EXECUTIVE OFFICE OF THE PRESIDENT
COUNCIL ON ENVIRONMENTAL QUALITY
WASHINGTON, D.C. 20503

CHAIRMAN

January 15, 2008

The Honorable Donald C. Winter
Secretary of the Navy
The Pentagon
Washington, DC 20350

SUBJECT: Emergency Alternative Arrangements for the U.S. Navy's Use of MFA Sonar in the Southern California Operating Area Composite Training Unit Exercises and Joint Task Force Training Exercises Scheduled to Occur through January 23, 2009

Dear Secretary Winter:

I am responding to your request of January 10, 2008, supplemented by your letter of January 11, 2008, seeking to obtain Council on Environmental Quality (CEQ) approval of alternative arrangements pursuant to 40 C.F.R. § 1506.11 for implementing the procedural provisions of the National Environmental Policy Act, 42 U.S.C. §§ 4321 et seq. (NEPA). The CEQ regulations implementing the procedural provisions of NEPA provide that where emergency circumstances make it necessary to take an action without observing the normal procedures set forth in those regulations, the federal agency taking the action should consult with CEQ about alternative arrangements for compliance with NEPA.

The United States Navy is requesting that CEQ provide for alternative arrangements for NEPA compliance for the Navy's proposed use of mid-frequency active ("MFA") sonar during Commander THIRD Fleet's nine (9) training exercises, four (4) Composite Unit Training Exercises ("COMPTUEX") and five (5) Joint Task Force Exercises ("JTFEX"), in the Southern California ("SOCAL") Operating Area. Your request and these alternative arrangements are based on the SOCAL Operating Area climate, weather conditions, land mass distribution, and the MFA training proposed for the four COMPTUEX and five JTFEX scheduled between today and January 23, 2009.

The COMPTUEX and JTFEX are major warfare training exercises that are required to certify naval Strike Groups as ready for deployment into combat operations. Strike Groups are a package or formation of Navy ships that function as a Carrier Strike Group or an Expeditionary Strike Group. A Carrier Strike Group is formed around an Aircraft Carrier with an embarked Air Wing, and an Expeditionary Strike Group is formed around an Amphibious Assault Ship with an embarked Marine Expeditionary Unit and is able to move embarked Marine Expeditionary Unit elements ashore via helicopter or amphibious-type craft. MFA sonar is defined as an active sonar system that operates within the 1 kHz to 10 kHz frequency range and MFA sonar capability allows the Strike Group to defend itself against quiet diesel electric submarines that may come within range or attack any of the ships in the Strike Group.

The SOCAL Operating Area is uniquely suited to conducting the Navy COMPTUEX and JTFEX because it contains all of the land, air, and at-sea bases necessary for conducting the exercises, and the shallow coastal areas in SOCAL realistically simulate areas where the Navy is likely to encounter hostile submarines. The SOCAL Operating Area includes Warning Area 291 (W-291), and the Southern California Antisubmarine Warfare Range (SOAR). The use of MFA sonar will be within W-291 and SOAR (Attachment A). SOAR is an instrumented underwater range which allows the Navy to monitor and evaluate the success of the Strike Group training. The Navy has conducted MFA sonar training exercises in the Southern California Operating Area since at least the 1970s.

The Navy is currently evaluating the environmental impact of MFA sonar training exercises through its development of the SOCAL Range Complex Environmental Impact Statement (SOCAL EIS). The Navy began the SOCAL EIS process in late 2006 and published its notice of intent on December 21, 2006. That EIS will meet the procedural requirements of NEPA for all training, including MFA sonar training in SOCAL. To comply with NEPA procedural requirements while developing the EIS, the Navy prepared an environmental assessment of the SOCAL training proposed for the time period prior to completion of the EIS. In addition, the Navy issued a consistency determination in accordance with the procedural requirements of the Coastal Zone Management Act, 16 U.S.C. §§ 1451 et seq. (CZMA).

In January 2007, the Deputy Secretary of Defense issued a National Defense Exemption (NDE) under the Marine Mammal Protection Act (MMPA) (16 U.S.C. § 1371(f)). The NDE provides for protection of marine mammals in the absence of an MMPA Letter of Authorization by including 29 specific conditions to minimize potential impacts on marine mammals. These 29 mitigation measures were developed in coordination with the National Marine Fisheries Service (NMFS), the agency with substantive responsibility for marine mammals. The NDE allows time for the Navy to execute a plan coordinated with the Department of Commerce to obtain a Letter of Authorization under the usual procedural requirements of the MMPA. The plan calls for the Navy to complete the usual MMPA process in conjunction with the SOCAL EIS process by the time the NDE expires on January 23, 2009. The likely effects of MFA sonar training on threatened and endangered marine mammals were further analyzed in consultation with NMFS under section 7 of the Endangered Species Act,16 U.S.C. §§ 1531 et seq. (ESA). In February of 2007, the Navy concluded consultation with NMFS, which issued a Biological Opinion that includes an incidental take statement that exempts the Navy from the prohibitions in section 9 of the Endangered Species Act through January 2009.

The Navy began the SOCAL EIS process that includes analysis of MFA sonar training and prepared the environmental assessment in an effort to provide procedural NEPA compliance for COMPTUEX and JTFX training in the SOCAL Operating Area. The Navy is preparing the draft SOCAL EIS for publication in early 2008. The draft EIS will include an analysis of the direct, indirect, and cumulative effects of MFA sonar training on marine mammals and provide the basis for finalizing mitigation measures for the use of MFA sonar in the SOCAL Operating Area. The requested alternative arrangements are intended to provide a process for environmental impact assessment and decision-making for the nine exercises, four COMPTUEX and five JTFEX, involving MFA sonar to be conducted prior to January 23, 2009, or completion of the SOCAL EIS process, whichever is earlier.

The record supporting the Navy request includes: your letters to CEQ dated January 10 and 11, 2008, with attachments; classified and unclassified briefing materials provided to CEQ by the Navy; CEQ discussions with NMFS; the environmental analyses conducted by the Navy in the environmental assessment for proposed COMPTUEX and JTFEX exercises and in the preliminary draft environmental impact statement for the SOCAL Range Complex; the February 9, 2007, Biological Opinion issued by NMFS pursuant to Section 7 of the ESA; after action report analyses prepared for NMFS by the Navy (Attachment B-G); the January 23, 2007, NDE; and the January 9, 2008, most recent review of the environmental effects of MFA sonar training in the SOCAL Operating Area by NMFS (Attachment H).

In its most recent review, NMFS considered the effects of Navy training exercises in SOCAL on marine mammals in and adjacent to the Navy's SOCAL Operating Area. James H. Lecky, the Director of the NMFS Office of Protected Resources, determined that while there is some potential for injury, the mitigation measures employed as a result of the NDE and the reporting and monitoring measures outlined in the Biological Opinion will minimize that risk to marine mammals in and adjacent to the exercise area. This review concluded that "NMFS does not expect the COMPTUEX and JTFEX exercises [through January 23, 2009] to result in adverse population level effects for any of the marine mammal populations." (Attachment H).

The record supporting the Navy request also includes the Orders issued January 3, 2008, and January 10, 2008, by the U.S. District Court for the Central District of California. The District Court has preliminarily determined that an environmental impact statement is necessary for these MFA sonar exercises in the SOCAL Operating Area. Following the November 13, 2007, Order from the Ninth Circuit Court of Appeals, the District Court issued the January 3, 2008, injunction allowing the exercises to proceed subject to specified mitigation measures. Those mitigation measures were modified by the January 10, 2008, order. Your letter of January 11, 2008, further informed me that the modified injunction imposes training restrictions, in particular the unaltered 2200 yard shut down requirement and the 6 dB power down requirement during significant surface ducting conditions, that continue to create a significant and unreasonable risk that Strike Groups will not be able to train and be certified as fully mission capable.

You have explained that the training restrictions set forth in the January 3, 2008, and January 10, 2008, injunctive orders prevent the Navy from providing Strike Groups with adequate proficiency training and create a substantial risk of precluding certification of the Strike Groups as combat ready in order to be deployed. Training in the use of MFA sonar is a vital component of the pre-deployment training in COMPTUEX and JTFEX. The use of MFA sonar is complex and requires constant training in realistic combat scenarios to maintain proficiency. MFA sonar is the Navy's best means of detecting potentially hostile diesel-electric submarines. The primary Strike Group targets of hostile submarines are the Navy aircraft carrier, which typically carries over 5300 servicemen and civilians, and the Amphibious Assault Ship carrying a Marine Expeditionary Unit. Thus, the inability to train effectively with MFA sonar puts the lives of thousands of Americans directly at risk. If a Strike Group does not gain proficiency in MFA sonar, and cannot be certified as combat ready, the broader national security implications are enormous, and the harm quickly compounds if additional Strike Groups cannot be certified.

Lack of such certification places at risk the logistical, defensive and offensive capabilities of these Strike Groups in the event of an undetected attack, further placing at risk the lives of the military and civil service personnel that the Strike Groups support and defend. Because of the unique features of the SOCAL area and the availability of the land, sea, and air bases, the exercises need to be conducted in the SOCAL Range Complex. The Navy must continue conducting sonar training exercises in portions of the SOCAL Range Complex through January 23, 2009, in order to provide certified PACFLEET assets for deployment. Therefore, there are urgent national security reasons for providing alternative arrangements under the CEQ regulations.

The Navy must continue conducting sonar training exercises in portions of the SOCAL Operating Area in January 2008 through January 2009 in order to provide certified PACFLEET assets for deployment. CEQ understands that the next training exercise is scheduled to take place in the month of January 2008 and that failure to conduct this training exercise will have immediate ramifications for Navy deployments around the world. Therefore, the Navy has requested that CEQ take immediate action on its proposal for alternative arrangements for NEPA compliance.

The Navy has consulted with and obtained comments on its proposal for alternative arrangements from official at NMFS. CEQ has also consulted with the NMFS for purposes of informing its response to the Navy proposal. Discussions between our staffs, your letter and supporting documents, and the classified declaration and briefings I have received, have clearly determined that the Navy cannot ensure the necessary training to certify strike groups for deployment under the terms of the injunctive orders. Based on the record supporting your request including the information provided during briefings and discussions to CEQ and others – in particular, the Biological Opinion and the NDE in which the Deputy Secretary of Defense determined that the national defense requires this training program and provided the NDE mitigation measures developed in consultation with NMFS – CEQ has concluded that the Navy must be able to conduct the nine SOCAL COMPTUEX and JTFEX in a realistic and effective manner that includes the use of MFA sonar so that naval strike groups can be certified and deployed in a timeframe that does not provide sufficient time to complete an EIS. Therefore, emergency circumstances are present for the nine exercises and alternative arrangements for compliance with NEPA under CEQ regulation 40 C.F.R. § 1506.11 are warranted.

Your request provides CEQ with: (1) Navy's commitment to apply measures for mitigating potential effects on marine mammals from the use of MFA sonar that are provided in the NDE and were developed in consultation with the NMFS; (2) public participation procedures for the preparation of the SOCAL EIS; (3) measures for adaptive management; and (4) long-term research commitments. CEQ has had a number of meetings and conference calls with representatives of the Navy, as well as with representatives of the Department of Commerce, as CEQ considered and developed these alternative arrangements.

These alternative arrangements focus on the process for environmental impact assessment, particularly public participation and research, prior to the completion of the SOCAL EIS, that will provide information for the ongoing EIS analysis and future development and analysis of MFA sonar training in the SOCAL Operating Area. These alternative arrangements

are based on the proposed training exercises scheduled between today and January 23, 2009 and the conditions present in the SOCAL Operating Area.

PUBLIC PARTICIPATION MEASURES:

The alternative arrangements include the following public participation measures that supplement the current public information plan for the SOCAL EIS described in your letter.

The Navy will provide notice of these alternative arrangements and publish this Decision Memorandum in the Federal Register. In addition, Navy will publish notice of these alternative arrangements in the following newspapers: (1) Los Angeles Times; (2) Sacramento Bee; (3) San Diego Union-Tribune; (4) North County Times (San Diego County); and (5) Daily Breeze (San Pedro, California).

Concurrent with the Federal Register notice, the Navy will include notices to the parties listed in Attachment E to your request of January 10, 2008, as well as World Wildlife Fund, Nature Conservancy, National Wildlife Federation, Whale and Dolphin Conservation Society, Ocean Mammal Institute, Center for Whale Research, Consortium for Oceanographic Research and Education, National Fisheries Institute, American Sportfishing Association, Coastal Conservation Association, International Fund for Animal Welfare, American Tunaboat Association, Pacific Fisheries Management Council, Western Fish Boat Owners Association, Southern California Lobster and Trap Fisherman's Association, Southern California Trawler's Association, Morro Bay Commercial Fisherman Organization, Southern California Commercial Fishing Association, California Wetfish Producers Association, United Anglers of Southern California, Tuna Club of Santa Catalina Island, International Game Fish Association, Long Beach Sportfishing, Recreational Fishing Alliance, United Anglers of Southern California, United Pier & Shore Anglers of California, Scripps Research Institute, University of California at Santa Cruz, and the Applied Physics Laboratory – University of Washington.

The notices will specifically seek input on the process for reviewing post-exercise assessments and include an offer to meet jointly with Navy representatives from the office of the Assistant Secretary of the Navy (Installations & Environment) and the office of the Chief of Naval Operations, and CEQ to discuss the alternative arrangements.

CEQ will be provided copies of any notices made in accordance with the alternative arrangements and the notices will be posted on the website at http://www.socalrangecomplexeis.com.

The Navy will also provide CEQ notice of the post-exercise assessments which the Navy prepares for each exercise within 120 days of completion of each exercise (or 120 days after completion of an exercise which is reported as part of a group of exercises) to which these alternative arrangements apply. Further dissemination of the post-exercise assessments will be determined after considering input received in response to the Navy notice of alternative arrangements and the further dissemination of the post-exercise assessments will be incorporated into the alternative arrangements.

After the conclusion of the alternative arrangements, and no later than March 23, 2009, the Navy will provide a report to CEQ on the use of the alternative arrangements that reviews the value and effectiveness of those arrangements. Notice of the report will be provided in the Federal Register, the five newspapers (Los Angeles Times; Sacramento Bee; San Diego Union-Tribune; North County Times (San Diego County); and Daily Breeze (San Pedro, California)) and on the website at http://www.socalrangecomplexeis.com.

RESEARCH MEASURES:

Efforts to obtain more information about the quantity, distribution, migration, and reactions of marine mammals to MFA sonar is ongoing and will continue. Consequently, information being obtained will inform compliance with the substantive provisions of the MMPA and ESA, and the procedural requirements of CZMA and NEPA. For NEPA, this information will inform the ongoing SOCAL EIS process as well as future exercise planning in the SOCAL Operating Area and serve to provide the basis for integrated compliance with all environmental statutes.

The Navy is implementing the following research measures to provide for continual improvement in the quality of information available.

a. The Navy is taking measures to improve the information regarding marine mammal presence and density in the SOCAL Operating Area by coordinating with the NMFS to determine the need to identify areas within the SOCAL Operating Area for additional marine mammal surveys. If a need is identified, an implementation plan identifying the areas and providing a schedule for the surveys will be developed no later than July 2008. The surveys will be designed to help determine where and when there are concentrations of marine mammals in the SOCAL Operating Area. The survey will occur over a two year period through July 2010.

b. The Navy is currently working on a program that will enhance its ability to use passive hydrophones on the SOAR Instrumented Range to detect and track marine mammals on those portions of the range where the passive hydrophones are in place. To ensure that these efforts remain focused, Navy will develop an implementation plan and schedule to expand the technical capability of existing hydrophones to detect marine mammals by April 4, 2008. The implementation plan should provide for completion of prototype classifiers for Cuvier's and Blainesville's beaked whales and visual verification of other small odontocetes detected by passive hydrophones by April 15, 2009.

c. As part of the SOCAL EIS, the Navy is evaluating a proposal to extend the range areas monitored by passive hydrophones. If Navy decides to extend the area covered by passive hydrophones as part of its ROD for the SOCAL Range Complex EIS, the Navy will determine a timetable for acquisition and installation of additional hydrophones by March 30, 2009.

d. The Navy is evaluating current research regarding infrared (IR) technology for use in collecting data regarding marine mammals, assessing the feasibility of acquiring and deploying

additional IR capabilities during major exercises or for conducting surveys, and developing a plan for acquiring and deploying IR in data collection efforts. The plan will be published no later than June 15, 2008.

MITIGATION MEASURES:

The Navy's proposed use of MFA sonar during the Commander THIRD Fleet's proposed nine training exercises (four COMPTUEX and five JTFEX), in the SOCAL Operating Area are based on the current knowledge of the SOCAL Operating Area and the 29 NDE mitigation measures, some of which are more fully described below:

a. The Navy is ensuring that watchstanders and lookouts will include at a minimum: (1) three non-dedicated watchstanders on all surface ships required to look out for marine mammals during all exercises; and (2) two lookouts on all surface ships required to look out for marine mammals during all exercises. Furthermore, all sightings of marine mammals by all watchstanders and all lookouts are to be reported directly to the Combat Information Center (CIC) or via the appropriate watch stations for submission to the CIC, and the CIC will disseminate the sighting information to all platforms in the area with a recommendation for appropriate action (e.g., power down sonar; surface or subsurface vessels to avoid area or increase distance from mammals; aerial platforms to increase vigilance). Similarly, all aerial platforms will monitor the area for marine mammals during their assigned missions and report marine mammal presence and confirmed sightings to Aircraft Control Unit for submission to the CIC, and the CIC will disseminate the sighting information to all platforms in the area to ensure they are aware of the presence of marine mammals and can take steps to increase vigilance or execute mitigation measures applicable to these exercises (e.g., power down sonar; surface or subsurface vessels to avoid area or increase distance from mammals; aerial platforms to increase vigilance).

b. The Navy is submitting after action reports to NMFS 120 days after the conclusion of any COMPTUEX or JTFEX that contains: (1) an assessment of the mitigation and monitoring measures and how to improve them; and (2) the results of marine mammal monitoring, including all instances where marine mammals were observed and the levels of MFA sonar to which they were exposed, based on the NDE sonar mitigation measures and the requirements of the Biological Opinion dated February 9, 2007.

c. Use of MFA sonar in the SOCAL Operating Area for COMPTUEX and JTFEX training is proposed to occur in W-291 and SOAR (Attachment A). The COMPTUEX and JTFEX training includes three components involving the use of MFA sonar: anti-submarine warfare exercises, submarine operations, and tracking operations. The training exercises in SOAR will occur at least 5 nm away from the western shoreline of San Clemente Island. Aside from San Clemente Island, there are no other islands located within W-291 or SOAR. The Channel Islands National Marine Sanctuary is located entirely outside of W-291 and SOAR. The training area also excludes other islands off of Southern California. For example, Santa Catalina Island and Santa Barbara Island are located entirely outside W-291 and SOAR.

d. The Navy will use meters rather than yards to describe the safety zone set forth in NDE II mitigation measure 20, and the safety zone used in the SOCAL Operating Area will be 1000 meters. The Navy will power down 6dB if a marine mammal is detected within the safety zone. The Navy will power down an additional 4 dB at 500 meters and will shut off sonar transmissions at 200 meters. The remaining features of the safety zone described in NDE measure 20 will remain the same.

CONCLUSION:

The alternative arrangements as presented in this letter and any subsequent notification requirements developed as described above represent appropriate alternative arrangements for compliance with NEPA for the actions taken to respond to this emergency. Alternative arrangements are limited to those actions necessary to control the immediate impacts of the emergency by providing trained and certified Naval Strike Groups for deployment to combat areas and will remain in effect during the preparation and completion of the SOCAL EIS or until January 23, 2009, whichever is earlier. Applying these alternative arrangements to any other area or exercise would not be appropriate absent an analysis tailored to such other area and exercise.

We are available to review these alternative arrangements in the event there are any concerns, questions or requests for clarifications from the Navy, other agencies, and the public. Please do not hesitate to contact me, Ted Boling, CEQ General Counsel, or Horst Greczmiel, CEQ Associate Director for NEPA, regarding the implementation of these arrangements.

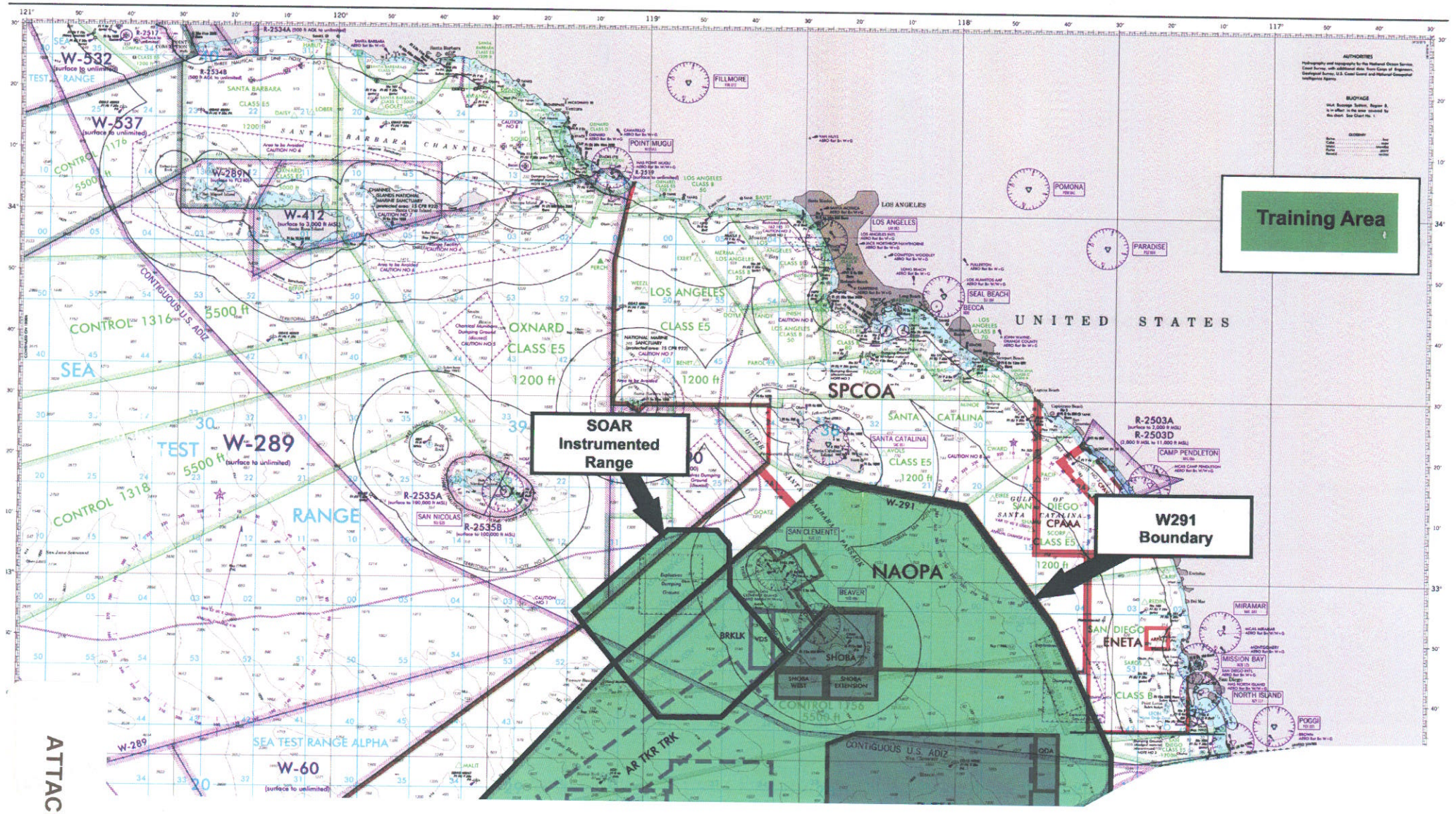
Yours Sincerely,

James L. Connaughton

Attachments

A: Chart of the SOCAL Operating Area identifying areas MFA sonar can be used under the terms of the NDE, Biological Opinion and the alternative arrangements.
B: USS Boxer ESG-5, Composite Training Unit Exercise (C2X 06-03), July 2006 and Joint Task Force Exercise 06-04 (JTFEX 06-04) 10-17 Aug 2006, After Action Report.
C: USS Stennis CSG, Composite Training Unit Exercise 06-04 (C2X 06-04), 20 Sept-12 Oct 2006, After Action Report.
D: USS Stennis CSG, Joint Task Force Exercise 07-01 (JTFEX 07-01), 07-16 Nov 2006, After Action Report.
E: USS Nimitz CSG, Composite Training Unit Exercise 07-01 (CSX 07-01), 19 Nov – 19 Dec 2006.
F. Department of the Navy Southern California Composite Training Unit Exercise / Joint Task Force Exercise Combined After Action Report, February – March 2007, Final, 28 June 2007.

G: Department of the Navy Southern California Composite Training Unit Exercise 07-7, After Action Report, September 2007, Preliminary Draft CPF Submittal, 04 January 2008 [USS Tarawa Expeditionary Strike Group].
H: United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service Memorandum, subject: Effects of Navy training exercises on marine mammals in and adjacent to the Navy's Southern California Operating Area, dated January 9, 2008.



ATTACHMENT A

Prepared for
National Marine Fisheries Service
Office of Protected Resources

Prepared by
Department of the Navy

In accordance with
National Defense Exemption 30 June 2006

USS Boxer ESG-5

COMPOSITE TRAINING UNIT EXERCISE (C2X 06-03)

July 2006

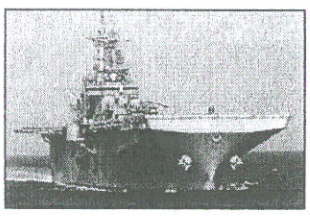
and

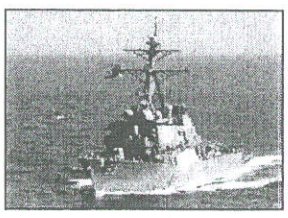
JOINT TASK FORCE EXERCISE 06-04 (JTFEX 06-04)

10-17 Aug 2006

After Action Report

Analysis of the Effectiveness of the Mitigation and Monitoring Measures
as Required Under the
National Defense Exemption from the Requirements of the Marine Mammal Protection Act for Certain DoD Mid-Frequency Active Sonar Activities





ATTACHMENT B

INTRODUCTION

This report is presented to fulfill the requirements conditional to the 30 June 2006 "National Defense Exemption (NDE) from the Requirements of the Marine Mammal Protection Act for Certain DoD Mid-Frequency Active Sonar Activities." The Navy is submitting this report to NMFS' Office of Protected Resources consistent with the requirement set forth in the MMPA NDE.

The following information is for the USS Boxer Expeditionary Strike Group (ESG) Composite Training Unit Exercise (C2X) 06-03 conducted in July 2006 and Joint Task Force Exercise (JTFEX) 06-04 conducted from 10-17 August 2006 in Southern California (SOCAL). The types of ASW training conducted during C2X 06-03 and JTFEX 06-04 involved the use of ships, submarines, aircraft, non-explosive exercise weapons, and other training related devices. ASW events occurred within portions of the Southern California Offshore Range (SCORE) and the Southern California Offshore ASW Range west of San Clemente Island. The following information is provided:

(1) Estimate of number of marine mammals affected by ASW exercises and discussion of nature of effects, if observed, based on results of real-time exercises and sightings of marine mammals;

(2) Assessment of effectiveness of mitigation and monitoring measures with recommendations on how to improve them;

(3) Results of marine species monitoring (real-time monitoring from all platforms) before, during, and after exercise;

(4) As much information (unclassified) as Navy can provide including, but not limited to, where and when sonar was used in relation to any measured received levels (such as sonobuoys), source levels, numbers of sources, and frequencies so it can be coordinated with observed cetacean behaviors.

This report, which contains only unclassified material, provides the necessary information and analyses, and thus fulfills these requirements. The report is organized by section as follows:

Section 1 provides an estimated number of marine mammals observed during the C2X 06-03 and JTFEX 06-04 ASW events based on analysis of actual events and sightings of marine mammals, noting the nature of any observed effects where possible.

Section 2 assesses the effectiveness of the NDE mitigation and monitoring measures required during exercises with regard to minimizing the use of Mid-Frequency Active Sonar (MFAS) in the vicinity of marine mammals. This section also includes an assessment of the practicality of implementation of the mitigation measures, the impact some of the measures had on safety, and the impact of the measures on the military readiness activities.

Section 3 provides data on the location and hours of active MFAS used during JTFEX 06-04 placed in context with observations of cetacean behaviors resulting from the aerial reconnaissance and exercise participants.

SECTION 1: Marine Mammals Observed

Section 1 provides estimated numbers of marine mammals observed in Southern California waters during JTFEX 06-04 ASW exercises and vessel transits. This information is based on analysis of actual events and sightings of marine mammals noting the nature of any observed effects. Note: No marine mammal sighting data were reported from C2X 06-03 due in part to the recent NDE promulgation and insufficient time in which to distribute reporting requirements. While marine mammals were present during C2X 06-03, there were no instances of required sonar shut downs due to close proximity of marine mammals to sonar sources.

All detections were made by standard Navy surface ship lookout marine mammal detection and reporting procedures. There were no sighting reports from aircraft platforms. Participating U.S. Navy Mid-Frequency Active Sonar (MFAS) equipped units included three P-3C maritime patrol aircraft and four SH-60B helicopters equipped with sonobuoys, two submarines, and surface vessels (two cruisers, two destroyers, and one frigate.

Table 1 provides a detailed timeline of marine mammal observations made by Navy exercise participants.

During JTFEX 06-04, there were 11 marine mammal sightings for a total of 230 animals Table 1 and **Figure 1**). Two of the 11 sightings included a total of 220 "dolphins" which comprised over 96% of total animal seen during JTFEX 96-04. This observation is consistent with science-based reports that dolphins, and in particular, the short-beaked common dolphin (*Delphinus delphis*), comprise as much as 85-95% of the marine mammal abundance within Southern California.

Table 1. Marine mammal sightings and actions by exercise participants JTFEX 06-04.

Date-Time	Description of Actions Taken	#
08/11- 1000	Surface ship sights 1 "unidentified large whale" transiting at 800 yards. MFAS NOT in use. No action taken.	1
08/11- 1100	Surface ship sights 1 "unidentified large whale" transiting at 1000 yards. MFAS NOT in use. No action taken.	1
08/11- 1600	Surface ship sights "pod of approximately 100 dolphins" traveling in group at 1000 yards. MFAS NOT in use. No action taken.	100
08/12- 1130	Surface ship sights 1 "unidentified large whale" transiting at 1200 yards. MFAS NOT in use. No action taken.	1
08/13- 0930	Surface ship sights 1 "unidentified large whale" transiting at 3500 yards. MFAS NOT in use. No action taken.	1
08/14- 1030	Surface ship sights 1 "unidentified large whale" transiting at 800 yards. Ship has no MFAS. No action taken.	1
08/14- 1400	Surface ship sights "pod of approximately 120 dolphins" traveling in group at 1000 yards. MFAS NOT in use. No action taken.	120
08/14- 1700	Surface ship sights 2 "unidentified large whales" transiting at 1600 yards. MFAS NOT in use. No action taken.	2
08/14- 1400	Surface ship sights dead seal carcass at 150 yards. Carcass was decomposed and moving with current. Seal had clearly died some time previously. MFAS NOT in use. No action taken.	1

08/15- 1100	Surface ship sights 1 "unidentified large whale" at 300 yards. MFAS NOT in use. Vessel stopped for two minutes to allow whale to cross bow at safe distance.	1
08/17- 0800	Surface ship sights 1 "unidentified large whale" at 1200 yards. Ship has no MFAS.	1
11	= total number of sightings Total number of animals=	**230**

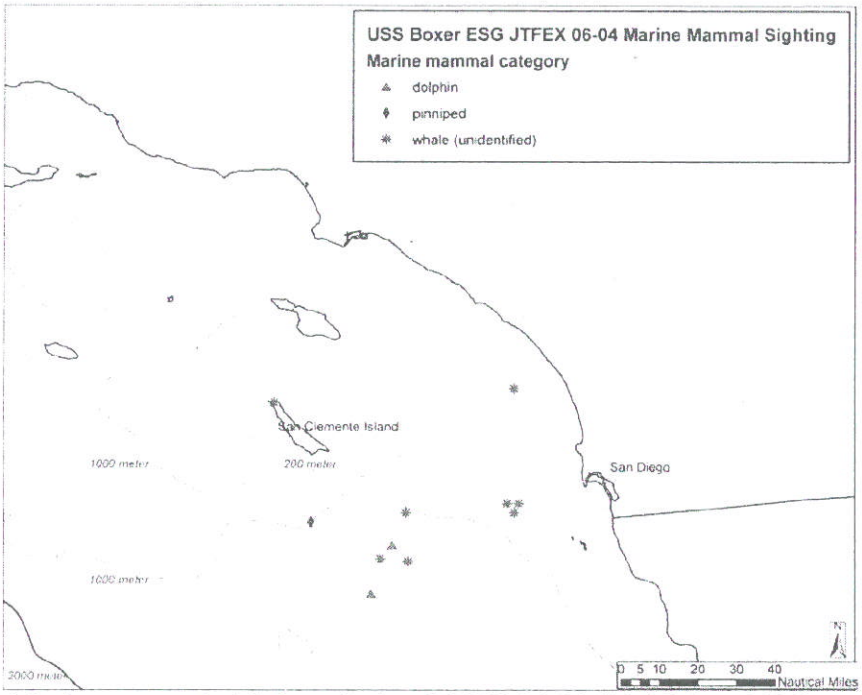


Figure 1. Marine mammal sightings during JTFEX 06-04 (10-17 Aug 2006). No sightings were made concurrent with MFAS use.

SECTION 2: Mitigation and Monitoring

As required under the RIMPAC IHA and adapted to the NDE, the report must contain "An assessment of the effectiveness of the mitigation and monitoring measures with recommendations on how to improve them." This section of the report, therefore, provides an assessment of the effectiveness of the mitigation and monitoring measures, and recommendations on how to improve them with regard to practicality of implementation, their impact on exercise safety, and their impact on the effectiveness of the military readiness training activity.

It must also be recognized that ASW proceeds slowly and requires careful development of a tactical frame of reference over time as data is integrated from a number of sources and sensors. Once MFAS is turned off for a period of time, simply turning it back on minutes later does not usually allow a Commander to simply continue from the last frame of reference. Thus, 15 minutes of lost MFAS time does not equate to only 15 minutes of lost exercise time but should be considered in the fuller context of its overall impact on the tempo and tactical development of a Common Operational Picture shared among exercise participants as they trained with the goal of interoperability and improvement of ASW skills in general.

C2X 06-03 Assessment and JTFEX 06-04 Assessment

MFAS sonar is only used during carefully reviewed scenarios and for only a small sub-set of any given exercise time frame. Therefore, as expected in JTFEX, a majority of these mammals were sighted during periods when MFAS was not in use.

There was high-level emphasis placed upon marine mammal protection as mandated by Navy regulation and policy, and, during C2X 06-03 and JTFEX 06-04, there were no marine mammal sightings during limited MFAS operation.

The reports from exercise participants contained nothing that could be construed as abnormal or "observed effects" of MFAS, or other vessel operations. There were no instances where marine mammals behaved in an erratic, unusual, or anything other than normal manner. Therefore, further analysis based on observed effects, as mandated by the reporting requirement, was not warranted.

NDE Assessment

NDE measures adhered to and impact to operations are discussed below.

A subset of the additional measures required by the NDE was not applicable within the context of C2X 06-03 and JTFEX 06-04 due to the absence of the conditions described. This subset of mitigation measures is as follows:

- Requirements regarding "*strong surface ducting conditions*"
- Requirements regarding "*low visibility conditions*"
- Requirements specific to operating MFAS in choke-points
- Restrictions from operating MFAS in constricted channels

The following protective measures, as mandated by NDE, were already Navy Standard Operating Procedures (SOP) as detailed in Navy lookout training, Protective Measures Assessment Protocol (PMAP), and Marine Species Awareness DVD Training. These measures will continue to be used in future exercises:

1. Personnel trained on marine mammal awareness and mitigation measures (Lookout Training Handbook NAVEDTRA 12968-B and U.S. Navy Marine Species DVD Version 1.1 June 2006).
2. Personnel on lookout with binoculars at all times when the vessel is moving through the water
3. Lookouts report sighting of any marine species, disturbance to the water's surface, or object in the water to Officer of the Deck, who is the Commanding Officer's direct representative on watch
4. Safety zone is established around an active sonar source and sonar power is reduced when marine mammals enter this zone
5. Submarine sonar operators review detection indicators of close-aboard marine mammals prior to commencement of ASW operations involving MFAS
6. Aerial surveillance for marine species occurs whenever possible and detections are reported to ships in the vicinity
7. Helicopters using active (dipping) sonar search for marine mammals prior to active sonar and employ a safety zone
8. Sonar always operated at lowest practicable level to meet tactical training objectives

Based on the following observations, Navy SOPs already in place were effective in detecting marine mammals. In addition, the steps taken by individual ship commanding officers to avoid impacts to marine mammals were effective, although not applicable in the JTFEX due to lack of sighting during use of MFAS.

Summary

- Marine mammals were sighted 11 times by exercise participants during JTFEX 06-04. In each of these cases, the marine mammals were detected by Navy watchstanders operating in accordance with Navy standard operational procedures and as reiterated by some NDE mitigation measures
- Of the 11 instances where marine mammals were detected during JTFEX 06-04, and during C2X 06-03, MFAS was not operating and there were no mandated sonar shut downs
- There were no indications of any effects to any marine species throughout the exercise

To organize the assessment of each particular mitigation measure, they are listed below in the order and organization as presented in the NDE.

ASSESSMENT OF MITIGATION AND MONITORING MEASURES

The three categories of mitigation and monitoring measures required by the June 30, 2006 NDE are assessed in this section. For ease of reference, the text of the measures is provided in italics, followed by an assessment, an analysis of operational impact and a recommendation on any improvements to each measure.

Measures 1-2

Mitigation measures 1 and 2 detail training requirements and operating procedures for units participating in MFAS ASW exercises. All of the training requirements within these two measures reflect the Marine Species Awareness Training (MSAT) that Navy lookouts and bridge personnel routinely receive as Navy SOP. This MSAT was developed in coordination with marine biology experts within the Navy, reviewed by a National Marine Fisheries Service (NMFS) regional office, and incorporates effective marine species detection cues and information necessary to protect marine species. This material is part of the Navy Lookout watchstander qualification system, will soon be available as online interactive training, and can also be provided in a video format for large audience presentations. NMFS reviewed the MSAT training for purposes of RIMPAC 06 and this training continued to be used by Navy to meet the full intent of these first two NDE mitigation measures.

Measure 1. Personnel Training:

- *Navy shipboard lookouts shall be qualified watchstanders who have completed marine species awareness training.*
  - *Navy watchstanders will participate in marine mammal observer training approved by NMFS.*

Measure 2. Operating Procedures

- *Bridge personnel on ships and submarines - Ships and surfaced submarines shall have personnel on lookout with binoculars at all times when the vessel is moving through the water. Standard operating procedure requires these lookouts maintain surveillance of the area visible around their vessel and to report the sighting of any marine species, disturbance to the water's surface, or object (unknown or otherwise) to the Officer in Command.*
  - *Bridge lookout personnel shall have completed marine species awareness training as updated in 2005.*
  - *At least one individual who has received this training will be present, and on watch, at all times during operation of tactical mid-frequency sonar, on each vessel operating mid-frequency sonar.*

Navy Assessment:

Measures 1 and 2 require marine species awareness training. Marine mammal lookout training for all units has been standard procedure for several years, and was updated with a new Marine Species Awareness Training DVD (U.S. Navy Marine Species Awareness Training DVD, Version 1.1). Training has been established and continues to be effective as a mitigation measure.

Operational Impact of these mitigation measures:

None.

Recommendation
None, these are effectively incorporated into Navy SOPs.

- *Aviation units - Aircraft participating in ASW events will conduct and maintain, whenever possible, surveillance for marine species prior to and during the event. The ability to effectively perform visual searches by participating aircraft crew will be heavily dependent upon the primary duties assigned as well as weather, visibility, and sea conditions. Sightings would be immediately reported to ships in the vicinity of the event as appropriate.*

Navy Assessment:
This measure documents what occurs in general, but has not been specifically described in a SOP.

Operational Impact of this mitigation measure:
None – this occurs routinely.

Recommendation
This mitigation measure should be retained and described in a SOP.

- *Sonar personnel on ships, submarines, and ASW aircraft -*
  - *Ship and submarine sonar operators will check for passive indications of close-aboard marine mammals prior to their commencement of ASW operations involving active mid-frequency sonar.*

Navy Assessment:
This measure documents what occurs for submarines as part of PMAP, and is used in general for surface ships, but has not been specifically described in a SOP.

Operational Impact of this mitigation measure:
None – this occurs routinely or is part of PMAP (for submarines).

Recommendation
This mitigation measure should be retained given that it details what occurs routinely. The measure has not been officially described in a SOP for surface ships. The measure is part of PMAP for submarines. This measure should be added for surface units in the next version of PMAP.

- *Sonar levels (generally) - The Navy will operate sonar at the lowest practicable level, not to exceed 235 dB, except for occasional short periods of time to meet tactical training objectives. Use of MFA sonar at source levels above 235 dB will be logged and reported in accordance with section 3.*

Navy Assessment:
This measure had no observable benefit to conservation, as shut down and power down procedures are followed if mammals are observed within designated safety zones.

Operational Impact of this mitigation measure:
The impact of this measure is undeterminable at this time.

Recommendation

This measure may not be particularly applicable to conduct of training. Sonar usage is tailored to the environmental conditions of the day, which may preclude practicable levels below the maximum.

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i. *In major fleer exercises, operate mid-frequency active sonar within 12 nm of a coast, except for RIMPAC 2006 (which is covered above) and military readiness activities at the established ranges at San Clemente Island and PMRF.*

Navy Assessment:
This measure was adhered to for JTFEX 06-04; for this major exercise there were no active sonar operations within 12 nm of a coast except those on the established instrumented ranges near San Clemente Island.

Operational Impact of this mitigation measure:
None.

Recommendation
Not applicable.

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ii. *Conduct sonar activities in constricted channels.*

Navy Assessment:
There are no naturally occurring bathymetrically constricted channels within the SOCAL area used for JTFEX 06-04.

Operational Impact of this mitigation measure:
None.

Recommendation
Not applicable.

- ***Safety zones*** *- When marine mammals are detected close aboard, all ships, submarines, and aircraft engaged in ASW would reduce mid-frequency active sonar power levels in accordance with the following specific actions:*
  - ***Helicopters*** *- Helicopters shall observe/survey the vicinity of an event location for 10 minutes before deploying active (dipping) sonar in the water. Helicopters shall not dip their sonar within 200 yards of a marine mammal and shall secure pinging if a marine mammal closes within 200 yards after pinging has begun.*

Navy Assessment:
This measure is fundamentally the same as the measure detailed in PMAP, with the addition of a specified 10 minute survey in advance of active sonar. PMAP prohibits active sonar use if there are animals within 200 yards of the dipping sonar transducer, and details the securing of sonar if an animal is detected within 200 yards or is closing on the source when active.

Operational Impact of this mitigation measure:
None.

Recommendation
The 10 minute survey prior to active sonar use is bounding the time in which survey would be done. As written in PMAP, the helicopter pilots must ensure there are no marine mammals in the 200 yard exclusion zone around the sonar transducer, regardless of time interval spent in searching. Since the searching of an area is dependent upon the environmental conditions of the day, bounding the survey timeframe may be unwarranted.

