, the 200-m isobath is over 200 km offshore.

SURTASS LFA sonar operations will be conducted over 22 km (12 nm) from coastlines including islands. As stated above LFA operations will rarely be conducted in water shallower than 200 m (656 ft). Therefore, the smalltooth sawfish and the Gulf sturgeon are not expected to be affected by SURTASS LFA sonar due to the fact that LFA sonar operations would not be conducted near their habitats. Part of the annual LOA application process includes consultation under the ESA. These consultations

will include listed species that are within the geographic range of the requested LOAs.

Comment 4: Statements that are made about behavior during Fish CEE while fish were caged during experiments are not supported by the study design (i.e., it may be irrelevant that behavior before and after the test were similar). It is unclear from the text whether or not the catfish tested were staying in same position (i.e., not swimming around cage) during the exposure. If so, this may have implications for species that might remain stationary, rather than swim away (or even be attracted), when encountered by a sound source. There may be a range of variability of behavior displayed in association with exposure to a sound, and it is difficult to make any conclusions until more data are available.

Response: The design for this study was a simple one in which the investigators compared behavior before, during, and after sound exposure. This is a clear design that has been widely used by other investigators interested in behavioral responses. Moreover, the study also compared the results during sound exposure to results of control experiments in which fish were treated precisely as in the sound experiments, but without the sound. As pointed out,

the catfish were stable in position during the sound exposure, facing the source, and then "milled around" between sound presentations.

It should be noted that the behavior described on page 4-14 of the Final SEIS and by the investigators is totally descriptive and not meant as an analysis of behavior of fish in the wild. The Navy recognizes that caged fish may behave very differently than fish in the wild. While the results from this study provide valuable information regarding fish behavior, and assist in making an informed decision, they are not necessarily a predictor of the behavior of fish in the wild.

Comment 5: Page 4-15: The potential environmental consequences (e.g., increased predation by other species, etc.) of fishes experiencing temporary threshold shifts (TTS) for 24 to 96 hours are not addressed. It seems inappropriate to conclude that impacts are minimal if these consequences are unknown. These CEE studies also demonstrated variation in TTS among members of the same species, which makes it difficult to assess impacts for other species and even other individuals within the same species.

Response: In no case during the study, regardless of variability, was TTS permanent. It is predicted that fish will experience much shorter exposures to SURTASS LFA sonar in the wild. Therefore, the length of TTS determined in the study is not relevant to fish in the wild because they are not likely to experience exposure levels high enough to cause TTS. Thus TTS is not likely to occur in the wild. The Navy recognizes that impacts may vary from species to species, as well as from individual fish in the same species. Recognizing these variations, this research, when combined with other relevant information, is enough to permit an informed decision on the issue of impacts to fish.

Comment 6: In the Fish CEE studies, Rainbow trout are considered hearing generalists (i.e., more sensitive to particle motion rather than pressure); yet measurements of particle motion in the test cage during exposure are not provided. Also, hearing thresholds were measured in pressure, which is inappropriate for this species (i.e., should be measured as particle motion). This should be addressed in future environmental analyses.

Response: As pointed out in Popper et al. 2007, the authors are well aware of the issues of particle motion vs.

pressure. However, it is of considerable importance to note (as indicated in the paper) that the nature of what is measured is irrelevant if all fish are tested in the same tank. In all cases, experimental and control animals are subject to the same signals, and thus, any changes in hearing are responses in the same sound field. As long as the sound field does not change (which it did not based on daily calibrations), and the fish are tested in the same way in the same tank, any change in hearing (or lack of change in hearing) is accurate no matter what the stimulus is to which fish are responding.

Comment 7: The Final SEIS (Page 4-16) states, "In effect, it is likely that fish could be even closer than 200 m (656 ft) to the source array and not be damaged by the sounds." This statement is provided without any supporting data, and the term "closer" is not defined. This should be addressed in future environmental analyses.

Response: The point the Navy was making was simply that, if exposure to 324 seconds of sound at 193 dB caused only minimal impact, it logically follows that a fish exposed only briefly - as is most likely - may be able to tolerate even higher level of sound without significant impact. I am not relying on this argument, however, in

reaching my conclusion regarding impacts to fish. Rather, I am satisfied that there will be minimal impact up to 193 dB based on results of the CEE study, along with the other information discussed in the SEIS and the ROD.

Marine Mammals:

Comment 1: Page 3-64 states "There is no direct measurement of auditory threshold for the hearing sensitivity of Mesoplodon species....." This is incorrect and should be updated with Cook et al. (2006) in future environmental analyses.

Response: A stranded Gervais' beaked whale was tested for hearing ability with Auditory Evoked potential (AEP) techniques (Cook et al. 2006). The shape of the curve is consistent with other odontocetes, and the animal had its highest sensitivity at 80 kHz (the upper limit tested). Hearing detection thresholds at lower frequencies, including those of interest to the SURTASS LFA sonar, were not tested (experiment range 5 to 80 kHz).

Under the regulations, the Navy must apply annually for letters of authorization for each SURTASS LFA vessel. This process is detailed in the Final SEIS Subchapters 4.4.1 and 4.4.2. Part of this application process is the review of current literature for the geographic areas of the

requests, and updating that literature and the process as necessary.

Comment 2: Table 4.4-2 (pages 4-43 through 4-51) provides the percentage of stock affected but provides no means of translation to exposures and takes. Furthermore, this information is only provided for 9 of the 31 mission areas. The Navy should consider updating this information in future environmental analysis.