Ships and submarines

i. ***#1,000 m** - When marine mammals are detected by any means (aircraft, lookout, or aurally) within 1000 m of the sonar dome (the bow), the ship or submarine will limit active transmission levels to at least 6 dB below the equipment's normal operating level for sector search modes. Ships and submarines would continue to limit maximum ping levels by this 6-dB factor until the animal has been seen to leave the area, has not been seen for 30 minutes, or the vessel has transited more than 2000 m beyond the location of the sighting.*

ii. ***#500 m** - Should the marine mammal be detected within or closing to inside 500 m of the sonar dome, active sonar transmissions will be limited to at least 10 dB below the equipment's normal operating level for sector search modes. Ships and submarines would continue to limit maximum ping levels by this 10-dB factor until the animal has been seen to leave the area, has not been seen for 30 minutes, or the vessel has transited more than 1500 m beyond the location of the sighting.*

iii. ***#200 m** - Should the marine mammal be detected within or closing to inside 200 m of the sonar dome, active sonar transmissions will cease. When a marine mammal or sea turtle is detected closing to inside approximately 200 m of the sonar dome, the principal risk becomes potential physical injury from collision. Accordingly, ships and submarines shall maneuver to avoid collision if the marine species closes within 200 m to the extent possible, with safety of the vessel being paramount. Sonar will not resume until the animal has been seen to leave the area, has not been seen for 30 minutes, or the vessel has transited more than 1200 m beyond the location of the sighting.*

Navy Assessment:
It is likely that this mitigation measure may be effective, but as drafted above it requires improvement. Similar protective measures were already Navy SOP for all units conducting MFAS training. The intent of this requirement was not tested during JTFEX 06-04 since no marine mammal sightings occurred during MFAS operation.

Operational Impact of this mitigation measure:
None during these particular exercises.

Recommendation
A "safety zone" mitigation measure was already SOP and this mitigation measure should be retained. A safety zone of 1000 m is based on the attenuation of sonar power level from a source of 235 dB to a received level of 173 dB under ideal conditions assuming direct path propagation with no reduction from other possible environmental factors. The criterion for the minimal threshold for marine species behavioral effect as required by

NMFS for the IHA application in RIMPAC 06, and applied to JTFEX 06-04 and COMPTUEX 06-03 was a 173 dB accumulated energy level.

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iv. ***Significant surface ducting conditions*** *- In significant surface ducting conditions, the Navy will enlarge the safety zones such that a 6-dB power-down will occur if a marine mammal enters the zone within a 2000 m radius around the source, a 10-dB power-down will occur if an animal enters the 1000 m zone, and shut down will occur when an animal closes within 500 m of the sound source.*

Navy Assessment:
There were no significant surface ducting conditions.

Operational Impact of this mitigation measure:
Not determinable for these exercises. Additionally, water conditions vary significantly over relatively short distances while operating in the littoral, which makes implementation of this measures unrealistic, and therefore the measure is considered ineffective.

Recommendation
This measure can not be effectively implemented, thus providing no additional protection and should be deleted.

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v. ***Low visibility conditions (i.e., whenever the entire safety zone cannot be effectively monitored due to nighttime, high sea state, or other factors)*** *- The Navy will use additional detection measures, such as infrared (IR) or enhanced passive acoustic detection. If detection of marine mammals is not possible out to the prescribed safety zone, the Navy will power down sonar as if marine mammals were present in the zones they cannot see (for example, at night, if night goggles allow detection out to 1000 m, power-down would not be necessary under normal conditions; however, in significant surface ducting conditions, the Navy would need to power down 6 dB, as they could not effectively detect mammals out to 2000 m, the prescribed safety zone).*

Navy Assessment:
This measure may not have been applicable; there were no days of poor visibility during the exercises, and no nighttime marine mammal sightings (Table 1). Depending on vessel class and funding, some more advance IR, thermal, or other image enhancement technology may not be part of the ship's table of organic equipment (TOE) (i.e. equipment supplied a part of a unit's normal complement).

Operational Impact of this mitigation measure:
Not Applicable.

Recommendation
None, this measure was not effectively tested.

Measure 3. Stranding Response and Reporting

- *The Navy will coordinate with the NMFS Stranding Coordinator for any unusual marine mammal behavior, including stranding, beached live or dead cetacean(s), floating marine mammals, or out-of-habitat/milling live cetaceans that may occur at any time during or shortly after major exercises.*

Navy Assessment:
There were no occurrences of unusual marine mammal behavior during or subsequent to JTFEX 06-04.

Operational Impact of this mitigation measure:
Not applicable.

Recommendation
None, this measure was not applicable for JTFEX 06-04 or COMPTUEX 06-03. There are existing Navy SOPs outlined in OPNAVINST 5090.1B Change 4 and Chief of Naval Operations N45 Supplemental Environmental Planning Policy (23 September 2004).

- *The Navy will provide a report to NMFS after the completion of a major exercise that includes:*
  - *An assessment of the effectiveness of these mitigation and monitoring measures with recommendations of how to improve them.*

Navy Assessment:
The details of the effectiveness assessment are discussed within this report. In the circumstance that occurred during JTFEX 06-04, no marine mammal sightings occurred concurrently with MFAS operation, so effectiveness of some mitigation measures could not be assessed.

Operational Impact of this mitigation measure:
Manpower time for data collection, analysis, report writing and drafting the after action marine mammal sighting Naval messages is required.

Recommendation
None at this time.

- *Results of the marine species monitoring during the major exercise. As much unclassified information as the Navy can provide including, but not limited to, where and when sonar was used (including sources not considered in take estimates, such as submarine and aircraft sonars) in relation to any measured received levels, source levels, numbers of sources, and frequencies, so it can be coordinated with observed cetacean behaviors. If necessary, classified information may be provided to NMFS personnel with an appropriate security clearance and need to know.*

Navy Assessment:
The details of the marine species monitoring are contained within Table 1 and Section 3 of this report.

Operational Impact of this mitigation measure:
None.

Recommendation
None at this time.

SECTION 3: Monitoring Results

The requirement from the NDE, "*Results of the marine species monitoring during the major exercise. As much unclassified information as the Navy can provide including, but not limited to, where and when sonar was used (including sources not considered in take estimates, such as submarine and aircraft sonars) in relation to any measured received levels, source levels, numbers of sources, and frequencies, so it can be coordinated with observed cetacean behaviors.*" is summarized in this section of the report.

Note that the marine mammal observations reported in Section 1 represent a skewed sample since there were no attempts made to detect marine mammals by other means in areas not being used by exercise participants.

Typically, there are no measurements (calibrated or otherwise) of actual sound levels made during an exercise and none were made during JTFEX 06-04. Source levels, numbers of sources, and frequencies are classified since that information would provide potential adversaries with important tactical data. Given that location planning and mitigation measures are designed to minimize interactions between Navy assets and marine mammals, the observations of marine mammals by Navy assets only occurred as infrequent and very brief encounters, the majority of which occurred when there was no MFAS in use.

Observations of marine species and their behaviors, as previously detailed, showed no unusual behaviors for coordination with MFAS use. There were no indications from the observations that the presence of exercise participants had any affect on any marine mammals.

The requirement to report where and when sonar was used so it can be coordinated with observed cetacean behaviors would provide no additional information since animals observed were behaving within the confines of apparent normal behavior. Information presented previously in Table 1 provides a list of instances when marine mammals were observed.

CONCLUSIONS

In summary, there were 11 sightings of 230 marine mammals from surface vessels during JTFEX 06-04 (Table 1, Figure 1), while no sightings were reported for C2X 06-03. All behaviors described in the after action report were within the range of apparently normal behaviors. The results of these monitoring efforts provided no evidence indicating there were any effects on the detected marine mammals as a result of the ASW exercises taking place.

Prepared for
National Marine Fisheries Service
Office of Protected Resources

Prepared by
Department of the Navy

In accordance with
National Defense Exemption 30 June 2006

USS Stennis CSG

COMPOSITE TRAINING UNIT EXERCISE 06-04

(C2X 06-04)

20 Sep-12 Oct 2006

After Action Report

Analysis of the Effectiveness of the
Mitigation and Monitoring Measures
as Required Under the
National Defense Exemption from Requirements of the Marine Mammal Protection Act for Certain DoD Mid-Frequency Active Sonar Activities

ATTACHMENT C

INTRODUCTION

This report is presented to fulfill the requirements conditional to the 30 June 2006 "National Defense Exemption (NDE) from Requirements of the Marine Mammal Protection Act" for Certain DoD Mid-Frequency Active Sonar Activities." The Navy is submitting this report to NMFS' Office of Protected Resources based on the requirement set forth in the MMPA NDE.

The following information is for the USS Stennis Carrier Strike Group (CSG) Composite Training Unit Exercise (C2X) 06-04 conducted from 20 Sep-12 Oct 2006 in Southern California (SOCAL). The types of ASW training conducted during C2X 06-04 involved the use of ships, submarines, aircraft, non-explosive exercise weapons, and other training related devices. ASW events occurred within portions of the Southern California Offshore Range (SCORE) and the Southern California Offshore ASW Range (SOAR) west of San Clemente Island. The following information is provided:

(1) Estimate of number of marine mammals affected by ASW exercises and discussion of nature of effects, if observed, based on results of real-time exercises and sightings of marine mammals;

(2) Assessment of effectiveness of mitigation and monitoring measures with recommendations on how to improve them;

(3) Results of marine species monitoring (real-time monitoring from all platforms) before, during, and after exercise;

(4) As much information (unclassified) as Navy can provide including, but not limited to, where and when sonar was used in relation to any measured received levels (such as sonobuoys), source levels, numbers of sources, and frequencies so it can be coordinated with observed cetacean behaviors.

This report, which contains only unclassified material, provides the necessary information and analyses, and thus fulfills these requirements. The report is organized by section as follows:

Section 1 provides an estimated number of marine mammals observed during the C2X 06-04 ASW events based on analysis of sightings of marine mammals, noting the nature of any observed effects where possible.

Section 2 assesses the effectiveness of the NDE mitigation and monitoring measures required during exercises with regard to minimizing the use of Mid-Frequency Active Sonar (MFAS) in the vicinity of marine mammals. This section also includes an assessment of the practicality of implementation of the mitigation measures, the impact some of the measures had on safety, and the impact of the measures on the military readiness activities.

Section 3 provides data on the location and hours of active MFAS used during C2X 06-04 placed in context with observations of cetacean behaviors resulting from the ship based reports and exercise participants.

SECTION 1: Marine Mammals Observed

Section 1 provides estimated numbers of marine mammals observed in Southern California waters during C2X 06-04 ASW exercises and vessel transits. This information is based on analysis of actual events and sightings of marine mammals noting the nature of any observed effects.

All detections were made by standard Navy surface ship lookout marine mammal detection and reporting procedures. There were no sighting reported from aircraft platforms. U.S. Navy participating Mid-Frequency Active Sonar (MFAS) equipped units included five P-3C maritime patrol aircraft, four SH-60B helicopters, five SH-60F helicopters and two submarines. U.S.Navy MFAS equipped participating surface vessels included three cruisers, five destroyers and two frigates.

Table 1 provides a detailed timeline of marine mammal observations made by Navy exercise participants. During C2X 06-04, there were **73** marine mammal sightings for a total estimate of **1,225** animals observed.

Thirty-one of the 73 sightings included a total of 1,091 "dolphins" which comprised 42% of the sightings and 89% of total animal seen during C2X 06-04. This observation is consistent with science-based reports that dolphins, and in particular, the short-beaked common dolphin (*Delphinus delphis*), comprise as much as 85-95% of the marine mammal abundance within Southern California.

Large whale sightings comprised 34% of the total sightings (n=25 sighting totaling 43 animals). Small whale sightings comprised 14% of the total sightings (n=10 sightings totaling 32 animals). Pinnipeds (seals or sea lions) sighting comprised 10% of the total sightings (n=7 sighting totaling 54 animals).

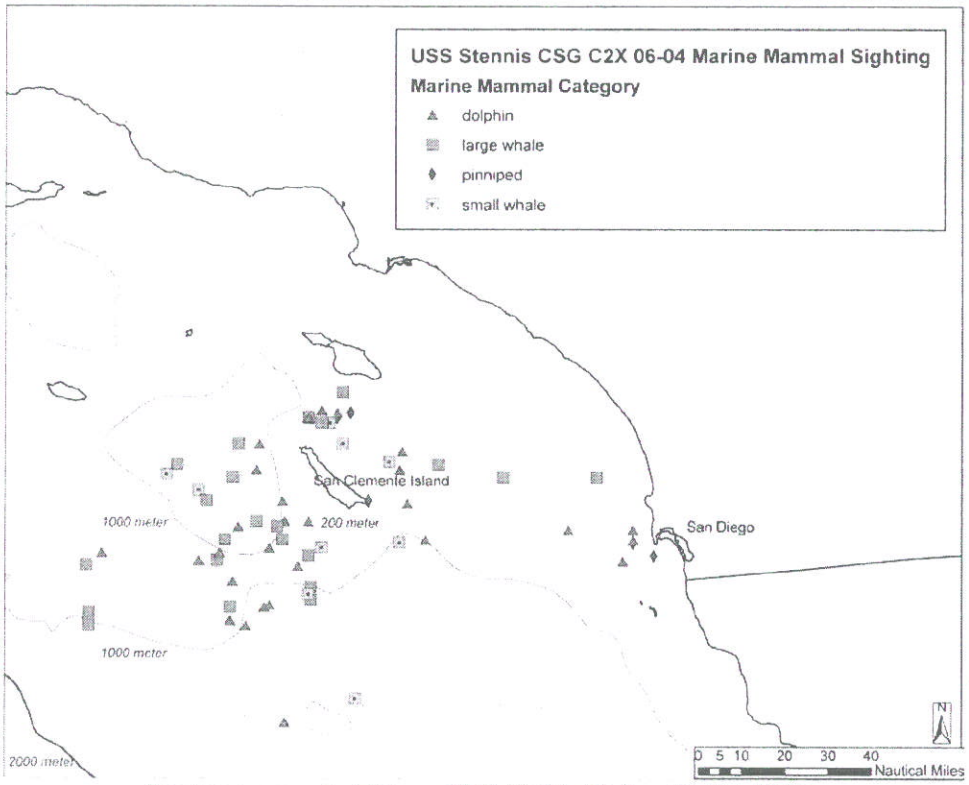
Table 1. Marine mammal sightings and actions by exercise participants during C2X 06-04. Text in red **Bold** indicates events when MFAS was in use and secured due to marine mammal mitigation. Red text in *Italics* indicates when MFAS was in use, but mitigation other than securing sonar was enacted.

Date-Time	Description of Actions Taken	# of animals	Animal Type	Observation
09/21-1104	Surface ship sights 14 "seals or sea lions" at 100 yards. MFAS NOT in use. No action taken.	14	pinniped	resting on surface
09/21-1004	Surface ship sights 20 "seals or sea lions" at 50 yards. MFAS NOT in use. No action taken.	20	pinniped	resting on surface
09/21-1232	Surface ship sights 1 "seal or sea lion" at 150 yards. MFAS NOT in use. No action taken.	1	pinniped	feeding
09/22-1740	Surface ship sights 25 "dolphins" at 100 yards. MFAS NOT in use. No action taken.	25	dolphin	traveling
09/22-0909	Surface ship sights 1 "small whale" at 1500 yards. MFAS NOT in use. No action taken.	1	small whale	traveling
09/22-0920	Surface ship sights 50 "dolphins" at 700 yards. MFAS NOT in use. No action taken.	50	dolphin	jumping
09/22-1257	Surface ship sights 1 "large whale" at 400 yards. MFAS NOT in use. No action taken.	1	large whale	traveling
09/22-1320	Surface ship sights 1 "large whale" at 200 yards. MFAS NOT in use. No action taken.	1	large whale	traveling
09/23-1819	Surface ship sights 20 "dolphins" at 1500 yards. MFAS NOT in use. No action taken.	20	dolphin	jumping
09/23-0800	Surface ship sights 100 "dolphins" at 1000 yards. MFAS NOT in use. No action taken.	100	dolphin	jumping
09/23-1203	Surface ship sights 20 "dolphins" at 300 yards. MFAS NOT in use. No action taken.	20	dolphin	jumping
09/23-1506	Surface ship sights 40 "dolphins" at 200 yards. MFAS NOT in use. No action taken.	40	dolphin	transiting
09/23-1520	Surface ship sights 1 "seal carcass" at 1000 yards. MFAS NOT in use. No action taken.	1	pinniped	-
09/24-0512	Surface ship sights 15 "dolphins" at 200 yards. MFAS NOT in use. No action taken.	15	dolphin	transiting
09/24-0616	Surface ship sights 50 "dolphins" at 100 yards. MFAS NOT in use. No action taken.	50	dolphin	jumping
09/24-0843	Surface ship sights 3 "small whales" at 400 yards. **MFAS in use. Sonar secured.**	3	small whale	traveling
09/24-1200	Surface ship sights 2 "large whales" at 1000 yards. MFAS NOT in use. No action taken.	2	large whale	milling
09/24-1355	Surface ship sights 1 "large whale" at 2000 yards. *MFAS in use. No action taken.*	1	large whale	milling
09/25-0714	Surface ship sights 2 "large whales" at 2000 yards. *MFAS in use. No action taken.*	2	large whale	milling
09/25-0735	Surface ship sights 20 "dolphins" at 300 yards. MFAS NOT in use. No action taken.	20	dolphin	traveling
09/25-0905	Surface ship sights 2 "large whales" at 2000 yards. *MFAS in use. Ship alters course.*	2	large whale	milling

Date-Time	Description of Actions Taken	# of animals	Animal Type	Observation
09/25-0943	Surface ship sights 1 "small whale" at 2000 yards. MFAS in use. Sonar secured.	1	small whale	traveling
09/25-1019	Surface ship sights 2 "large whales" at 1000 yards. MFAS NOT in use. No action taken.	2	large whale	milling
09/25-1122	Surface ship sights 16 "dolphins" at 150 yards. MFAS in use. Sonar secured.	16	dolphin	jumping
09/25-1157	Surface ship sights 1 "large whale" at 200 yards. MFAS NOT in use. No action taken.	1	large whale	traveling
09/25-1240	Surface ship sights 16 "dolphins" at 200 yards. MFAS in use. Sonar secured.	16	dolphin	jumping
09/26-1208	Surface ship sights 20 "dolphins" at 500 yards. MFAS NOT in use. No action taken.	20	dolphin	traveling
09/26-1409	Surface ship sights 5 "large whales" at 1000 yards. MFAS NOT in use. No action taken.	5	large whale	traveling
09/26-1415	Surface ship sights 5 "large whales" at 500 yards. MFAS NOT in use. No action taken.	5	large whale	traveling
09/26-1540	Surface ship sights 3 "small whales" at 800 yards. MFAS NOT active. No action taken.	3	small whale	traveling
09/27-0530	Surface ship sights 1 "small whale" at 500 yards. MFAS NOT active. No action taken.	1	small whale	traveling
09/27-1203	Surface ship sights 1 "small whale" at 2000 yards. *MFAS active. Ship alters course.*	1	small whale	traveling
09/28-1615	Surface ship sights 4 "large whales" at 1000 yards. MFAS NOT in use. No action taken.	4	large whale	traveling
09/28-0933	Surface ship sights 1 "large whale" at 800 yards. MFAS NOT in use. No action taken.	1	large whale	traveling
09/28-1115	Surface ship sights 1 "seal or sea lion" at 1000 yards. MFAS NOT in use. No action taken.	1	pinniped	jumping
09/28-1133	Surface ship sights 2 "large whales" at 1000 yards. MFAS in use. Sonar secured.	2	large whale	milling
09/28-1239	Surface ship sights 2 "large whales" at 1000 yards. MFAS NOT in use. No action taken.	2	large whale	milling
09/29-0543	Surface ship sights 1 "large whale" at 2000 yards. *MFAS in use. Ship alters course.*	1	large whale	milling
09/30-0841	Surface ship sights 1 "large whale" at 2000 yards. *MFAS in use. Ship alters course.*	1	large whale	milling
09/30-1117	Surface ship sights 30 "dolphins" at 500 yards. MFAS NOT in use. No action taken.	30	dolphin	jumping
10/01-1236	Surface ship sights 1 "large whale" at 1000 yards. MFAS NOT in use. No action taken.	1	large whale	traveling
10/01-1328	Surface ship sights 1 "large whale" at 2000 yards. MFAS NOT in use. No action taken.	1	large whale	traveling
10/01-1429	Surface ship sights 1 "large whale" at 1000 yards. MFAS NOT in use. Ship alters course.	1	large whale	traveling
10/02-1717	Surface ship sights 2 "large whales" at 600 yards. MFAS NOT in use. No action taken.	2	large whale	traveling

Date-Time	Description of Actions Taken	# of animals	Animal Type	Observation
10/02-1000	Surface ship sights 1 "dolphin" at 100 yards. MFAS NOT in use. No action taken.	1	dolphin	traveling
10/03-1123	Surface ship sights 20 "dolphins" at 1500 yards. MFAS NOT in use. No action taken.	20	dolphin	jumping
10/04-2219	Surface ship sights 2 "small whales" at 500 yards. MFAS NOT in use. No action taken.	2	small whale	traveling
10/04-0612	Surface ship sights 1 "large whale" at 500 yards. MFAS NOT in use. No action taken.	1	large whale	milling
10/05-0912	Surface ship sights 20 "dolphins" at 1500 yards. MFAS NOT in use. No action taken.	20	dolphin	jumping
10/06-0907	Surface ship sights 1 "large whale" at 1000 yards. MFAS NOT in use. No action taken.	1	large whale	traveling
10/06-1100	Surface ship sights 3 "small whales" at 1000 yards. MFAS NOT active. No action taken.	3	small whale	traveling
10/07-0634	Surface ship sights 50 "dolphins" at 1000 yards. MFAS NOT in use. No action taken.	50	dolphin	jumping
10/07-0842	Surface ship sights 20 "dolphins" at 50 yards. MFAS NOT in use. Ship alters course.	20	dolphin	jumping
10/08-1412	Surface ship sights 8 "dolphins" at 50 yards. MFAS NOT in use. No action taken.	8	dolphin	jumping
10/09-2131	Surface ship sights 40 "dolphins" at 100 yards. MFAS NOT in use. Ship alters course.	40	dolphin	jumping
10/09-0610	Surface ship sights 30 "dolphins" at 500 yards. MFAS NOT in use. No action taken.	30	dolphin	jumping
10/09-1157	Surface ship sights 17 "pilot whales" at 200 yards. MFAS NOT in use. Ship stops to allow animals to pass bow.	17	small whale	traveling
10/09-1320	Surface ship sights 13 "dolphins" at 1000 yards. MFAS NOT in use. No action taken.	13	dolphin	traveling
10/10-0543	Surface ship sights 2 "large whales" at 1000 yards. MFAS NOT in use. No action taken.	2	large whale	milling
10/10-0650	Surface ship sights 15 "dolphins" at 1000 yards. MFAS NOT in use. No action taken.	15	dolphin	jumping
10/10-0800	Surface ship sights 200 "dolphins" at 500 yards. MFAS NOT in use. No action taken.	200	dolphin	jumping
10/11-0836	Surface ship sights 2 "large whales" at 150 yards. MFAS NOT in use. Ship alters course.	2	large whale	traveling
10/11-1036	Surface ship sights 1 "seal or sea lion" at 200 yards. MFAS NOT in use. No action taken.	1	pinniped	milling
10/12-1625	Surface ship sights 125 "dolphins" at 2000 yards. MFAS NOT in use. No action taken.	125	dolphin	jumping
10/12-2225	Surface ship sights 4 "dolphins" at 1000 yards. MFAS NOT in use. No action taken.	4	dolphin	jumping
10/12-0002	Surface ship sights 1 "large whale" at 200 yards. MFAS NOT in use. No action taken.	1	large whale	traveling
10/12-0600	Surface ship sights 36 "dolphins" at 200 yards. MFAS NOT in use. No action taken.	36	dolphin	jumping

Date-Time	Description of Actions Taken	# of animals	Animal Type	Observation
10/12-0950	Surface ship sights 10 "dolphins" at 100 yards. MFAS NOT in use. No action taken.	10	dolphin	jumping
10/12-1028	Surface ship sights 20 "seals or sea lions" at 2000 yards. MFAS NOT in use. No action taken.	20	pinniped	traveling
10/13-1643	Surface ship sights 20 "dolphins" at 800 yards. MFAS NOT in use. No action taken.	20	dolphin	jumping
10/13-1655	Surface ship sights 1 "seal or sea lion" at 100 yards. MFAS NOT in use. No action taken.	1	pinniped	traveling
10/13-0028	Surface ship sights 50 "dolphins" at 1000 yards. MFAS NOT in use. No action taken.	50	dolphin	traveling
10/13-0925	Surface ship sights 5 "dolphins" at 200 yards. MFAS NOT in use. No action taken.	5	dolphin	jumping
73	= total sighting events total number of animals=	1225		



Marine mammal sightings C2X 06-04 (20 Sep-12 Oct 2006).

SECTION 2: Mitigation and Monitoring

As required under the NDE, the report must contain "An assessment of the effectiveness of the mitigation and monitoring measures with recommendations on how to improve them". This section of the report, therefore, provides an assessment of the effectiveness of the mitigation and monitoring measures, and recommendations on how to improve them with regard to practicality of implementation, their impact on exercise safety, and their impact on the effectiveness of the military readiness training activity.

It must also be recognized that ASW proceeds slowly and requires careful development of a tactical frame of reference over time as data is integrated from a number of sources and sensors. Once MFAS is turned off for a period of time, simply turning it back on minutes later does not usually allow a Commander to simply continue from the last frame of reference. Thus, 15 minutes of lost MFAS time does not equate to only 15 minutes of lost exercise time but should be considered in the fuller context of its overall impact on the tempo and tactical development of a Common Operational Picture shared among exercise participants as they trained with the goal of interoperability and improvement of ASW skills in general.

C2X 06-04 Assessment

Individual ship sonar use is contained in classified databases; approximately 310 hours of active MFAS occurred during C2X 06-04. MFAS sonar is only used during carefully reviewed scenarios and for only a small sub-set of any given exercise time frame. Therefore, as expected in C2X, a majority of marine mammals were sighted during periods when MFAS was not in use (Figure 1). Eight-five percent (85%) of the sightings (62 sightings) were in this category. Table 2 is the subset of marine mammal sightings during actual MFAS use during C2X 06-04.

During C2X 06-04, there were five instances where MFAS was secured (i.e. turned-off) due to sighting of marine mammals. This represented 7% of the total sighting events, and directly impacted ASW training readiness. Sonar was secured at ranges of 150, 200, 400, 1000, and 2000 yards. Of interest is the fact that these events represent only two surface ship ASW platforms within C2X 06-04. While securing MFAS at the 2000 yard range is not required under Navy SOP and NDE, there is no indication in the data reports whether sonar transmission reduction of -6 dB at 1100 yards (approx. 1000 m), -10 dB at 550 yards (approx 500 meters) were applied, or whether the animals were sighted at the specified ranges and the decision was made to secure sonar at 400 and 1000 yards as an overly-conservative measure.

There were five large whale sightings during MFAS operation. One of these sightings occurred within an NDE 'safety zone' distance, and a DDG sonar (i.e. AN/SQS-53C) was secured due to large whale presence. Little if any sonar exposure is anticipated to have occurred during this sighting. First, while relative motion of the whales' travel was not reported, if the whales maintained their horizontal location as based on a milling behavior described in Table 2, then vessel motion would have taken the ship away from the animals at approximately 270 yards per minute assuming a nominal 8 knot (9.2 mph) speed of advance. Range to the whale would have then been 1,270 yards at time T+1 minute, and 2,350 yards by time T+5 minutes. Second, sonar

was secured as soon as the whale was sighted at 1000 yards, reducing the potential exposure to only that brief period prior to sighting and securing.

There were four sightings representing 5.5 % of the total sightings where MFAS was in use, and because the animals were outside of the mitigation zones, sonar was not secured. In these events, the animals were at 2000 yards and, as an added precaution, the ship maneuvered to open the distance between the animal and vessel. There were two sightings representing 3% of the total sightings where MFAS was in use, but since the animals were well beyond mitigation zones and there was no indication that maneuver to avoid was required, no action was taken and operations continued as normal.

There were five marine mammal sightings at night (approximately 7% of total sightings), although MFAS was not in use during any of these events. There were also five instances when a ship altered course in the presence of marine mammal (approximately 5% of total sightings), but MFAS was not in operation at these times, and no ASW training opportunities were lost.

The reports from exercise participants contained nothing that could be construed as abnormal or "observed effects" of MFAS, or other vessel operations. There were no instances where marine mammals behaved in an erratic, unusual, or anything other than apparently normal manner. Therefore, further analysis based on observed effects, as mandated by the reporting requirement, was not warranted.

Table 2. Marine mammal sightings only during MFAS operation and resulting actions during C2X 06-04.

Date-Time	Description of Actions Taken	Animal Type	Observation
09/24-0843	Surface ship sights 3 "small whales" at 400 yards. MFAS in use. Sonar secured.	3 small whales	traveling
09/24-1355	Surface ship sights 1 "large whale" at 2000 yards. *MFAS in use. No action taken.*	1 large whale	milling
09/25-0714	Surface ship sights 2 "large whales" at 2000 yards. *MFAS in use. No action taken.*	2 dolphins	milling
09/25-0905	Surface ship sights 2 "large whales" at 2000 yards. *MFAS in use. Ship alters course.*	2 large whales	milling
09/25-0943	Surface ship sights 1 "small whale" at 2000 yards. MFAS in use. Sonar secured.	1 small whale	traveling
09/25-1122	Surface ship sights 16 "dolphins" at 150 yards. MFAS in use. Sonar secured.	16 dolphins	jumping
09/25-1240	Surface ship sights 16 "dolphins" at 200 yards. MFAS in use. Sonar secured.	16 dolphins	jumping
09/27-1203	Surface ship sights 1 "small whale" at 2000 yards. *MFAS active. Ship alters course.*	1 small whale	traveling
09/28-1133	Surface ship sights 2 "large whales" at 1000 yards. MFAS in use. Sonar secured.	2 large whales	milling
09/29-0543	Surface ship sights 1 "large whale" at 2000 yards. *MFAS in use. Ship alters course.*	large whale	milling
09/30-0841	Surface ship sights 1 "large whale" at 2000 yards. *MFAS in use. Ship alters course.*	large whale	milling

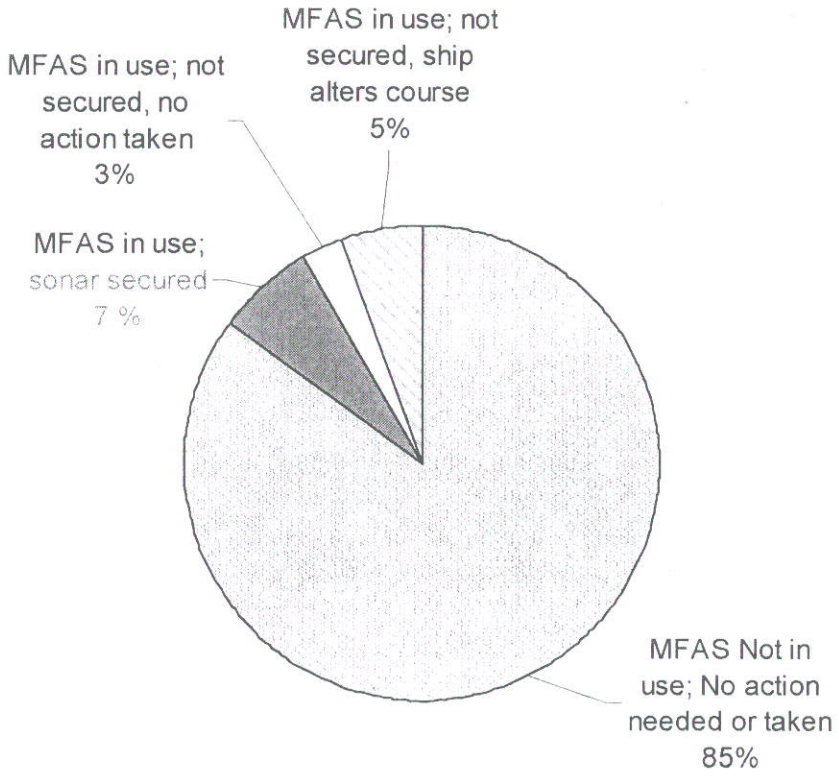


Figure 1. Actions taken by surface ships reporting marine mammal sightings during C2X 06-04.

NDE Assessment

NDE measures adhered to and impact to operations are discussed below.

A subset of the additional measures required by the NDE was not applicable within the context of C2X 06-04 due to the absence of the conditions described. This subset of mitigation measures is as follows:

- Requirements regarding "*strong surface ducting conditions*" (none observed)
- Requirements regarding "*low visibility conditions*" (detection to 1000m was maintained during MFAS use)
- Requirements specific to operating MFAS in choke-points (no choke points) ,
- Restrictions from operating MFAS in constricted channels (none present)

The following protective measures, as mandated by NDE, were already Navy Standard Operating Procedures (SOP) as detailed in Navy lookout training, Protective Measures Assessment Protocol (PMAP), and Marine Species Awareness DVD Training. These measures will continue to be used in future exercises:

1. Personnel trained on marine mammal awareness and mitigation measures (Lookout Training Handbook NAVEDTRA 12968-B and U.S. Navy Marine Species DVD Version 1.1 June 2006).
2. Personnel on lookout with binoculars at all times when the vessel is moving through the water
3. Lookouts report sighting of any marine species, disturbance to the water's surface, or object in the water to Officer of the Deck, who is the Commanding Officer's direct representative on watch
4. Safety zone is established around an active sonar source and sonar power is reduced or secured when marine mammals enter this zone
5. Submarine sonar operators review detection indicators of close-aboard marine mammals prior to commencement of ASW operations involving MFAS
6. Aerial surveillance for marine species occurs whenever possible and detections are reported to ships in the vicinity
7. Helicopters using active (dipping) sonar search for marine mammals prior to active sonar and employ a safety zone
8. Sonar always operated at lowest practicable level to meet tactical training objectives

Based on the following observations, Navy SOPs already in place were effective in detecting marine mammals. In addition, the steps taken by individual ship commanding officers to avoid impacts to marine mammals were effective.

To organize the assessment of each particular mitigation measure, they are listed below in the order and organization as presented in the NDE.

ASSESSMENT OF MITIGATION AND MONITORING MEASURES

The three categories of mitigation and monitoring measures required by the June 30, 2006 NDE are assessed in this section. For ease of reference, the text of the measures is provided in italics, followed by an assessment, an analysis of operational impact and a recommendation on any improvements to each measure.

Measures 1-2

Mitigation measures 1 and 2 detail training requirements and operating procedures for units participating in MFAS ASW exercises. All of the training requirements within these two measures reflect the Marine Species Awareness Training (MSAT) that Navy lookouts and bridge personnel routinely receive as Navy SOP. This MSAT was developed in coordination with marine biology experts within the Navy and based on review of other marine species training materials. The training incorporates effective marine species detection cues and information necessary to protect marine species. This material is part of the Navy Lookout watchstander qualification system, is available as online training, and can also be provided in a video format for large audience presentations. NMFS regional staff reviewed the MSAT training for purposes of RIMPAC 06 and this training continued to be used by Navy to meet the full intent of these first two NDE mitigation measures.

Measure 1. Personnel Training:

- *Navy shipboard lookouts shall be qualified watchstanders who have completed marine species awareness training.*
  - *Navy watchstanders will participate in marine mammal observer training approved by NMFS.*

Measure 2. Operating Procedures

- *Bridge personnel on ships and submarines - Ships and surfaced submarines shall have personnel on lookout with binoculars at all times when the vessel is moving through the water. Standard operating procedure requires these lookouts maintain surveillance of the area visible around their vessel and to report the sighting of any marine species, disturbance to the water's surface, or object (unknown or otherwise) to the Officer in Command.*
  - *Bridge lookout personnel shall have completed marine species awareness training as updated in 2005.*
  - *At least one individual who has received this training will be present, and on watch, at all times during operation of tactical mid-frequency sonar, on each vessel operating mid-frequency sonar.*

Navy Assessment:

Measures 1 and 2 (first major bullets) require marine species awareness training. Marine mammal lookout training for all units has been standard procedure for several years, and was updated with a new Marine Species Awareness Training (U.S. Navy Marine Species Awareness Training DVD, Version 1.1). Training has been established and continues to be effective as a mitigation measure.

Operational Impact of these mitigation measures:

None.

Recommendation

None, these are effectively incorporated into Navy SOPs and the training curriculum.

- *Aviation units - Aircraft participating in ASW events will conduct and maintain, whenever possible, surveillance for marine species prior to and during the event. The ability to effectively perform visual searches by participating aircraft crew will be heavily dependent upon the primary duties assigned as well as weather, visibility, and sea conditions. Sightings would be immediately reported to ships in the vicinity of the event as appropriate.*

Navy Assessment:
This measure documents what occurs in general, but has not been specifically described in a SOP.

Operational Impact of this mitigation measure:
None – this occurs routinely.

Recommendation
This mitigation measure should be retained and described in a SOP.

- *Sonar personnel on ships, submarines, and ASW aircraft -*
  - *Ship and submarine sonar operators will check for passive indications of close-aboard marine mammals prior to their commencement of ASW operations involving active mid-frequency sonar.*

Navy Assessment:
This measure documents what occurs for submarines as part of PMAP, and is used in general for surface ships, but has not been specifically described in a SOP.

Operational Impact of this mitigation measure:
None – this occurs routinely or is part of PMAP (for submarines).

Recommendation
This mitigation measure should be retained given that it details what occurs routinely. The measure has not been officially described in a SOP for surface ships. The measure is part of PMAP for submarines. This measure should be added for surface units in the next version of PMAP.

- *Sonar levels (generally) - The Navy will operate sonar at the lowest practicable level, not to exceed 235 dB, except for occasional short periods of time to meet tactical training objectives. Use of MFA sonar at source levels above 235 dB will be logged and reported in accordance with section 3.*

Navy Assessment:
This measure had no observable benefit to conservation, due to operator shut down if mammals were observed, regardless of range, which will be discussed in further detail in following sections.

Operational Impact of this mitigation measure:
The impact of this measure is undeterminable at this time.

Recommendation

This measure may not be particularly applicable to conduct of training. Sonar usage is tailored to the environmental conditions of the day, which may preclude practicable levels below the maximum.

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i. *In major fleer exercises, operate mid-frequency active sonar within 12 nm of a coast, except for RIMPAC 2006 (which is covered above) and military readiness activities at the established ranges at San Clemente Island and PMRF.*

Navy Assessment:
This measure was adhered to for C2X 06-04; there were no active sonar operations within 12 nm of a coast except those on the established instrumented ranges near San Clemente Island.
Operational Impact of this mitigation measure:
None.

Recommendation
Not applicable.

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ii. *Conduct sonar activities in constricted channels.*

Navy Assessment:
There are no naturally occurring bathymetrically constricted channels within the SOCAL area used for C2X 06-04.

Operational Impact of this mitigation measure:
None.

Recommendation
Not applicable.

- ***Safety zones*** *- When marine mammals are detected close aboard, all ships, submarines, and aircraft engaged in ASW would reduce mid-frequency active sonar power levels in accordance with the following specific actions:*
  - ***Helicopters*** *- Helicopters shall observe/survey the vicinity of an event location for 10 minutes before deploying active (dipping) sonar in the water. Helicopters shall not dip their sonar within 200 yards of a marine mammal and shall secure pinging if a marine mammal closes within 200 yards after pinging has begun.*

Navy Assessment:
This measure is fundamentally the same as the measure detailed in PMAP, with the addition of a specified 10 minute survey in advance of active sonar. PMAP prohibits active sonar use if there are animals within 200 yards of the dipping sonar transducer, and details the securing of sonar if an animal is detected within 200 yards or is closing on the source when active.

Operational Impact of this mitigation measure:
None.

Recommendation
The 10 minute survey prior to active sonar use is bounding the time in which survey would be done. As written in PMAP, the helicopter pilots must ensure there are no marine mammals in the 200 yard exclusion zone around the sonar transducer, regardless of time interval spent in searching. Since the searching of an area is dependent upon the environmental conditions of the day, bounding the survey timeframe may be unwarranted.

- ***Ships and submarines***

i. ***#1,000 m*** *- When marine mammals are detected by any means (aircraft, lookout, or aurally) within 1000 m of the sonar dome (the bow), the ship or submarine will limit active transmission levels to at least 6 dB below the equipment's normal operating level for sector search modes. Ships and submarines would continue to limit maximum ping levels by this 6-dB factor until the animal has been seen to leave the area, has not been seen for 30 minutes, or the vessel has transited more than 2000 m beyond the location of the sighting.*

ii. ***#500 m*** *- Should the marine mammal be detected within or closing to inside 500 m of the sonar dome, active sonar transmissions will be limited to at least 10 dB below the equipment's normal operating level for sector search modes. Ships and submarines would continue to limit maximum ping levels by this 10-dB factor until the animal has been seen to leave the area, has not been seen for 30 minutes, or the vessel has transited more than 1500 m beyond the location of the sighting.*

iii. ***#200 m*** *- Should the marine mammal be detected within or closing to inside 200 m of the sonar dome, active sonar transmissions will cease. When a marine mammal or sea turtle is detected closing to inside approximately 200 m of the sonar dome, the principal risk becomes potential physical injury from collision. Accordingly, ships and submarines shall maneuver to avoid collision if the marine species closes within 200 m to the extent possible, with safety of the vessel being paramount. Sonar will not resume until the animal has been seen to leave the area, has not been seen for 30 minutes, or the vessel has transited more than 1200 m beyond the location of the sighting.*

Navy Assessment:

It is likely that this mitigation measure is effective, but as drafted above it requires improvement. Similar protective measures were already Navy SOP for all units conducting MFAS training. The intent of this requirement is not met in the reactions of the participating units during C2X 06-04 when marine mammals were sighted during MFAS use. Some units are securing versus powering down (one instance at 1000 yards), and one unit secured sonar at a distance where no action was required (2000 yards).

Operational Impact of this mitigation measure:

Not determinable in the reactions of the participating units. In the unit after action reports, four scenarios exist: Unit observed mammals and was not active, unit was active and sonar was secured, unit was active and sonar not secured because mammals were at or beyond 2000 yards and the ship altered course, and unit was active and sonar not secured because animals were at or beyond 2000 yards. This loss of MFAS training hours is more than a simple metric involving a loss of training time as a small percentage of the overall exercise hours since, in at least several of the C2X 06-04 cases, the proximity of a submarine in the vicinity meant there was a potential submarine detection opportunity missed by the exercise participants.

Recommendation

A "safety zone" mitigation measure was already SOP and this mitigation measure should be retained. A safety zone of 1000 m is based on the attenuation of sonar power level from a source of 235 dB to a received level of 173 dB under ideal conditions assuming direct path propagation with no reduction from other possible environmental factors. The criterion for the minimal threshold for marine species effect as required by NMFS for the IHA application in RIMPAC 06 was a 173 dB accumulated energy level. No behavioral effects were observed for any mammals that were present within the defined safety zones. The description of behaviors that NMFS believes would be useful for Navy observers to report as potential behavioral effects should be provided by NMFS in order that continued observation, over time, can factor into continued development of safety zones.

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iv. ***Significant surface ducting conditions*** - *In significant surface ducting conditions, the Navy will enlarge the safety zones such that a 6-dB power-down will occur if a marine mammal enters the zone within a 2000 m radius around the source, a 10-dB power-down will occur if an animal enters the 1000 m zone, and shut down will occur when an animal closes within 500 m of the sound source.*

Navy Assessment:
There were no significant surface ducting conditions; however, as stated earlier, the intent of this requirement is not met in the reactions of the participating units.

Operational Impact of this mitigation measure:
Not determinable in the reactions of the participating units. Additionally, water conditions vary significantly over relatively short distances while operating in the littoral, which makes implementation of this measure unrealistic. .

Recommendation
This measure can not be effectively implemented, thus providing no additional protection and should be deleted as a real-time continuous monitoring requirement.

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v. ***Low visibility conditions (i.e., whenever the entire safety zone cannot be effectively monitored due to nighttime, high sea state, or other factors)*** - *The Navy will use additional detection measures, such as infrared (IR) or enhanced passive acoustic detection. If detection of marine mammals is not possible out to the prescribed safety zone, the Navy will power down sonar as if marine mammals were present in the zones they cannot see (for example, at night, if night goggles allow detection out to 1000 m, power-down would not be necessary under normal conditions; however, in significant surface ducting conditions, the Navy would need to power down 6 dB, as they could not effectively detect mammals out to 2000 m, the prescribed safety zone).*

Navy Assessment:
This measure may not have been applicable; there were no days of poor visibility during the exercise, and no nighttime marine mammal sightings (Table 1) during periods of MFA sonar use. However, there were marine mammal sightings at night, demonstrating the effectiveness of Navy units in sighting marine mammals during nighttime (i.e., nighttime is not low visibility). Depending on vessel class and funding, some more advanced IR, thermal, or other image enhancement technology may not be part of the ship's table of organic equipment (TOE) (i.e. equipment supplied a part of a unit's normal complement).

Operational Impact of this mitigation measure:
Not Applicable.

Recommendation
None, this measure was not effectively tested with respect to power down, but the capability of sighting marine mammals at night was demonstrated.

Measure 3. Stranding Response and Reporting

- *The Navy will coordinate with the NMFS Stranding Coordinator for any unusual marine mammal behavior, including stranding, beached live or dead cetacean(s), floating marine mammals, or out-of-habitat/milling live cetaceans that may occur at any time during or shortly after major exercises.*

Navy Assessment:
There were no occurrences of unusual marine mammal behavior during or subsequent to C2X 06-04. Note that, in the one instance a seal carcass was found.

Operational Impact of this mitigation measure:
None for this exercise.

Recommendation
None. Note that reporting of the seal carcass was not required in accordance with existing Navy policy, as the carcass was not associated with Navy exercise activities. However, , since the intent of the NDE is that any mammal, regardless of condition (e.g., state of decay indicative that death occurred well prior to Navy presence) is to be reported, clarification of the NDE measure will be provided to Navy units in future letters of instruction or mitigation messages.

- *The Navy will provide a report to NMFS after the completion of a major exercise that includes:*
  - *An assessment of the effectiveness of these mitigation and monitoring measures with recommendations of how to improve them.*

Navy Assessment:
The details of the effectiveness assessment are discussed within this report. In the circumstance that occurred during C2X 06-04, marine mammal sightings occurred concurrent with MFAS during only a few activities, so effectiveness of some mitigation measures can not be fully assessed intrinsic to this exercise.

Operational Impact of this mitigation measure:
Manpower time for data collection, analysis, report writing and drafting the after action marine mammal sighting Naval messages is required.

Recommendation
None at this time.

- *Results of the marine species monitoring during the major exercise. As much unclassified information as the Navy can provide including, but not limited to, where and when sonar was used (including sources not considered in take estimates, such as submarine and aircraft sonars) in relation to any measured received levels, source levels, numbers of sources, and frequencies, so it can be coordinated with observed cetacean behaviors. If necessary, classified information may be provided to NMFS personnel with an appropriate security clearance and need to know.*

Navy Assessment:
The details of the marine species monitoring are contained within Table 1 and Section 3 of this report.

Operational Impact of this mitigation measure:
None

Recommendation
None at this time. Navy and NMFS dialogue on monitoring and reporting will continue.

CONCLUSIONS AND SUMMARY

- Marine mammals were sighted 73 times by exercise participants. Approximately 1225 animals were observed within Southern California waters (Table 1, Figure 1). In each of these cases, the marine mammals were detected by Navy watchstanders operating in accordance with Navy standard operational procedures and as reiterated by some NDE mitigation measures
- Of the 73 instances where marine mammals were detected, MFAS was not operating in 63 events and there were no mandated sonar shut downs
- MFAS was secured five times representing a 7% loss of ASW training opportunities, as well as potentially interrupting the tactical situational awareness of the participating units and CSG (Figure 2)
- There were no indications of any effects to any marine species throughout the exercise. All behaviors described in the after action report were within the range of apparent normal behavior

Prepared for
National Marine Fisheries Service
Office of Protected Resources

Prepared by
Department of the Navy

In accordance with
National Defense Exemption 30 June 2006

USS Stennis CSG

JOINT TASK FORCE EXERCISE 07-01

(JTFEX 07-01)

07-16 Nov 2006

After Action Report

Analysis of the Effectiveness of the Mitigation and Monitoring Measures as Required Under the National Defense Exemption from the Requirements of the Marine Mammal Protection Act for Certain DoD Mid-Frequency Active Sonar Activities

ATTACHMENT D

INTRODUCTION

This report is presented to fulfill the requirements conditional to the 30 June 2006 "National Defense Exemption (NDE) from the Requirements of the Marine Mammal Protection Act for Certain DoD Mid-Frequency Active Sonar Activities." The Navy is submitting this report to NMFS' Office of Protected Resources, as required by the NDE.

The following information is for the USS Stennis Carrier Strike Group (CSG) Joint Task Force Exercise (JTFEX) 07-01 conducted from 07-16 Nov 2006 in Southern California (SOCAL). The types of ASW training conducted during JTFEX 07-01 involved the use of ships, submarines, aircraft, non-explosive exercise weapons, and other training related devices. ASW events occurred within portions of the Southern California Offshore Range (SCORE) and the Southern California Offshore ASW Range west of San Clemente Island. The following information is provided:

(1) Estimate of number of marine mammals affected by ASW exercises and discussion of nature of effects, if observed, based on results of real-time exercises and sightings of marine mammals;

(2) Assessment of effectiveness of mitigation and monitoring measures with recommendations on how to improve them;

(3) Results of marine species monitoring (real-time monitoring from all platforms) before, during, and after exercise;

(4) As much information (unclassified) as Navy can provide including, but not limited to, where and when sonar was used in relation to any measured received levels (such as sonobuoys), source levels, numbers of sources, and frequencies so it can be coordinated with observed cetacean behaviors.

This report, which contains only unclassified material, provides the necessary information and analyses, and thus fulfills these requirements. The report is organized by section as follows:

Section 1 provides an estimated number of marine mammals observed during the JTFEX 07-01 ASW events, based on analysis of actual events and sightings of marine mammals, noting the nature of any observed effects where possible.

Section 2 assesses the effectiveness of the NDE mitigation and monitoring measures required during exercises with regard to minimizing the use of Mid-Frequency Active Sonar (MFAS) in the vicinity of marine mammals. This section also includes an assessment of the practicality of implementation of the mitigation measures, the impact some of the measures had on safety, and the impact of the measures on the military readiness activities.

Section 3 provides data on the location and hours of active MFAS used during JTFEX 06-2 placed in context with observations of cetacean behaviors resulting from the ship based reports and exercise participants.

SECTION 1: Marine Mammals Observed

Section 1 provides estimated numbers of marine mammals observed in Southern California waters during JTFEX 07-01 ASW exercises and vessel transits. This information is based on analysis of actual events and sightings of marine mammals noting the nature of any observed effects.

All detections were made by standard Navy surface ship lookout marine mammal detection and reporting procedures. There were no sightings reported from aircraft platforms. Participating U.S. Navy Mid-Frequency Active Sonar (MFAS) equipped vessels included three submarines, two cruisers and six destroyers. **Table 1** provides a detailed timeline of marine mammal observations made by Navy exercise participants.

During JTFEX 07-01, there were **18** marine mammal sightings for an estimated total of **140** animals observed (Table 1 and **Figure 1**). Note: the total animal count is biased downward because two sighting reports did not contain estimates for number of animals.

Seven of the 18 sightings included a total of 95 "dolphins" which comprised 39% of the sightings and 68% of total animals seen during JTFEX 07-01. This observation is consistent with science-based reports that dolphins, and in particular, the short-beaked common dolphin (*Delphinus delphis*), comprise as much as 85-95% of the marine mammal abundance within Southern California.

Small whale sightings comprised 39% of the total sightings (n=7 sighting totaling 41 animals). Large whale sighting comprised 6% of the total sightings (n=1 sightings totaling 1 animal). Pinnipeds (seals or sea lions) sightings comprised 11% of the total sightings (n=2 sighting totaling 3 animals).

Table 1. Marine mammal sightings and actions by exercise participants during JTFEX 07-01. Text in red Bold indicates events when MFAS was in use and secured due marine mammal mitigation. Red text in *Italics* indicates when MFAS was in use, but mitigation other than securing sonar was enacted. (all times local Pacific Standard Time)

Date-Time	Description of Actions Taken	# of animals	Animal Type
11/07- 1335	Surface ship sights 25 "dolphins" jumping at 1000 yards. MFAS in use. Sonar secured.	25	dolphin
11/07- 1520	Surface ship sights 2 "small whales" traveling at 1000 yards. MFAS NOT active. Ship reduced speed.	2	small whale
11/07- 0816	Surface ship sights 2 "small whales" milling at 4000 yards. MFAS NOT active. Ship reduced speed.	2	small whale
11/07- 0915	Surface ship sights 2 "small whales" traveling at 8000 yards. MFAS NOT active. Ship increased speed to open distance between whales and ship.	2	small whale
11/07- 0921	Surface ship sights 2 "small whales" traveling at 3000 yards. MFAS NOT active. No action taken.	2	small whale
11/08- 1031	Surface ship sights 20 "dolphins" traveling at 100 yards. MFAS NOT in use. No action taken.	20	dolphin
11/11- 0636	Surface ship sights 1 "small whale" milling at 2000 yards. MFAS NOT active. No action taken.	1	small whale
11/11- 0630	Surface ship sights 1 "large whale" traveling at 500 yards. MFAS NOT active. Ship slowed to avoid animal's path.	1	large whale
11/11- 0923	Surface ship sights 1 "seal or sea lion" lingering at 150 yards. MFAS in use. Sonar secured.	1	pinniped
11/12- 0636	Surface ship sights 1 "small whale" milling at 2000 yards. *MFAS in use. No action taken*	1	small whale
11/12- 0704	Surface ship sights unknown number of "dolphins" traveling at 300 yards. MFAS NOT in use. No action taken.	not reported	dolphin
11/12- 0418	Surface ship sights 10 "dolphins" traveling at 50 yards. MFAS NOT in use. Ship decreased speed.	10	dolphin
11/12- 0600	Surface ship sights unknown number of "whales" traveling at 300 yards. MFAS NOT in use. Ship changed course to avoid animal path.	not reported	whale
11/13- 0651	Surface ship sights 28 "dolphins" traveling at 1000 yards. MFA in use. Sonar secured	28	dolphin
11/13- 1541	Surface ship sights 31 "small whales" traveling at 1000 yards. MFAS NOT in use. Ship altered course to avoid animal path.	31	small whale
11/14- 0711	Surface ship sights 7 "dolphins" traveling at 2000 yards. MFAS NOT in use. No action taken.	7	dolphin
11/14- 0845	Surface ship sights 5 "dolphins" traveling at 1500 yards. MFAS NOT in use. No action taken.	5	dolphin
11/14- 1505	Surface ship sights 2 "seals or sea lions" traveling at 700 yards. MFAS NOT is use. No action taken.	2	pinniped
18	= total sighting events total number of animals =	**140**	

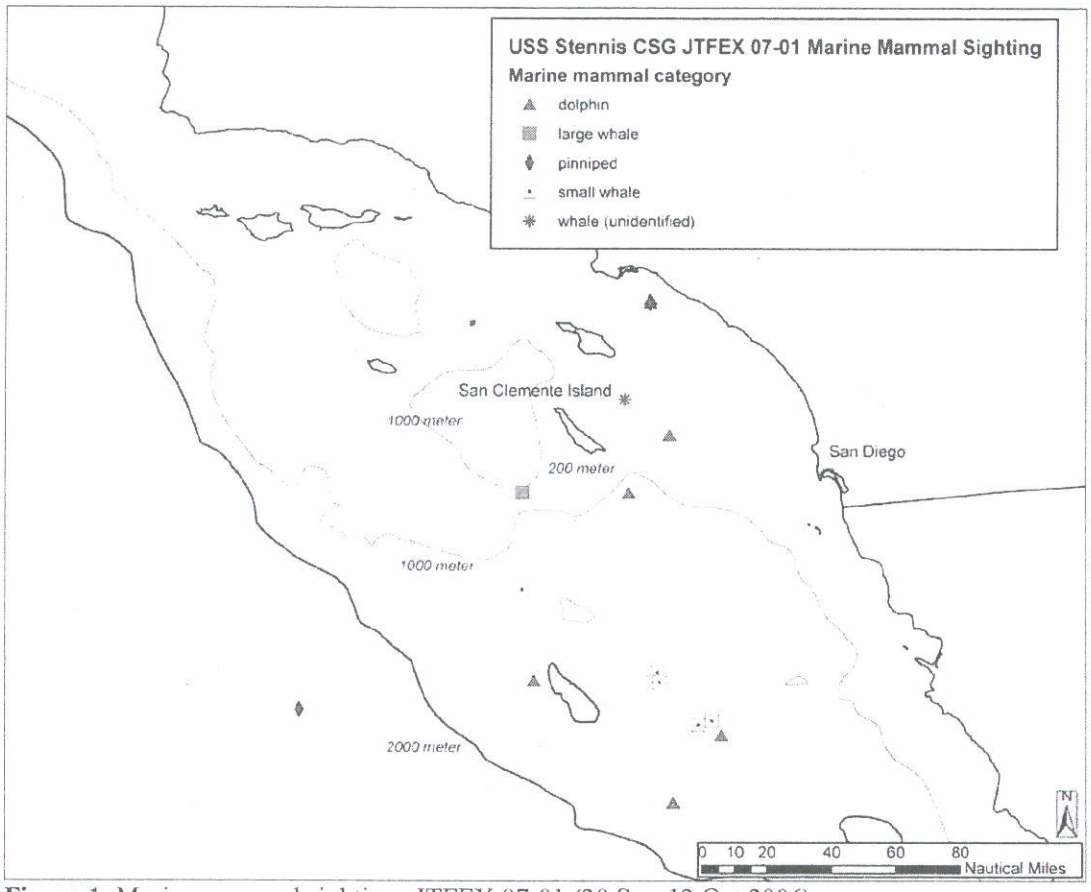

Figure 1. Marine mammal sightings JTFEX 07-01 (20 Sep-12 Oct 2006).

SECTION 2: Mitigation and Monitoring

As required under the NDE, the report must contain "An assessment of the effectiveness of the mitigation and monitoring measures with recommendations on how to improve them." This section of the report, therefore, provides an assessment of the effectiveness of the mitigation and monitoring measures, and recommendations on how to improve them with regard to practicality of implementation, their impact on exercise safety, and their impact on the effectiveness of the military readiness training activity.

It must also be recognized that ASW proceeds slowly and requires careful development of a tactical frame of reference over time as data is integrated from a number of sources and sensors. Once MFAS is turned off for a period of time, simply turning it back on minutes later does not usually allow a Commander to simply continue from the last frame of reference. Thus, 15 minutes of lost MFAS time does not equate to only 15 minutes of lost exercise time but should be considered in the fuller context of its overall impact on the tempo and tactical development of a Common Operational Picture shared among exercise participants as they trained with the goal of interoperability and improvement of ASW skills in general.

JTFEX 07-01 Assessment

MFAS sonar is only used during carefully reviewed scenarios and for only a small sub-set of any given exercise time frame. Therefore, as expected in JTFEX, a majority of these mammals were sighted during periods when MFAS was not in use (**Figure 2**). Seventy-eight percent (**78%**) of the sightings (14 sightings) were in this category.

During JTFEX 07-01, there were three (**3**) instances where MFAS was secured (i.e. turned-off) due to sighting of marine mammals. This represented **17%** of the total sighting events, and directly impacted ASW training readiness. Sonar was secured at ranges of 150 and 1000 yards. Of interest is the fact that these events represent only two ASW surface ships within JTFEX 07-01. While securing MFAS at the 1000 yard range is not required under Navy SOP and NDE, there is no indication in the data reports whether sonar transmission reduction of -6 dB at 1100 yards (approx. 1000 m), -10 dB at 550 yards (approx 500 meters) were applied, or whether the animals were sighted at the specified ranges and the decision made to secure sonar at 1000 yards as an overly-conservative measure.

Finally, there was one sighting representing 6% of the total sightings where MFAS was in use, but since the animals were well beyond mitigation zones, no action was taken and operations continued as normal.

There was one marine mammal sighting at night (approximately 6% of total sightings), and MFAS was not in use. There were also six instances when a ship altered course in the presence of marine mammal (33% of total sightings), but MFAS was not in operation at these times, and no ASW training opportunities were lost.

The reports from exercise participants contained nothing that could be construed as abnormal or "observed effects" of MFAS use or other vessel operations. There were no instances where marine mammals behaved in an erratic, unusual, or anything other than apparently normal manner. Therefore, further analysis based on observed effects, as mandated by the reporting requirement, was not warranted.

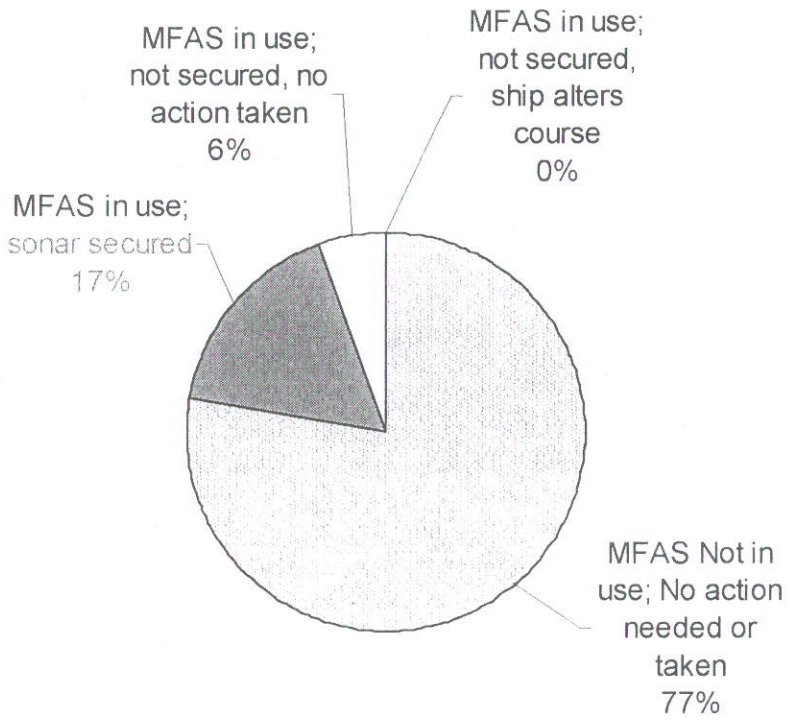

Figure 2. Actions taken by surface ships reporting marine mammal sightings JTFEX 07-01.

NDE Assessment

NDE measures adhered to and impact to operations are discussed below.

A subset of the additional measures required by the NDE was not applicable within the context of JTFEX 07-01 due to the absence of the conditions described. This subset of mitigation measures is as follows:

- Requirements regarding "*strong surface ducting conditions*"
- Requirements regarding "*low visibility conditions*"
- Requirements specific to operating MFAS in choke-points
- Restrictions from operating MFAS in constricted channels

The following protective measures, as mandated by NDE, were already Navy Standard Operating Procedures (SOP) as detailed in Navy lookout training, Protective Measures Assessment Protocol (PMAP), and Marine Species Awareness DVD Training. These measures will continue to be used in future exercises:

1. Personnel trained on marine mammal awareness and mitigation measures (Lookout Training Handbook NAVEDTRA 12968-B and U.S. Navy Marine Species DVD Version 1.1 June 2006).
2. Personnel on lookout with binoculars at all times when the vessel is moving through the water
3. Lookouts report sighting of any marine species, disturbance to the water's surface, or object in the water to Officer of the Deck, who is the Commanding Officer's direct representative on watch
4. Safety zone is established around an active sonar source and sonar power is reduced when marine mammals enter this zone
5. Submarine sonar operators review detection indicators of close-aboard marine mammals prior to commencement of ASW operations involving MFAS
6. Aerial surveillance for marine species occurs whenever possible and detections are reported to ships in the vicinity
7. Helicopters using active (dipping) sonar search for marine mammals prior to active sonar and employ a safety zone
8. Sonar always operated at lowest practicable level to meet tactical training objectives

Based on the following observations, Navy SOPs already in place were effective in detecting marine mammals. In addition, the steps taken by individual ship commanding officers to avoid impacts to marine mammals were effective. .

To organize the assessment of each particular mitigation measure, they are listed below in the order and organization as presented in the NDE.

ASSESSMENT OF MITIGATION AND MONITORING MEASURES

The three categories of mitigation and monitoring measures required by the June 30, 2006 NDE are assessed in this section. For ease of reference, the text of the measures is provided in italics, followed by an assessment, an analysis of operational impact and a recommendation on any improvements to each measure.

Measures 1-2

Mitigation measures 1 and 2 detail training requirements and operating procedures for units participating in MFAS ASW exercises. All of the training requirements within these two measures reflect the Marine Species Awareness Training (MSAT) that Navy lookouts and bridge personnel routinely receive as Navy SOP. This MSAT was developed in coordination with marine biology experts within the Navy, reviewed by National Marine Fisheries Service (NMFS), and incorporates effective marine species detection cues and information necessary to protect marine species. This material is part of the Navy Lookout watchstander qualification system, will soon be available as online interactive training, and can also be provided in a video format for large audience presentations. NMFS regional staff reviewed the MSAT training for purposes of RIMPAC 06 and this training continued to be used by Navy to meet the full intent of these first two NDE mitigation measures.

Measure 1. Personnel Training:

- *Navy shipboard lookouts shall be qualified watchstanders who have completed marine species awareness training.*
  - *Navy watchstanders will participate in marine mammal observer training approved by NMFS.*

Measure 2. Operating Procedures

- *Bridge personnel on ships and submarines - Ships and surfaced submarines shall have personnel on lookout with binoculars at all times when the vessel is moving through the water. Standard operating procedure requires these lookouts maintain surveillance of the area visible around their vessel and to report the sighting of any marine species, disturbance to the water's surface, or object (unknown or otherwise) to the Officer in Command.*
  - *Bridge lookout personnel shall have completed marine species awareness training as updated in 2005.*
  - *At least one individual who has received this training will be present, and on watch, at all times during operation of tactical mid-frequency sonar, on each vessel operating mid-frequency sonar.*

Navy Assessment:

Measures 1 and 2 require marine species awareness training. Marine mammal lookout training for all units has been standard procedure for several years, and was updated with a new Marine Species Awareness Training (U.S. Navy Marine Species Awareness Training DVD, Version 1.1). Training has been established as and continues to be effective as a mitigation measure.

Operational Impact of these mitigation measure:

None.

Recommendation
None, these are effectively incorporated into Navy SOPs.

- *Aviation units - Aircraft participating in ASW events will conduct and maintain, whenever possible, surveillance for marine species prior to and during the event. The ability to effectively perform visual searches by participating aircraft crew will be heavily dependent upon the primary duties assigned as well as weather, visibility, and sea conditions. Sightings would be immediately reported to ships in the vicinity of the event as appropriate.*

Navy Assessment:
This measure documents what occurs in general, but has not been specifically described in a SOP.

Operational Impact of this mitigation measure:
None – this occurs routinely.

Recommendation
This mitigation measure should be retained and described in a SOP.

- *Sonar personnel on ships, submarines, and ASW aircraft -*
  - *Ship and submarine sonar operators will check for passive indications of close-aboard marine mammals prior to their commencement of ASW operations involving active mid-frequency sonar.*

Navy Assessment:
This measure documents what occurs for submarines as part of PMAP, and is used in general for surface ships, but has not been specifically described in a SOP.

Operational Impact of this mitigation measure:
None – this occurs routinely or is part of PMAP (for submarines).

Recommendation
This mitigation measure should be retained given that it details what occurs routinely. The measure has not been officially described in a SOP for surface ships. The measure is part of PMAP for submarines. This measure should be added for surface units in the next version of PMAP.

- *Sonar levels (generally) - The Navy will operate sonar at the lowest practicable level, not to exceed 235 dB, except for occasional short periods of time to meet tactical training objectives. Use of MFA sonar at source levels above 235 dB will be logged and reported in accordance with section 3.*

Navy Assessment:
This measure had no observable benefit to conservation, due to operator shut down if mammals were observed, regardless of range, which will be discussed in further detail in following sections.

Operational Impact of this mitigation measure:
The impact of this measure is undeterminable at this time.

Recommendation

This measure may not be particularly applicable to conduct of training. Sonar usage is tailored to the environmental conditions of the day, which may preclude practicable levels below the maximum.

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i. *In major fleer exercises, operate mid-frequency active sonar within 12 nm of a coast, except for RIMPAC 2006 (which is covered above) and military readiness activities at the established ranges at San Clemente Island and PMRF.*

Navy Assessment:
This measure was adhered to for this event; for this major exercise there were no active sonar operations within 12 nm of a coast except those on the established instrumented ranges near San Clemente Island.

Operational Impact of this mitigation measure:
None.

Recommendation
Not applicable.

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ii. *Conduct sonar activities in constricted channels.*

Navy Assessment:
There are no naturally occurring bathymetrically constricted channels within the SOCAL area used for JTFEX 07-01.

Operational Impact of this mitigation measure:
None.

Recommendation
Not applicable.

- ***Safety zones** - When marine mammals are detected close aboard, all ships, submarines, and aircraft engaged in ASW would reduce mid-frequency active sonar power levels in accordance with the following specific actions:*
  - ***Helicopters** - Helicopters shall observe/survey the vicinity of an event location for 10 minutes before deploying active (dipping) sonar in the water. Helicopters shall not dip their sonar within 200 yards of a marine mammal and shall secure pinging if a marine mammal closes within 200 yards after pinging has begun.*

Navy Assessment:
This measure is fundamentally the same as the measure detailed in PMAP, with the addition of a specified 10 minute survey in advance of active sonar. PMAP prohibits active sonar use if there are animals within 200 yards of the dipping sonar transducer, and details the securing of sonar if an animal is detected within 200 yards or is closing on the source when active.

Operational Impact of this mitigation measure:
None.

Recommendation
The 10 minute survey prior to active sonar use is bounding the time in which survey would be done. As written in PMAP, the helicopter pilots must ensure there are no marine mammals in the 200 yard exclusion zone around the sonar transducer, regardless of time interval spent in searching. Since the searching of an area is dependent upon the

environmental conditions of the day, bounding the survey timeframe may be unwarranted.

Ships and submarines

i. ***#1,000 m*** *- When marine mammals are detected by any means (aircraft, lookout, or aurally) within 1000 m of the sonar dome (the bow), the ship or submarine will limit active transmission levels to at least 6 dB below the equipment's normal operating level for sector search modes. Ships and submarines would continue to limit maximum ping levels by this 6-dB factor until the animal has been seen to leave the area, has not been seen for 30 minutes, or the vessel has transited more than 2000 m beyond the location of the sighting.*

ii. ***#500 m*** *- Should the marine mammal be detected within or closing to inside 500 m of the sonar dome, active sonar transmissions will be limited to at least 10 dB below the equipment's normal operating level for sector search modes. Ships and submarines would continue to limit maximum ping levels by this 10-dB factor until the animal has been seen to leave the area, has not been seen for 30 minutes, or the vessel has transited more than 1500 m beyond the location of the sighting.*

iii. ***#200 m*** *- Should the marine mammal be detected within or closing to inside 200 m of the sonar dome, active sonar transmissions will cease. When a marine mammal or sea turtle is detected closing to inside approximately 200 m of the sonar dome, the principal risk becomes potential physical injury from collision. Accordingly, ships and submarines shall maneuver to avoid collision if the marine species closes within 200 m to the extent possible, with safety of the vessel being paramount. Sonar will not resume until the animal has been seen to leave the area, has not been seen for 30 minutes, or the vessel has transited more than 1200 m beyond the location of the sighting.*

Navy Assessment:

It is likely that this mitigation measure is effective, but as drafted above it requires improvement. Similar protective measures were already Navy SOP for all units conducting MFAS training. The intent of this requirement is not met in the reactions of the participating units during JTFEX 07-01 when marine mammals were sighted during MFAS use. Upon sighting of animals, regardless of range, but at 1000 yards or less from two of three sonar securing events, sonar was turned off.

Operational Impact of this mitigation measure:

Not determinable in the reactions of the participating units. In the unit after action reports, three scenarios exist: The unit observed mammals and was not active, the ship was active and sonar was secured, and the ship was active but animal was beyond mitigation range. This loss of MFAS training hours is more than a simple metric involving a loss of training time as a small percentage of the overall exercise hours since, in at least several of the JTFEX 07-01 cases, the proximity of a submarine in the vicinity meant there was a potential submarine detection opportunity missed by the exercise participants.

Recommendation

A "safety zone" mitigation measure was already SOP and this mitigation measure should be retained. A safety zone of 1000 m is based on the attenuation of sonar power level from a source of 235 dB to a received level of 173 dB under ideal conditions assuming direct path propagation with no reduction from other possible environmental factors. The criterion for the minimal threshold for marine species effect as required by NMFS for the IHA application in RIMPAC 06 was a 173 dB accumulated energy level. The types of behavioral observations that NMFS believes would be useful for Navy to report should

be discussed in more detail so that these monitoring reports and evaluation of safety zones continue to contribute to NMFS assessments.

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iv. ***Significant surface ducting conditions*** *- In significant surface ducting conditions, the Navy will enlarge the safety zones such that a 6-dB power-down will occur if a marine mammal enters the zone within a 2000 m radius around the source, a 10-dB power-down will occur if an animal enters the 1000 m zone, and shut down will occur when an animal closes within 500 m of the sound source.*

Navy Assessment:
There were no significant surface ducting conditions; however, as stated earlier, the intent of this requirement is not met in the reactions of the participating units.

Operational Impact of this mitigation measure:
Not determinable in the reactions of the participating units. Additionally, water conditions vary significantly over relatively short distances while operating in the littoral, which makes implementation of this measure unrealistic, and therefore ineffective.

Recommendation:
This measure can not be effectively implemented, thus providing no additional protection and should be deleted.

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v. ***Low visibility conditions (i.e., whenever the entire safety zone cannot be effectively monitored due to nighttime, high sea state, or other factors)*** *- The Navy will use additional detection measures, such as infrared (IR) or enhanced passive acoustic detection. If detection of marine mammals is not possible out to the prescribed safety zone, the Navy will power down sonar as if marine mammals were present in the zones they cannot see (for example, at night, if night goggles allow detection out to 1000 m, power-down would not be necessary under normal conditions; however, in significant surface ducting conditions, the Navy would need to power down 6 dB, as they could not effectively detect mammals out to 2000 m, the prescribed safety zone).*

Navy Assessment:
This measure may not have been applicable; there were no days of poor visibility during the exercise, and no nighttime marine mammal sightings (Table 1). Depending on vessel class and funding, some more advance IR, thermal, or other image enhancement technology may not be part of the ship's table of organic equipment (TOE) (i.e. equipment supplied a part of a unit's normal complement).

Operational Impact of this mitigation measure:
Not Applicable.

Recommendation
None, this measure was not effectively tested.

Measure 3. Stranding Response and Reporting

- *The Navy will coordinate with the NMFS Stranding Coordinator for any unusual marine mammal behavior, including stranding, beached live or dead cetacean(s), floating marine mammals, or out-of-habitat/milling live cetaceans that may occur at any time during or shortly after major exercises.*

Navy Assessment:
There were no occurrences of unusual marine mammal behavior during or subsequent to JTFEX 07-01.

Operational Impact of this mitigation measure:
Not applicable.

Recommendation
None, this measure was not applicable for JTFEX 07-01. There are existing Navy SOPs outlined in OPNAVINST 5090.1B Change 4 and Chief of Naval Operations N45 Supplemental Environmental Planning Policy (23 September 2004).

- *The Navy will provide a report to NMFS after the completion of a major exercise that includes:*
  - *An assessment of the effectiveness of these mitigation and monitoring measures with recommendations of how to improve them.*

Navy Assessment:
The details of the effectiveness assessment are discussed within this report.

Operational Impact of this mitigation measure:
Manpower time for data collection, report writing, and drafting the after action marine mammal sighting Naval messages is required.

Recommendation
None at this time.

- *Results of the marine species monitoring during the major exercise. As much unclassified information as the Navy can provide including, but not limited to, where and when sonar was used (including sources not considered in take estimates, such as submarine and aircraft sonars) in relation to any measured received levels, source levels, numbers of sources, and frequencies, so it can be coordinated with observed cetacean behaviors. If necessary, classified information may be provided to NMFS personnel with an appropriate security clearance and need to know.*

Navy Assessment:
The details of the marine species monitoring are contained within Table 1 and Section 3 of this report.

Operational Impact of this mitigation measure:
None.

Recommendation
None at this time. Navy and NMFS dialogue on monitoring and reporting will continue.

SECTION 3: Monitoring Results

The requirement from the NDE, "*Results of the marine species monitoring during the major exercise. As much unclassified information as the Navy can provide including, but not limited to, where and when sonar was used (including sources not considered in take estimates, such as submarine and aircraft sonars) in relation to any measured received levels, source levels, numbers of sources, and frequencies, so it can be coordinated with observed cetacean behaviors.*" is summarized in this section of the report.

Note that the marine mammal observations reported in Section 1 represent a skewed sample since there were no attempts made to detect marine mammals by other means in areas not being used by exercise participants.

Typically, there are no measurements (calibrated or otherwise) of actual sound levels made during an exercise and none were made during JTFEX 07-01. Source levels, numbers of sources, and frequencies are classified since that information would provide potential adversaries with important tactical data. Given that location planning and mitigation measures are designed to minimize interactions between Navy assets and marine mammals, the observations of marine mammals by Navy assets only occurred as infrequent and very brief encounters, the majority of which occurred when there was no MFAS in use.

Observations of marine species and their behaviors, as previously detailed, showed no unusual behaviors for coordination with MFAS use. There were no indications from the observations that the presence of exercise participants had any affect on any marine mammals.

The requirement to report where and when sonar was used so it can be coordinated with observed cetacean behaviors would provide no additional information since animals observed were behaving within the confines of apparent normal behavior. Information presented previously in Table 1 provides a list of instances when marine mammals were observed.

CONCLUSIONS AND SUMMARY

- Marine mammals were sighted 18 times by exercise participants. Approximately 140 animals were observed within Southern California waters (Table 1, Figure 1). In each of these cases, the marine mammals were detected by Navy watchstanders operating in accordance with Navy standard operational procedures and as reiterated by some NDE mitigation measures.
- Of the 18 instances where marine mammals were detected, MFAS was not operating in 15 events and there were no mandated sonar shut downs.
- MFAS was secured three times representing a 17% loss of ASW training opportunities from sighting events, as well as potentially interrupting the tactical situational awareness of the participating units and CSG (Figure 2).
- There were no indications of any effects to any marine species throughout the exercise. All behaviors described in the after action report were within the range of normal behaviors.
- Mitigation measures required by the Navy, which were in addition to Navy SOP protective measures, did not provide any demonstrated increased protection to marine mammals. Administration of the additional mitigation measures distracted exercise participants, watchstanders, and exercise commanders at the headquarters level from their primary responsibility of exercise training and safety. While these personnel seemed to adequately absorb this increased workload, there were no indications the hypersensitivity the additional mitigation measures required provided any additional protection to marine mammals.

Prepared for
National Marine Fisheries Service
Office of Protected Resources

Prepared by
Department of the Navy

In accordance with
National Defense Exemption 30 June 2006

USS Nimitz CSG

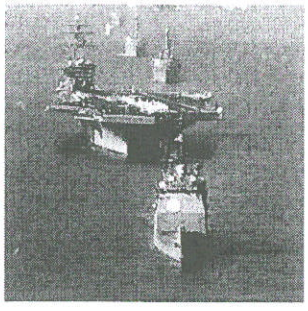
COMPOSITE TRAINING UNIT EXERCISE 07-01

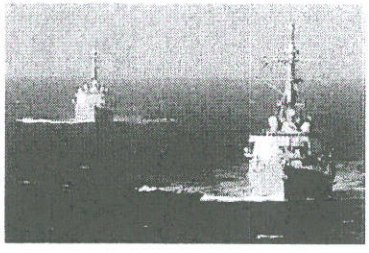
(C2X 07-01)

19 Nov- 19 Dec 2006

After Action Report

Analysis of the Effectiveness of the Mitigation and Monitoring Measures as Required Under the National Defense Exemption from the Requirements of the Marine Mammal Protection Act for Certain DoD Mid-Frequency Active Sonar Activities





ATTACHMENT E

INTRODUCTION

This report is presented to fulfill the requirements conditional to the 30 June 2006 "National Defense Exemption (NDE) from the Requirements of the Marine Mammal Protection Act for Certain DoD Mid-Frequency Active Sonar Activities." The Navy is submitting this report to NMFS' Office of Protected Resources consistent with the requirement set forth in the MMPA NDE.

The following information is for the USS Nimitz Carrier Strike Group (CSG) Composite Training Unit Exercise (C2X) 07-01 conducted from 19 Nov - 19 Dec 2006 in Southern California (SOCAL). The types of ASW training conducted during C2X 07-01 involved the use of ships, submarines, aircraft, non-explosive exercise weapons, and other training related devices. ASW events occurred within portions of the Southern California Offshore Range (SCORE) and the Southern California Offshore ASW Range west of San Clemente Island. The following information is provided:

(1) Estimate of number of marine mammals affected by ASW exercises and discussion of nature of effects, if observed, based on results of real-time exercises and sightings of marine mammals;

(2) Assessment of effectiveness of mitigation and monitoring measures with recommendations on how to improve them;

(3) Results of marine species monitoring (real-time monitoring from all platforms) before, during, and after exercise;

(4) As much information (unclassified) as Navy can provide including, but not limited to, where and when sonar was used in relation to any measured received levels (such as sonobuoys), source levels, numbers of sources, and frequencies so it can be coordinated with observed cetacean behaviors.

This report, which contains only unclassified material, provides the necessary information and analyses, and thus fulfills these requirements. The report is organized by section as follows:

Section 1 provides an estimated number of marine mammals observed during the C2X 07-01 ASW events based on analysis of sightings of marine mammals, noting the nature of any observed effects where possible.

Section 2 assesses the effectiveness of the NDE mitigation and monitoring measures required during exercises with regard to minimizing the use of Mid-Frequency Active Sonar (MFAS) in the vicinity of marine mammals. This section also includes an assessment of the practicality of implementation of the mitigation measures, the impact some of the measures had on safety, and the impact of the measures on the military readiness activities.

Section 3 provides data on the hours of active MFAS used during C2X 06-2 placed in context with observations of cetacean behaviors resulting from the ship based reports and exercise participants.

SECTION 1: Marine Mammals Observed

Section 1 provides estimated numbers of marine mammals observed in Southern California waters during C2X 07-01 ASW exercises and vessel transits. This information is based on analysis of actual events and sightings of marine mammals noting the nature of any observed effects.

All detections were made by standard Navy surface ship lookout marine mammal detection and reporting procedures. There were no sighting reports from aircraft platforms.

Table 1 provides a detailed timeline of marine mammal observations made by Navy exercise participants.

During C2X 07-01, there were **48** marine mammal sightings for a total of **376** animals Table 1 and **Figure 1**).

Twenty-one of the 48 sightings included a total of 304 "dolphins" which comprised 44% of the sightings and 81% of total animals seen during C2X 07-01. This observation is consistent with science-based reports that dolphins comprise as much as 85-95% of the marine mammal abundance within Southern California.

Unspecified whale sightings comprised 44% of the total sightings (n=21 sighting totaling 26 animals). There were no small whale sightings, or at least no designation of distinction reported between small and large whales with the exception of one humpback whale sighting (n=1 animal). Pinnipeds (seals or sea lions) sighting comprised 4% of the total sightings (n=2 sighting totaling 45 animals).

Table 1. Marine mammal sightings and actions by exercise participants during C2X 07-01. Text in red Bold indicates events when MFAS was in use and secured dueto marine mammal mitigation. Red text in *Italics* indicates when MFAS was in use, but mitigation other than securing sonar was enacted.

Date-Time	Description of Actions Taken	# of animals	Animal Type
11/30- 1310	Surface ship sights 1 "whale" traveling at 6000 yards. MFAS in use. MFAS in use. Sonar secured.	1	whale
12/02- 1045	Surface ship sights 1 "whale" jumping at 2000 yards. *MFAS in use. Ship changes course AND reduces output 6 dB*	1	whale
12/02- 1500	Surface ship sights 50 "dolphins" feeding at 100 yards. MFAS NOT in use. No action taken.	50	dolphin
12/02- 1400	Suface ship sights 10 "seal or sea lions" feeding at 100 yards. MFAS NOT in use. No action taken.	10	pinniped
12/03- 1705	Surface ships sights 1 "whale" traveling at 4000 yards. *MFAS in use. No action taken.*	1	whale
12/03- 0644	Surface ship sights 30 "dolphins" traveling at 250 yards. MFAS NOT in use. No action taken.	30	dolphin
12/03- 0742	Surface ship sights 1 "humpback whale" spouting at 4000 yards. MFAS NOT in use. No action taken.	1	large whale
12/03- 0919	Surface ships sights 1 "whale" traveling at 1500 yards. *MFAS in use. No action taken.*	1	whale
12/03- 1528	Surface ship sights 10 "dolphins" at 2000 yards who closed to bow ride. MFAS NOT in use. Ship slows speed.	10	dolphin
12/03- 1529	Surface ship sights 10 "dolphins" traveling at 2000 yards. MFAS NOT in use. No action taken.	10	dolphin
12/03- 1528	Surface ship sights 1 "whale" traveling at 4000 yards. MFAS NOT in use. No action taken.	1	whale
12/04- 1623	Surface ship sights 2 "whales" traveling at 1700 yards. *MFAS in use. No action taken.*	2	whale
12/04- 1633	Surface ship sights 2 "whales" traveling at 1500 yards. *MFAS in use. No action taken.*	2	whale
12/04- 0928	Surface ship sights 10 "dolphins" traveling at 8000 yards. MFAS NOT in use. No action taken.	10	dolphin
12/04- 0917	Surface ship sights 1 "whale" traveling and spouting at 6000 yards. MFAS NOT in use. No action taken.	1	whale
12/04- 2312	Surface ship sights 3 "whales" traveling at 8000 yards. MFAS NOT in use. No action taken.	3	whale
12/05- 0840	Surface ship sights 40 "dolphins" traveling at 400 yards. MFAS NOT in use. No action taken.	40	dolphin
12/05- 1004	Surface ship sights 1 "whale" traveling at 200 yards. MFAS NOT in use. No action taken.	1	whale
12/05- 1430	Surface ship sights 5 "dolphins" traveling at 6000 yards. MFAS NOT in use. No action taken.	5	dolphin
12/06- 0715	Surface ship sights 20 "dolphins" feeding at 500 yards. MFAS NOT in use. No action taken.	20	dolphin
12/06- 0837	Surface ship sights 4 "dolphins" traveling at 2500 yards. MFAS NOT in use. No action taken.	4	dolphin
12/06- 0955	Surface ship sights 4 "dolphins" traveling at 500 yards. MFAS NOT in use. No action taken.	4	dolphin

Date-Time	Description of Actions Taken	# of animals	Animal Type
12/06- 1008	Surface ship sights 5 "dolphins" traveling at 500 yards. MFAS NOT in use. No action taken.	5	dolphin
12/06- 1547	Surface ship sights 20 "dolphins" traveling at 2000 yards. MFAS NOT in use. No action taken.	20	dolphin
12/07- 0749	Surface ship sights 10 "dolphins" traveling at 200 yards. MFAS NOT in use. No action taken.	10	dolphin
12/08- 1820	Surface ship sights 10 "dolphins" traveling at 200 yards. MFAS NOT in use. Ship alters course.	10	dolphin
12/08- 1046	Surface ship sights 1 "whale" traveling at 1000 yards. *MFAS in use. Ship changes course AND reduces output 6 dB*	1	whale
12/08- 1300	Surface ship sights 13 "dolphins" traveling at 400 yards. MFAS NOT in use. No action taken.	13	dolphin
12/08- 1509	Surface ship sights 1 "whale" traveling at 200 yards. MFAS NOT in use. Ship alters course.	1	whale
12/09- 0655	Surface ship sights "unknown marine mammal", no range given. MFAS in use. Sonar secured.	unk	unknown
12/09- 0759	Surface ship sights 1 "whale" traveling at 4000 yards. *MFAS in use. No action taken.*	1	whale
12/09- 0821	Surface ship sights 1 "whale" traveling at 4000 yards. MFAS in use. Sonar secured.	1	whale
12/09- 0905	Surface ship sights 1 "unknown marine mammal", no range given. MFAS in use. Sonar secured.	unk	unknown
12/09- 1024	Surface ship sights 1 "whale" traveling at 4000 yards. *MFAS in use. No action taken.*	1	whale
12/09- 1035	Surface ship sights 1 "whale" traveling at 600 yards. *MFAS in use. Sonar reduces output 10 dB*	1	whale
12/09- 1131	Surface ship sights "unknown marine mammal", no range given. MFAS in use. Sonar secured.	unk	unknown
12/10- 0706	Surface ship sights 1 "whale" traveling at 600 yards. MFAS NOT in use. Ship alters course.	1	whale
12/10- 0946	Surface ship sights 1 "whale" traveling at 200 yards. MFAS NOT in use. Ship alters course.	1	whale
12/11- 0533	Surface ship sights 20 "dolphins" bow riding. MFAS NOT in use. No action taken.	20	dolphin
12/13- 2252	Surface ship sights 1 "whale" traveling at 4000 yards. MFAS in use. Sonar secured.	1	whale
12/15- 0905	Surface ship sights 9 "dolphins" jumping at 6000. MFAS NOT in use. No action taken.	9	dolphin
12/17- 2217	Surface ship sights 1 "whale" traveling at 3100 yards. MFAS in use. Sonar secured.	1	whale
12/18- 1336	Surface ship sights 12 "dolphins" traveling at 100 yards. MFAS NOT in use. No action taken.	12	dolphin
12/19- 1018	Surface ship sights 12 "dolphins" traveling at 100 yards. MFAS NOT in use. No action taken.	12	dolphin
12/19- 1410	Surface ship sights 35 "seals or sea lions" jumping at 100. MFAS NOT in use. No action taken.	35	pinniped

Date-Time	Description of Actions Taken	# of animals	Animal Type
12/19- 1442	Surface ship sights 2 "whales" tail slapping at 3000 yards. MFAS NOT in use. Ship alters course.	2	whale
12/20- 0857	Surface ship sights 7 "dolphins" traveling at 5000 yards. MFAS NOT in use. No action taken.	7	dolphin
12/20- 0920	Surface ship sights 3 "dolphins" jumping at 50 yards. MFAS NOT in use. No action taken.	3	dolphin
48	= total sighting events total number of animals =	**376**	

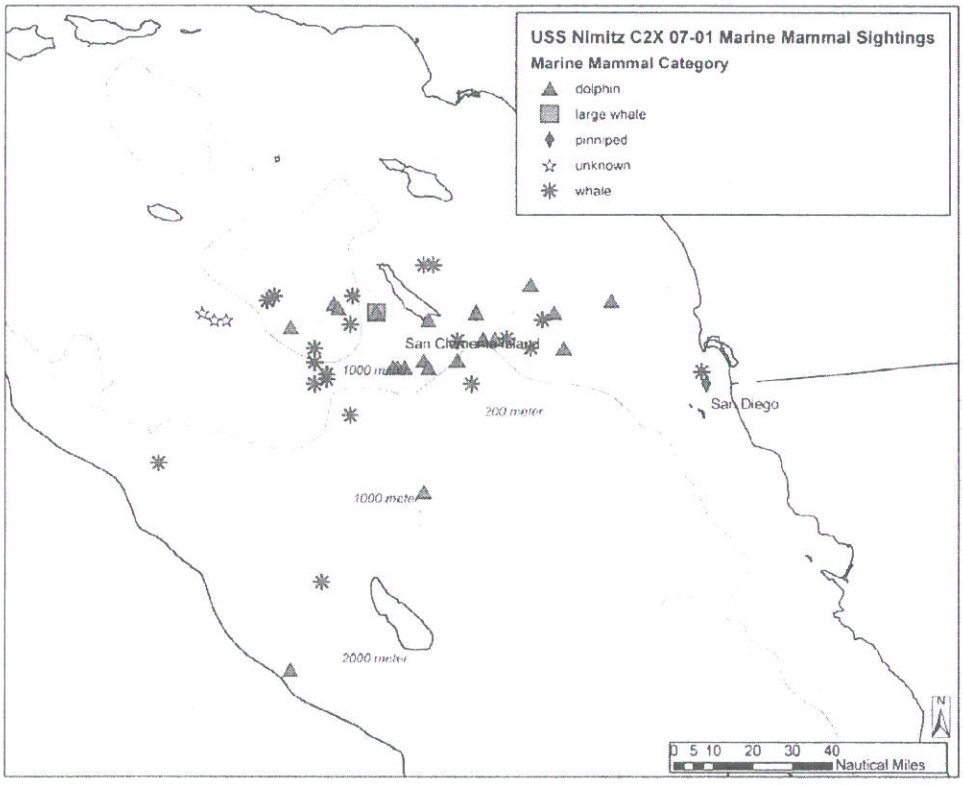


Figure 1. Marine mammal sightings C2X 07-01.