Response: First, the commenter has misinterpreted Tables 4.4-2 through 4.4-10 in the Final SEIS. These tables present the estimates of marine mammal stocks potentially affected for the Risk Assessment Case Study as presented in the Final SEIS Subchapter 4.4.2 and as such are not directly related to the 31 acoustic modeling sites from the FOEIS/EIS. However, the Navy does agree that the information in future environmental analyses will be updated. That is why the annual LOA application process starts with updated data collection for the particular geographic areas in which authorizations are sought.

CONCLUSIONS

I have considered the following issues relative to the potential environmental impacts from the employment of the

SURTASS LFA sonar system including, but not limited to, the following information from the FOEIS/EIS and the Final SEIS.

The analyses and findings of the FOEIS/EIS remain valid and have been incorporated into the Final SEIS by reference, except as noted or modified. The conclusions and decisions from the FOEIS/EIS ROD (67 FR 48145) remain valid, except as noted or modified in this document. These include the adequacy of scientific information on human divers and the Navy sponsored research to study the potential effects of low frequency sound on divers to fill these gaps; adequacy of scientific information on marine animals and the Low Frequency Sound Scientific Research Program conducted by independent bioacousticians and marine biologists; development of impact criteria including risk continuum and thresholds; analytical methodology, analyses, and results of the determination of potential impacts; the NOAA/Navy Joint Interim Report Bahamas Marine Mammal Stranding Event of 15-16 March 2000 as it relates to the potential for SURTASS LFA sonar to cause tissue damage/injury to marine mammals; resonance and bubble growth issues as they relate to the potential for SURTASS LFA sonar to cause tissue damage/injury to marine animals;

NMFS initial Final Rule for the Taking of Marine Mammals Incidental to Navy Operations of SURTASS LFA Sonar and their response to comments received on the Proposed Rule; NMFS initial Biological Opinion on the Navy's Proposed Employment of SURTASS LFA Sonar; comments received on the SURTASS LFA Sonar FOEIS/EIS; and requests from environmental groups for the Navy to prepare a supplemental EIS based on significant new information.

The Final SEIS focuses on providing additional information regarding the environment that could potentially be affected by employment of SURTASS LFA; providing additional information related to mitigation of the potential impacts of the system; addressing pertinent deficiencies raised by the Court including additional mitigation and monitoring, additional area alternatives analysis, and analysis of the potential impacts of LF sound on fish; and providing the information necessary to apply for a new five-year rule that would provide for incidental takes under the MMPA, taking into account the NDAA FY04 amendments to the MMPA for military readiness. The SEIS also provided details of updated analyses and research on the potential effects to fish, sea turtles, and marine mammals; proposed modifications to mitigation/interim

operational restrictions; marine mammal stranding events potentially related to anthropogenic noise; cumulative impacts; long term monitoring; and ongoing and planned research.

Based upon my review of the comparative analysis of the potential for environmental and socioeconomic effects from the five alternatives presented in the Final SEIS and public comments received during the NEPA process, I have decided to implement Alternative 2 of the Final SEIS, which was identified as the Navy's preferred alternative, with certain geographical restrictions and monitoring mitigation designed to reduce potential adverse effects on the marine environment. This will include employment of up to four SURTASS LFA sonar systems as initially analyzed in the FOEIS/EIS in the oceanic areas as presented in Figure 1-1 (SURTASS LFA Sonar Systems Potential Areas of Operations) of the FOEIS/EIS. Based on current operational requirements, exercises using these sonar systems could occur in the Pacific, Atlantic, and Indian oceans, and the Mediterranean Sea. This decision permits the Navy to reasonably fulfill its purpose of providing U.S. forces with reliable, effective, and efficient long-range detection of new-generation, quiet

submarines, while the geographic restrictions and monitoring mitigation requirements constitute all practical means to avoid or minimize environmental harm from the alternative selected. This alternative also provides for the ten offshore biologically important areas listed in the final Rule (50 CFR 184(f)). NMFS has amended the proposed rule to add a 1-km (0.5-nm) buffer to the OBIA SPL restriction. Accordingly, the final rule 50 CFR 184(e)(2) requires the Navy to ensure SPLs do not exceed 180 dB (re 1 microPa(rms)) at a distance of 1 km (0.5 nm) seaward of the outer perimeter of the OBIA. This measure will limit SPLs within OBIA to less than approximately 174 dB.

In addition, this decision and implementation of this alternative provide for continued long-term monitoring and research, which will further enhance the understanding of the potential effects of anthropogenic sounds on the marine environment.

If there is a need to operate LFA sonar in U.S. waters in the future, the Navy will address any coastal zone consistency issues in conjunction with the annual LOA application process.

Actions requiring issuance of NMFS LOA(s) are being addressed through NMFS rulemaking under 50 CFR Part 216 and

the Final Rule. Actions requiring issuance of incidental take statements (ITSS) are being addressed as part of the NMFS Biological Opinion on the U.S. Navy's proposed use of SURTASS LFA Sonar that has been prepared by NMFS in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.) (Consultation No. F/FPR/2007/02184, dated 14 August 2007).

Operational employments of the SURTASS LFA sonar systems are contingent upon issuance of LOAs for each system, which the Navy anticipates being issued with an effective date of 16 August 2007 in specific bio-geographic provinces approved for operations. Operational employments are also contingent upon issuance of ITSS concurrent with the above LOAs and for the same specified bio-geographic provinces.

AUG 15 2007

Date



BJ Penn
Assistant Secretary of the
Navy (Installations and
Environment)