SECTION 2: Mitigation and Monitoring

As required under the NDE, the report must contain "An assessment of the effectiveness of the mitigation and monitoring measures with recommendations on how to improve them". This section of the report, therefore, provides an assessment of the effectiveness of the mitigation and monitoring measures, and recommendations on how to improve them with regard to practicality of implementation, their impact on exercise safety, and their impact on the effectiveness of the military readiness training activity.

It must also be recognized that ASW proceeds slowly and requires careful development of a tactical frame of reference over time as data is integrated from a number of sources and sensors. Once MFAS is turned off for a period of time, simply turning it back on minutes later does not usually allow a Commander to simply continue from the last frame of reference. Thus, 15 minutes of lost MFAS time does not equate to only 15 minutes of lost exercise time but should be considered in the fuller context of its overall impact on the tempo and tactical development of a Common Operational Picture shared among exercise participants as they trained with the goal of interoperability and improvement of ASW skills in general.

C2X 07-01 Assessment

MFAS sonar is only used during carefully reviewed scenarios and for only a small sub-set of any given exercise time frame. Therefore, as expected in C2X, a majority of these mammals were sighted during periods when MFAS was not in use (**Figure 2**). Approximately **85%** of the sightings (32 of 48 sightings) were in this category.

Although there was high-level emphasis placed upon adhereing to the marine mammal protection measures as written, during C2X 07-01, there were seven instances where MFAS was secured (i.e. turned-off) due to sighting of marine mammals. This represented **15%** of the total sighting events, and directly impacted ASW training readiness. Sonar was secured at ranges of from 600 to 6000 yards. While securing MFAS beyond the 200 yard range is not required under Navy SOP and NDE, it appears that an overly-conservative approach was applied by individual ships.

There were three events (6% of total sighting events) where operators reduced sonar dB levels per Navy SOP and NDE due to approaching marine mammals (by 6 dB at 1000 yards, by 6 dB at 2000 yards, by 10 dB at 600 yards). The reduced output event at 2000 yards is greater than mandated by Navy SOP and NDE. Operators commented on decreased detection ranges due to power down requirements and resulting loss of ASW tactical awareness.

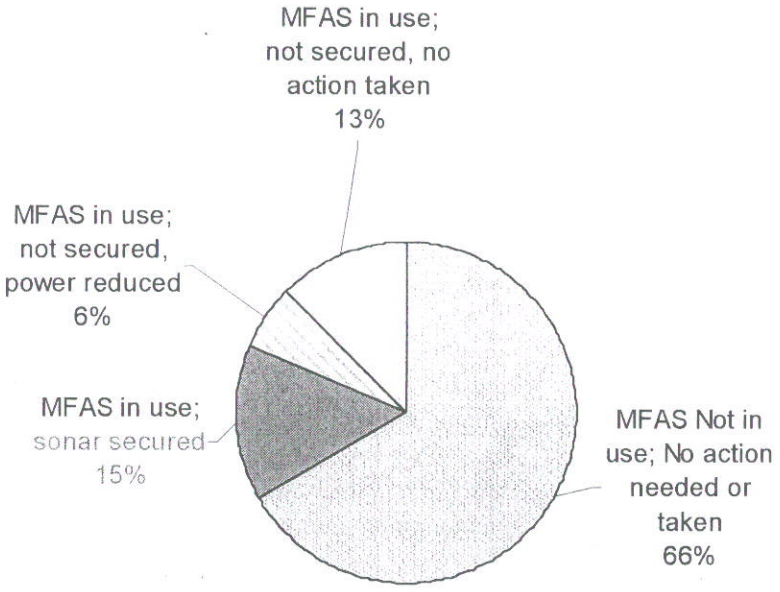
There were six sightings representing 13% of the total sightings where MFAS was in use, and because the animals were outside of the mitigation zones, sonar was not secured.

There were four marine mammal sightings at night (approximately 8% of total sightings). Two of the sonar securing events occurred at night, and happen to have occurred even though the animals were sighted at 3100 and 4000 yards.

There were also six instances when a ship altered course in the presence of marine mammal, but MFAS was not in operation at these times, and no ASW training opportunities were lost.

The reports from exercise participants contained nothing that could be construed as abnormal or "observed effects" of MFAS, or other vessel operations. There were no instances where marine mammals behaved in an erratic, unusual, or anything other than an apparently normal manner. Therefore, further analysis based on observed effects, as mandated by the reporting requirement, was not warranted.

Figure 2. Actions taken by surface ships reporting marine mammal sightings during C2X 07-01.



NDE Assessment

NDE measures adhered to and impacts to operations are discussed below.

A subset of the additional measures required by the NDE was not applicable within the context of C2X 07-01 due to the absence of the conditions described. This subset of mitigation measures is as follows:

- Requirements regarding "*strong surface ducting conditions*"
- Requirements regarding "*low visibility conditions*"
- Requirements specific to operating MFAS in choke-points
- Restrictions from operating MFAS within constricted channels

The following protective measures, as mandated by NDE, were already Navy Standard Operating Procedures (SOP) as detailed in Navy lookout training, Protective Measures Assessment Protocol (PMAP), and Marine Species Awareness DVD Training. These measures will continue to be used in future exercises:

1. Personnel trained on marine mammal awareness and mitigation measures (Lookout Training Handbook NAVEDTRA 12968-B and U.S. Navy Marine Species DVD Version 1.1 June 2006).
2. Personnel on lookout with binoculars at all times when the vessel is moving through the water
3. Lookouts report sighting of any marine species, disturbance to the water's surface, or object in the water to Officer of the Deck, who is the Commanding Officer's direct representative on watch
4. Safety zone is established around an active sonar source and sonar power is reduced when marine mammals enter this zone
5. Submarine sonar operators review detection indicators of close-aboard marine mammals prior to commencement of ASW operations involving MFAS
6. Aerial surveillance for marine species occurs whenever possible and detections are reported to ships in the vicinity
7. Helicopters using active (dipping) sonar search for marine mammals prior to active sonar and employ a safety zone
8. Sonar always operated at lowest practicable level to meet tactical training objectives

Based on the following observations, Navy SOPs already in place were effective in detecting marine mammals. In addition, the steps taken by individual ship commanding officers to avoid impacts to marine mammals were effective, although not applicable in this C2X due to lack of sighting during use of MFAS.

To organize the assessment of each particular mitigation measure, they are listed below in the order and organization as presented in the NDE.

NDE MITIGATION AND MONITORING REQUIREMENTS

The three categories of mitigation and monitoring measures required by the June 30, 2006 NDE are assessed in this section. For ease of reference, the text of the measures is provided in italics, followed by an assessment, an analysis of operational impact, and a recommendation on any improvements to each measure.

Measures 1-2

Mitigation measures 1 and 2 detail training requirements and operating procedures for units participating in MFAS ASW exercises. All of the training requirements within these two measures reflect the Marine Species Awareness Training (MSAT) that Navy lookouts and bridge personnel routinely receive as Navy SOP. This MSAT was developed in coordination with marine biology experts within the Navy, reviewed by National Marine Fisheries Service (NMFS), and incorporates effective marine species detection cues and information necessary to protect marine species. This material is part of the Navy Lookout watchstander qualification system, will soon be available as online interactive training, and can also be provided in a video format for large audience presentations. NMFS regional staff reviewed the MSAT training for purposes of RIMPAC 06 and this training continued to be used by Navy to meet the full intent of these first two NDE mitigation measures.

Measure 1. Personnel Training:

- *Navy shipboard lookouts shall be qualified watchstanders who have completed marine species awareness training.*
  - *Navy watchstanders will participate in marine mammal observer training approved by NMFS.*

Measure 2. Operating Procedures

- *Bridge personnel on ships and submarines - Ships and surfaced submarines shall have personnel on lookout with binoculars at all times when the vessel is moving through the water. Standard operating procedure requires these lookouts maintain surveillance of the area visible around their vessel and to report the sighting of any marine species, disturbance to the water's surface, or object (unknown or otherwise) to the Officer in Command.*
  - *Bridge lookout personnel shall have completed marine species awareness training as updated in 2005.*
  - *At least one individual who has received this training will be present, and on watch, at all times during operation of tactical mid-frequency sonar, on each vessel operating mid-frequency sonar.*

Navy Assessment:

Measures 1 and 2 require marine species awareness training. Marine mammal lookout training for all units has been standard procedure for several years, and was updated with a new Marine Species Awareness Training DVD (U.S. Navy Marine Species Awareness Training DVD, Version 1.1). Training has been established as and continues to be effective as a mitigation measure.

Operational Impact of these mitigation measure:

None.

Recommendation
None, these are effectively incorporated into Navy SOPs.

- *Aviation units - Aircraft participating in ASW events will conduct and maintain, whenever possible, surveillance for marine species prior to and during the event. The ability to effectively perform visual searches by participating aircraft crew will be heavily dependent upon the primary duties assigned as well as weather, visibility, and sea conditions. Sightings would be immediately reported to ships in the vicinity of the event as appropriate.*

Navy Assessment:
This measure documents what occurs in general, but has not been specifically described in a SOP.

Operational Impact of this mitigation measure:
None – this occurs routinely.

Recommendation
This mitigation measure should be retained and described in a SOP.

- *Sonar personnel on ships, submarines, and ASW aircraft -*
  - *Ship and submarine sonar operators will check for passive indications of close-aboard marine mammals prior to their commencement of ASW operations involving active mid-frequency sonar.*

Navy Assessment:
This measure documents what occurs for submarines as part of PMAP, and is used in general for surface ships, but has not been specifically described in a SOP.

Operational Impact of this mitigation measure:
None – this occurs routinely or is part of PMAP (for submarines).

Recommendation
This mitigation measure should be retained given that it details what occurs routinely. The measure has not been officially described in a SOP for surface ships. The measure is part of PMAP for submarines. This measure should be added for surface units in the next version of PMAP.

- *Sonar levels (generally) - The Navy will operate sonar at the lowest practicable level, not to exceed 235 dB, except for occasional short periods of time to meet tactical training objectives. Use of MFA sonar at source levels above 235 dB will be logged and reported in accordance with section 3.*

Navy Assessment:
This measure had no observable benefit to conservation, due to operator shut down if mammals were observed, regardless of range, which will be discussed in further detail in following sections.

Operational Impact of this mitigation measure:
The impact of this measure is undeterminable at this time.

Recommendation

This measure may not be particularly applicable to conduct of training. Sonar usage is tailored to the environmental conditions of the day, which may preclude practicable levels below the maximum.

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i. *In major fleer exercises, operate mid-frequency active sonar within 12 nm of a coast, except for RIMPAC 2006 (which is covered above) and military readiness activities at the established ranges at San Clemente Island and PMRF.*

Navy Assessment:

This measure was adhered to for this event; for this major exercise there were no active sonar operations within 12 nm of a coast except those on the established instrumented ranges near San Clemente Island.

Operational Impact of this mitigation measure:

None.

Recommendation

Not applicable.

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ii. *Conduct sonar activities in constricted channels.*

Navy Assessment:

There are no naturally occurring bathymetrically constricted channels within the SOCAL area used for C2X 07-01.

Operational Impact of this mitigation measure:

None.

Recommendation

Not applicable.

- ***Safety zones*** *- When marine mammals are detected close aboard, all ships, submarines, and aircraft engaged in ASW would reduce mid-frequency active sonar power levels in accordance with the following specific actions:*
  - ***Helicopters*** *- Helicopters shall observe/survey the vicinity of an event location for 10 minutes before deploying active (dipping) sonar in the water. Helicopters shall not dip their sonar within 200 yards of a marine mammal and shall secure pinging if a marine mammal closes within 200 yards after pinging has begun.*

Navy Assessment:

This measure is fundamentally the same as the measure detailed in PMAP, with the addition of a specified 10 minute survey in advance of active sonar. PMAP prohibits active sonar use if there are animals within 200 yards of the dipping sonar transducer, and details the securing of sonar if an animal is detected within 200 yards or is closing on the source when active.

Operational Impact of this mitigation measure:

None.

Recommendation

The 10 minute survey prior to active sonar use is bounding the time in which survey would be done. As written in PMAP, the helicopter pilots must ensure there are no marine mammals in the 200 yard exclusion zone around the sonar transducer, regardless of time interval spent in searching. Since the searching of an area is dependent upon the

environmental conditions of the day, bounding the survey timeframe may be unwarranted.

Ships and submarines

i. ***#1,000 m*** *- When marine mammals are detected by any means (aircraft, lookout, or aurally) within 1000 m of the sonar dome (the bow), the ship or submarine will limit active transmission levels to at least 6 dB below the equipment's normal operating level for sector search modes. Ships and submarines would continue to limit maximum ping levels by this 6-dB factor until the animal has been seen to leave the area, has not been seen for 30 minutes, or the vessel has transited more than 2000 m beyond the location of the sighting.*

ii. ***#500 m*** *- Should the marine mammal be detected within or closing to inside 500 m of the sonar dome, active sonar transmissions will be limited to at least 10 dB below the equipment's normal operating level for sector search modes. Ships and submarines would continue to limit maximum ping levels by this 10-dB factor until the animal has been seen to leave the area, has not been seen for 30 minutes, or the vessel has transited more than 1500 m beyond the location of the sighting.*

iii. ***#200 m*** *- Should the marine mammal be detected within or closing to inside 200 m of the sonar dome, active sonar transmissions will cease. When a marine mammal or sea turtle is detected closing to inside approximately 200 m of the sonar dome, the principal risk becomes potential physical injury from collision. Accordingly, ships and submarines shall maneuver to avoid collision if the marine species closes within 200 m to the extent possible, with safety of the vessel being paramount. Sonar will not resume until the animal has been seen to leave the area, has not been seen for 30 minutes, or the vessel has transited more than 1200 m beyond the location of the sighting.*

Navy Assessment:

It is likely that this mitigation measure is effective, but as drafted above it requires improvement. Similar protective measures were already Navy SOP for all units conducting MFAS training. The intent of this requirement is not met in the reactions of the participating units during C2X 07-01 when marine mammals were sighted during MFAS use. Upon sighting of animals, regardless of range, but at 1000 yards or more from two of five events, sonar was secured.

Operational Impact of this mitigation measure:

Not determinable in the reactions of the participating units. In the unit after action reports, four scenarios exist: Unit observed marine mammals and was not active; unit was active and sonar was secured; unit was active and sonar not secured but ship reduce sonar output; and unit was active and sonar not secured because animals were at or beyond 1500 yards. This loss of MFAS training hours is more than a simple metric involving a loss of training time as a small percentage of the overall exercise hours since, in at least several of the C2X 07-01 cases, the proximity of a submarine in the vicinity meant there was a potential submarine detection opportunity missed by the exercise participants. During C2X 07-01, operators directly commented on lost detection opportunities due to deceased power output resulting from marine mammal sightings.

Recommendation

A "safety zone" mitigation measure was already SOP and this mitigation measure should be retained. A safety zone of 1000 m is based on the attenuation of sonar power level from a source of 235 dB to a received level of 173 dB under ideal conditions assuming direct path propagation with no reduction from other possible environmental factors. The

criterion for the minimal threshold for marine species effect as required by NMFS for the IHA application in RIMPAC 06 was a 173 dB accumulated energy level..

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iv. ***Significant surface ducting conditions*** *- In significant surface ducting conditions, the Navy will enlarge the safety zones such that a 6-dB power-down will occur if a marine mammal enters the zone within a 2000 m radius around the source, a 10-dB power-down will occur if an animal enters the 1000 m zone, and shut down will occur when an animal closes within 500 m of the sound source.*

Navy Assessment:
There were no significant surface ducting conditions; however, as stated earlier, the intent of this requirement is not met in the reactions of the participating units.

Operational Impact of this mitigation measure:
Not determinable in the reactions of the participating units. Additionally, water conditions vary significantly over relatively short distances while operating in the littoral, which makes implementation of this measure unrealistic.

Recommendation
This measure can not be effectively implemented, thus providing no additional protection and should be deleted.

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v. ***Low visibility conditions (i.e., whenever the entire safety zone cannot be effectively monitored due to nighttime, high sea state, or other factors)*** *- The Navy will use additional detection measures, such as infrared (IR) or enhanced passive acoustic detection. If detection of marine mammals is not possible out to the prescribed safety zone, the Navy will power down sonar as if marine mammals were present in the zones they cannot see (for example, at night, if night goggles allow detection out to 1000 m, power-down would not be necessary under normal conditions; however, in significant surface ducting conditions, the Navy would need to power down 6 dB, as they could not effectively detect mammals out to 2000 m, the prescribed safety zone).*

Navy Assessment:
This measure may not have been applicable; there were no days of poor visibility during the exercise, and four nighttime marine mammal sightings (Table 1). Two instances occurred at night where MFAS was secured at 3,100 yds and 4,000 yds. Depending on vessel class and funding, some more advance IR, thermal, or other image enhancement technology may not be part of the ship's table of organic equipment (TOE) (i.e. equipment supplied a part of a unit's normal complement).

Operational Impact of this mitigation measure:
Not Applicable.

Recommendation
None, this measure was not effectively tested with respect to power down, but the ability to sight marine mammals at night was demonstrated.

Measure 3. Stranding Response and Reporting

- *The Navy will coordinate with the NMFS Stranding Coordinator for any unusual marine mammal behavior, including stranding, beached live or dead cetacean(s), floating marine mammals, or out-of-habitat/milling live cetaceans that may occur at any time during or shortly after major exercises.*

Navy Assessment:
There were no occurrences of unusual marine mammal behavior during or subsequent to C2X 07-01.

Operational Impact of this mitigation measure:
Not applicable.

Recommendation
None, this measure was not applicable for C2X 07-01. There is existing Navy SOP outlined in OPNAVINST 5090.1B Change 4 and Chief of Naval Operations N45 Supplemental Environmental Planning Policy (23 September 2004).

- *The Navy will provide a report to NMFS after the completion of a major exercise that includes:*
  - *An assessment of the effectiveness of these mitigation and monitoring measures with recommendations of how to improve them.*

Navy Assessment:
The details of the effectiveness assessment are discussed within this report.

Operational Impact of this mitigation measure:
Manpower time for data collection, analysis, report writing and . drafting the after action marine mammal sighting Naval messages is required.

Recommendation
None at this time.

  - *Results of the marine species monitoring during the major exercise. As much unclassified information as the Navy can provide including, but not limited to, where and when sonar was used (including sources not considered in take estimates, such as submarine and aircraft sonars) in relation to any measured received levels, source levels, numbers of sources, and frequencies, so it can be coordinated with observed cetacean behaviors. If necessary, classified information may be provided to NMFS personnel with an appropriate security clearance and need to know.*

Navy Assessment:
The details of the marine species monitoring are contained within Table 1 and Section 3 of this report.

Operational Impact of this mitigation measure:
None

Recommendation
None. Navy and NMFS dialogue on monitoring and reporting is ongoing.

SECTION 3: Monitoring Results

The requirement from the NDE, "*Results of the marine species monitoring during the major exercise. As much unclassified information as the Navy can provide including, but not limited to, where and when sonar was used (including sources not considered in take estimates, such as submarine and aircraft sonars) in relation to any measured received levels, source levels, numbers of sources, and frequencies, so it can be coordinated with observed cetacean behaviors.*" is summarized in this section of the report.

Note that the reporting of marine mammal observations in Section 1 represents a skewed sample since there were no attempts made to detect marine mammals by other means in areas not being used by exercise participants.

Typically, there are no measurements (calibrated or otherwise) of actual sound levels made during an exercise and none were made during C2X 07-01. Source levels, numbers of sources, and frequencies are classified since that information would provide potential adversaries with important tactical data. Given that location planning and mitigation measures are designed to minimize interactions between Navy assets and marine mammals, the observations of marine mammals by Navy assets only occurred as infrequent and very brief encounters, the majority of which occurred when there was no MFAS in use.

Observations of marine species and their behaviors, as previously detailed, showed no unusual behaviors for coordination with MFAS use. There were no indications from the observations that the presence of exercise participants had any affect on any marine mammals.

The requirement to report where and when sonar was used so it can be coordinated with observed cetacean behaviors would provide no additional information since animals observed were behaving within the confines of apparent normal behavior. Information presented previously in Table 1 provides a list of instances when marine mammals were observed.

CONCLUSIONS AND SUMMARY

- Marine mammals were sighted 48 times by exercise participants. Approximately 376 animals were observed within Southern California waters (Table 1, Figure 1). In each of these cases, the marine mammals were detected by Navy watchstanders operating in accordance with Navy standard operational procedures and as reiterated by NDE mitigation measures.
- Of the 48 instances where marine mammals were detected, MFAS was not operating in 32 events and there were no mandated sonar shut downs.
- MFAS was secured ten times representing a 15% loss of ASW training opportunities for sighting events, as well as potentially interrupting the tactical situational awareness of the participating units and CSG (Figure 2).
- There were no indications of any effects to any marine species throughout the exercise. All behaviors described in the after action report were within the range of normal behaviors.
- Mitigation measures required by the Navy, which were in addition to Navy SOP protective measures, did not provide any demonstrated increased protection to marine mammals. Administration of the additional mitigation measures distracted exercise participants, watchstanders, and exercise commanders at the headquarters level from their primary responsibility of exercise training and safety. While these personnel seemed to adequately absorb this increased workload, there were no indications the hypersensitivity the additional mitigation measures required provided any additional protection to marine mammals.

Prepared for
National Marine Fisheries Service
Office of Protected Resources

Prepared by
Department of the Navy

In accordance with
National Defense Exemption 23 January 2007
Biological Opinion 09 February 2007

Department of the Navy
SOUTHERN CALIFORNIA
COMPOSITE TRAINING UNIT EXERCISE / JOINT TASK FORCE EXERCISE
Combined After Action Report
February-March 2007

FINAL

28 June 2007

Abstract

This report presents an analysis of the effectiveness of the mitigation and monitoring measures as required under the Biological Opinion on the U.S. Navy's Proposed Composite Unit Training Exercises and Joint Task Force Exercises Off Southern California From February 2007 to January 2009

AND

Discussion of the nature of effects, if observed, under the National Defense Exemption from the Requirements of the Marine Mammal Protection Act (MMPA) for Mid-Frequency Active Sonar

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ATTACHMENT F

INTRODUCTION

This report is presented to fulfill Navy and Pacific Fleet written reporting requirements conditional to the 23 January 2007 National Defense Exemption (NDE) from the Requirements of the MMPA for Certain DoD Military Readiness Activities That Employ Mid-Frequency Active Sonar (MFAS) or Improved Extended Echo Ranging Sonobuoys. In addition, these NDE mitigation measures are included in the 9 February 2007 Biological Opinion (BO) for the *U.S. Navy's Proposed Composite Unit Training Exercises (COMPTUEX) and Joint Task Force Exercises (JTFEX) Off Southern California From February 2007 to January 2009*. Reporting under the BO also fulfills reporting requirements for the NDE.

REPORT ORGANIZATION

This report, which contains only unclassified material, provides the information and analyses for three Southern California (SOCAL) at-sea major exercises, and is submitted in fulfillment of NDE and BO written requirements.

The report is organized by section in the following order:

Section 1 Exercise Summaries provides exercise specific summary including the starting and ending dates, the number of ships and aircraft participating, and the number of hours of active sonar used.

Section 2 Observations and Mitigation Effectiveness provides an estimated number of marine mammals observed during COMPTUEX 07-02, JTFEX-07-03, and JTFEX 07-05 potentially affected or not affected by Anti-submarine Warfare (ASW) operations, noting the nature of any observed effects where possible. In addition, Section 2 assesses the effectiveness of the NDE and BO mitigation and monitoring measures required during exercises with regard to minimizing the use of MFAS in the vicinity of marine mammals.

Appendices contain tables and figures (**Appendix A**), and other supplementary information (**Appendix B**).

BACKGROUND

Composite Unit Training Exercises (COMPTUEX) is part of an Integrated Phase of the Fleet Readiness Training Plan (FRTP) and may involve either a Carrier Strike Group (CSG) or an Expeditionary Strike Group (ESG). A COMPTUEX is conducted as a series of scheduled training events that occur according to a given time schedule against an opposition force. COMPTUEX provides an opportunity for the Strike Group to become proficient in the myriad of required warfare skill sets. Additionally, it stresses the integration or coordination of the different warfare areas and provides realistic training on in-theater operations. The COMPTUEX is normally more structured than the JTFEX, so it is longer in duration.

JTFEX is in the Sustainment or Final Phase of the FRTP and may involve either a CSG or an ESG. It is a scenario-driven, at-sea training exercise designed to evaluate the Strike Group's preparedness for forward deployed contingency and combat operations. JTFEX also utilizes a simulated (mock) opposition force and serves as the venue for U.S. THIRD Fleet to assess the readiness, interoperability, and proficiency of naval forces in realistic, free-play scenarios, ranging from military operations other-than- war to armed conflict. As the final certification event of the FRTP, the Strike Group must demonstrate the ability to operate and integrate into a Joint Operations Area under simulated austere, hostile conditions.

One COMPTUEX and two JTFEXs were conducted in the waters off Southern California from 14 February to 24 March 2007 (**Table A-1 Appendix A**). The types of ASW training conducted during COMPTUEX and JTFEX involved the use of ships, submarines, aircraft, non-explosive exercise weapons, and other training related devices within portions of the Southern California Operating Area (**Figure A-1 Appendix A**).

COMPTUEX 07-02, JTFEX 07-03, and JTFEX 07-05 were planned and prepared by the U.S. Navy prior to receiving the Terms and Conditions of the BO on 13 February 2007. This includes coordinating the logistical arrangements for these advanced training events, ensuring marine species awareness training was provided to exercise participants, and preparation and distribution of the Letter of Instruction (LOI) (**Appendix B**) which reiterates the applicable mitigation measures and explains procedures for reporting marine mammal sightings discussed in Section 2.

Given the timing between issuance of the BO and exercise start dates, some of the procedures used to report sighting information could not be modified in time to collect relevant data to more fully address the exact language of the Terms and Conditions. In addition, the Terms of the BO required the U.S. Navy to submit a monitoring plan by 31 March 2007. These three exercises occurred prior to that plan's submission, therefore the procedures used were consistent with the measures described in the BO. The Office of Protected Resources (OPR), National Marine Fisheries Service (NMFS) and the U.S. Navy have been coordinating to improve data objectives, data quality, and reporting requirements to assist in the analysis for future COMPTUEXs and JTFEXs. This has been a continual, iterative dialog leading to integration of additional monitoring techniques and procedures that will help to advance the state of knowledge on marine mammal distribution and potential MFAS effects or, lack of effects, within the SOCAL Operating Area (OPAREA). The U.S. Navy will explore establishment of new metrics and processes based on these enhancements to the exercise monitoring program, and plans to integrate new results into future reports.

MFAS equipped platforms participating in COMPTUEX and JTFEX include Ticonderoga-class guided missile cruisers (CG) and Arleigh Burke-class guided missile destroyers (DDG) surface combatants with AN/SQS-53C sonar and associated aviation assets (SH-60B/F/R with AN/AQS-13F or AQS-22 dipping sonar, and AN/SSQ-62B/C/D/E Directional Command Activated Sonobuoy System -DICASS), and P-3 Maritime Patrol Aircraft (MPA) (DICASS sonobuoy).

Total numbers of ASW capable aviation assets participating in a given exercise varies based on maintenance ready aircraft and ship configuration. For instance, early versions of the DDG destroyers, the newest Navy surface combatant, do not have onboard hangers for helicopters. Later versions have hangars and up to two SH-60B/F/Rs. Of more importance than actual aircraft numbers however, is that active sonar use by aviation assets is captured and added to sonar totals reported in this document. MFAS on Los Angeles-class (SSN) submarines (AN/BQQ-5) is seldom used in tactical training scenarios, where passive sonar use is the preferred system in order to maximize the stealth aspects of undersea operations.

SECTION 1 EXERCISE SUMMARIES

EXERCISE SPECIFICS

COMPTUEX 07-02 was conducted from 14 February to 02 March 2007 and involved an ESG (**Table A-1 Appendix A**). Ships assigned to this ESG included: (3) non-MFAS equipped ships and (3) MFAS equipped ships. Other participating units representing support and opposition forces included (2) submarines and (2) MFAS equipped ships, although there was no active sonar use by these supporting platforms. Based on DDG ships participating in COMPTUEX 07-02, there were approximately six ASW SH-60s helicopters participating. In addition, one to two ASW P-3 MPA also participated.

JTFEX 07-03 was conducted from 23 February to 03 March 2007 and involved a CSG (**Table A-1 Appendix A**). Ships assigned to this CSG included: (1) non-MFAS equipped ship and (5) MFAS equipped ships. Other participating units representing support and opposition forces included (2) submarines and (3) MFAS equipped ships, although there was no active sonar use by these supporting platforms. Based on the DDG ships participating in JTFEX 07-03, there were approximately of 8-12 ASW SH-60s helicopters available.

JTFEX 07-05 from 14 to 24 March 2007 again involved the same ESG that participated in COMPTUEX 07-02 (**Table A-1 Appendix A**). Other participating units representing support and opposition forces included (2) submarines and (2) MFAS equipped ships, although there was no active sonar use by these supporting platforms. Based on the DDG ships participating in JTFEX 07-05, there were approximately six ASW SH-60 helicopters available.

MITIGATION MEASURES PERFORMED

All mitigations measures as stated in the 23 January 2007 NDE were adhered to for all three Southern California exercises. These 29 NDE measures include specific details for Personnel Training, establish Lookout and Watchstander Responsibilities, mandate specific Operating Procedures, and describe Coordination and Reporting requirements. Observation data from Navy lookout sightings for each exercise is described in Section II.

NDE mitigation measures include:

I. General Maritime Protective Measures: Personnel Training:

1. All lookouts onboard platforms involved in ASW training events will review the NMFS approved Marine Species Awareness Training (MSAT) material prior to use of mid-frequency active sonar.
2. All Commanding Officers, Executive Officers, and officers standing watch on the bridge will have reviewed the MSAT material prior to a training event employing the use of MFAS.
3. Navy lookouts will undertake extensive training in order to qualify as a watchstander in accordance with the Lookout Training Handbook (NAVEDTRA 12968-B).
4. Lookout training will include on-the-job instruction under the supervision of a qualified, experienced watchstander. Following successful completion of this supervised training period, Lookouts will complete the Personal Qualification Standard program, certifying that they have demonstrated the necessary skills (such as detection and reporting of partially submerged objects). This does not preclude personnel being trained as lookouts counted as those listed in previous measures so long as supervisors monitor their progress and performance.
5. Lookouts will be trained in the most effective means to ensure quick and effective communication within the command structure in order to facilitate implementation of protective measures if marine species are spotted.

II. General Maritime Protective Measures: Lookout and Watchstander Responsibilities:

6. On the bridge of surface ships, there will always be at least three people on watch whose duties include observing the water surface around the vessel.

7. In addition to the three personnel on watch noted previously, all surface ships participating in ASW exercises will have at all times during the exercise at least two additional personnel on watch as lookouts.

8. Personnel on lookout and officers on watch on the bridge will have at least one set of binoculars available for each person to aid in the detection of marine mammals.

9. On surface vessels equipped with MFAS, pedestal mounted "Big Eye" (20x110) binoculars will be present and in good working order to assist in the detection of marine mammals in the vicinity of the vessel.

10. Personnel on lookout will employ visual search procedures employing a scanning methodology in accordance with the Lookout Training Handbook (NAVEDTRA 12968-B).

11. After sunset and prior to sunrise, lookouts will employ Night Lookouts Techniques in accordance with the Lookout Training Handbook.

12. Personnel on lookout will be responsible for reporting all objects or anomalies sighted in the water (regardless of the distance from the vessel) to the Officer of the Deck, since any object or disturbance (e.g., trash, periscope, surface disturbance, discoloration) in the water may be indicative of a threat to the vessel and its crew or indicative of a marine species that may need to be avoided as warranted.

III. Operating Procedures

13. A Letter of Instruction, Mitigation Measures Message or Environmental Annex to the Operational Order will be issued prior to the exercise to further disseminate the personnel training requirement and general marine mammal protective measures.

14. Commanding Officers will make use of marine species detection cues and information to limit interaction with marine species to the maximum extent possible consistent with safety of the ship.

15. All personnel engaged in passive acoustic sonar operation (including aircraft, surface ships, or submarines) will monitor for marine mammal vocalizations and report the detection of any marine mammal to the appropriate watch station for dissemination and appropriate action.

16. During MFAS operations, personnel will utilize all available sensor and optical systems (such as Night Vision Goggles to aid in the detection of marine mammals.

17. Navy aircraft participating in exercises at sea will conduct and maintain, when operationally feasible and safe, surveillance for marine species of concern as long as it does not violate safety constraints or interfere with the accomplishment of primary operational duties.

18. Aircraft with deployed sonobuoys will use only the passive capability of sonobuoys when marine mammals are detected within 200 yards of the sonobuoy.

19. Marine mammal detections will be immediately reported to assigned Aircraft Control Unit for further dissemination to ships in the vicinity of the marine species as appropriate where it is reasonable to conclude that the course of the ship will likely result in a closing of the distance to the detected marine mammal.

20. Safety Zones - When marine mammals are detected by any means (aircraft, shipboard lookout, or acoustically) within 1,000 yards of the sonar dome (the bow), the ship or submarine will limit active transmission levels to at least 6 dB below normal operating levels.

    (i) Ships and submarines will continue to limit maximum transmission levels by this 6 dB factor until the animal has been seen to leave the area, has not been detected for 30 minutes, or the vessel has transited more than 2,000 yards beyond the location of the last detection.

(ii) Should a marine mammal be detected within or closing to inside 500 yards of the sonar dome, active sonar transmissions will be limited to at least 10 dB below the equipment's normal operating level. Ships and submarines will continue to limit maximum ping levels by this 10 dB factor until the animal has been seen to leave the area, has not been detected for 30 minutes, or the vessel has transited more than 2,000 yards beyond the location of the last detection.

(iii) Should the marine mammal be detected within or closing to inside 200 yards of the sonar dome, active sonar transmissions will cease. Sonar will not resume until the animal has been seen to leave the area, has not been detected for 30 minutes, or the vessel has transited more than 2,000 yards beyond the location of the last detection.

(iv) Special conditions applicable for dolphins and porpoises only: If, after conducting an initial maneuver to avoid close quarters with dolphins or porpoises, the Officer of the Deck concludes that dolphins or porpoises are deliberately closing to ride the vessel's bow wave, no further mitigation actions are necessary while the dolphins or porpoises continue to exhibit bow wave riding behavior.

(v) If the need for power-down should arise as detailed in "Safety Zones" above, Navy shall follow the requirements as though they were operating at 235 dB - the normal operating level (i.e., the first power-down will be to 229 dB, regardless of at what level above 235 sonar was being operated).

21. Prior to start up or restart of active sonar, operators will check that the Safety Zone radius around the sound source is clear of marine mammals.

22. Sonar levels (generally) – The ship or submarine will operate sonar at the lowest practicable level, not to exceed 235 dB, except as required to meet tactical training objectives.

23. Helicopters shall observe/survey the vicinity of an ASW exercise for 10 minutes before the first deployment of active (dipping) sonar in the water.

24. Helicopters shall not dip their sonar within 200 yards of a marine mammal and shall cease pinging if a marine mammal closes within 200 yards after pinging has begun.

25. Submarine sonar operators will review detection indicators of close-aboard marine mammals prior to the commencement of ASW operations involving active mid-frequency sonar.

26. Increased vigilance during major ASW training exercises with tactical active sonar when critical conditions are present.

Based on lessons learned from strandings in Bahamas 2000, Madeiras 2000, Canaries 2002, and Spain 2006, beaked whales are of particular concern since they have been associated with MFAS operations. Navy should avoid planning major ASW training exercises with MFAS in areas where they will encounter conditions which, in their aggregate, may contribute to a marine mammal stranding event.

The conditions to be considered during exercise planning include:

(1) Areas of at least 1000 m depth near a shoreline where there is a rapid change in bathymetry on the order of 1000-6000 meters occurring across a relatively short horizontal distance (e.g., 5 nm).

(2) Cases for which multiple ships or submarines ($\geq$ 3) operating MFAS in the same area over extended periods of time ($\geq$ 6 hours) in close proximity ($\leq$ 10NM apart).

(3) An area surrounded by land masses, separated by less than 35 nm and at least 10 nm in length, or an embayment, wherein operations involving multiple ships/subs ($\geq$ 3) employing MFAS near land may produce sound directed toward the channel or embayment that may cut off the lines of egress for marine mammals.

(4) Although not as dominant a condition as bathymetric features, the historical presence of a significant surface duct (i.e. a mixed layer of constant water temperature extending from the sea surface to 100 or more feet).

If the major exercise must occur in an area where the above conditions exist in their aggregate, these conditions must be fully analyzed in environmental planning documentation. Navy will increase vigilance by undertaking the following additional protective measure:

A dedicated aircraft (Navy asset or contracted aircraft) will undertake reconnaissance of the embayment or channel ahead of the exercise participants to detect marine mammals that may be in the area exposed to active sonar. Where practical, advance survey should occur within about two hours prior to MFA sonar use, and periodic surveillance should continue for the duration of the exercise. Any unusual conditions (e.g., presence of sensitive species, groups of species milling out of habitat, any stranded animals) shall be reported to the Officer in Tactical Command (OTC), who should give consideration to delaying, suspending or altering the exercise.

All safety zone requirements described in Measure 20 apply.

The post-exercise report must include specific reference to any event conducted in areas where the above conditions exist, with exact location and time/duration of the event, and noting results of surveys conducted.

IV. Coordination and Reporting

27. Navy will coordinate with the local NMFS Stranding Coordinator for any unusual marine mammal behavior and any stranding, beached live/dead or floating marine mammals that may occur at any time during or within 24 hours after completion of mid-frequency active sonar use associated with ASW training activities.

28. Navy will submit a report to the OPR, NMFS, within 120 days of the completion of a Major Exercise. This report must contain a discussion of the nature of the effects, if observed, based on both modeled results of real-time events and sightings of marine mammals.

29. If a stranding occurs during an ASW exercise, NMFS and Navy will coordinate to determine if MFAS should be temporarily discontinued while the facts surrounding the stranding are collected.

SECTION 2 OBSERVATIONS AND MITIGATION EFFECTIVENESS

MARINE MAMMALS AND OCEANOGRAPHIC CONDITIONS

Section 2 provides estimated numbers of marine mammals observed in Southern California waters during COMPTUEX 07-02 (Bonhomme Richard ESG), JTFEX 07-03 (USS Nimitz CSG), and JTFEX 07-05 (Bonhomme Richard ESG). This information is based on analysis of actual events and sightings of marine mammals reported by exercise participants noting the nature of any observed effects. **Table A-2 Appendix A** lists a subset of possible marine mammal species occurring in Southern California waters and highlights the Endangered Species Act (ESA) listed species described in the BO.

All detections were made by standard Navy surface ship lookout reporting procedures as detailed in a Commander, THIRD Fleet LOI issued to each CSG and ESG prior to participation in a COMPTUEX or JTFEX (**Appendix B**). No marine mammal sightings were reported by helicopters or P-3s.

February to March 2007 oceanographic conditions, a factor in small scale marine mammal distribution within Southern California waters, were typical for the winter season (Hickey 1993). Satellite monitoring data for sea surface temperature (SST), chlorophyll, and frontal probability index were obtained online from the OceanWatch North Pacific Demonstration Project, a program of CoastWatch and the Environmental Research Division, Southwest Fisheries Science Center (SWFSC), National Marine Fisheries Service (NMFS) (http://las.pfeg.noaa.gov/oceanWatch/oceanwatch.php). **Figures A-2 through A-4 Appendix A** show 14-day composite averages of SST, chlorophyll, and frontal probability for the period ending 28 February and 24 March. SST values ranged from approximately 11-16.5°C (51.8-61.7°F) and were fairly uniform throughout the COMPTUEX\JTFEX OPAREAs (**Figure A-2**). Chlorophyll was higher in February than in March (**Figure A-3**), and no significant February front features are visible at the resolution provided by the frontal probability index (**Figure A-4**).

Based on seasonal survey and monitoring results for Southern California (Dohl et al. 1981, Dohl et al. 1986, Bonnell and Dailey 1993, Carretta et al. 2000, Ferguson and Barlow 2001, Hildebrand 2005, Soldevilla et al. 2006, Carretta et al. 2007, Oleson et al. 2007), expected February to March marine mammal occurrence within the SOCAL OPAREA include in order of likely abundance:

- For toothed whales and dolphins, the most abundant species type in Southern California are the Pacific white-sided dolphin, northern right whale dolphin, Dall's porpoise, and short-beaked common dolphin;
- For pinnipeds, the California sea lion;
- For baleen whales, migrating gray whales, and ESA listed fin whales. (**Table A-2 Appendix A**)

A significant portion of northward migrating gray whales travel along offshore paths to the east and west of San Clemente Island (Bonnell and Dailey 1993, Carretta et al. 2000). ESA listed fin whales are found on the Southern California shelf year round (Carretta et al. 2000, Hildebrand 2005, Soldevilla et al. 2006). ESA listed blue whales are, in general, not observed or tracked acoustically in Southern California between February and March (**Figure A-5 Appendix A**) (Hildebrand 2005, Soldevilla et al. 2006, Oleson 2007). ESA listed sperm whale clicks have been detected year-round in Southern California but more often in offshore slope waters, although detections and visual detections are more limited during winter (**Table A-3 Appendix A**) (Soldevilla et al. 2006).

On the U.S. West coast, several species of naturally occurring diatoms produce a toxin called domoic acid which has been linked to marine mammal strandings including pinnipeds (Geraci et al. 1999, Van Dolah et al. 2003, MMC 2004, Van Dolah 2005, Greig et al. 2005, Brodie et al. 2006, NMFS, 2007a). Domoic acid causes amnesic shellfish poisoning (ASP) and is a phycotoxin (algal toxin) found associated with

certain algal blooms of the genus *Pseudo-nitzschia*. In particular, California sea lions have been reported to be particular susceptible to domoic acid poisoning (CDFG 2002, Greig et al. 2005, Brodie et al. 2006), leading to unexpected mortality events (UME) as defined by Dierauf and Gulland 2001, Harwood 2002, Gulland 2006, NMFS 2007a. There were documented California sea lion UMEs from domoic acid poisoning in 2000 and 2002 (NMFS 2007b), and although not formally reported by NMFS or in peer-reviewed literature yet, there are indications that a severe domoic acid event occurred within California ocean waters this year from late winter to spring and increases in cetacean and pinniped mortalities predicted (CDFG 2007, Morris 2007, UCSC 2007).

EXERCISE MARINE MAMMAL SIGHTINGS

COMPTUEX 07-02 Observations

Table A-4 provides a detailed timeline of marine mammal observations made by Navy exercise participants for COMPTUEX 07-02. During COMPTUEX 07-02, there were 26 live marine mammal sightings for a total of 404 animals (**Table A-4**). Numbers of animals reported by a ship are based on the observer's estimate of the number of animals present. Four sightings of two animals were of floating dead animals (see below). Of these 30 (26 +4) sightings, 37% (355 animals) were identified as dolphins. During this COMPTUEX, 37% of the sightings were categorized as "unidentified whales" that could have been either non-ESA listed gray whales, ESA large whales (most likely fin, or less likely sperm whales), or non-ESA small whales. Small whales constituted 10% of the sightings.

A single unidentified badly decomposed whale carcass was sighted floating southeast of San Clemente Island on 22 February 2007 by a surface ship. The sighting vessel was not using MFAS at the time (**Table A-4**). Species identification of the carcass was not possible due to the advanced state of decomposition. A voice report was made to NMFS HQ, and a Navy message sent to Chief of Naval Operations (CNO). Subsequent sighting of a whale carcass 30 minutes later on 22 February 2007 by another ship and again 29 hours later on 23 February 2007 by a third vessel (**Figure A-6 Appendix A**). Regional ocean circulation in the region is dominated by the California Current and various counter-currents and eddies (Hickey 1993). In winter the California Current has less velocity and is more variable around the southern Channel Islands, typically flowing along underwater isobaths and across sill contours (Hickey 1993). Information on surface currents for 22 February in **Figure A-6** was obtained from the Southern California Coastal Ocean Observing System (SCCOOS), a joint organization providing real-time ocean monitoring data for Southern California (http://www.sccoos.org/index.html). The surface current velocity vector diagram in **Figure A-6** was provided by the Coastal Ocean Currents Monitoring Program. This figure represents a 25-hour averaging of surface current (i.e. determined from the preceding 25 hours of data) derived from non-Navy radar based measurements. Velocity vectors indicate that surface currents in the region of the first carcass sighting were from 5-15 centimeters/second (approximately 0.2-0.5 feet/second) heading to the southeast. This is consistent with typical velocities reported in Hickey (1993). These multiple sightings of the same carcass, therefore, most likely represent southeasterly movement of the carcass as a result of local surface currents. Due to the advanced degree of decomposition and southerly movement of the carcass, the animal most likely died from possibly natural causes some time before the exercise start date on 14 February and to the north of the vessels participating in COMPTUEX 07-02.

One dead floating sea lion was observed on 25 February by a non-MFAS equipped ship. As discussed previously, significant sea lion mortalities and UMEs are expected based on the current 2007 winter-spring Southern California domoic acid poisoning event, and in line with past historic UMEs for sea lions from the same cause.

JTFEX 07-03 Observations

Table A-5 provides a detailed timeline of marine mammal observations made by Navy exercise participants for JTFEX 07-03.

During JTFEX 07-03, there were 42 live marine mammal sightings for an estimated total of 881 animals (**Table A-5**). There were no sightings of floating dead animals. Of these 42 sightings, 67% (858 animals) were identified as dolphins. During this JTFEX, "unidentified whales" that could have been either ESA large whales, or non-ESA small whales accounted for 21% of the sightings. Small whales constituted 5% of the sightings. There was only one sighting of a single large whale.

JTFEX 07-05 Observations

Table A-6 provides a detailed timeline of marine mammal observations made by Navy exercise participants for JTFEX 07-05.

During JTFEX 07-05, there were 61 live marine mammal sightings for an estimated total of 729 animals (**Table A-6**). Five sightings of five floating dead animals were reported, four seals or sea lions, and one dolphin (discussed below). Of these 61 live sightings, 44% (607 animals) were identified as dolphins. Post-analysis of the species identification for the 18 March sighting raises questions as to whether the lookout reports are accurate in their identification. As stated previously in discussion on predicted SOCAL marine mammal species, blue whales are not commonly sighted during these winter and early spring periods. This does not rule out the possibility that blue whales could be present, but is worth clarifying for future reports.

Four dead floating seals or sea lions were reported during JTFEX 07-05 twice on 16 March 2007, on 18 March 2007, and 19 March 2007. MFAS was not in use at the time by exercise participants and the reporting vessels (**Table A-6**). Although estimated decomposition of the animals was not reported, given the relative short distance between sightings (<10 nm), the short time span between successive sightings, the relative plots of the sighting locations, and typical current flow, these events again represents multiple sightings of the same one or two carcasses. As discussed previously, significant sea lion mortalities and UMEs are expected based on the current 2007 winter-spring Southern California domoic acid poisoning event, and in line with past historic UMEs for sea lions from the same cause. A dead dolphin reported by a non-MFAS equipped ship at the end of the exercise on 24 March 2007 was sighted significantly after the majority of MFAS use, and in a location where MFAS ships had not been operating. This animal mortality can not be associated with sonar operation and may have been caused by other factors. Domoic acid poisoning, since it affects the marine food chain, may also have played a role.

MITIGATION AND MONITORING ASSESSMENT

OVERVIEW

The NDE calls for the U.S. Navy to submit a report to NMFS that includes a discussion of the nature of the effects, if observed, based on modeling results and marine mammal sightings. In addition, the BO Terms and Conditions require a report that evaluates the mitigation measures and details results from the U.S. Navy's exercise monitoring program. In this case, the mitigation measure under the BO are the NDE measures, therefore the discussion is presented together in this section.

This section of the report, therefore, provides an assessment of the effectiveness of the mitigation and monitoring measures. It must also be recognized that ASW proceeds slowly and requires careful development of a tactical frame of reference over time as data is integrated from a number of sources and

sensors. Once MFAS is turned off for a period of time, turning it back on later does not usually allow a Commander to simply continue from the last frame of reference. Thus, lost MFAS time not only equates to lost exercise time but should be considered in the fuller context of its overall impact on the tempo and development of a "tactical picture" shared among exercise participants as they trained toward the goal of improving ASW skills in general.

Passive Sonar

Passive sonar involves acoustic listening to underwater sounds and does not involve transmitting active sound into the water column. Passive sonar use is driven by the tactical nature of an ASW or training event, and should be assumed to be employed whenever possible. Given the nature of passive sonar technology and underwater sound propagation, localizing or determining absolute position of an object is more difficult than active sonar.

The U.S. Navy does not have a reporting system to capture the amount of passive sonar employed within a given geographic region. For COMPTUEX 07-02, JTFEX 07-03, and JTFEX 07-05, there were no reports of passive acoustic detections of marine mammals by exercise participants. Future reports will explore whether metrics for passive acoustic use can be generated, and if marine mammal detections are occurring.

Active Sonar

Typically, there are no measurements (calibrated or otherwise) of actual sound levels made during an exercise and none were made during COMPTUEX 07-02, JTFEX 07-03, and JTFEX 07-05. Source levels, numbers of sources, and frequencies are classified since that information would provide potential adversaries with important tactical data. An explanation of sonar hours as presented in this report is also warranted. Total active sonar hours represent a sum of the total time from a number of individual training events during a COMPTUEX or JTFEX. This value does not represent actual total sonar ping hours. In other words, the ship logs when the sonar was turned on at the beginning of a training event, and reports time until the event is finished. During this period, the MFAS only puts active sound into the water at discrete intervals. Sonar signals are not a continuous source of acoustic energy. For example, surface ship sonar signal consists of a pulse (i.e. ping) less than two seconds long with approximately a minimum of 30 seconds between successive pings (NMFS 2007c).

Given that location planning and mitigation measures are designed to minimize interactions between Navy assets and marine mammals, the observations of marine mammals by Navy assets only occurred as infrequent and very brief encounters, the majority of which occurred when there was no MFAS in use.

COMPTUEX 07-02 Assessment

During COMPTUEX 07-02, 130.5 hours of MFAS use was reported. Of note, this estimate may be missing data from one vessel whose sonar times were not found in classified Navy tracking systems, yet performed mitigation during some sightings. At worst, and in line with other vessels during COMPTUEX 07-02, estimated MFAS use would be between 15-65 hours leading to a total sonar hours of 145.5 to 195.5.

MFAS is only used during carefully reviewed scenarios and for only a small subset of any given exercise time frame. Therefore, as expected in COMPTUEX 07-02, a majority of these mammals were sighted during periods when MFAS was not in use (**Table A-4**). 80 percent of the sightings were in this category. Although there was high-level emphasis placed upon marine mammal protection as mandated by Navy regulation and policy, during COMPTUEX 07-02 there were three instances where MFAS was secured (i.e. transmission stopped) due to sighting of marine mammals during MFAS operation. This represented

10% of the total sighting events, and may have impacted ASW training. Sonar was secured at observed ranges of 50, 4000, and 4000 yards (**Tables A-4 and A-7**). Securing of MFAS at the 4000 yard range is not required under Navy SOP and NDE, and represents an overall conservative mitigation procedure conducted twice by the same MFAS vessel.

There were two sightings where MFAS was powered down per NDE requirements, once at 300 yards and once at 1000 yards.

There were no sightings of marine mammal outside of the mitigation safety zone where MFAS was in use, but no mitigation occurred.

In summary for COMPTUEX 07-02, the reports from exercise participants contained nothing that could be construed as abnormal or "observed effects" of MFAS, or other vessel operations. There were no instances where marine mammals behaved in any erratic, unusual, or anything other than apparently normal manner. There were no reports of ship strikes on marine mammals, and one report of a vessel maneuvering to avoid the path of a marine mammal.

JTFEX 07-03 Assessment

During JTFEX 07-03, 99.9 hours of MFAS use was reported.

MFAS is only used during carefully reviewed scenarios and for only a small subset of any given exercise time frame. During JTFEX 07-03 there were no reported sightings of marine mammals concurrent with MFAS operation, and no reports of MFAS having to be secured due to the presence of marine mammals.

There were no instances where marine mammals behaved in any erratic, unusual, or anything other than apparently normal manner. There were no reports of ship strikes on marine mammals, and one report of a vessel maneuvering to avoid the path of a marine mammal.

JTFEX 07-05 Assessment

During JTFEX 07-05, 47.8 hours of MFAS use was reported.

MFAS is only used during carefully reviewed scenarios and for only a small subset of any given exercise time frame. Therefore, as expected in JTFEX 07-05, a majority of these mammals were sighted during periods when MFAS was not in use (**Table A-6 and A-8**). 83% of the sightings were in this category.

Although there was high-level emphasis placed upon marine mammal protection as mandated by Navy regulation and policy, during JTFEX 07-05 there were five instances where MFAS was secured (i.e., transmission stopped) due to sighting of marine mammals during MFAS operation. This represented 8% of the total sighting events, and may have impacted ASW training. Sonar was secured at observed ranges of 75, 800, 2000, and 2000 yards (**Tables A-6 and A-8**). There were three sightings when MFAS was in use and where the distance to the animal(s) was not recorded by the reporting unit. Securing MFAS at ranges greater than 200 yard range is not required under Navy SOP and NDE, and represents an overall conservative mitigation procedure conducted twice by a single MFAS vessel.

There were six sightings where MFAS was powered down per NDE requirements: unknown range, unknown range, 500, 500, 500, and 1500 yards. There was no explanation for why the unknown ranges were not reported which will be addressed in future marine species awareness training and additional LOI language to stress the importance of this piece of information.

There were no sightings of marine mammal outside of the mitigation safety zone where MFAS was in use, but no mitigation occurred.

There were 12 instances when MFAS was not in use and the vessel changed course to maneuver away from a marine mammal.

In summary for JTFEX 07-05, the reports from exercise participants contained nothing that could be construed as abnormal or "observed effects" of MFAS, or other vessel operations. There were no instances where marine mammals behaved in any erratic, unusual, or anything other than in apparently normal manner. There were no reports of ship strikes on marine mammals, and 12 reports of vessels maneuvering to avoid the path of a marine mammal.

NDE AND BO ASSESSMENT

All 23 Jan 2007 NDE measures promulgated in the *Mid-Frequency Active Sonar Mitigation Measures during Major Training Exercises or within Established DoD Maritime Ranges and Established Operating Areas* (NDE) section were implemented for COMPTUEX 07-02, JTFEX 07-03, and JTFEX 07-05.

Prior to COMPTUEX and JTFEX, the U.S. Navy assessed the physical and oceanographic conditions of the SOCAL OPAREA per NDE Measure 26 "*Increase vigilance during major ASW training exercises with tactical active sonar when critical conditions are present*", and determined that pre-MFAS aerial surveys were not warranted. While there can be complex bottom topography underlying the ocean areas of Southern California (NCCOS 2005), there are no MFAS operations with surrounding land masses, channels, or embayments thought to be contributing factors associated with past strandings of certain beaked whale species in the Atlantic Ocean and Mediterranean Sea (Cox et al. 2006). Therefore, the requirements stated in NDE Measure 26 do not apply to the physical conditions found in Southern California.

In addition to the above assessment of the NDE, the BO calls for a report that evaluates the effectiveness of the U.S. Navy's exercise mitigation measures. As described previously, the three categories of measures, Personnel Training, Lookout and Watchstander Responsibilities, and Operating Procedures as outline in the NDE, appear effective in detecting and responding appropriately to the presence of marine mammals, when observed. For instance, one BO Term and Condition requests the U.S. Navy to estimate the number of ESA listed marine mammals that may have been exposed to received energy level equal to or greater than 173 dB re 1 $\mu Pa^2 \cdot s$.

If a conservative metric of between 1000-1400 yards from a surface ship MFAS is used as an approximate boundary to 173 dB re 1 $\mu Pa^2 \cdot s$, then counts of marine mammals sighting distances during MFAS use from **Tables A-7** and **A-8** can be compared to this distance.

- For COMPTUEX, 54 animals were sighted at ranges less than 1400 yards, representing 20 potential ESA species, and 34 MMPA species (see **Table A-7**). However, in the three cases involved, U.S. Navy mitigation resulted in MFAS either being reduced in power or turned off, which would have reduced or eliminated potential exposures.
- For JTFEX 07-03, no marine animals were sighted within the proscribed mitigation ranges (200, 500, 1000 yards), so no MFAS exposure is expected.
- For JTFEX 07-05, 164 animals were sighted at ranges less than 1400 yards, representing 34 potential ESA species, and 130 MMPA species (see **Table A-7**). In the eight cases involved, U.S. Navy mitigation resulted in MFAS either being reduced in power or turned off, which would have reduced or eliminated potential exposures. Complicating this assessment is the lack of range to animals for three sightings mentioned previously.

From **Table A-9 Appendix A**, potential exposure estimates are shown based on acoustic impact modeling conducted for the COMPTUEX/JTFEX Environmental Assessment/Overseas Environmental Assessment

(EA/OEA) (DoN 2007). Using an exercise average for ESA species for instance, an estimated 48.2 blue whales (46.4 Level B Sub-TTS + 2.0 Level B), 39.0 fin whales (37.6 Level B Sub-TTS + 1.4 Level B), 4.7 humpback whales (4.7 Level B Sub-TTS + 0 Level B), 0.3 sei whales (0.3 Level B Sub-TTS + 0 Level B), and 9.0 sperm whales (8.4 Level B Sub-TTS + 0.6 Level B) would be predicted to be exposed to MFAS during any given COMPTUEX or JTFEX. By way of comparison, even the 54 and 162 animals from COMPTUEX 07-02 and JTFEX 07-05 are significantly less than the total marine mammals estimated by the model.

The U.S. Navy acknowledges that this discussion does not account for potential marine mammal species not observed, which is a difficult determination even for the marine mammal scientific community, and is seeking to address this issue as discussed below.

As to the effect of MFAS power reduction and securing due to the presence of marine mammals, there is no additional information that can be added at this time as to the operational effect of these events. There is an effort underway within the operational community to try and articulate exactly what kind of relative effect MFAS mitigation measures have on ASW training.

In regards to impacts not associated with MFAS such as ship strikes, the U.S. Navy has a robust ship strike reporting program and reports from COMPTUEX and JTFEX of no ship strikes and of maneuvering to avoid animals provides some evidence that these avoidance measures are effective.

Data Limitations and Improvements

The U.S. Navy is committed to development of robust exercise and long-term range complex monitoring plans that will integrate multiple tools in order to provide better assessment of marine mammal occurrence and possible MFAS effects, or lack of effects.

Future reporting requirements will collect more detailed descriptions on marine mammal behavioral observations by Navy lookouts for validation by NMFS. Improvements to reporting requirements are planned for September 2007 and 2008 exercises to better incorporate non-subjective categories of behavioral description, and instead report "what the observer saw", and how long the observation continued. Adding sea state and visibility reports at the time of sighting may result in a better determination of the effective visual monitoring ranges being reported. While identification to species-level would be optimal, that level of detail may not be immediately obtainable from U.S. Navy lookout reports without further training and testing of alternative methodologies to supplement existing shipboard reports. In accordance with the BO, data collection needs to address these questions will be incorporated into future exercises as the U.S. Navy's exercise monitoring program evolves.

There is no information from which to assess how many, if any, animals not observed by Navy lookouts may or may not have been exposed to MFAS received levels greater than 173 dB re 1 $\mu Pa^2 \cdot s$. Data collection needs to address this question will also be incorporated into future exercises, although this remains a problematic science issue for even non-Navy marine mammal surveys.

Although not conducted specifically for these February 2007 to March 2007 exercises, ship based and aerial monitoring designed in support of future exercise monitoring and future range complex monitoring is being developed by the U.S. Navy. The COMPTUEX/JTFEX Monitoring Plan is being reviewed and enhanced for FY08 implementation. New information on the scope and results from any exercise monitoring will be provided in subsequent U.S. Navy After Action Reports. The U.S. Navy is looking to integrate additional monitoring tools and techniques in future exercises as the exercise and range complex monitoring plans are designed and implemented.

NDE Measure 27 calls for the U.S. Navy to report any dead and floating marine mammals that may be sighted. Since the floating whale carcass observed during COMPTUEX 07-02 was found badly decomposed, the U.S. Navy seeks clarification from NMFS on whether these coincidental encounters with decomposing floating carcasses warrant reporting under the NDE should a similar circumstance be encountered in future exercises. Navy does not believe that repeated reports are required when different units locate the same floating carcass.

Circumstantial evidence for increased natural marine mammal mortality associated with potential algal toxin within California ocean waters during early 2007 is not unexpected and may have contributed to floating pinniped and dolphin carcasses observed during COMPTUEX 07-02 and JTFEX 07-05.

CONCLUSIONS AND SUMMARY

- Marine mammals were sighted 138 times by exercise participants during COMPTUEX 07-02, JTFEX 07-03, and JTFEX 07-05. These sightings reported approximately 2,014 animals.
- In each of these cases, the marine mammals were detected by Navy watchstanders in accordance with Navy standard operational procedures and as reiterated by NDE mitigation measures.
- Observations of marine species and their behaviors, as previously detailed, showed no unusual behaviors due to MFAS use. There were no indications from the observations reported that the presence of exercise participants had any affect on any marine mammals. The U.S. Navy acknowledges that it is difficult to assess the potential exposure to sonar for species not observed, but is willing to address this challenge by integrating other monitoring elements in accordance with the BO.
- There were no ship strikes on marine mammals during these exercises and 13 instances where U.S. Navy vessels maneuvered to avoid crossing a marine mammal's path and increase the separation between the ship and animal.
- In approximately 88% of the instances where marine mammals were detected during COMPTUEX 07-02, JTFEX 07-03, and JTFEX 07-05, MFAS was not operating and there were no mandated sonar shut downs.
- Between combined COMPTUEX 07-02, JTFEX 07-03, and JTFEX 07-05 events, MFAS was secured eight times representing an approximately 6% loss of ASW training opportunities, as well as potentially interrupting the tactical situational awareness of the participating units and ESG/CSG.
- For COMPTUEX 07-02, JTFEX 07-03, and JTFEX 07-05, when marine mammals were observed within 1000 yards of a MFAS ship using sonar regardless of the species, sonar power was either reduced or secured per the mitigation measures until the animals clear the area or the range between the ship and animals increases.
- Improvements to the U.S. Navy lookout reporting procedures will be implemented for future exercises to better capture metrics on weather conditions during the sighting, and more detailed observations of animal behavior.
- The U.S. Navy is committed to development of robust exercise and long-term range complex monitoring plans that will integrate multiple tools in order to provide better assessment of marine mammal occurrence and possible MFAS effects, or lack of effects. FY08 plans may include various mixes of ship and aerial surveys independent of exercise participants, validation by experienced biologist(s) on lookout effectiveness in observing marine mammals, and use of new research and development technologies to advance the state of marine mammal monitoring.

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APPENDIX A- TABLE AND FIGURES

INTRODUCTION

This Appendix contains material supporting the discussion in the U.S. Navy's COMPTUEX/JTFEX After Action Report. It is divided into two Appendices. Appendix A contains tables and figures referred to in the main Report. Appendix B contains the THIRD FLEET Letter of Instruction (LOI) directing exercise participants to comply with NDE and BO conditions, and specifies the exact marine mammal sighting reporting language ships are responsible for providing after the exercise.

Table A-1. SOCAL COMPTUEX and JTFEX in SOCAL between February and March 2007.

CSG/ESG	Event Name	Dates	MFAS Use Reported (hours)
ESG	COMPTUEX 07-02	14 Feb-02 Mar 2007	130 hrs
CSG	JTFEX 07-03	23 Feb-03 Mar 2007	99.9 hrs
ESG	JTFEX 07-05	14-24 Mar 2007	47.8
* This estimate may be missing data from one vessel whose sonar times were not found in classified Navy tracking systems, yet performed mitigation during some sightings. At worst, and in line with other vessels during COMPTUEX 07-02, estimated use would be between 15-65 hours leading to a total sonar hours of 145.5 to 195.5.			

Table A-2. Potential sighting probabilities for select Southern California marine mammal species.

Sighting Probability	Species
Likely Occurrence, Most Likely Seen	**Gray whale (non-ESA listed)** Seasonal migration through Southern California, northward migration occurring during COMPTUEX 07-02, JTFEX 07-03, and JTFEX 07-05 **Fin whale (ESA listed)** Small regional population
Possible Occurrence, Less Likely Seen	**Sperm whale (ESA listed)** Generally seen >2000 meter depth contour. Less common on California shelf waters. Limited visual sighting during Feb-Mar. **Humpback whale (ESA listed)** Wintering grounds possibly off Mexico. Limited visual sighting during Feb-Mar. **Guadalupe fur seal (ESA listed)** Small population, limited breeding on southern California Channel Islands.
Not Expected to Be Seen	**Blue whale (ESA listed)** Not common winter Southern California species, limited to no acoustic and visual sightings Feb-Mar. **Sei whale (ESA listed)** Very rare in Southern California. Only three visual sightings since 1970, may prefer water temperatures greater than 21C

Table A-3. Visual detections of cetaceans over California Cooperative Oceanic Fisheries Investigations (CalCOFI) cruises from July 2004–November 2005. Total number of individuals sighted per species for each trip (Table from: Soldevilla et al. 2006).

	Jul. 2004	Nov. 2004	Jan. 2005	Apr. 2005	Jul. 2005	Nov. 2005	Total
Blue whale	9	7	–	–	14	–	30
Fin whale	11	9	–	2	7	32	61
Gray whale	–	1	4	–	–	–	5
Humpback whale	2	22	–	17	7	7	55
Minke whale	–	–	–	1	2	1	4
Sperm whale	14	–	–	5	5	3	27
Killer whale	–	–	–	–	6	–	6
Baird's beaked whale	20	–	–	–	–	–	20
Cuvier's beaked whale	2	4	–	–	–	–	6
Unid. beaked whale	–	2	–	–	–	–	2
Unid. whale	34	25	6	7	18	6	96
Common dolphin—short-beaked	1657	1946	2421	440	2184	412	9060
Common dolphin—long-beaked	475	3729	60	1650	1084	235	7233
Common dolphin—unid. spp	843	852	29	32	3481	1621	6858
Risso's dolphin	17	102	12	26	–	235	392
Northern right whale dolphin	–	2	5	299	3	14	323
Pacific white-sided dolphin	25	183	44	157	81	2	492
Rough-toothed dolphin	–	–	–	9	–	–	9
Striped dolphin	77	–	–	–	–	–	77
Bottlenose dolphin	30	11	–	20	–	56	117
Unid. dolphin	900	2204	1220	183	207	392	5106
Dall's porpoise	2	–	21	58	–	17	98
Harbor porpoise	2	–	–	–	–	–	2
Total individuals sighted	4120	9099	3822	2906	7099	3033	30079

Table A-4. Marine mammal sightings and actions by exercise participants during COMPTUEX 07-02.
Text in red Bold indicate events when MFAS was in use and secured due to marine mammal mitigation. Red text in *Italics* indicates when MFAS was in use, but mitigation other than securing sonar enacted.

Date-Time (local)	Ship Type	Description of Actions Taken	# of animals	Animal Type
02/15-1708	MFAS ship	Surface ships sights 2 "whales" traveling at 800 yards. MFAS NOT in use. No action taken.	2	whale
02/15-0905	MFAS ship	Surface ships sights 1 "dolphin" traveling at 20 yards. MFAS NOT in use. No action taken.	1	dolphin
02/15-1005	*non- MFAS ship*	Surface ships sights 30 "porpoises" traveling at 50 yards. NO MFAS on ship. No action taken.	30	dolphin
02/15-0534	*non- MFAS ship*	Surface ships sights 3 "whales" traveling at 1000 yards. NO MFAS on ship. No action taken.	3	whale
02/17-0921	MFAS ship	Surface ships sights 1 "pilot whale" resting at 800 yards. MFAS NOT in use. No action taken.	1	sm whale
02/17-1137	MFAS ship	Surface ships sights 1 "whale" resting at 4000 yards. MFAS NOT in use. No action taken.	1	whale
02/20-0747	MFAS ship	Surface ships sights 4 "dolphins" bow riding at 15 yards. MFAS NOT in use. No action taken.	4	dolphin
02/20-0714	MFAS ship	Surface ships sights 3 "whales" traveling at 10000 yards (5 nm). MFAS NOT in use. No action taken.	3	whale
02/20-0910	MFAS ship	Surface ships sights 1 "whale" traveling at 4000 yards (2 nm). *MFAS IN USE. Sonar secured.*	1	whale
02/20-0910	MFAS ship	Surface ships sights 20 "dolphins" traveling at 4000 yards (2 nm). *MFAS IN USE. Sonar secured.*	20	dolphin
02/20-0834	MFAS ship	Surface ships sights 1 "pilot whale" traveling at 11000 yards. MFAS NOT in use. No action taken.	1	sm whale
02/20-1103	MFAS ship	Surface ships sights 4 "pilot whales" traveling at 300 yards. *MFAS IN USE. Reduce by 10dB.*	4	sm whale
02/21-0801	MFAS ship	Surface ships sights 20 "whales" traveling at 1000 yards. *MFAS IN USE. Reduce dB and ship speed.*	20	whale
02/21-0830	*non- MFAS ship*	Surface ships sights 20 "dolphins" closing to bow riding at 1000 yards. NO MFAS on ship. No action taken.	20	dolphin
02/21-0845	MFAS ship	Surface ships sights 30 "dolphins" traveling at 26000 yards. MFAS NOT in use. No action taken.	30	dolphin
02/22-1030	MFAS ship	Surface ships sights 1 **"dead whale"** floating at 1000 yards. MFAS NOT in use. No action taken.	x	dead whale
02/22-1100	*non- MFAS ship*	Surface ships sights 1 **"dead whale"** floating near bow. NO MFAS on ship. No action taken.	x	dead whale
02/23-1604	MFAS ship	Surface ships sights 1 **"dead whale"** floating at 500 yards. MFAS NOT in use. No action taken.	x	dead whale
02/24-1345	MFAS ship	Surface ships sights 1 "whale" traveling at 2000 yards. MFAS NOT in use. No action taken.	1	whale
02/25-1355	*non- MFAS ship*	Surface ships sights 1 **"dead sea lion"** floating at 300 yards. NO MFAS on ship. No action taken.	x	dead sea lion
02/25-1428	*non- MFAS ship*	Surface ships sights 1 "seal" traveling at 500 yards. NO MFAS on ship. No action taken.	1	seal
02/25-1444	*non- MFAS ship*	Surface ships sights 1 "whale" traveling at 500 yards. NO MFAS on ship. No action taken.	1	whale

Date-Time (local)	Ship Type	Description of Actions Taken	# of animals	Animal Type
02/25-1636	*non- MFAS ship*	Surface ships sights 60-80 "dolphins" traveling at 1000-10000 yards. NO MFAS on ship. No action taken.	80	dolphin
02/27-0646	*non- MFAS ship*	Surface ships sights 100 "dolphins" traveling at 1000-10000 yards. NO MFAS on ship. No action taken.	100	dolphin
02/28-0818	MFAS ship	Surface ships sights 20 "dolphins" traveling at 500 yards. MFAS NOT in use. No action taken.	20	dolphin
02/28-1048	MFAS ship	Surface ships sights 20 "dolphins" traveling at 20 yards. MFAS NOT in use. No action taken.	20	dolphin
02/28-1425	MFAS ship	Surface ships sights 30 "dolphins" traveling at 50 yards. MFAS IN USE. Sonar secured.	30	dolphin
03/01-1115	MFAS ship	Surface ships sights 2 "whales" traveling at 6 yards. MFAS NOT in use. **Ship maneuvers to avoid.**	2	whale
03/01-1145	MFAS ship	Surface ships sights 5 "whales" traveling at 1000 yards. MFAS NOT in use. No action taken.	5	whale
03/01-1615	MFAS ship	Surface ships sights 3 "whales" traveling at 2000 yards. MFAS NOT in use. No action taken.	3	whale
	30 (26 + 4 dead)	= total sighting events total number of animals =	**404**	

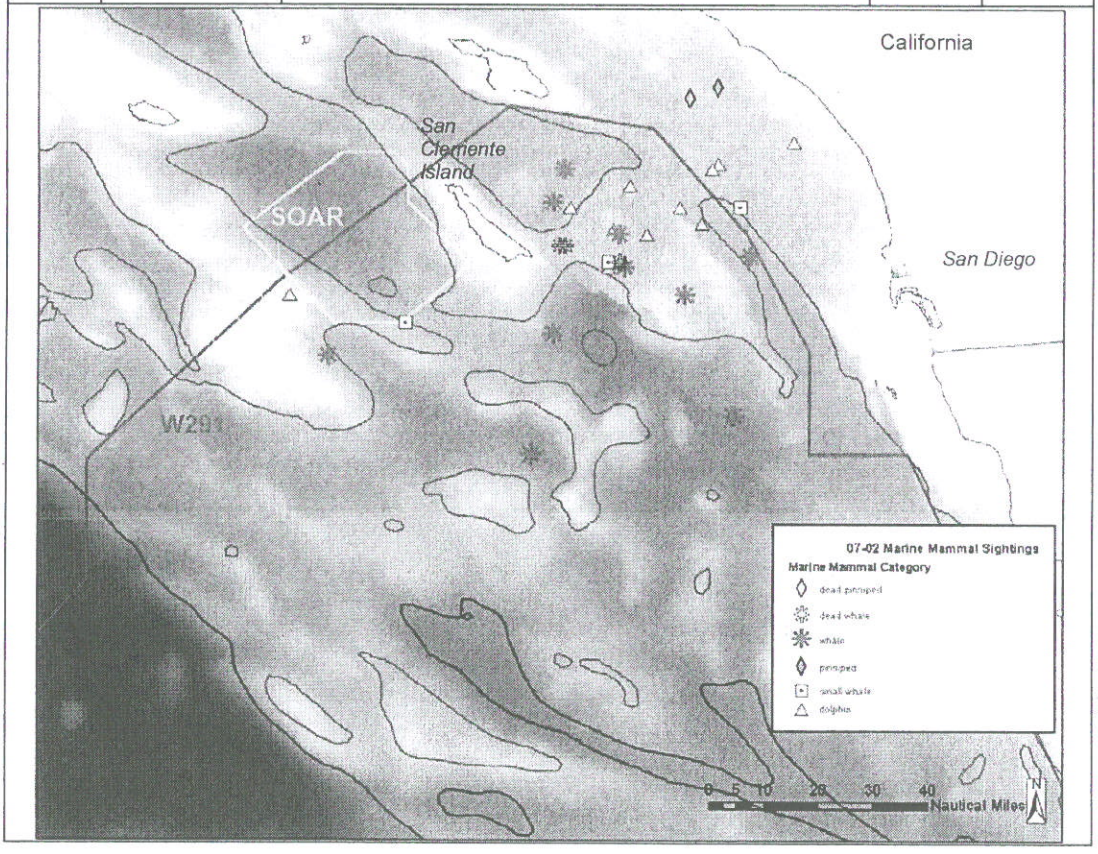

Table A-5. Marine mammal sightings and actions by exercise participants during JTFEX 07-03. Text in red Bold indicate events when MFAS was in use and secured due to marine mammal mitigation. Red text in *Italics* indicates when MFAS was in use, but mitigation other than securing sonar enacted.

Date-Time (local)	Ship Type	Description of Actions Taken	# of animals	Animal Type
02/15-1110	MFAS ship	Surface ships sights 1 "dolphin" jumping at 300 yards. MFAS NOT in use. No action taken.	1	dolphin
02/23-1432	MFAS ship	Surface ships sights 20+ "dolphins" jumping at 300 yards. MFAS NOT in use. No action taken.	20	dolphin
02/24-0747	MFAS ship	Surface ships sights 100+ "dolphins" bow riding at 50 yards. MFAS NOT in use. No action taken.	100	dolphin
02/24-0824	MFAS ship	Surface ships sights 70 "dolphins" swimming at 500 yards. MFAS NOT in use. No action taken.	70	dolphin
02/24-0958	MFAS ship	Surface ships sights 15 "dolphins" traveling at 1700 yards. MFAS NOT in use. No action taken.	15	dolphin
02/24-1154	MFAS ship	Surface ships sights 1 "whale" traveling at 1200 yards. MFAS NOT in use. No action taken.	1	whale
02/24-1408	MFAS ship	Surface ships sights 20+ "dolphins" traveling at 100 yards. MFAS NOT in use. No action taken.	20	dolphin
02/24-1623	MFAS ship	Surface ships sights 1 "large whale" milling at 1000 yards. MFAS NOT in use. No action taken.	1	large whale
02/25-0924	MFAS ship	Surface ships sights 1 "whale" traveling at 4000 yards. MFAS NOT in use. No action taken.	1	whale
02/25-0924	MFAS ship	Surface ships sights 4 "whales" spouting at 4000 yards. MFAS NOT in use. No action taken.	4	whale
02/25-0924	MFAS ship	Surface ships sights 1 "pilot whale" traveling at 500 yards. MFAS NOT in use. No action taken.	1	small whale
02/25-1031	MFAS ship	Surface ships sights 2 "dolphins" traveling at 1000 yards. MFAS NOT in use. No action taken.	2	dolphin
02/25-1112	MFAS ship	Surface ships sights 3 "dolphins" traveling at 400 yards. MFAS NOT in use. No action taken.	3	dolphin
02/25-1128	MFAS ship	Surface ships sights 30 "dolphins" jumping at 20 yards. MFAS NOT in use. No action taken.	30	dolphin
02/25-1128	MFAS ship	Surface ships sights 1 "sea lion" traveling at 300 yards. MFAS NOT in use. No action taken.	1	sea lion
02/25-1130	MFAS ship	Surface ships sights 6 "small whales" milling at 4000 yards. MFAS NOT in use. No action taken.	6	small whale
02/25-1130	MFAS ship	Surface ships sights 20+ "dolphins" traveling at 4000 yards. MFAS NOT in use. No action taken.	20	dolphin
02/25-1518	MFAS ship	Surface ships sights 2 "dolphins" traveling at 10 yards. MFAS NOT in use. No action taken.	2	dolphin
02/25-1700	MFAS ship	Surface ships sights 250 "dolphins" traveling at 1000 yards. MFAS NOT in use. No action taken.	250	dolphin
02/25-1733	MFAS ship	Surface ships sights unknown number of "dolphins" traveling at 100 yards. MFAS NOT in use. Ship maneuvered.	?	dolphin
02/25-1745	MFAS ship	Surface ships sights 10 "dolphins" jumping at 100 yards. MFAS NOT in use. No action taken.	10	dolphin
02/26-1110	MFAS ship	Surface ships sights 20 "dolphins" traveling at 500 yards. MFAS NOT in use. No action taken.	20	dolphin

Date-Time (local)	Ship Type	Description of Actions Taken	# of animals	Animal Type
02/26-1112	MFAS ship	Surface ships sights 2 "whales" traveling at 200 yards. MFAS NOT in use. No action taken.	2	whale
02/26-1112	MFAS ship	Surface ships sights 15 "dolphins" traveling at 500 yards. MFAS NOT in use. No action taken.	15	dolphin
02/26-1112	MFAS ship	Surface ships sights 8 "dolphins" bow riding at 10 yards. MFAS NOT in use. No action taken.	8	dolphin
02/26-1128	MFAS ship	Surface ships sights 6 "dolphins" bow riding at 10 yards. MFAS NOT in use. No action taken.	6	dolphin
02/26-1642	MFAS ship	Surface ships sights 17 "dolphins" swimming at 2000 yards. MFAS NOT in use. No action taken.	17	dolphin
02/26-1706	MFAS ship	Surface ships sights 1 "whale" swimming at 500 yards. MFAS NOT in use. No action taken.	1	whale
02/26-1711	MFAS ship	Surface ships sights 4 "dolphins" swimming at 500 yards. MFAS NOT in use. No action taken.	4	dolphin
02/27-0808	MFAS ship	Surface ships sights 6-8 "dolphins" bow riding at 10 yards. MFAS NOT in use. No action taken.	8	dolphin
02/27-0856	MFAS ship	Surface ships sights 5-6 "dolphins" bow riding at 10 yards. MFAS NOT in use. No action taken.	6	dolphin
02/27-1512	MFAS ship	Surface ships sights 5 "dolphins" swimming at 100 yards. MFAS NOT in use. No action taken.	5	dolphin
02/27-1814	MFAS ship	Surface ships sights several "whales" traveling at 1000 yards. MFAS NOT in use. Ship maneuvered.	?	whale
03/01-1430	MFAS ship	Surface ships sights 1 "humpback whale" jumping at 100 yards. MFAS NOT in use. No action taken.	1	whale
03/02-0800	MFAS ship	Surface ships sights 1 "dolphin" spouting at 4000 yards. MFAS NOT in use. No action taken.	1	dolphin
03/02-1128	MFAS ship	Surface ships sights 200 "dolphins" jumping at 100 yards. MFAS NOT in use. No action taken.	200	dolphin
03/02-1750	MFAS ship	Surface ships sights 1 "whale" swimming at 1000 yards. MFAS NOT in use. No action taken.	1	whale
03/03-1006	MFAS ship	Surface ships sights 2 "dolphins" jumping at 300 yards. MFAS NOT in use. No action taken.	2	dolphin
03/03-1006	MFAS ship	Surface ships sights 8 "dolphins" swimming at 1000 yards. MFAS NOT in use. No action taken.	8	dolphin
03/05-0620	MFAS ship	Surface ships sights 15 "dolphins" bow riding at 180 yards. MFAS NOT in use. No action taken.	15	dolphin
03/05-0957	MFAS ship	Surface ships sights 1 "whale" jumping at 2000 yards. MFAS NOT in use. No action taken.	1	whale
03/05-0958	MFAS ship	Surface ships sights 2 "seals" swimming at 500 yards. MFAS NOT in use. No action taken.	2	seal
	42	= total sighting events total number of animals =	881	

Date-Time (local)	Ship Type	Description of Actions Taken	# of animals	Animal Type

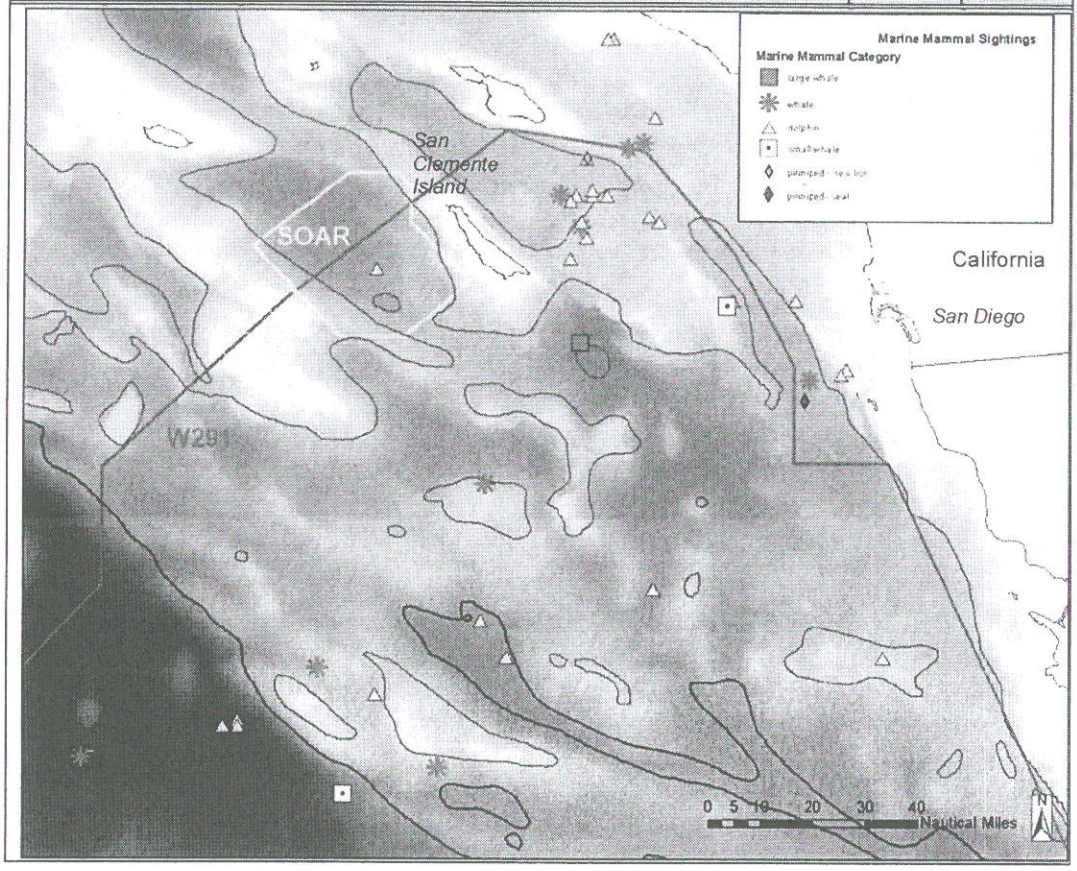

Table A-6. Marine mammal sightings and actions by exercise participants during JTFEX 07-05.
Text in red **Bold** indicate events when MFAS was in use and secured due to marine mammal mitigation. Red text in *Italics* indicates when MFAS was in use, but mitigation other than securing sonar enacted.

Date-Time (local)	Ship Type	Description of Actions Taken	# of animals	Animal Type
03/14-0838	MFAS ship	Surface ship sights 10 "sm whales" milling at 4000 yards. MFAS NOT in use. **Ship alters course.**	10	sm whale
03/14-1020	MFAS ship	Surface ship sights 2 "lg whales" traveling at 700 yards. MFAS NOT in use. No action taken.	2	lg whale
03/14-1207	MFAS ship	Surface ship sights 2 "sm whales" traveling at 2000 yards. MFAS NOT in use. **Ship alters course.**	2	sm whale
03/14-1344	MFAS ship	Surface ship sights 1 "sm whale" traveling at 200 yards. MFAS NOT in use. **Ship alters course.**	1	sm whale
03/14-1613	MFAS ship	Surface ship sights 1 "lg whale" traveling at 3000 yards. MFAS NOT in use. **Ship alters course.**	1	lg whale
03/14-1642	MFAS ship	Surface ship sights 2 "sea lions" milling at 20 yards. MFAS NOT in use. No action taken.	2	pinniped
03/15-0700	MFAS ship	Surface ship sights 2 "lg whales" traveling at 3000 yards. MFAS NOT in use. **Ship alters course.**	2	lg whale
03/15-0715	MFAS ship	Surface ship sights 3 "dolphins" traveling at 2000 yards. MFAS NOT in use. No action taken.	3	dolphin
03/15-0753	MFAS ship	Surface ship sights 1 "sm whale" traveling at 1000 yards. MFAS NOT in use. No action taken.	1	sm whale
03/15-0822	MFAS ship	Surface ship sights 2 "pilot whales" traveling at 1000 yards. MFAS NOT in use. No action taken.	2	sm whale
03/15-0826	MFAS ship	Surface ship sights 17 "dolphins" traveling at 200 yards. MFAS NOT in use. **Ship alters course.**	17	dolphin
03/15-0826	MFAS ship	Surface ship sights 3 "dolphins" traveling at 500 yards. MFAS NOT in use. No action taken.	3	dolphin
03/15-0949	MFAS ship	Surface ship sights 9 "sm whales" traveling at 1000 yards. MFAS NOT in use. **Ship alters course.**	9	sm whale
03/15-1028	MFAS ship	Surface ship sights 5 "dolphins" milling at 1000 yards. MFAS NOT in use. No action taken.	5	dolphin
03/15-1054	MFAS ship	Surface ship sights "several hundred dolphins" playing at 3800 yards. MFAS NOT in use. No action taken.	100	dolphin
03/15-1258	MFAS ship	Surface ship sights 1 to 4 "lg whales" traveling forward to aft at unknown range. MFAS IN USE. Sonar secured.	4	lg whale
03/15-1427	MFAS ship	Surface ship sights 4 "dolphins" traveling at 100 yards. MFAS NOT in use. No action taken.	4	dolphin
03/15-1545	MFAS ship	Surface ship sights 4 "dolphins" traveling at 4000 yards. MFAS NOT in use. No action taken.	4	dolphin
03/15-1622	MFAS ship	Surface ship sights 40 "dolphins" traveling at 4000 yards. MFAS NOT in use. No action taken.	40	dolphin
03/15-1647	MFAS ship	Surface ship sights 1 "dolphin" at unknown range. MFAS NOT in use. No action taken.	1	dolphin
03/15-1753	MFAS ship	Surface ship sights 1 "whale" traveling at 500 yards. MFAS NOT in use. No action taken.	1	whale
03/15-2245	MFAS ship	Surface ship sights 1 "lg whale" traveling at 1500 yards. MFAS IN USE. Reduce dB. *Ship alters course.*	1	lg whale
03/16-0724	MFAS ship	Surface ship sights 1 "**deceased seal**" at unknown range. MFAS NOT in use. No action taken.	x	dead pinniped

Date-Time (local)	Ship Type	Description of Actions Taken	# of animals	Animal Type
03/16-1736	MFAS ship	Surface ship sights 1 "**deceased seal or sea lion**" at 10 yards. MFAS NOT in use. No action taken.	x	dead pinniped
03/17-0700	MFAS ship	Surface ship sights 2 "lg whales" traveling at 500 yards. MFAS NOT in use. No action taken.	2	lg whale
03/17-0801	*non- MFAS ship*	Surface ship sights 12 "dolphins" closing to bow-ride at 1000 yards. Non-MFAS equipped ship. No action taken.	12	dolphin
03/17-0910	MFAS ship	Surface ship sights 4 "dolphins" at 10 yards. MFAS NOT is use. No action taken.	4	dolphin
03/17-1304	MFAS ship	Surface ship sights 3 "dolphins" at 200 yards. MFAS NOT is use. No action taken.	3	dolphin
03/18-0050	*non- MFAS ship*	Surface ship sights 1 "whale" milling at 300 yards. Non-MFAS equipped ship. Ship alters course.	1	whale
03/18-0111	MFAS ship	Surface ship sights 1 "sm humpback whale" traveling at 4000 yards. MFAS NOT in use. No action taken.	1	lg whale
03/18-0153	*non- MFAS ship*	Surface ship sights 1 "**deceased sea lion**" at unknown range. Non-MFAS equipped ship. No action taken.	x	dead pinniped
03/18-0832	MFAS ship	Surface ship sights 100+ "dolphins" traveling/feeding at 1000 yards. MFAS NOT in use. No action taken.	100	dolphin
03/18-0919	MFAS ship	Surface ship sights 6 "dolphins" traveling at 2000 yards. MFAS NOT in use. No action taken.	6	dolphin
03/18-1231	MFAS ship	Surface ship sights 20 "dolphins" traveling at 75 yards. MFAS IN USE. Sonar secured.	20	dolphin
03/18-1301	MFAS ship	Surface ship sights 1 "humpback whale" traveling at 4000 yards. MFAS NOT in use. No action taken.	1	lg whale
03/18-1603	MFAS ship	Surface ship sights 1 "whale" traveling at 2000 yards. MFAS IN USE. Sonar secured.	1	whale
03/18-1614	MFAS ship	Surface ship sights 10 "blue whales" traveling at 800 yards. MFAS IN USE. Sonar secured.	10	lg whale
03/18-1733	MFAS ship	Surface ship sights 2 "whales" traveling at 6000 yards. MFAS NOT in use. No action taken.	2	whale
03/18-1802	MFAS ship	Surface ship sights 100 "dolphins" traveling at 500 yards. *MFAS IN USE. Sonar reduce -16 dB.*	100	dolphin
03/18-1843	MFAS ship	Surface ship sights 10 "whales" traveling unknown range. *MFAS IN USE. Sonar dB reduced.*	10	whale
03/18-1949	MFAS ship	Surface ship sights 10 "whales" traveling unknown range. *MFAS IN USE. Sonar dB reduced.*	10	whale
03/19-0610	MFAS ship	Surface ship sights 2 "whales" traveling at 2000 yards. MFAS NOT in use. No action taken.	2	whale
03/19-0613	MFAS ship	Surface ship sights 6 "dolphins" traveling at 500 yards. MFAS NOT in use. No action taken.	6	dolphin
03/19-0650	MFAS ship	Surface ship sights 1 "lg whale" traveling at 2000 yards. MFAS IN USE. Sonar secured. Ship alters course.	1	lg whale
03/19-0745	*non- MFAS ship*	Surface ship sights 5 "bottlenose dolphins" traveling at 500 yards. Non-MFAS equipped ship. No action taken.	5	dolphin
03/19-0752	MFAS ship	Surface ship sights 2 "seals" traveling at 500 yards. *MFAS IN USE. Sonar reduce -10 dB.*	2	pinniped
03/19-0753	MFAS ship	Surface ship sights 1 "whale" traveling at 15000 yards. MFAS NOT in use. No action taken.	1	whale

Date-Time (local)	Ship Type	Description of Actions Taken	# of animals	Animal Type
03/19-0755	MFAS ship	Surface ship sights 4 "pilot whales" traveling at 2000 yards. MFAS NOT in use. No action taken.	4	sm whale
03/19-0819	*non- MFAS ship*	Surface ship sights 7 "dolphins" closing to bow-ride at 500 yards. Non-MFAS equipped ship. No action taken.	7	dolphin
03/19-0928	MFAS ship	Surface ship sights 10 "seals" traveling at 1700 yards. MFAS NOT in use. No action taken.	10	pinniped
03/19-1019	*non- MFAS ship*	Surface ship sights 100 "dolphins" traveling at 1500 yards. Non-MFAS equipped ship. No action taken.	100	dolphin
03/19-1056	*non- MFAS ship*	Surface ship sights 2 "dolphins" traveling at 100 yards. Non-MFAS equipped ship. No action taken.	2	dolphin
03/19-1056	*non- MFAS ship*	Surface ship sights 2 "dolphins" traveling at 2000 yards. Non-MFAS equipped ship. No action taken.	2	dolphin
03/19-1106	MFAS ship	Surface ship sights 1 "whale" traveling at 1500 yards. MFAS NOT in use. No action taken.	1	whale
03/19-1111	MFAS ship	Surface ship sights 20 "whales" traveling at 12000 yards. MFAS NOT in use. No action taken.	20	whale
03/19-1127	MFAS ship	Surface ship sights 10 "dolphins" traveling at 1300 yards. MFAS NOT in use. No action taken.	13	dolphin
03/19-1332	*non- MFAS ship*	Surface ship sights 1 "**deceased sea lion**" at 800 yards. Non-MFAS equipped ship. No action taken.		dead pinniped
03/19-1337	MFAS ship	Surface ship sights 8 "dolphins" traveling at 500 yards. *MFAS IN USE. Sonar reduce -10 dB.*	8	dolphin
03/19-1546	*non- MFAS ship*	Surface ship sights 1 "humpback whale" traveling at 400 yards. Non-MFAS equipped ship. No action taken.	1	lg whale
03/20-0920	MFAS ship	Surface ship sights 1 "lg whale" traveling at 1000 yards. MFAS NOT in use. No action taken.	1	lg whale
03/20-1156	MFAS ship	Surface ship sights 2 "fin whales" feeding at 4000 yards. MFAS NOT in use. **Ship alters course.**	2	lg whale
03/22-1149	*non- MFAS ship*	Surface ship sights 12 "bottlenose dolphins" at 350 yards. Non-MFAS equipped ship. **Ship alters course.**	12	dolphin
03/23-0701	*non- MFAS ship*	Surface ship sights 20 "bottlenose dolphins" traveling at 2350 yards. Non-MFAS equipped ship. **Ship alters course.**	20	dolphin
03/23-1016	*non- MFAS ship*	Surface ship sights 1 "whale" traveling at 50 yards. Non-MFAS equipped ship. **Ship alters course.**	1	whale
03/23-1312	*non- MFAS ship*	Surface ship sights 10 "dolphins" traveling at 50 yards. Non-MFAS equipped ship. **Ship alters course.**	10	dolphin
03/24-1123	*non- MFAS ship*	Surface ship sights 1 "**deceased dolphin**" at 500 yards. Non-MFAS equipped ship. No action taken.	x	dead dolphin
	66 (61 + 5 dead)	= total sighting events total number of animals =	**729**	

Date-Time (local)	Ship Type	Description of Actions Taken	# of animals	Animal Type

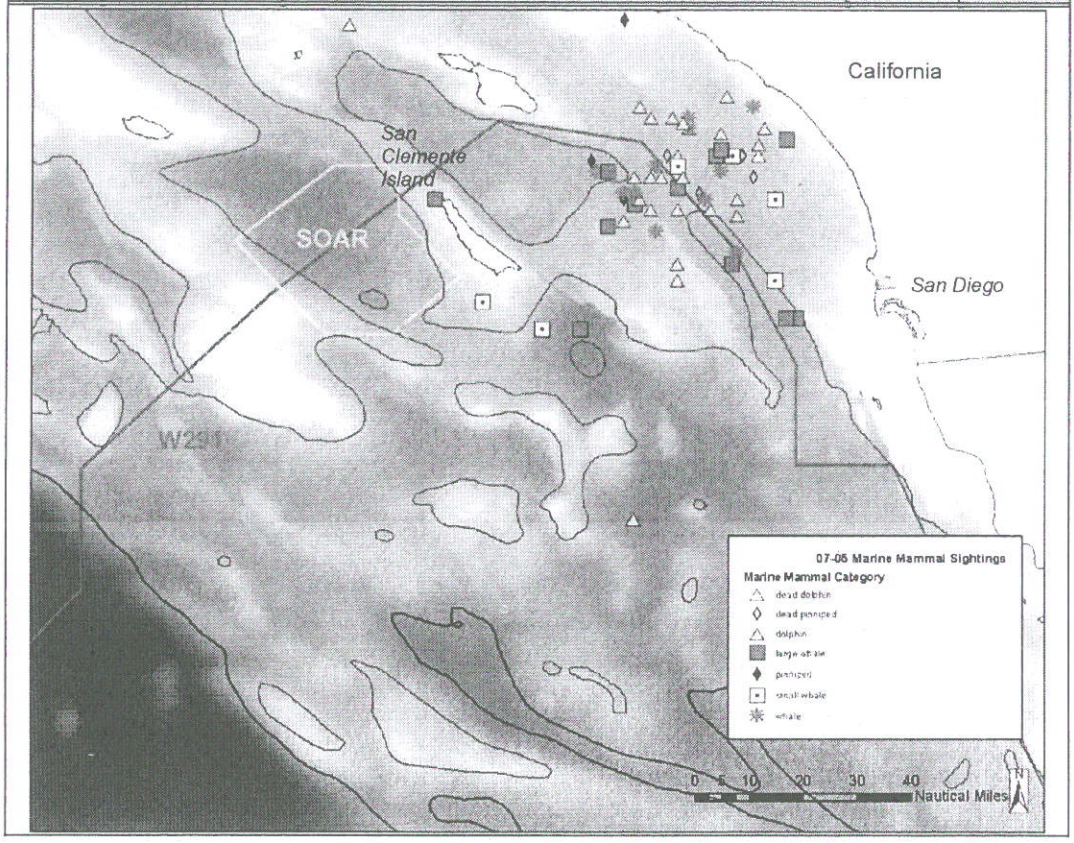

Table A-7. Sightings during COMPTUEX 07-02 where MFAS mitigation occurred.

(**Bold**= potential ESA species).

Assessment by Date				
Date	**Range (yards)**	**Animal Type**	**MFAS Action**	**Potential Exposure per NDE and BO**
2/20	4000	**1 whale**	Secured	Not probable, sonar secured >NDE requirement
2/20	4000	20 dolphins	Secured	Not probable, sonar secured >NDE requirement
2/20	300	4 pilot whales	Reduce power	Not probable, sonar reduced -10dB per NDE requirement
2/21	1000	**20 whales**	Reduce power	Not probable, sonar reduced >NDE requirement
2/28	50	30 dolphins	Secured	Possible

Assessment by Range			
Range	**ESA species (potential)**	**MMPA species**	**Comments**
200 yards- Sonar secured (turned off)	0	30 dolphins	Secured when animals initially observed at 50-yards
500 yards- Sonar reduced -10 dB	0	4 pilot whales	Reduced power when observed at 300-yards
1000 yards- Sonar reduced -6 dB	20 whales		Reduced power when observed at 1000-yards

Table A-8. Sightings during JTFEX 07-05 where MFAS mitigation occurred.

(**Bold**= potential ESA species).

Assessment by Date				
Date	**Range (yards)**	**Animal Type**	**MFAS Action**	**Potential Exposure per NDE**
3/15	unk	**1-4 lg whale**	Secured	Possible
3/15	1500	**1 lg whale**	Reduce power	Not probable, sonar power reduced >NDE requirement
3/18	75	20 dolphins	Secured	Possible
3/18	800	**10 blue whales**	Secured	Possible
3/18	2000	**1 lg whale**	Secured	Not probable, sonar secured >NDE requirement
3/18	unk	**10 whales**	Reduce power	Possible
3/18	unk	**10 whales**	Reduce power	Possible
3/18	500	100 dolphins	Reduce power	Not probable, sonar power reduced -16dB >NDE requirement
3/19	2000	**1 lg whale**	Secured	Not probable, sonar secured per NDE requirement
3/19	500	2 seals	Reduce power	Not probable, sonar power reduced -10dB per NDE requirement
3/19	500	8 dolphins	Reduce power	Not probable, sonar power reduced -10dB per NDE requirement

Assessment by Range			
Range	**ESA species** (potential)	**MMPA species**	**Comments**
200 yards- Sonar secured (turned off)	1-4 lg whale		Secured at unknown range to observation
	10 whales		Reduced at unknown range to observation
	10 whales		Reduced at unknown range to observation
		20 dolphins	Secured when initially observed at 75-yrds
500 yards- Sonar reduced -10 dB		100 dolphins	Reduced when initially observed at 500-yrds
		2 seals	Reduced when initially observed at 500-yrds
		8 dolphins	Reduced when initially observed at 500-yrds
1000 yards- Sonar reduced -6 dB	10 blue whales		Secured when initially observed at 800-yrds

Table A-9. Total annual exposures for sonar and underwater detonations (*left*) from DoN 2007 based on 7 exercise per year (COMPTUEX/JTFEX EA/OES Table 4.3-38), and estimated exposures per exercise (*right*).

Species	DoN 2007 annual exposures			Estimated singe exercise exposures		
	Level B Sub TTS	Level B	Level A	Level B Sub TTS	Level B	Level A
ESA-listed						
Blue whale	325	14	0	46.4	2.0	0
Fin whale	263	10	0	37.6	1.4	0
Humpback whale	33	0	0	4.7	0	0
Sei whale	2	0	0	0.3	0	0
Sperm whale	59	4	0	8.4	0.6	0
Non-ESA listed						
Gray whale	64	0	0	9.1	0	0
Bryde's whale	2	0	0	0.3	0	0
Minke whale	24	2	0	3.4	0.3	0
Baird's beaked whale	4	0	(4)*	0.6	0	0.6
Cuvier's beaked whale	208	10	(218)*	29.7	1.4	31.1
Mesoplodon spp.	0	0	0	0	0	0
Ziphiid beaked whale	49	3	(52)*	7.0	0.4	7.4
Dwarf sperm whale	0	0	0	0.0	0	0
False killer whale	16	0	0	2.3	0	0
Killer whale	12	1	0	1.7	0.1	0
Pygmy sperm whale	859	56	0	122.7	8.0	0
Short-finned pilot whale	0	0	0	0	0	0
Bottlenose dolphin	516	30	0	73.7	4.3	0
Common dolphin	69,258	3,491	35	9,894.0	498.7	5.0
Dall's porpoise	142	3	0	20.3	0.4	0
Northern right whale dolphin	3,003	227	0	429.0	32.4	0
Pacific white-sided dolphin	1,949	101	0	278.4	14.4	0
Pantropical spotted dolphin	547	6	0	78.1	0.9	0
Risso's dolphin	2,050	96	0	292.9	13.7	0
Rough-toothed dolphin	0	0	0	0	0	0
Striped dolphin	1,554	78	0	222.0	11.1	0
California sea lion	0	0	0	0	0	0
Northern elephant seal	0	0	0	0	0	0
Pacific harbor seal	6	0	0	0.9	0	0

* ALL predicted beaked whale Level B exposures counted as Level A exposures.

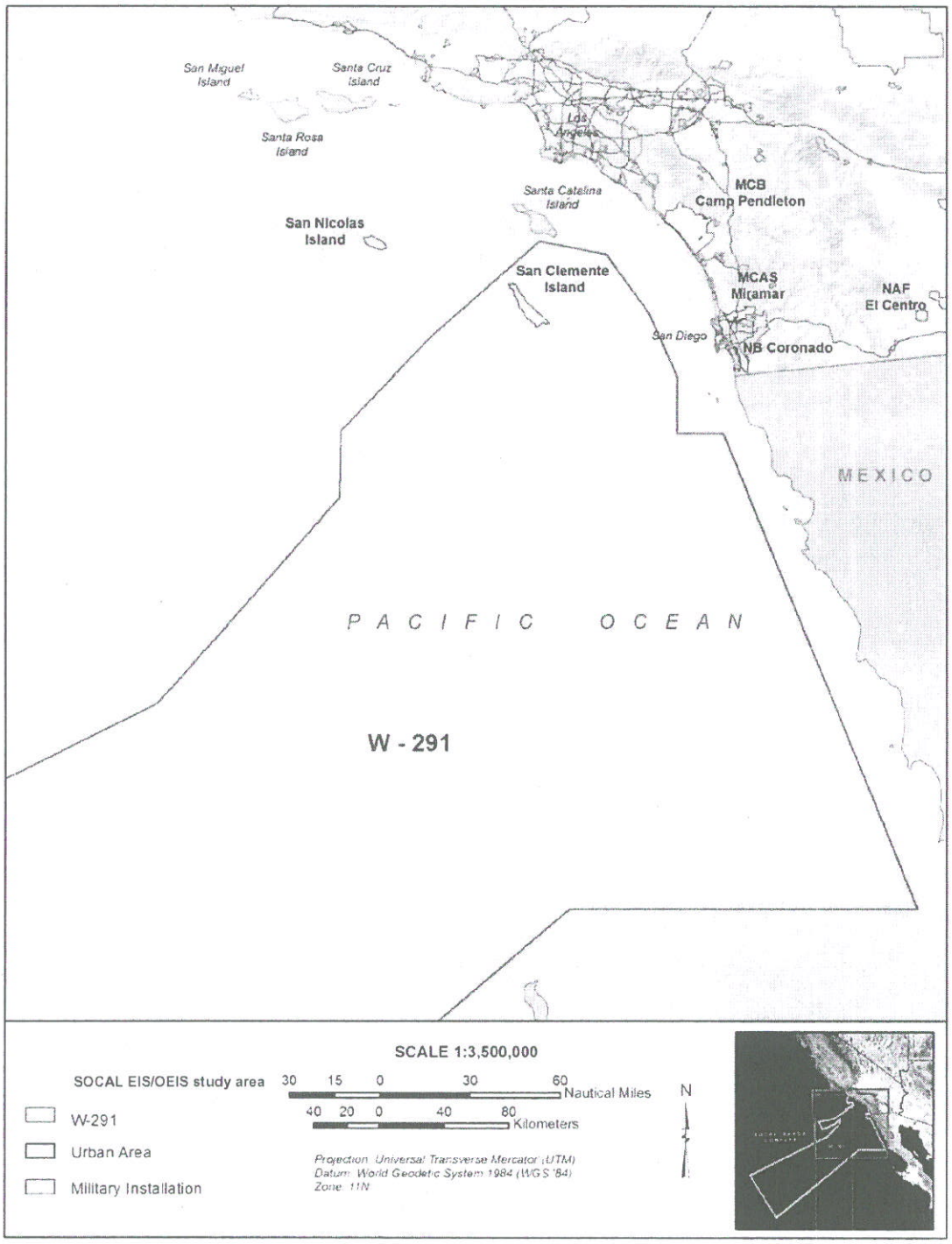

Figure A-1. General Southern California Operating Area (draft figure from SOCAL EIS).

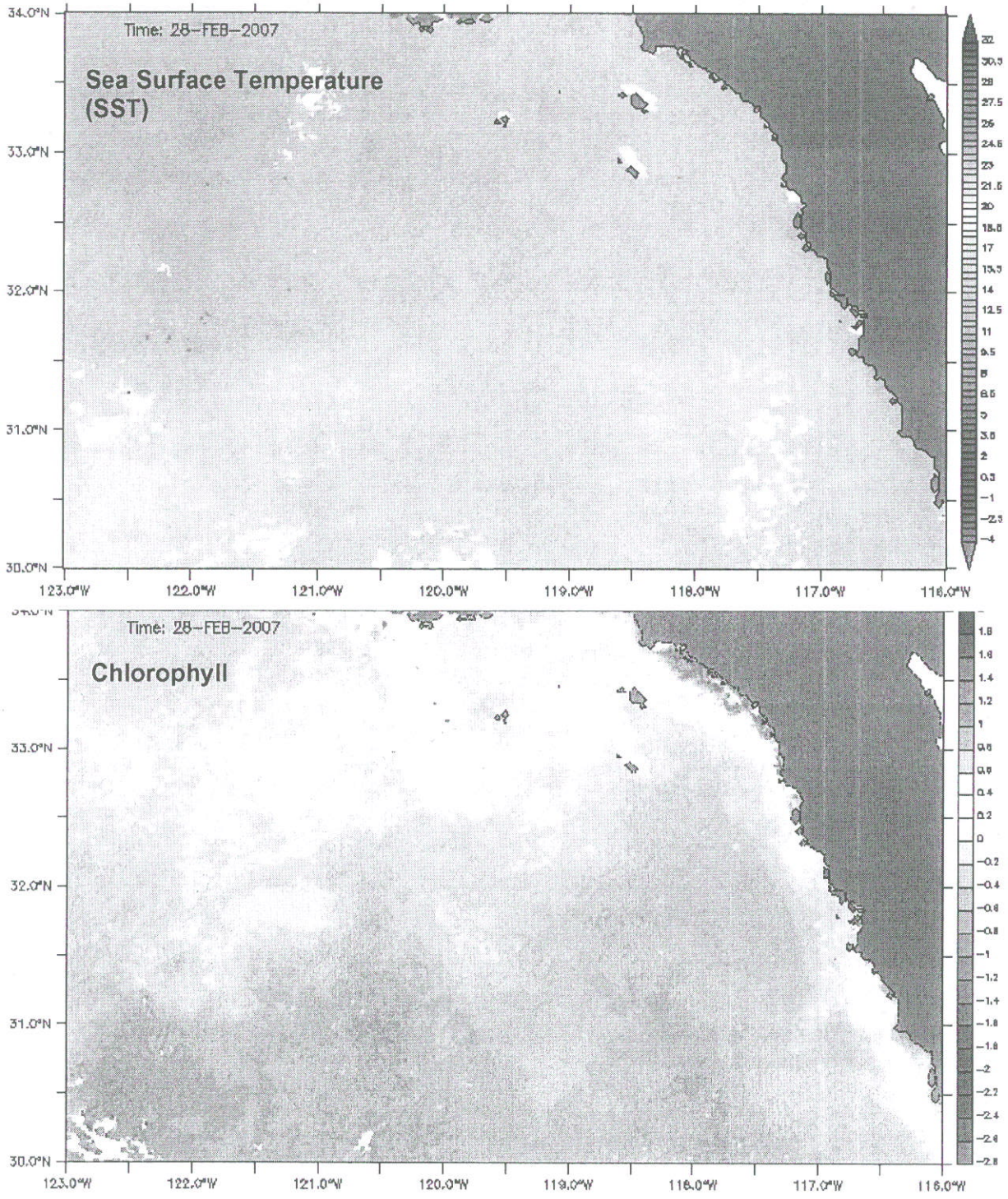

Figure A-2. SST (top) and Chlorophyll (bottom) conditions for Southern California, 14-day composite ending 28 Feb 2007.
Data from: CoastWatch and Southwest Fisheries Science Center, NMFS.
http://las.pfeg.noaa.gov/oceanWatch/oceanwatch.php

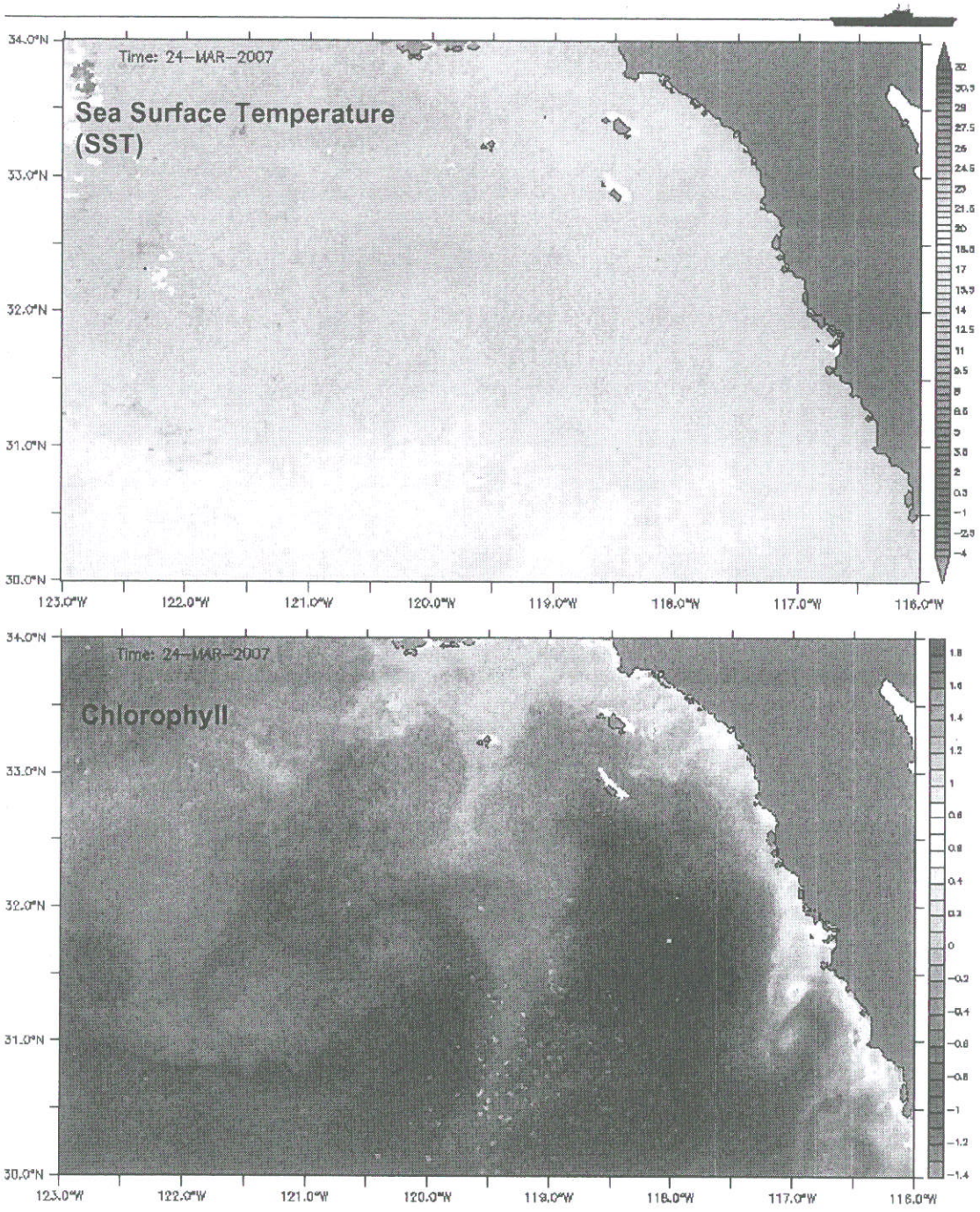

Figure A-3. SST (top) and Chlorophyll (bottom) for Southern California, 14-day composite ending 24 March 2007.
Data from: CoastWatch and Southwest Fisheries Science Center, NMFS.
http://las.pfeg.noaa.gov/oceanWatch/oceanwatch.php

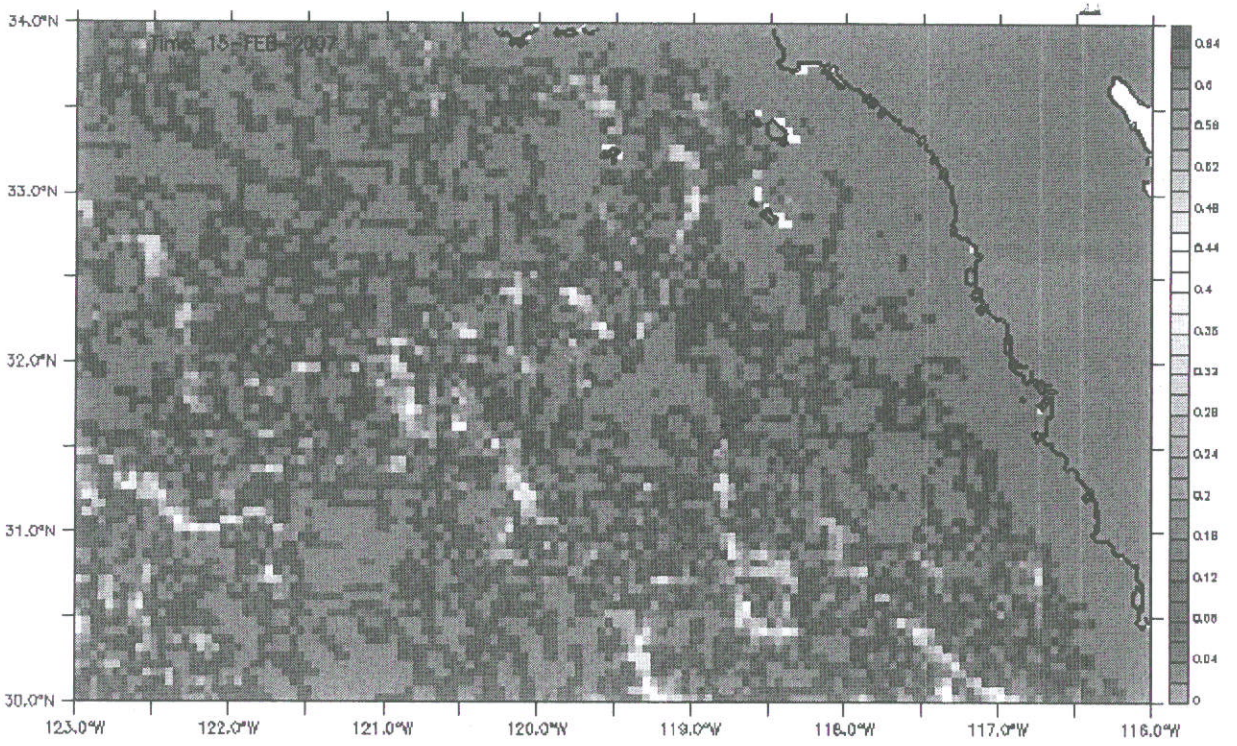

Figure A-4. Frontal Probability Index for Southern California, 14 day composite ending 15 February 2007 (only data available as of document preparation date).
Data from: CoastWatch and Southwest Fisheries Science Center, NMFS.
http://las.pfeg.noaa.gov/oceanWatch/oceanwatch.php

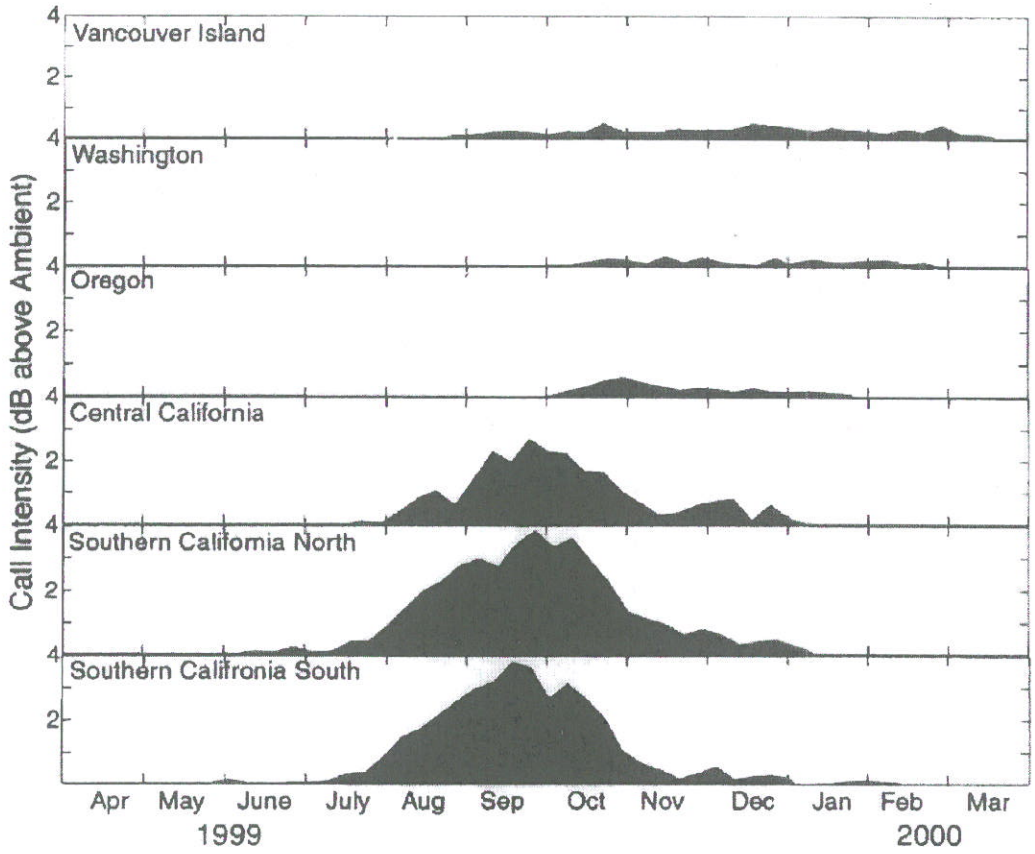

Figure A-5. Seven year average (1994-2000) of blue whale acoustic intensity for each of six sites along the continental shelf of the western North America (From: Hildebrand 2005).

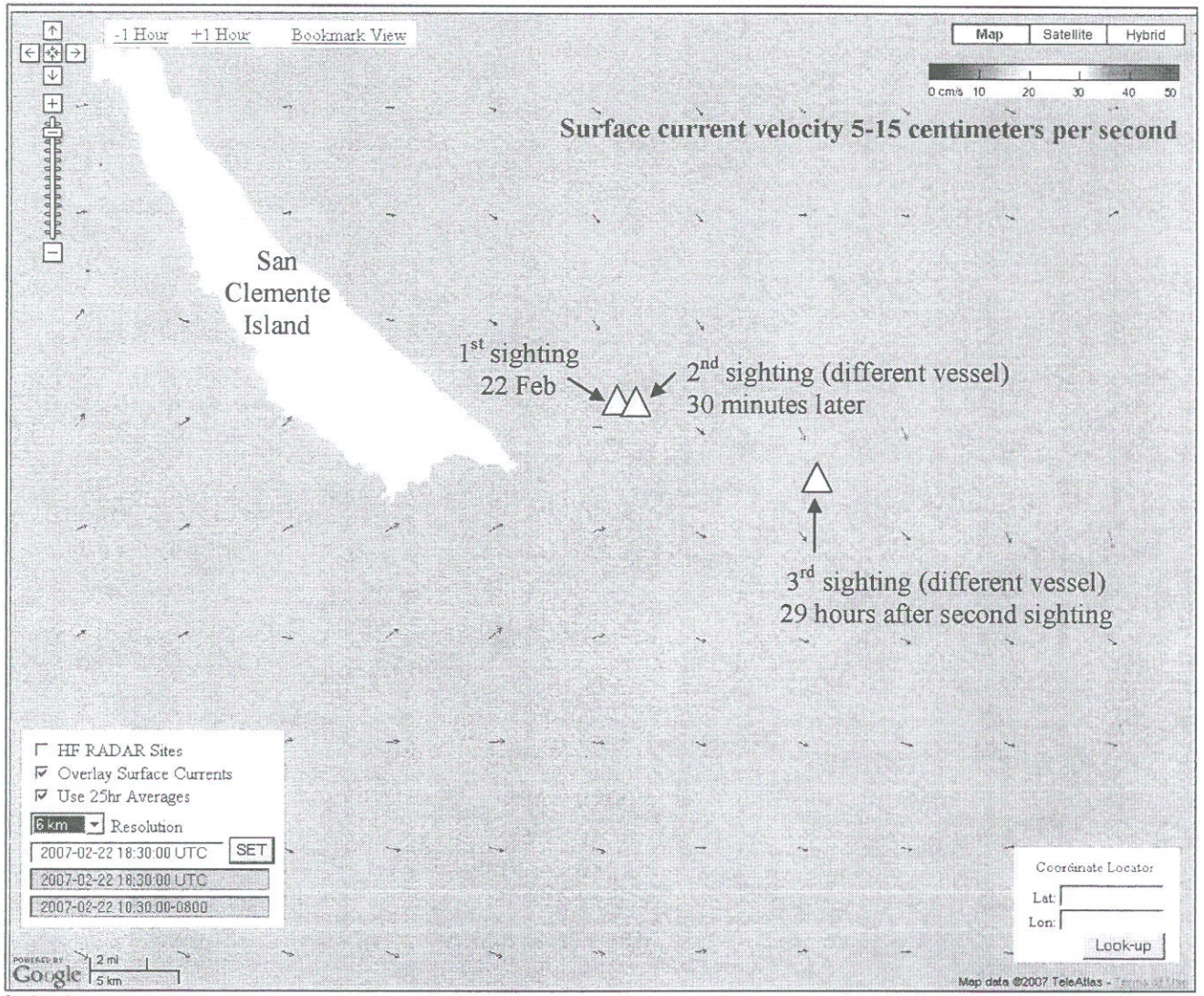

Figure A-6. Surface currents measured from on radar-based current mapping (25-hour averaging) at 10:30 am Pacific Standard time on 22 February 2007 relative to multiple sightings of the same decomposed whale carcass by several ships from 22-23 February.
(Data and image online from: from Coastal Ocean Currents Monitoring Program)

APPENDIX B- LETTER OF INSTRUCTION

SUBJ/MARINE MAMMAL AND ENDANGERED SPECIES LETTER OF INSTRUCTION (LOI) /IN SUPPORT OF xxxxx07-xx//

REF/A/DOC/16USC1361-1372/-/1972//

REF/B/DOC/16USC1531-1544/-/1973//

REF/C/INST/OPNAVINST 5090.1B CH-3/01NOV1994//
REF/D/MSG/SECNAV/181634ZNOV2005//

REF/E/LTR/DOD/23JAN2007//

NARR/REF A IS THE MARINE MAMMAL PROTECTION ACT. REF B IS THE ENDANGERED SPECIES ACT. REF C IS THE ENVIRONMENTAL AND NATURAL RESOURCES PROGRAM MANUAL. REF D IS ALNAV REQUIRING RETENTION OF ALL MID-FREQUENCY ACTIVE SONAR USE LOGS AND MATERIALS RELATED TO MID-FREQUENCY ACTIVE SONAR DUE TO ONGOING LITIGATION IN US FEDERAL COURT. REF E IS NATIONAL DEFENSE EXEMPTION FROM REQUIREMENTS OF THE MARINE MAMMAL PROTECTION ACT FOR CERTAIN DOD MID-FREQUENCY ACTIVE SONAR ACTIVITIES.//

GENTEXT/REMARKS/1. (U) DUE TO POSSIBLE PRESENCE OF PROTECTED MARINE SPECIES WITHIN xxxxx 07-xx OPERATING AREA AND POTENTIAL EFFECTS ON THESE SPECIES FROM USE OF MID-FREQUENCY ACTIVE SONAR, THE FOLLOWING GUIDANCE IS PROVIDED FOR EXERCISE CONDUCT AND REPORTING. THE MAJORITY OF THE GUIDANCE AND INFORMATION IN THIS MESSAGE IS COMPILED FROM EXISTING LAWS AND REGULATIONS FOUND IN REFS A-E.

1.A. (U) MARINE MAMMALS. REF A PROHIBITS HARASSING, CAPTURING, INJURING OR KILLING ANY MARINE MAMMAL (INCLUDING WHALES, DOLPHINS, SEALS AND PORPOISES) IN U.S. WATERS OR ON THE HIGH SEAS. THE TERM HARASS IS INTERPRETED BROADLY AND INCLUDES ACTS OF PURSUIT, TORMENT OR ANNOYANCE WHICH HAVE THE SIGNIFICANT POTENTIAL TO INJURE A MARINE MAMMAL IN THE WILD OR WHICH DISTURBS OR IS LIKELY TO DISTURB A MARINE MAMMAL 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 SUCH BEHAVIORAL PATTERNS ARE ABANDONED OR SIGNIFICANTLY ALTERED.

1.B. (U) ENDANGERED SPECIES. REF B PROHIBITS THE TAKING (HARASSING, HARMING, PURSUING, HUNTING, SHOOTING, WOUNDING, KILLING, TRAPPING, CAPTURING OR COLLECTING OR TO ATTEMPT TO DO SO) OF ANY FEDERALLY PROTECTED ENDANGERED OR THREATENED SPECIES UPON THE HIGH SEAS, WITHIN THE UNITED STATES OR IN THE TERRITORIAL SEA OF THE UNITED STATES.

2. (U) REF E SPECIFIES NEW REQUIREMENTS EFFECTIVE THROUGH 23 JANUARY 2009 WHEN USING MID FREQUENCY ACTIVE (1 KHZ-10 KHZ) SONAR (MFAS) (E.G. SHIP AND SUB HULL MOUNTED SONAR, HELO DIPPING SONAR AND DICASS SONOBUOYS) DURING MAJOR EXERCISES OR WHEN TRAINING OR CONDUCTING MAINTENANCE WITHIN ESTABLISHED OPERATING AREAS.

2.A. (U) THESE REQUIREMENTS APPLY:

2.A.1. (U) DURING XXXXX 07-0X TRAINING EXERCISES.

2.A.2. (U) TO THE USE OF MFAS SYSTEMS FOR THE PURPOSE OF SEARCHING FOR AND TRACKING OF SUBMARINES AND MINES.

2.B. (U) THESE REQUIREMENTS DO NOT APPLY TO:

2.B.1. (U) OPERATIONAL USE, INCLUDING FORCE PROTECTION AND SAFETY OF NAVIGATION.

2.B.2. (U) UNDERWATER COMMUNICATION SYSTEMS AND FATHOMETERS.

3. (U) A COORDINATED CUSFFC/CPF GUIDANCE MESSAGE WILL BE RELEASED IN THE NEAR FUTURE TO ENSURE COMPLIANCE WITH REF E REQUIREMENTS. IN THE INTERIM, FOR THE PURPOSES OF xxxxxx 07-xx, THE FOLLOWING ACTIONS ARE DIRECTED.

3.A. (U) PERSONNEL TRAINING.

3.A.1 (U) ALL SURFACE SHIP LOOKOUTS AND TOPSIDE WATCHSTANDERS (I.E., OODS, JOODS) AS WELL AS MPA AIRCREWS AND ASW/MIW HELICOPTER AIRCREWS MUST COMPLETE MARINE SPECIES AWARENESS TRAINING (MSAT) BY VIEWING THE U.S. NAVY MSAT DVD. MSAT TRAINING MUST BE REVIEWED PRIOR TO USE OF MFA SONAR. THESE PERSONNEL ARE NOT SOLELY MARINE MAMMAL OBSERVERS AND CAN PERFORM OTHER DUTIES (E.G., LOOKOUT, JOOD).

UNITS SHOULD ALREADY HAVE A COPY OF THE MSAT DVD, WHICH WAS DISTRIBUTED IN AUGUST 2006. IF NOT RECEIVED, CONTACT xxxxxx, TEL: xxx-xxx-xxxx, NIPRNET EMAIL: xxxxxxxxx TO OBTAIN A COPY. THE MSAT TRAINING CAN BE FOUND ON HTTPS:/MMRC.TECQUEST.NET/. IN ADDITION, MARINE MAMMAL TRAINING SLIDES ARE AVAILABLE ON THE xxxxxxx WEBSITE AT xxxxxxx.

3.B. (U) AVIATION UNITS.

3.B.1 (U) MPA AND OTHER AIRCRAFT PARTICIPATING IN ASW EVENTS AND FLYING LOW ENOUGH TO REASONABLY SPOT MARINE MAMMALS SHALL MONITOR FOR MARINE MAMMALS PRIOR TO AND DURING THE EVENT AND REPORT SIGHTINGS TO xxxxxx. IF SONAR IS SECURED (I.E. DICASS SONOBUOY) DUE TO PRESENCE OF MARINE MAMMALS WITHIN 200 YARDS, THEN REPORTING REQUIREMENT DESCRIBED IN PARA 4.A.2 APPLY.

3.C. (U) SONAR OPERATORS.

3.C.1 (U) SUB OPERATORS WILL CHECK FOR PASSIVE INDICATION OF MARINE MAMMALS CLOSE ABOARD PRIOR TO USE OF MFAS. CLOSE ABOARD IS DEFINED AS VISIBLE BEARING RATE ON DIMUS DISPLAY. SHIP OPERATORS WILL CHECK FOR PASSIVE INDICATION OF MARINE MAMMALS ON THE UNDERWATER TELEPHONE IOT ALERT LOOKOUTS PRIOR TO USE OF MFAS. IF MFAS SONAR IS SECURED DUE TO PRESENCE OF MARINE MAMMALS, THEN REPORTING REQUIREMENTS DESCRIBED IN PARA 4.A.2 APPLY AS APPLICABLE AND CAN BE DETERMINED.

3.D. (U) MFAS OPERATIONS.

3.D.1. (U) OPERATE MFAS AT LOWEST PRACTICABLE LEVEL, NOT TO EXCEED 235 DB, EXCEPT FOR OCCASIONAL SHORT PERIODS OF TIME TO MEET TACTICAL TRAINING OBJECTIVES. USE OF MFAS AT SOURCE LEVELS ABOVE 235 DB SHALL BE LOGGED AND REPORTED IAW PARA 4.

3.D.2. (U) PRIOR TO START-UP OR RESTART OF ACTIVE SONAR, OPERATORS WILL CHECK THAT THE BUFFER ZONE DESCRIBED BELOW IN PARA. 3.E IS CLEAR OF MARINE MAMMALS.

3.D.3. (U) HELICOPTERS SHALL OBSERVE/SURVEY THE VICINITY OF EACH ASW EVENT LOCATION FOR 10 MINS PRIOR TO COMMENCEMENT OF THE PROSECUTION (BEFORE DEPLOYING ACTIVE (DIPPING) SONAR). HELICOPTERS SHALL NOT DEPLOY THEIR SONAR WITHIN 200 YARDS OF A MARINE MAMMAL AND WILL SECURE ACTIVE TRANSMISSIONS IF A MARINE MAMMAL CLOSES WITHIN 200 YARDS. IF SONAR IS SECURED DUE TO PRESENCE OF MARINE MAMMALS WITHIN 200 YARDS, THEN REPORTING REQUIREMENT DESCRIBED IN PARA 4.A.2 APPLY.

3.E. (U) HULL MOUNTED MFAS BUFFER ZONES.

3.E.1. PRIOR TO START-UP OR RESTART OF MFAS, OPERATORS WILL CHECK THAT SAFETY ZONES IN PARA 3.E.2-4 ARE CLEAR OF MARINE MAMMALS.

3.E.2. (U) 1000 YARDS. WHEN MARINE MAMMALS ARE DETECTED BY ANY MEANS (AIRCRAFT, LOOKOUT, OR AURALLY) WITHIN 1000 YARDS OF THE SONAR DOME, THE SHIP OR SUBMARINE WILL LIMIT ACTIVE TRANSMISSION LEVELS TO AT LEAST 6 DB BELOW THE EQUIPMENT NORMAL OPERATING LEVEL FOR SECTOR SEARCH MODES. SHIPS AND SUBMARINES WILL CONTINUE TO LIMIT MAXIMUM PING LEVELS BY THIS 6 DB FACTOR UNTIL THE ANIMAL HAS BEEN SEEN TO LEAVE THE AREA, HAS NOT BEEN SEEN FOR 30 MINUTES, OR THE VESSEL HAS TRANSITED MORE THAN 2000 YARDS BEYOND THE LOCATION OF THE LAST SIGHTING.

3.E.3. (U) 500 YARDS. SHOULD THE MARINE MAMMAL BE DETECTED WITHIN OR CLOSING TO INSIDE 500 YARDS OF THE SONAR DOME, ACTIVE SONAR TRANSMISSIONS WILL BE LIMITED TO AT LEAST 10 DB BELOW THE EQUIPMENT'S NORMAL OPERATING LEVEL FOR SECTOR SEARCH MODES. SHIPS AND SUBMARINES WILL CONTINUE TO LIMIT MAXIMUM PING LEVELS BY THIS 10 DB FACTOR UNTIL THE ANIMAL HAS BEEN SEEN TO LEAVE THE AREA, HAS NOT BEEN SEEN FOR 30 MINUTES, OR THE VESSEL HAS TRANSITED MORE THAN 2000 YARDS BEYOND THE LOCATION OF THE LAST SIGHTING.

3.E.4. (U) 200 YARDS. SHOULD THE MARINE MAMMAL BE DETECTED WITHIN OR CLOSING TO INSIDE 200 YARDS OF THE SONAR DOME, ACTIVE SONAR TRANSMISSIONS WILL CEASE. WHEN A MARINE MAMMAL IS DETECTED CLOSING TO INSIDE APPROXIMATELY 200 YARDS OF THE SONAR DOME, THE PRINCIPAL RISK BECOMES POTENTIAL PHYSICAL INJURY FROM COLLISION. ACCORDINGLY, IF THE MARINE SPECIES CLOSES WITHIN 200 YARDS, SHIPS AND SUBMARINES SHALL MANEUVER TO AVOID COLLISION TO THE GREATEST EXTENT POSSIBLE, WITH SAFETY OF THE VESSEL BEING PARAMOUNT. ACTIVE SONAR WILL NOT RESUME UNTIL THE ANIMAL HAS BEEN SEEN TO LEAVE THE AREA, HAS NOT BEEN SEEN FOR 30 MINUTES, OR THE VESSEL

HAS TRANSITED MORE THAN 2000 YARDS BEYOND THE LOCATION OF THE LAST SIGHTING.

3.E.5. (U) SPECIAL CONDITIONS APPLICABLE TO DOLPHINS AND PORPOISES

ONLY: IF, AFTER CONDUCTING AN INITIAL MANEUVER TO AVOID CLOSE QUARTERS WITH DOLPHINS OR PORPOISES, THE OFFICER OF THE DECK CONCLUDES THAT DOLPHINS OR PORPOISES ARE DELIBERATELY CLOSING TO RIDE THE VESSEL BOW WAVE, NO FURTHER MITIGATION ACTIONS ARE NECESSARY WHILE THE DOLPHINS OR PORPOISES CONTINUE TO EXHIBIT BOW WAVE RIDING BEHAVIOR.

3.F. (U) LOOKOUTS

3.F.1. (U) ON THE BRIDGE OF SURFACE SHIPS, THERE WILL BE AT LEAST THREE PEOPLE ON WATCH WHOSE DUTIES INCLUDE OBSERVING THE WATER SURFACE AROUND THE VESSEL. IN ADDITION TO THE THREE PERSONNEL ON WATCH, ALL SURFACE SHIPS PARTICIPATING IN ASW EXERCISES WILL HAVE AT ALL TIMES DURING THE EXERCISE AT LEAST TWO ADDITIONAL PERSONNEL ON WATCH AS LOOKOUTS. EACH PERSON ON WATCH WILL HAVE A SET OF BINOCULARS TO AID IN DETECTION OF MARINE MAMMALS. ON SURFACE VESSELS EQUIPPED WITH MFAS, PEDESTAL-MOUNTED BIG EYE (20 X 110) BINOCULARS WILL BE USED TO ASSIST IN DETECTION OF MARINE MAMMALS IN THE VICINITY OF THE VESSEL.

3.F.2. (U) DURING MFAS OPERATIONS, PERSONNEL WILL UTILIZE ALL AVAILABLE SENSOR AND OPTICAL SYSTEMS (SUCH AS NIGHT VISION GOGGLES) TO AID IN DETECTION OF MARINE MAMMALS.

3.F.3. (U) PERSONNEL ON LOOKOUT WILL EMPLOY VISUAL SEARCH PROCEDURES EMPLOYING A SCANNING METHODOLOGY IAW LOOKOUT TRAINING HANDBOOK (NAVEDTRA 12968-B).

3.F.4 (U) AFTER SUNSET AND PRIOR TO SUNRISE, LOOKOUTS WILL EMPLOY NIGHT LOOKOUT TECHNIQUES IN ACCORDANCE WITH LOOKOUT TRAINING HANDBOOK.

4. (U) REPORTS AND DATA COLLECTION.

4.A. (U) ALL UNITS WILL CONTINUE TO SEND SPORTS MESSAGES.

4.A.1. (U) ALL UNITS EMPLOYING MFAS ARE REQUIRED TO SUBMIT AN AFTER ACTION REPORT (AAR), CLASSIFIED AS CONFIDENTIAL. XXXX STRIKE GROUP COMMANDER SHALL CONSOLIDATE ALL REPORTS INTO A FINAL REPORT AND FORWARD TO xxxxxxx, INFO CHAIN OF COMMAND, WITHIN 10 DAYS OF COMPLETION OF THE EXERCISE. THIS TIMELINE IS REQUIRED DUE TO REGULATORY REQUIREMENTS THAT NAVY VERBALLY REPORT MARINE MAMMAL SIGHTING INFORMATION AND IMPACTS TO MFAS OPS TO NATIONAL MARINE FISHERIES SERVICES WITHIN 15 BUSINESS DAYS FROM EXERCISE COMPLETION.

4.A.2. (U) THE FINAL REPORT (SUBJ: MFA MARINE MAMMAL REPORT FOR EXERCISE xxxxx 07-xx) WILL BE COMPRISED OF TWO PARTS. PART ONE WILL REPORT ALL MARINE MAMMALS SIGHTED DURING THE EXERCISE, AND WILL INCLUDE THE DATA LISTED BELOW:

A.DTG OF INITIAL SIGHTING.

B. UNIT AND POSIT (UNIT NAME AND LAT/LONG). NOTE, IF REPORT IS FOR ASW HELO ASSIGNED TO VESSEL, THIS MUST BE REPORTED SEPARATELY FROM SURFACE SHIP REPORTS.

C. DESCRIPTION OF ANIMAL BY SPECIES IF KNOWN, OTHERWISE SPECIFY: DOLPHIN, SM WHALE (SMALL WHALE), LG WHALE (LARGE WHALE), SEAL/SEALION.

D. ESTIMATED NUMBER OF ANIMALS.

E. TRUE BEARING AND RANGE FROM UNIT.

F. ANIMALS BEHAVIOR AT TIME OF SIGHTING: RESTING, TRAVELING (NOTE DIRECTION IN RELATION TO SHIP COURSE), BOW-RIDING, FEEDING/ERRATIC, MILLING (I.E., STAYING IN SAME AREA), JUMPING CLEAR OUT OF WATER, FLIPPER/TAIL SLAPPING, OTHER, OR UNKNOWN).

G. ACTION TAKEN: NONE, ALTER COURSE TO AVOID, MFAS POWER DOWN, MFAS SECURED (I.E. CEASE ACTIVE SONAR TRANSMISSION).

ONLY IN CASES WHERE MFAS IS POWERED DOWN OR SECURED, THE FOLLOWING ADDITIONAL INFORMATION IS REQUIRED IN ORDER TO FORWARD POST-EXERCISE IMPACT ASSESSMENT TO CPF AND NATIONAL MARINE FISHERIES SERVICE:

H. UNIT COURSE AND SPD.

I. ANIMAL COURSE AND EST SPD.

J. ACTION TIMELINE: LENGTH OF TIME MFAS POWERED DOWN, OR SECURED.

K. ACTION IMPACT (I.E. TACTICAL DEGRADATION ASSESSMENT): NONE, SLIGHT, MODERATE, SEVERE.

- REPEAT PARAS. A-L AS NECESSARY TO REPORT ADDITIONAL SIGHTINGS.

SIGHTING SHALL BE IN FORMAT:

A. DTG/ B. UNIT-POSIT/C. DESCRIPT/ D. # ANIMAL/ E. BRNG-RNG/ F. BEHAV/ G. ACTION TAKEN/H. UNIT CRS-SPD/ I. ANIMAL CRS/ J. ACTION TIME/

PART TWO OF THE REPORT WILL PROVIDE A COMMANDER'S ASSESSMENT OF EFFECTIVENESS OF THE MITIGATION MEASURES IMPLEMENTED IN REF E, MAKE RECOMMENDATIONS TO IMPROVE THESE MEASURES, AND REPORT ANY IMPACT TO TRAINING FIDELITY CAUSED BY THESE MEASURES (E.G., SONAR POWER REDUCTION CAUSED BY MARINE MAMMAL ENTERING BUFFER ZONE). IT IS PARTICULARLY IMPORTANT TO CAPTURE THE IMPACT THAT THESE MEASURES MAY HAVE ON OPERATIONS AND TRAINING.

5. (U) ENSURE WATCHSTANDERS ARE BRIEFED ON THE POSSIBLE PRESENCE OF MARINE MAMMALS AND THAT ALL SIGHTINGS ARE REPORTED TO THE BRIDGE. NOTE, WHALES OFTEN TRAVEL IN GROUPS AND A SIGHTING INDICATES THE POSSIBILITY OF OTHER WHALES IN THE VICINITY.

5.A. (U) UPON SIGHTING A WHALE, ADJUST COURSE AND SPEED AS NECESSARY TO MAINTAIN A SAFE DISTANCE CONSISTENT WITH PRUDENT SEAMANSHIP.

5.B. (U) SIGHTINGS OF ALL WHALES SHALL BE PASSED VIA CHAIN OF COMMAND TO THE CFMCC BATTLE WATCH CAPTAIN IOT ALERT OTHER SHIPS IN THE AREA TO THE POSSIBILITY OF THE WHALES' PRESENCE.

5.C. (U) IN THE EVENT OF A WHALE COLLISION. IF POSSIBLE, TAKE VIDEO AND/OR PHOTOGRAPHS OF THE STRICKEN WHALE.

5.C.1. (U) ATTEMPT TO IDENTIFY DISTINGUISHING CHARACTERISTICS OF THE WHALE INVOLVED. THE "WHALE WHEEL," A DEVICE THAT LISTS VARIOUS SPECIES OF WHALES AND THEIR IDENTIFYING FEATURES, CAN ASSIST IN THIS REGARD.

5.D. (U) REPORTING REQUIREMENTS FOR A WHALE COLLISION. CHAPTER

19-11.3.2 OF REF C PROVIDES GUIDANCE CONCERNING WHALE STRIKES.

5.D.1. (U) IN THE EVENT OF A COLLISION WITH A WHALE OR ON SIGHTING A MARINE MAMMAL FLOATING CARCASS DURING xxxxxx 07-0X, AN APPROPRIATE UNIT SITREP/OPREP MESSAGE MUST CONTAIN THE FOLLOWING ADDRESSEES AND INFORMATION:

A. DATE, TIME AND LOCATION.

B. VESSEL'S COURSE AND SPEED.

C. OPERATIONS BEING CONDUCTED BY THE VESSEL.

D. WEATHER CONDITIONS, VISIBILITY AND SEA STATE.

E. DESCRIBE THE ANIMAL IN AS MUCH DETAIL AS POSSIBLE; E.G., LENGTH, COLOR, CONDITION OF BODY, OTHER DISTINGUISHING FEATURES. DO NOT SPECULATE.

F. NARRATIVE OF INCIDENT, INCLUDING RELATIVE POSITION AND MOVEMENTS OF SHIP AND WHALE.

G. INDICATE IF PICTURES/VIDEOS WERE TAKEN FROM FLIGHT DECK CAMERAS OR OTHER INSTALLED OR PORTABLE CAMERAS.

5.D.2. (U) A VOICE REPORT (VIA ISIC) TO xxxxxx IS ALSO REQUIRED. IF VOICE COMMUNICATIONS ARE NOT AVAILABLE, MAKE REPORT VIA CHAT.

6. (U) ALL UNITS THAT EMPLOY MFAS SHALL ENSURE THEY FULLY UNDERSTAND AND IMPLEMENT THE MITIGATION AND REPORTING REQUIREMENTS PROMULGATED IN THIS MESSAGE.

6.A. (U) COMMANDING OFFICERS SHALL THOROUGHLY REVIEW THIS GUIDANCE WITH KEY PERSONNEL AND WATCHSTANDERS TO ENSURE FULL SITUATIONAL AWARENESS AND COMPLIANCE.

7. (U) REMINDER, NOTHING IN THIS MESSAGE RESTRICTS THE AUTHORITY OF A COMMANDING OFFICER FROM TAKING SUCH MEASURES DEEMED NECESSARY FOR OPERATIONAL FORCE PROTECTION AND SAFETY OF NAVIGATION PURPOSES.// BT

Prepared for
National Marine Fisheries Service
Office of Protected Resources

Prepared by
Department of the Navy

In accordance with
National Defense Exemption 23 January 2007
Biological Opinion 09 February 2007

Department of the Navy
SOUTHERN CALIFORNIA
COMPOSITE TRAINING UNIT EXERCISE 07-7
After Action Report
September 2007

PRELIMINARY DRAFT CPF SUBMITTAL

04 January 2008

Abstract

This report presents an analysis of the effectiveness of the mitigation and monitoring measures as required under the Biological Opinion on the U.S. Navy's Proposed Composite Unit Training Exercises and Joint Task Force Exercises Off Southern California From February 2007 to January 2009

AND

Discussion of the nature of effects on marine mammals, if observed, under the National Defense Exemption from the Requirements of the Marine Mammal Protection Act (MMPA) for Mid-Frequency Active Sonar

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ATTACHMENT G

EXECUTIVE SUMMARY

- This reports summarizes marine mammal sightings and assessment of mitigation effectiveness for the U.S. Navy's Composite Unit Training Exercise (COMPTUEX) 07-7 conducted with the USS Tarawa Expeditionary Strike Group (ESG) from 7 to 21 September 2007 within the offshore waters of Southern California.
- During COMPTUEX 07-7, there were a total of 57 sightings of marine mammals for an estimated total of 289 animals.
- There were four cases of these 57 sightings where surface ship mid-frequency active sonar (MFAS) was in use, but turned off (secured) upon initial marine mammal sightings and until the animals left the area. One case occurred at a range of 3000 yards which is greater than the safety zones specified within the 23 January 2007 National Defense Exemption (NDE).
- Four potential ESA-listed whales were sighted at 50 yards during MFAS transmission and could have potentially been exposed to SEL greater than 173 dB re 1 μPa2.s. The vessel immediately secured MFAS on sighting and stopped to allow the whales to clear the area. No apparent abnormal behavior from the animals was reported. The other two cases involved schools of non-ESA-listed dolphins or porpoise sighted near and approaching MFAS vessels, which secured sonar on first report of the sighting and kept the sonar off until the animals had departed.
- No marine mammal ship strikes occurred during COMPTUEX 07-7. There were three reports of U.S. Navy ships proactively maneuvering to avoid close encounters with marine mammals, providing evidence that these marine mammal mitigation measures are well-understood by Fleet operators and actively executed in operational practices.
- For all of COMPTUEX 07-7 marine mammal sightings, there was no obvious indication or report that any animal behaved in a manner not associated with normal movement, or foraging, recognizing that the level of biological information obtained is limited at this time.
- Based on visual reports of marine mammals from U.S. Navy lookouts during COMPTUEX 07-7, the U.S. Navy's COMPTUEX/JTFEX Environmental Assessment/Overseas Environmental Assessment (EA/OEA) acoustic modeling appears to very conservatively over estimate the amount of potential acoustic exposures, including those to Endangered Species Act (ESA) listed species. The degree of variability and over predictive nature inherent within these acoustic impact models is based largely on the significant natural variability within the science of at-sea marine mammal surveys used to derive density estimates, and other model limitations.
- The U.S. Navy is developing robust and operationally feasible exercise and long-term range complex monitoring plans that will attempt to integrate multiple tools and new technologies if applicable in order to provide better assessment of marine mammal occurrence, improved detection, and lead to a more science based determination of MFAS effects, or lack of effects

INTRODUCTION

This report is presented to fulfill U.S. Navy and U.S. Pacific Fleet written reporting requirements conditional to the 23 January 2007 National Defense Exemption (NDE) from the Requirements of the MMPA for Certain DoD Military Readiness Activities That Employ Mid-Frequency Active Sonar (MFAS) or Improved Extended Echo Ranging Sonobuoys. In addition, as these NDE mitigation measures are included in the 30 July 2007 *Biological Opinion (BO) on the U.S. Navy's Composite Unit Training Exercises (COMPTUEX) and Joint Task Force Exercises (JTFEX) Off Southern California From February 2007 to January 2009*. Reporting under the BO also fulfills reporting requirements for the NDE.

COMTUEX/JTFEX BO written report requirements as specified by NMFS (2007).

a. Summary of exercise (starting and ending date of exercise, number of ships and aircraft involved in exercise, and number of hours passive and active sonar was used during the exercise)

b. Specific mitigation measures Navy implemented during exercise;

c. Number of ESA-listed marine mammals that (i) had been detected within 200 yards of a sonobuoy and 500 and 1,000 yards of a sonar dome or during an active transmission and (ii) the estimate of number of ESA-listed marine mammals that had been exposed to MFAS at received levels equal to or greater than 173 dB re 1 μPa2.s

d. Reports of the activity or activities that ESA-listed marine mammals had been observed to exhibit while they were within 200 yards of a sonobuoy and 500 and 1,000 yards of a sonar dome that was actively transmitting during exercise

Reports of observations shall identify date, time, and visual conditions associated (if the observation is produced from a helicopter, the report should identify the speed, vector, and altitude of the airship; the sea state, and lighting conditions) with observation; and how long an observer or set of observers maintained visual contact with a marine mammal;

e. evaluation of effectiveness of those mitigation measures at avoiding exposing endangered whales to ship traffic and endangered whales and pinnipeds to MFAS. This evaluation shall identify the specific observations that support any conclusion U.S. Navy reaches about effectiveness of mitigation measures;

f. evaluation of monitoring program's ability to detect marine mammals that occur within 200 yards of a sonobuoy and 500 and 1,000 yards of a sonar dome, during an active transmission (or close enough to an exercise to be exposed to mid-frequency sonar at received levels equal to or greater than 173 dB re 1 μPa2.s) with specific evidence that supports any conclusions U.S. Navy reaches.

REPORT ORGANIZATION

This report contains only unclassified material and provides the information and analysis for Composite Unit Training Exercise (COMPTUEX) 07-7, and is submitted in fulfillment of NDE and BO written requirements.

The report is organized by section in the following order:

Section 1 Exercise Summaries provides exercise specific summary including the starting and ending dates, the number of ships and aircraft participating, and the number of hours of mid-frequency active sonar (MFAS) used from all emitters.

Section 2 Observations and Mitigation Effectiveness provides an estimated number of marine mammals observed during COMPTUEX 07-7 potentially affected or not affected by Anti-submarine Warfare (ASW) operations, noting the nature of any observed effects where possible. In addition, Section 2 assesses the effectiveness of the NDE and BO mitigation and monitoring measures required during exercises with regard to power down and shut down zones when marine mammal are sighted within the vicinity of ships using MFAS.

Appendix A contains tables, figures and lists the NDE mitigation measures.

BACKGROUND

Composite Unit Training Exercises (COMPTUEX) is part of an Integrated Phase of the Fleet Readiness Training Plan (FRTP) and may involve either a Carrier Strike Group (CSG) or an Expeditionary Strike Group (ESG). A COMPTUEX is conducted as a series of scheduled training events that occur according to a given time schedule against an opposition force. COMPTUEX provides an opportunity for the Strike Group to become proficient in a myriad of required warfare skill sets. Additionally, it stresses the integration or coordination of the different warfare areas and provides realistic training on in-theater operations.

Prior to the exercise marine species awareness training was provided to exercise participants. A Letter of Instruction (LOI) which reiterated the applicable NDE mitigation measures as specified in **Appendix B** was also distributed to participants and explains procedures for reporting marine mammal sightings discussed in Section 2.

MFAS equipped platforms participating in COMPTUEX 07-7 as part of the ESG included one Ticonderoga-class guided missile cruiser (CG), and one Arleigh Burke-class guided missile destroyer (DDG) with AN/SQS-53C mid-frequency sonar, and one Oliver Hazard Perry-class frigate (FFG) with AN/SQS-56 mid-frequency sonar, and associated SH-60B/F/R helicopters with AN/AQS-13F or AQS-22 mid-frequency dipping sonar, and AN/SSQ-62B/C/D/E Directional Command Activated Sonobuoy System (DICASS). Four additional MFAS equipped ships were also part of the overall exercise and included one CG, two DDGs, and one FFG.

Active sonar use by aviation assets is captured and added to sonar totals reported in this document. MFAS on Los Angeles-class (SSN) submarines (AN/BQQ-5) is seldom used in tactical training scenarios and MFAS from submarines was not used in COMPTUEX 07-7.

SECTION 1 EXERCISE SUMMARIES

EXERCISE SPECIFICS

COMPTUEX 07-7 was conducted from 7 to 21 September 2007 and involved the USS Tarawa (LHA 1) ESG (**Table A-1 Appendix A**). Ships participating in COMPTUEX 07-7 included three MFAS equipped ships. Other participating units representing amphibious assault, support, and opposition forces included submarines and three non-MFAS equipped ships. There was no active sonar use by these supporting platforms because of either tactical considerations (submarines) or lack of MFAS (amphibious assault ships, supply ships). Based on the LHA, CG, DDG, and FFG ships participating in COMPTUEX 07-7, there were two to four ASW-capable SH-60 B/F helicopters available for training during the exercise on any given day depending on maintenance availability.

MITIGATION MEASURES PERFORMED

All mitigations measures required by the 23 January 2007 NDE were followed (**Appendix A**). Those 29 NDE measures include specific details for personnel training, established lookout and watchstander responsibilities, mandated specific operating procedures, and described coordination and reporting requirements. Observation data from Navy lookout sightings for COMPTUEX 07-7 is described in Section 2.

SECTION 2 OBSERVATIONS AND MITIGATION EFFECTIVENESS

MARINE MAMMALS AND OCEANOGRAPHIC CONDITIONS

Section 2 provides estimated numbers of marine mammals observed in Southern California offshore waters during COMPTUEX 07-7. This information is based on analysis of actual events and sightings of marine mammals reported by exercise participants. **Table A-2 Appendix A** lists sighting information from U.S. Navy lookouts. **Table A-3 Appendix A** lists possible marine mammal species occurring in Southern California waters based solely on estimated distribution and abundance. These tables highlight the Endangered Species Act (ESA) listed species described in the COMPTUEX/JTFEX BO (NMFS 2007), and shows estimated potential acoustic exposures derived from acoustic impact modeling (DoN 2007 COMPTUEX/JTFEX EA/OEA).

All detections described in this section were made by standard Navy surface ship and aircrew lookout reporting procedures as detailed in a formal LOI issued prior to the exercise which reiterates the NDE measures and safety zones described in **Appendix A**.

EXERCISE MARINE MAMMAL SIGHTINGS

COMPTUEX 07-7 Biological Observations

Table A-2 Appendix A contains a complete list of COMPTUEX 07-7 marine mammal visual sightings made by U.S. Navy lookouts and watch teams based on standardized reporting protocols. There were a total of 57 marine mammal sightings for an estimated 289 animals during COMPTUEX 07-7. As in other U.S. Navy exercise after action reports, the majority of animals sighted were dolphins and porpoises since these species can often occur in large schools. For COMPTUEX 07-7, this was again true with 13 dolphin sightings accounting for 223 animals or 77.2% of the total estimated number of animals (223 of 289).

There were three sightings of animals classified as "small whales", 10 sightings of animals classified as "large whales", 27 sightings of animals classified as "whale" (not designated small whale or large whale), one sighting of a pinniped (seal or sea lion), and one sighting of a marine mammal not classified into any particular species.

There were two sightings of a whale carcass during COMPTUEX 07-7, one on 17 September, and again on 18 September. No MFAS had been used within 24 hours of these sightings and as discussed in the *MFAS Events* section below, NOAA and NMFS suspects that ship strike somewhere adjacent to the Channel Islands Marine Sanctuary may have caused these mortalities. Prevailing currents within Southern California are normally north-to-south and would have caused the carcasses to drift into the COMPTUEX exercise area.

Oceanographic conditions were typical for Southern California in September with sea surface temperatures ranging between 16-22°C (60.8-71.6°F) (**Figures A-2 and A-3 Appendix A**). Based on reports from individual U.S. Navy ships, sea states were relatively mild with the majority of sea states between 1 and 2, and only a few sea state 3s (**Table A-2 Appendix A**). Sea states are relatively important because visual observations of marine mammals at sea become increasingly difficult at higher sea states above 3 for smaller, more cryptic species such as beaked whales that do not travel in large schools (**Table A-4 Appendix A**).

MITIGATION AND MONITORING ASSESSMENT

OVERVIEW

The NDE calls for the U.S. Navy to submit a report to NMFS that includes a discussion of the nature of the any effects or lack of effects based on modeling results and marine mammal sightings. In addition, the BO Terms and Conditions require a report that evaluates the mitigation measures and details results from the U.S. Navy's exercise monitoring program. In this case, the mitigation measure under the BO are the NDE measures, therefore the discussion is presented together in this section.

This section of the report provides an assessment of the effectiveness of the mitigation and monitoring measures. ASW proceeds slowly and requires careful development of a tactical frame of reference over time. Data is integrated from a number of sources and sensors. Once MFAS is turned off for a period of time, turning it back on later does not usually allow a commander to simply continue from the last frame of reference. Lost MFAS time not only equates to lost exercise time but has a broader, overall impact on the tempo and development of a "tactical picture" shared among exercise participants as they train toward the goal of improving ASW skills in general.

COMPTUEX 07-7 Assessment

Mitigation measures were designed to minimize interactions between Navy assets and marine mammals involving MFAS levels that have been extrapolated to result in PTS and determined to result in TTS. During COMPTUEX 07-7 Navy assets observed marine mammals only infrequently and encounters were brief in duration. Navy ships were not tasked nor expected to maintain contact with marine mammals sighted for purposes of monitoring requirements. To do so would have unnecessarily interfered with military readiness activities and may result in concerns with whether Navy ships were intentionally harassing marine mammals. While the majority of encounters reported occurred when there MFAS was not in use, no conclusions or inferences can be drawn with whether MFAS was a factor. Many other factors exist including, but not limited to, the number of hours of underway time easily exceeding the number of hours during which MFAS was operating and the sea conditions in existence in the extremely large area over which the exercise occurred.

There were no marine mammal ship strikes during COMPTUEX 07-7. Three vessels not using MFAS reported changing course to avoid crossing the path of traveling marine mammals and ensure safe distances between the ship and animal.

Passive Sonar

Passive sonar involves acoustic listening to underwater sounds and does not involve transmitting active sound into the water column. Passive sonar use is driven by the tactical nature of an ASW or training event, and should be assumed to be employed whenever possible. Given the nature of passive sonar technology and underwater sound propagation, localizing or determining range and absolute position of an object is generally not possible with any single ship-based passive sonar.

For COMPTUEX 07-7, there were no reports of passive acoustic detection of marine mammals by an exercise participant.

Active Sonar

Specific source levels, numbers of sources, and frequencies of active sonars used during COMPTUEX 07-7 are classified since this information provides potential adversaries with important tactical data.

During COMPTUEX 07-7, 134 hours of MFAS time was reported from all sources including hull-mounted 53C, helicopter dipping sonar, and DICASS sonobuoys (**Table A-1 Appendix A**). It should be noted that MFAS is only used during carefully reviewed scenarios and for only a small subset of any given exercise time frame. Total active sonar hours, as presented in this report, represent a sum of the total MFAS time from a number of individual training events during COMPTUEX 07-7. In other words, the unit using sonar records when the sonar was turned on at the beginning of a training event, and reports time until the event is finished. The sonar "on period" is not equivalent to active sonar transmission since there may be tactical and maintenance reasons why MFAS may not be in transmit mode. Therefore, based on how the U.S. Navy MFAS reporting system operates and standardized reporting protocols, number of MFAS hours value does not represent actual total sonar ping hours. Furthermore, during period when there is an active transmission, MFAS only puts active sound into the water at discrete intervals. Sonar signals are not a continuous source of acoustic energy. For example, surface ship sonar signal consists of a pulse (i.e. ping) significantly less than one-two seconds long with time between successive pings as much as 30 seconds (NMFS 2007). During typical active sonar use, the MFAS active sonar is silent for the vast majority of the time which was also the case for COMPTUEX 07-7.

MFAS Events

Table A-5 Appendix A shows COMPTUEX 07-7 marine mammal sightings in relation to NDE mandated safety zones. There were a total of four occurrences of MFAS being turned off (i.e. secured) by surface ships based on marine mammal sightings. One of these four events was an instance when MFAS was secured by a ship at ranges beyond those required under NDE (3000 yards). Given MFAS propagation loss at ranges from 2000 to 6500 yards, this animal would not have been exposed to MFAS transmission with SEL greater than 173 dB re 1 µPa2.s. In addition, MFAS was secured for 10 minutes after the initial sighting until animals were no longer in view of the lookouts.

Four whales which may or may not have been ESA listed species (blue, fin, humpback, sei, or sperm whales) were sighted within 50 yards of a MFAS transmission on 14 September 2007. **Table A-5 Appendix A** has a relative position diagram for this event with the closest of the four animals reported at 50 yards. Given the reported sighting distance it is possible that some or all of these whales may have been exposed to SEL greater than 173 dB re 1 µPa2.s prior to the sonar being secured. The vessel ceased sonar transmission and stopped to allow the animals to clear the area.

The remaining two events where MFAS was secured involved dolphin or porpoise pods traveling in close proximity to the ship, along the starboard side for one report on 19 September, and at 200 yards on 20 September (the animals approaching the bow of the ship from ahead while on a reciprocal course). MFAS was secured upon sighting these marine mammals and remained secured until sufficient distance had been opened between the vessel and the animals.

There are combinations of factors that reduce the acoustic energy received by dolphins approaching MFAS transmitting ships. Dolphins parallel or astern of the bow are outside of the main beam of the MFAS vertical beam pattern. Source levels drop quickly outside of the main beam. Sidelobes of the radiate beam pattern that point to the surface are significantly lower in power. Together with spherical spreading losses, received levels in the ship's bow wave and sides can be more than 42 dB below the actual power output. It is unlikely that the dolphins sighted on 19 September were exposed to SEL greater than 173 dB re 1 μPa2.s. On 20 September, per NDE safety ranges, MFAS was secured at 200 yards as porpoises approached the ship from ahead. From some point between 500 to 1000 yards, it was possible that these animals may have been exposed to SEL greater than 173 dB, yet no adverse reactions were noted, MFAS was secured, and the animals passed the ship without incident.

No live or dead stranded marine mammals were sighted during or after COMPTUEX 07-7. One possible blue whale carcass was sighted northwest of San Clemente Island during COMPTUEX 07-7 and may represent the southwest bound drifting of previously reported carcass as determined by NOAA and NMFS. From the text box below, the 17 and 18 September Navy observation northwest of San Clemente Island was likely the deceased animal from the preceding 8 September Long Beach stranding. This carcass was towed back to sea by authorities and offshore surface currents were favorable for southwest drift to the northeast of San Clemente Island where it was sighted by a U.S. Navy surface ship (**Figure A-5 Appendix A**). The carcass sighting on 18 September by the same U.S. Navy vessel was a re-sighting of the 17 September report.

"..on Sept. 8 NMFS got a call from the USCG about a male blue whale carcass 72 feet long, in the Long Beach Harbor. The animal had been long dead, so it was difficult to determine cause of death – but they presume it had been brought in on the bow of a ship. However, it was difficult to tell if the cause of death was the ship strike. Several days later they had another report of a carcass near San Clemente Island, but they presume it is likely the same whale that had been in Long Beach. On September 11th, there was a report of a dead floating female blue whale approximately 70 feet long was sighted offshore from Santa Barbara, and the necropsy revealed that it was clearly a fresh ship strike. Another animal was observed the day before yesterday (September 19th), and scientists believe it was also a ship strike and that it will land in Ventura. NMFS is taking tissue samples of all of the stranded whales. This is unprecedented and NMFS does not know what is happening, as they have never seen three blue whales wash up within ten days. It was noted that it is common to see high numbers of blue whales in the channel, as the waters around the Channel Islands and near San Pedro are part of the feeding area for the whale."

From: NOAA 2007 (Channel Islands National Marine Sanctuary, Sanctuary Advisory Council, Draft Meeting Notes September 21, 2007

Modeling Estimates Applicable to COMPTUEX 07-7

For the COMPTUEX/JTFEX EA/OEA (DoN 2007) an estimate of potential acoustic and explosive exposures to marine mammals was generated in support of the NEPA process. **Table A-3** in **Appendix A** shows estimated marine mammal acoustic exposures from model derived calculations based on estimated marine mammal densities, operational parameters, sound transmission loss, and potential energy accumulated based strictly on pre-exercise acoustic impact modeling (DoN 2007).

The exercise specific model estimated total potential exposures over two years of Southern California COMPTUEX and JTFEX exercises. Extrapolating for a single exercise as in Table A-3 estimates 12,198 potential exposures (11,564 sub-TTS Level B, 590 TTS Level B, and 44 Level A). Clearly, as seen from the numbers of animals reported from COMPTUEX 07-7 (289 marine mammals), the level of animal density encountered within Southern California, even considering animals not detected visually, appears to have been significantly less than modeling assumptions. COMPTUEX 07-7 only encountered approximately 2.4% of the number of animals the acoustic model predicted. This is reflective of the conservative data used to populate acoustic effects models, and the broad assumptions that are typically used in the models concerning animal distribution and biology.

NDE AND BO ASSESSMENT

All measures promulgated in the 23 January 2007 *Mid-Frequency Active Sonar Mitigation Measures during Major Training Exercises or within Established DoD Maritime Ranges and Established Operating Areas* (NDE) section were implemented before and during COMPTUEX 07-7.

In addition to the above assessment of the NDE, the BO calls for a report that evaluates the effectiveness of the U.S. Navy's exercise mitigation measures. As described previously, the three categories of measures (Personnel Training, Lookout and Watchstander Responsibilities, and Operating Procedures) as outline in the NDE, appear effective in detecting and responding appropriately to the presence of marine mammals, when visually observed.

NMFS (2007) COMPTUEX/JTFEX 07-7 BO Terms and Condition require the U.S. Navy to estimate the number of ESA-listed marine mammals that may have been exposed to received energy level equal to or greater than 173 dB re 1 μPa2•s.

During COMPTUEX 07-7, only one FFG surface ship equipped with AN/SQS-56 MFAS sighted potential ESA-listed marine mammals within a range that may have led to SEL exposure greater than 173 dB re 1 μPa2.s. As described previously, this was for four whales sighted at 50-yards on 14 September 2007. The AN/SQS-56 is not as powerful as the AN/SQS-53C on DDG and CG ships, but is conservatively added to acoustic impact models as a 53C when calculating pre-exercise acoustic exposures for the COMPTUEX/JTFEX EA/OEA. From **Table A-4 Appendix A**, a single COMPTUEX/JTFEX would be expected to potentially expose 101 ESA-listed marine mammals, yet only four potential ESA-listed marine mammals were observed during COMPTUEX 07-7 at ranges that may have exposed them to SEL greater than 173 dB re 1 μPa2.s.

In addition, for all of COMPTUEX 07-7 marine mammal sightings, there was no obvious indication or report that any animal behaved in a manner not associated with normal movement, or foraging, recognizing that the level of biological information obtained is limited at this time.

The U.S. Navy acknowledges that this discussion does not account for potential marine mammal species not visually observed, which is a difficult determination even within the marine mammal scientific survey community.

In regards to impacts not associated with MFAS such as ship strikes, the U.S. Navy has a robust required ship strike reporting program. No marine mammal ship strikes occurred during COMPTUEX 07-7. **Table A-2, Appendix A**, summarizes three instances where U.S. Navy ships proactively maneuvered to avoid close encounters with marine mammals, providing evidence that these marine mammal mitigation measures are well-understood by Fleet operators and actively executed in operational practices. For COMPTUEX 07-7, these procedures are assessed to have been effective.

Data Limitations and Improvements

There is no information from which to assess how many, if any, animals not observed by Navy lookouts may or may not have been exposed to MFAS received levels greater than 173 dB re 1 $\mu Pa^2 \cdot s$. Data collection needs to address this question will be reviewed as they become available for potential incorporation into future exercises, although this remains a problematic science issue for even non-Navy marine mammal surveys. Real-time passive sonar systems used by the U.S. Navy and to some degree by most of the marine mammal science community lack the ability to automatically classify detected species, although there is substantial academic research into improving this capability. Most current passive data sets rely on extensive post-collection analysis by skilled subject matter experts to conclusive establish species identification. In addition to species classification, range detection using moving passive acoustic systems on U.S. Navy ships is limited in real time at the typical 8-10 knot speeds at which many ASW training events occur. Indeed, if passive range detection of any submerged contacts (submarines, marine mammals) was more advanced and easier, then there would be less tactical reliance on active sonar systems.

The U.S. Navy is beginning development of robust, realistic, and operationally feasible exercise and long-term range complex monitoring plans. The goal of these plans is to integrate multiple tools such as surveys in an effort to generate better assessments of marine mammal occurrence and possible MFAS effects, or lack of effects.

In accordance with the COMPTUEX/JTFEX BO, data collection needs to address unresolved questions regarding likely area-specific species composition and potential for alternative detection technologies may be incorporated into future exercises as the U.S. Navy's exercise monitoring program evolves.

REFERENCES

DoN. 2007. Final Environmental Assessment/Overseas Environmental Assessment for Joint Task Force Exercises and Composite Training Unit Exercises- February 2007. Department of the Navy.

NMFS. 2007. Biological opinion on the U.S. Navy's proposed Composite Training Unit Exercises and Joint Task Force Exercises off Southern California from February 2007 to January 2009. Office of Protected Resources, National Marine Fisheries Service, Silver Springs, MD. 182 pp.

NOAA. 2007. Channel Islands National Marine Sanctuary, Sanctuary Advisory Council, Draft Meeting Notes September 21, 2007, Santa Barbara, CA.

APPENDIX A- TABLE AND FIGURES

INTRODUCTION

This Appendix contains material supporting the discussion in the U.S. Navy's COMPTUEX 07-7 After Action Report. It is divided into two parts. Appendix A Part 1 contains tables and figures referred to in the main Report. Part 2 contains the 2007 NDE mitigation measures.

EXERCISE PARTICULARS

Table A-1. Exercise summary for COMPTUEX 07-7 conducted within SOCAL 7-21 September 2007.

Participants	Event Name	Dates	MFAS Use Reported (hours)
USS Tarawa ESG	COMPTUEX 07-7	07-21 Sep 2007	134 hrs
Number of MFAS equipped surface ships in ESG:			3 (1 CGs, 1 DDGs, 1 FFGs)
Number of other MFAS equipped surface ships:			4 (1 CG, 2 DDGs, 1 FFG)
Estimated number of potential ASW helicopters:			2-4 ESG assigned units 4-6 others Upper estimate assumes no helicopters down for maintenance

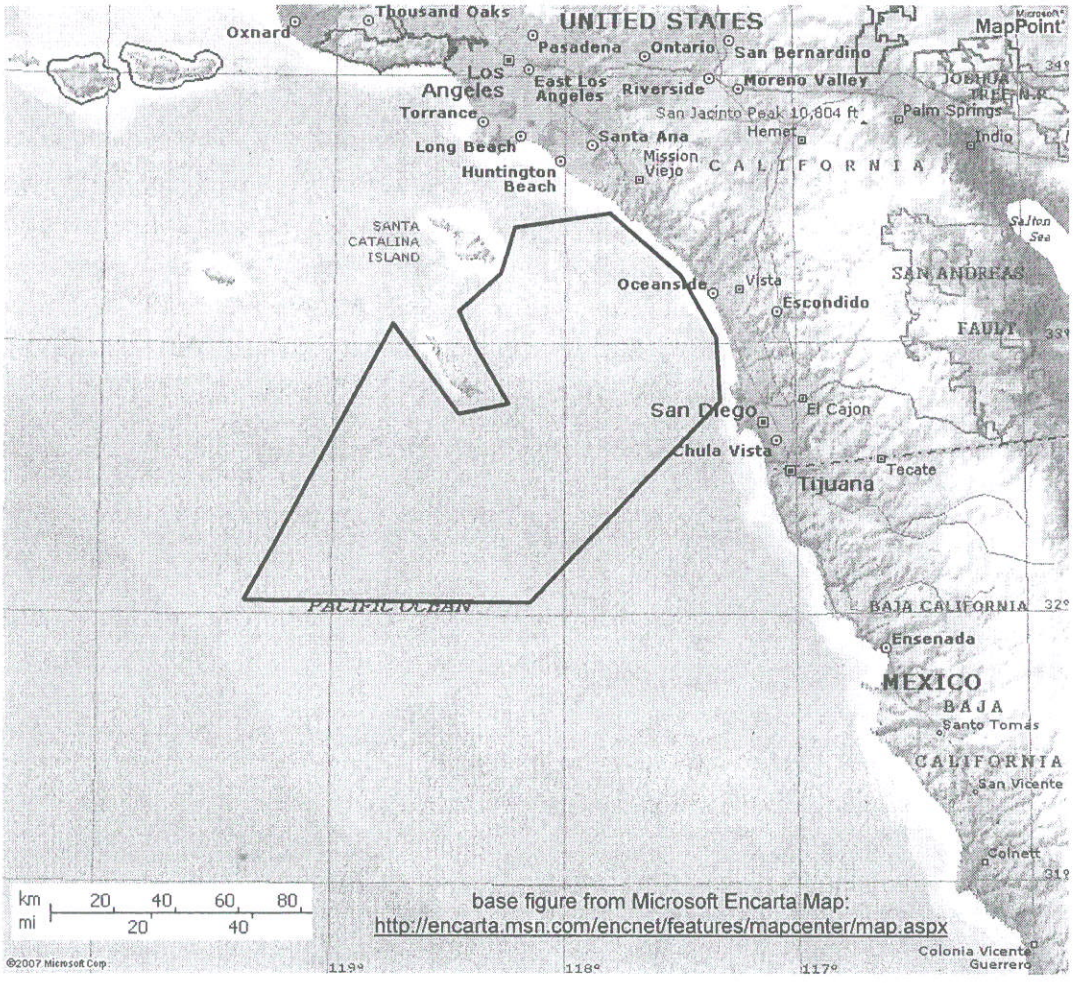


Figure A-1. Approximate area of reported marine mammal sightings during exercise COMPTUEX 07-7.
Note: this area only represents the area in which marine mammal sightings were reported by exercise participants and does not imply operational area.

EXERCISE RESULTS

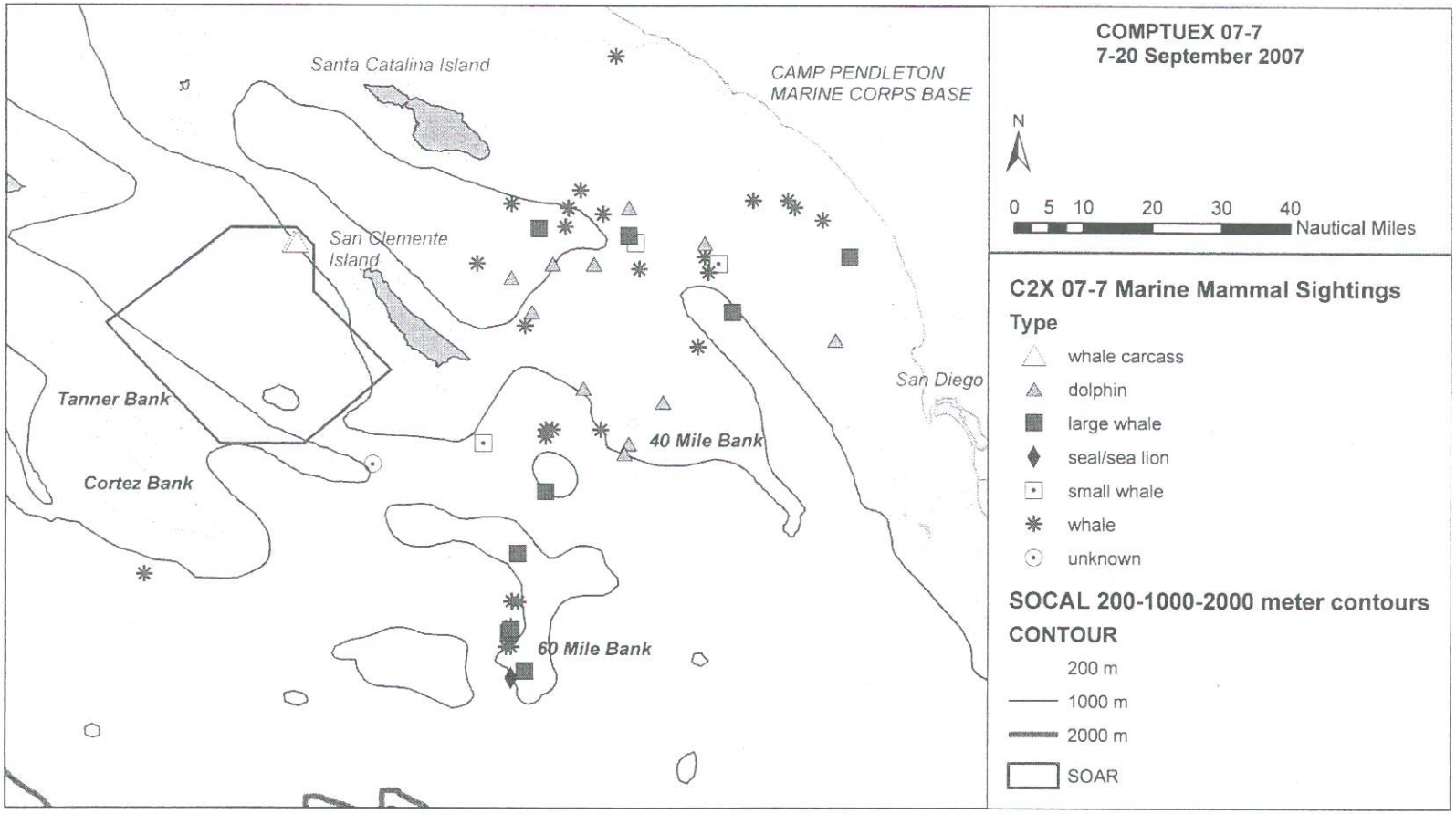
Table A-2. Marine mammal sightings and actions by exercise participants during COMPTUEX 07-7. Text in red **Bold** indicate events when MFAS was in use and secured due to marine mammal mitigation. "NR" indicates "Not Reported".

Date-Time local	Description of Actions Taken	MFAS Lost Train Time (min)	Type of detect	Sea State and Weather	#	Animal Type	MFAS in use ?	MFAS Secured?
9/08-0730	Surface ship sights 1 "whale" broaching at 4000 yards. MFAS not in use. No action taken.		visual	1-NR	1	whale		
9/08-1300	Surface ship sights 20 "porpoises" moving at 25000. MFAS not in use. No action taken.		visual	3-NR	20	porpoise		
9/10-0840	Surface ship sights 3 "large whales" at 500 yards on the surface for two minutes. MFAS not in use. No action taken.		visual	2-NR	3	large whale		
9/10-0909	Surface ship sights 3 "dolphins" at 200 yards on surface for 30 seconds. MFAS not in use. No action taken.		visual	1-NR	3	dolphin		
9/10-0957	Surface ship sights 2 "small whales" at 4000 yards by spout blows. MFAS not in use. No action taken.		visual	1-NR	2	small whale		
9/10-1051	Surface ship sights 3 "dolphins" at 500 yards on surface playing		visual	1-NR	3	dolphin		
9/10-1330	Surface ship sights 6 "dolphins" at 20 yards crossing ships bow. MFAS not in use. Ship maneuvers to avoid.		visual	2-SKC	6	dolphin		
9/10-1620	Surface ship sights 1 "whale". Non-MFAS ship. Ship stops for 5 minutes to allow animal to clear area.		visual	2-NR	1	whale		
9/10-1644	Surface ships sights 1 "whale" at 1000 yards blowing off bow. Non-MFAS ship. Ship alters course to avoid for 5 minutes.		visual	2-clear	1	whale		
9/10-1644	Surface ships sights 1 "whale" at 1000 yards blowing off port bow for 5 minutes. Non-MFAS ship. No action taken		visual	2-clear	1	whale		
9/11-0710	Surface ship sights 1 "large whale (dark gray, black back, no flukes up on dive) at non-reported range. Non-MFAS ship. No action taken.		visual	2-clear	1	large whale		
9/11-0747	Surface ships sights 1 "whale" at unspecified range port bow for 5 minutes. Non-MFAS ship. No action taken		visual	2-clear	1	whale		
9/11-1505	Surface ship sights 1 "unknown marine mammal" at 500 yards.		visual	2-NR	1	unknown		

9/12-1846	Surface ships sights 1 "whale" at unspecified range off bow for 5 minutes. Non-MFAS ship. No action taken		visual	2-clear	1	whale		
9/13-1806	Surface ships sights "whale corpse". Navy reporting message sent. MFAS not in use. No action taken.		visual	NR	1	whale		
9/14-1737	Surface ship sights 4 "whales" at 50 yards diving and surfacing several time. **MFAS in use. MFAS secured during middle of ASW exercise.** *Ship alters course and stops to avoid animals.*	NR	visual	3-NR	4	whale	yes	yes
9/14-0807	Surface ship sights 2 "whales" at 3500 yards spouting and fluking up. Non-MFAS-ship. No action taken.		visual	1-clear	2	whale		
9/14-0820	Surface ship sights 2 "whales" at 4000 yards with multiple long spouts. Non-MFAS ship. No action taken		visual	1-clear	2	whale		
9/14-0907	Surface ship sights 1 "large whale" at 1800 yards. Non-MFAS ship. No action taken		visual	NR	1	large whale		
9/14-1534	Surface ships sights 2 "whales" at unspecified range off bow with blows seen for 5 minutes. Non-MFAS ship. No action taken		visual	2-clear	2	whale		
9/15-1707	Surface ships sights 1 "whale" at unspecified range off bow with blows seen for 5 minutes. Non-MFAS ship. No action taken		visual	1-clear	1	whale		
9/15-1456	Surface ship sights 1 "seal at 100 yards swimming. MFAS not in use. No action taken.		visual	1-NR	1	seal		
9/16-0755	Surface ship sights 4 "whales from between 30-1500 yards along multiple bearings. First sighting was at 1300 yards. Whales were transiting and observed for 8 minutes until lost from view. Non-MFAS ship. No action taken.		visual	2-NR	4	whale		
9/16-0640	Surface ship sights 1 "large whale" at 1000 yards swimming for 4 minutes until lost from sight. MFAS not in use. No action taken.		visual	2-NR	1	whale		
9/16-0736	Surface ships sights 2 "large whales" at 2000 yards swimming for 6 minutes until lost from view. MFAS not in use. No action taken.		visual	2-clear	2	large whale		
9/16-0808	Surface ship sights 3 "whales" at 2000 yards blowing off starboard bow for 15 minutes. Non-MFAS ship. No action taken.		visual	2-clear	3	whale		
9/16-0823	Surface ship sights 2 "whales" at 4000 yards blowing off starboard bow for 15 minutes. Non-MFAS ship. *Ship maneuvers to allow larger passing range to animals.*		visual	2-clear	2	whale		
9/16-0831	Surface ship sights 2 "whales" at 3000 yards blowing off starboard beam. Non-MFAS ship. No action taken.		visual	2-clear	2	whale		
9/16-0835	Surface ship sights 2 "large whales" at 2000 yards swimming for 3 minutes until lost from view. MFAS not in use. No action taken.		visual	2-clear	2	large whale		

9/16-0844	Surface ship sights 1 "large whale" at 600 yards swimming for 5 minutes until lost from view. MFAS not in use. *Ship maneuvers to increase distance between ship and animal.*		visual	2-clear	1	large whale		
9/16-0851	Surface ship sights 1 "whale" at non-reported range blowing off bow. Non-MFAS ship. No action taken.		visual	2-clear	1	whale		
9/16-0900	Surface ships sights 1 "large whale" at 100 yards swimming for 5 minutes. MFAS not in use. Ship maneuvers and stops to allow animal to cross ship's bow.		visual	3-clear	1	large whale		
9/16-1056	Surface ship sights 1 "whale" at 200 yards. Broaching and moving port to starboard. MFAS not in use. No action taken.		visual	2-NR	1	whale		
9/16-1457	Surface ship sights 40+ "dolphins" at 2000 yards swimming for 7 minutes until lost from view. MFAS not in use. No action taken.		visual	2-clear	40	dolphin		
9/17-0800	Surface ship sights "whale carcass" floating. Navy reporting message sent. MFAS not in use for the 24 hours preceding the sighting. No action taken.		visual	NR	1	**carcass**		
9/17-0913	Surface ships sights 24 "porpoises" at 300 yards. MFAS not in use. No action taken.		visual	1-NR	24	porpoise		
9/17-1545	Surface ship sights 20 "dolphins" at 1500 yards moving from port to starboard. MFAS not in use. No action taken.		visual	NR	20	dolphin		
9/17-1611	Surface ship sights 1 "pilot whale" at 200 yards. MFAS not in use. Ship maneuvers to open range between ship and animal.		visual	NR	1	small whale		
9/18-1801	Surface ship sights 1 "whale" 2000 yards off bow for 1 minutes until lost from view. Non-MFAS ship. No action taken.		visual	1-clear	1	whale		
9/18-1429	Surface ship sights "whale carcass" floating. Navy reporting message sent. No action taken.		visual	NR	1	**carcass**		
9/19-0656	Surface ship sights 1 "whale" at non-reported range blowing for 1 minute. Non-MFAS ship. No action taken.		visual	2-clear	1	whale		
9/19-0849	Surface ship sights 1 "whale" at non-reported range off bow for 5 minutes. Non-MFAS ship. No action taken.		visual	1-clear	1	whale		
9/19-0955	Surface ship sights 1 "whale" at non-reported range blowing off bow for 5 minutes. Non-MFAS ship. No action taken.		visual	2-clear	1	whale		
9/19-0957	Surface ship sights 1 "small whale" at 3000 yards. **MFAS in use. MFAS secured for 10 minutes.**	10	visual	2-NR	1	small whale	yes	yes

9/19-0957	Surface ship sights 1 "whale" at non-reported range off bow for 5 minutes. Non-MFAS ship. No action taken.		visual	2-clear	1	whale		
9/19-1006	Surface ship sights 1 "whale" at non-reported range blowing off port bow for 5 minutes. Non-MFAS ship. Ship maneuvers to open range between ship and animal.		visual	1-clear	1	whale		
9/19-1018	Surface ship sights 1 "whale" at non-reported range blowing off starboard quarter for 5 minutes. Non-MFAS ship. No action taken.		visual	1-clear	1	whale		
9/19-1049	Surface ship sights unknown number of dolphins along starboard side of ship. **MFAS is use. MFAS secured for 18 minutes.**	18	visual	1-clear		dolphin	yes	yes
9/19-1130	Surface ship sights 2 "fin whales" at 4000 yards swimming south and crossing bow ahead of ship. Non-MFAS ship. No action taken.		visual	1-clear	2	large whale		
9/19-1139	Surface ship sights 20 "dolphins" at 1000 yards swimming for 5 minutes until lost from view due to ship's movement. MFAS not in use. No action taken.		visual	2-part cloudy	20	dolphin		
9/19-1305	Surface ship sights 2 "large whales" at 1000 yards swimming for 5 minutes until lost from view. MFAS not in use. Ship maneuvers to open range between ship and animals.		visual	3-NR	2	large whale		
9/20-1756	Surface ship sights 63 "porpoises" at 200 yards swimming toward ship. MFAS not in use. No action taken.		visual	NR-clear	63	porpoise		
9/20-0300	Surface ship sights 2 "large whales" at 6000 yards swimming north before lost from view. Non-MFAS ship. No action taken		visual-night	1-clear	2	large whale		
9/20-1200	Surface ship sights 1 "large whale" at non reported range. Non-MFAS ship. No action taken.		visual	NR	1	large whale		
9/20-1205	Surface ships 1 "whale" 4000 yards off bow blowing for 5 minutes. Non-MFAS ship. No action taken.		visual	NR	1	whale		
9/20-1450	Surface ship sights 4 "porpoises" at 200 yards swimming on a reverse parallel course as the ship. **MFAS in use. MFAS secured for 20 minutes.**	20	visual	1-NR	4	porpoise	yes	yes
9/21-0840	Surface ship sights 20 "dolphins" at 1000 yards swimming for 5 minutes until lost from view due to ship's movement. MFAS not in use. No action taken.		visual	2-clear	20	dolphin		
57	**= total number of sightings**	**48 min**	**= known lost MFAS training time in minutes**		**289**	**= # of marine mammals**		


Santa Catalina Island
CAMP PENDLETON
MARINE CORPS BASE
San Clemente
Island
Tanner Bank
Cortez Bank
40 Mile Bank
60 Mile Bank
San Diego
COMPTUEX 07-7
7-20 September 2007
N
0 5 10 20 30 40
Nautical Miles
C2X 07-7 Marine Mammal Sightings
Type
whale carcass
dolphin
large whale
seal/sea lion
small whale
whale
unknown
SOCAL 200-1000-2000 meter contours
CONTOUR
200 m
1000 m
2000 m
SOAR

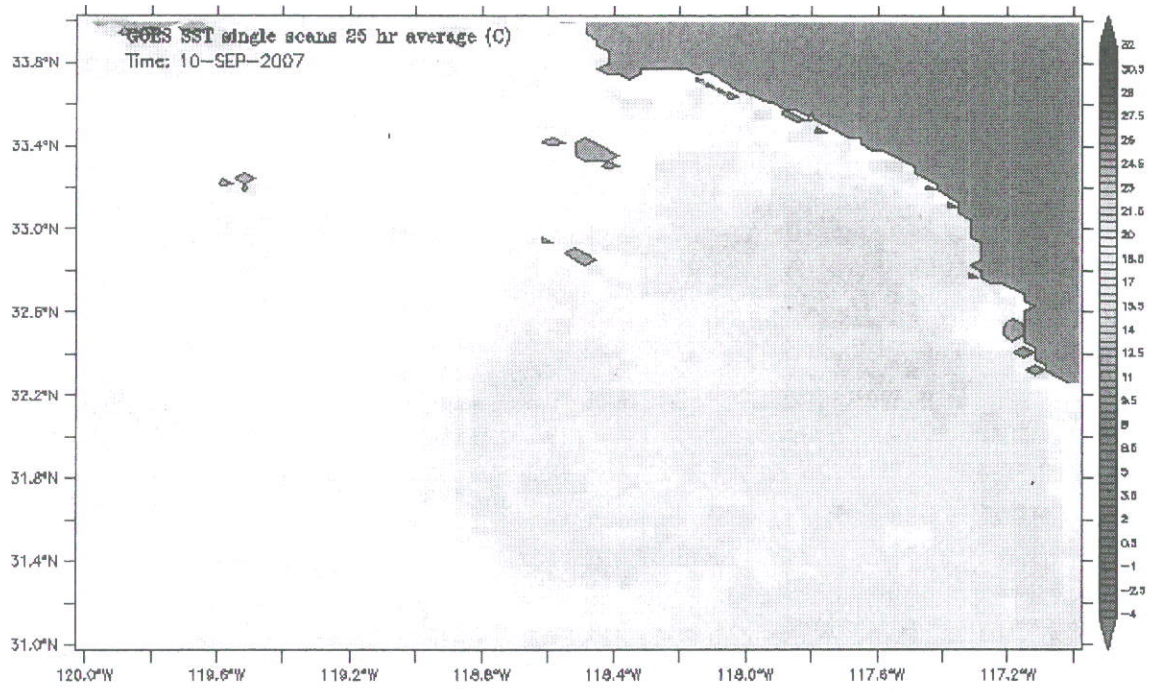


Figure A-2. Sea surface temperature (SST) for Southern California on 10 September 2007.
(GOES SST 25 hour average from North Pacific Demonstration Project Ocean Watch provided online by Coastwatch and Southwest Fisheries Science Center, NMFS http://las.pfeg.noaa.gov)

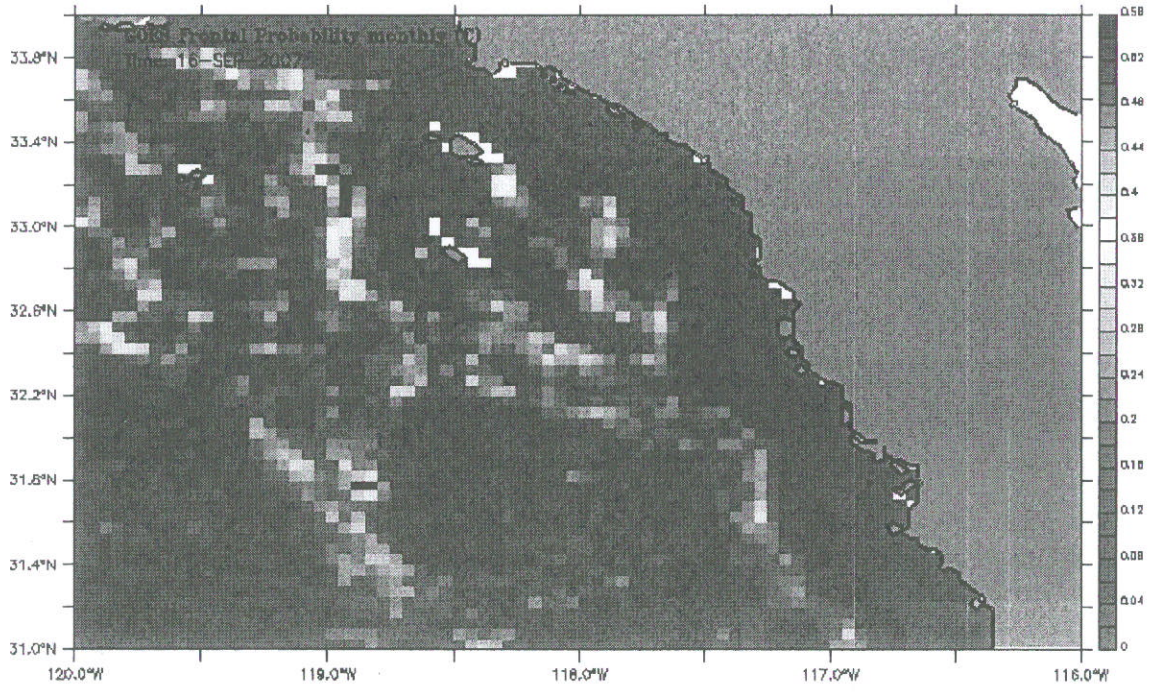


Figure A-3. Southern California monthly frontal probability index for September 2007 (16 Sep 2007); medium and long term frontal activity is often associated with potentially increased biological activity as oceanographic conditions concentrate nutrients within a defined area.
(from North Pacific Demonstration Project Ocean Watch provided online by Coastwatch and Southwest Fisheries Science Center, NMFS http://las.pfeg.noaa.gov)

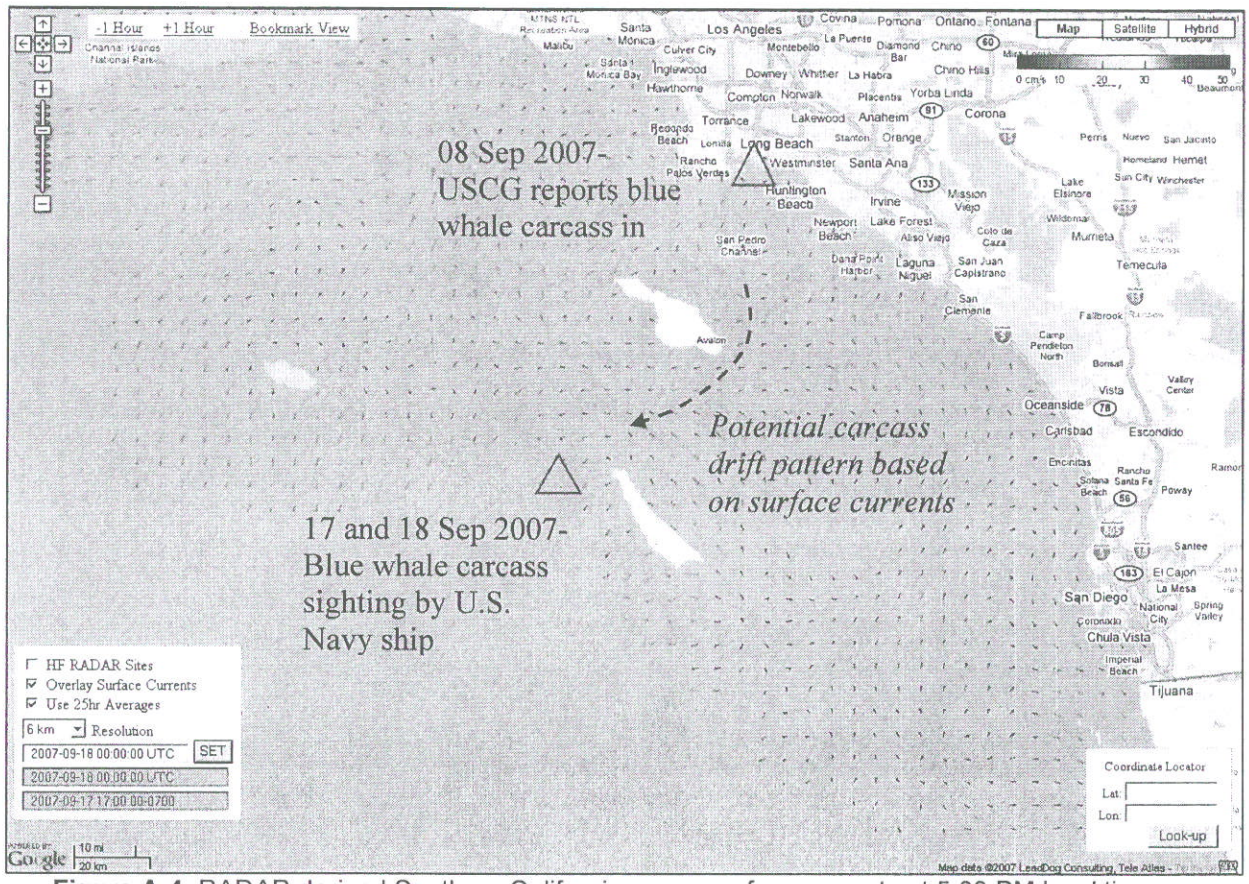


Figure A-4. RADAR derived Southern California ocean surface currents at 5:00 PM local time on 18 September.
(6 km, 25-hour averaged provided by the Coastal Ocean Currents Monitoring Program obtained online via the Southern California Coastal Observation System http://www.sccoos.org/index.html).

Table A-3. Total estimated annual exposures based on pre-exercise modeling for sonar and underwater detonations from DoN 2007 based on seven exercise per year (COMPTUEX/JTFEX EA/OEA Table 4.3-38) (*left*), and estimated exposures per exercise (estimated total exposures divided by seven) (*right*).

Species	DoN 2007 annual estimated exposures			Estimated singe exercise exposures		
	Level B Sub TTS	Level B	Level A	Level B Sub TTS	Level B	Level A
ESA-listed						
Blue whale	325	14	0	46.4	2.0	0
Fin whale	263	10	0	37.6	1.4	0
Humpback whale	33	0	0	4.7	0	0
Sei whale	2	0	0	0.3	0	0
Sperm whale	59	4	0	8.4	0.6	0
Non-ESA listed						
Gray whale	64	0	0	9.1	0	0
Bryde's whale	2	0	0	0.3	0	0
Minke whale	24	2	0	3.4	0.3	0
Baird's beaked whale	4	0	(4)*	0.6	0	0.6
Cuvier's beaked whale	208	10	(218)*	29.7	1.4	31.1
Mesoplodon spp.	0	0	0	0	0	0
Ziphiid beaked whale	49	3	(52)*	7.0	0.4	7.4
Dwarf sperm whale	0	0	0	0.0	0	0
False killer whale	16	0	0	2.3	0	0
Killer whale	12	1	0	1.7	0.1	0
Pygmy sperm whale	859	56	0	122.7	8.0	0
Short-finned pilot whale	0	0	0	0	0	0
Bottlenose dolphin	516	30	0	73.7	4.3	0
Common dolphin	69,258	3,491	35	9,894.0	498.7	5.0
Dall's porpoise	142	3	0	20.3	0.4	0
Northern right whale dolphin	3,003	227	0	429.0	32.4	0
Pacific white-sided dolphin	1,949	101	0	278.4	14.4	0
Pantropical spotted dolphin	547	6	0	78.1	0.9	0
Risso's dolphin	2,050	96	0	292.9	13.7	0
Rough-toothed dolphin	0	0	0	0	0	0
Striped dolphin	1,554	78	0	222.0	11.1	0
California sea lion	0	0	0	0	0	0
Northern elephant seal	0	0	0	0	0	0
Pacific harbor seal	6	0	0	0.9	0	0
			Total=	11564	590	44

* ALL predicted beaked whale Level B exposures counted as Level A exposures.

Table A-4. Relationship between Beaufort sea state and ocean conditions.

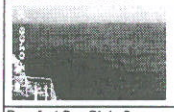
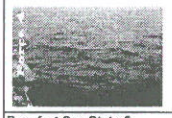
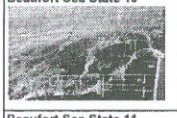
Graphic	Beaufort Sea State Number	Observed Sea Surface Condition	Sailor's Term	Effects on Land	Typical Wind Speed (MPH)
	0	Mirror smooth and glassy surface	Calm	Calm; smoke rises straight up	0
Beaufort Sea State 1 	1	Small ripples or capillary waves on glassy surface	Light Air	Smoke drifts with wind direction	1-3
Beaufort Sea State 2 	2	Larger ripples or wavelets on glassy surface	Light Breeze	Leaves begin to rustle; wind felt on face	4 - 7
Beaufort Sea State 3 	3	Wavelets of irregular direction and shape; a few crests break on glassy surface	Gentle Breeze	Small flags extend; leaves in constant motion	8 - 12
Beaufort Sea State 4 	4	Small chop, defined direction; numerous whitecaps	Moderate Breeze	Dust, leaves, andloose paper move	13 - 18
Beaufort Sea State 5 	5	Heavy chop; many white foaming crests; some spray	Fresh Breeze	Small trees begin to sway	19 - 24
Beaufort Sea State 6 	6	Larger surface waves form; whitecaps everywhere; more spray	Strong Breeze	Large branches move; whistling heard in wires	25 - 31
Beaufort Sea State 7 	7	Sea heaps up; white foam starts to blow in streaks along direction of wind; spindrift forms	Near Gale	Resistance strong when walking	32 - 38
Beaufort Sea State 8 	8	Moderately high waves, crests begin to break into spindrift; well marked streaks of foam	Gale	Twigs and small branches broken off trees	39 - 46
Beaufort Sea State 9 	9	High waves, sea begins to roll; spray begins to reduce visibility; dense streaks of foam	Strong Gale	Slight structural damage occurs (chimney-pots and slates removed).	47 - 54
Beaufort Sea State 10 	10	Sea mostly covered in white foam; visibility reduced; exceptionally large waves	Storm	Trees uprooted; considerable structural damage	55 - 63
Beaufort Sea State 11 	11	Exceptionally high waves; Sea completely covered with long white patches of foam lying along direction of wind. Everywhere edges of wave crests are blown into froth. Visibility affected.	Violent Storm	Wide-spread damage	64-72
Beaufort Sea State 12 	12	The air is filled with foam and spray. Sea completely white with driving spray; visibility very seriously affected	Hurricane	Significant flooding and wind damage	73-83

Table A-5. Sightings during COMPTUEX 07-7 where MFAS was on and mitigation occurred.

(**Bold**= potential ESA species).

Assessment by Range for Surface Ship MFA sonar			
Range	**ESA species** (potential)	**MMPA species**	**Comments**
200 yards- Sonar secured (turned off)	**4 whales**		Whales sighted at 50 yards on 14 Sep. MFAS secured during middle of ASW exercise. Ship alters course and stops to avoid animals. Relative position of ship (S) movement and whale location (W) shown below: 
		unk # dolphins	Pod of dolphins sighted along starboard side of ship on 19 Sep. MFAS secured for 18 minutes.
		4 porpoises	Porpoises/dolphins sighted at 200 yards approaching ship on reciprocal heading on 20 Sep. MFAS secured for 20 minutes.
500 yards- Sonar reduced -10 dB (surface ship only)			No reports
1000 yards- Sonar reduced -6 dB (surface ship only)			No reports
>1000 yards- No NDE-mandated mitigation required			No reports
>2000 yards- No NDE-mandated mitigation required	1 sm whale		Ship secures sonar on sighting at 3000 yards on 19 Sep. MFAS secured for 10 minutes.
Assessment by Range for Helicopter MFA dipping sonar			
Range	**ESA species** (potential)	**MMPA species**	**Comments**
< 200 yards- Sonar secured (turned off)			No reports
>200 yards- No NDE-mandated mitigation required			No reports

NDE CONDITIONS AND LETTER OF INSTRUCTION

NDE

NDE mitigation measures include:

I. General Maritime Protective Measures: Personnel Training:

1. All lookouts onboard platforms involved in ASW training events will review the NMFS approved Marine Species Awareness Training (MSAT) material prior to use of mid-frequency active sonar.
2. All Commanding Officers, Executive Officers, and officers standing watch on the bridge will have reviewed the MSAT material prior to a training event employing the use of MFAS.
3. Navy lookouts will undertake extensive training in order to qualify as a watchstander in accordance with the Lookout Training Handbook (NAVEDTRA 12968-B).
4. Lookout training will include on-the-job instruction under the supervision of a qualified, experienced watchstander. Following successful completion of this supervised training period, Lookouts will complete the Personal Qualification Standard program, certifying that they have demonstrated the necessary skills (such as detection and reporting of partially submerged objects). This does not preclude personnel being trained as lookouts counted as those listed in previous measures so long as supervisors monitor their progress and performance.
5. Lookouts will be trained in the most effective means to ensure quick and effective communication within the command structure in order to facilitate implementation of protective measures if marine species are spotted.

II. General Maritime Protective Measures: Lookout and Watchstander Responsibilities:

6. On the bridge of surface ships, there will always be at least three people on watch whose duties include observing the water surface around the vessel.
7. In addition to the three personnel on watch noted previously, all surface ships participating in ASW exercises will have at all times during the exercise at least two additional personnel on watch as lookouts.
8. Personnel on lookout and officers on watch on the bridge will have at least one set of binoculars available for each person to aid in the detection of marine mammals.
9. On surface vessels equipped with MFAS, pedestal mounted "Big Eye" (20x110) binoculars will be present and in good working order to assist in the detection of marine mammals in the vicinity of the vessel.
10. Personnel on lookout will employ visual search procedures employing a scanning methodology in accordance with the Lookout Training Handbook (NAVEDTRA 12968-B).
11. After sunset and prior to sunrise, lookouts will employ Night Lookouts Techniques in accordance with the Lookout Training Handbook.

12. Personnel on lookout will be responsible for reporting all objects or anomalies sighted in the water (regardless of the distance from the vessel) to the Officer of the Deck, since any object or disturbance (e.g., trash, periscope, surface disturbance, discoloration) in the water may be indicative of a threat to the vessel and its crew or indicative of a marine species that may need to be avoided as warranted.

III. Operating Procedures

13. A Letter of Instruction, Mitigation Measures Message or Environmental Annex to the Operational Order will be issued prior to the exercise to further disseminate the personnel training requirement and general marine mammal protective measures.

14. Commanding Officers will make use of marine species detection cues and information to limit interaction with marine species to the maximum extent possible consistent with safety of the ship.

15. All personnel engaged in passive acoustic sonar operation (including aircraft, surface ships, or submarines) will monitor for marine mammal vocalizations and report the detection of any marine mammal to the appropriate watch station for dissemination and appropriate action.

16. During MFAS operations, personnel will utilize all available sensor and optical systems (such as Night Vision Goggles to aid in the detection of marine mammals.

17. Navy aircraft participating in exercises at sea will conduct and maintain, when operationally feasible and safe, surveillance for marine species of concern as long as it does not violate safety constraints or interfere with the accomplishment of primary operational duties.

18. Aircraft with deployed sonobuoys will use only the passive capability of sonobuoys when marine mammals are detected within 200 yards of the sonobuoy.

19. Marine mammal detections will be immediately reported to assigned Aircraft Control Unit for further dissemination to ships in the vicinity of the marine species as appropriate where it is reasonable to conclude that the course of the ship will likely result in a closing of the distance to the detected marine mammal.

20. Safety Zones - When marine mammals are detected by any means (aircraft, shipboard lookout, or acoustically) within 1,000 yards of the sonar dome (the bow), the ship or submarine will limit active transmission levels to at least 6 dB below normal operating levels.

    (i) Ships and submarines will continue to limit maximum transmission levels by this 6 dB factor until the animal has been seen to leave the area, has not been detected for 30 minutes, or the vessel has transited more than 2,000 yards beyond the location of the last detection.

    (ii) Should a marine mammal be detected within or closing to inside 500 yards of the sonar dome, active sonar transmissions will be limited to at least 10 dB below the equipment's normal operating level. Ships and submarines will continue to limit maximum ping levels by this 10 dB factor until the animal has been seen to leave the area, has not been detected for 30 minutes, or the vessel has transited more than 2,000 yards beyond the location of the last detection.

    (iii) Should the marine mammal be detected within or closing to inside 200 yards of the sonar dome, active sonar transmissions will cease. Sonar will not resume until the animal has been seen to leave the area, has not been detected for 30 minutes, or the vessel has transited more than 2,000 yards beyond the location of the last detection.

(iv) Special conditions applicable for dolphins and porpoises only: If, after conducting an initial maneuver to avoid close quarters with dolphins or porpoises, the Officer of the Deck concludes that dolphins or porpoises are deliberately closing to ride the vessel's bow wave, no further mitigation actions are necessary while the dolphins or porpoises continue to exhibit bow wave riding behavior.

(v) If the need for power-down should arise as detailed in "Safety Zones" above, Navy shall follow the requirements as though they were operating at 235 dB - the normal operating level (i.e., the first power-down will be to 229 dB, regardless of at what level above 235 sonar was being operated).

21. Prior to start up or restart of active sonar, operators will check that the Safety Zone radius around the sound source is clear of marine mammals.

22. Sonar levels (generally) – The ship or submarine will operate sonar at the lowest practicable level, not to exceed 235 dB, except as required to meet tactical training objectives.

23. Helicopters shall observe/survey the vicinity of an ASW exercise for 10 minutes before the first deployment of active (dipping) sonar in the water.

24. Helicopters shall not dip their sonar within 200 yards of a marine mammal and shall cease pinging if a marine mammal closes within 200 yards after pinging has begun.

25. Submarine sonar operators will review detection indicators of close-aboard marine mammals prior to the commencement of ASW operations involving active mid-frequency sonar.

26. Increased vigilance during major ASW training exercises with tactical active sonar when critical conditions are present.

Based on lessons learned from strandings in Bahamas 2000, Madeiras 2000, Canaries 2002, and Spain 2006, beaked whales are of particular concern since they have been associated with MFAS operations. Navy should avoid planning major ASW training exercises with MFAS in areas where they will encounter conditions which, in their aggregate, may contribute to a marine mammal stranding event.

The conditions to be considered during exercise planning include:

(1) Areas of at least 1000 m depth near a shoreline where there is a rapid change in bathymetry on the order of 1000-6000 meters occurring across a relatively short horizontal distance (e.g., 5 nm).

(2) Cases for which multiple ships or submarines ($\geq$ 3) operating MFAS in the same area over extended periods of time ($\geq$ 6 hours) in close proximity ($\leq$ 10NM apart).

(3) An area surrounded by land masses, separated by less than 35 nm and at least 10 nm in length, or an embayment, wherein operations involving multiple ships/subs ($\geq$ 3) employing MFAS near land may produce sound directed toward the channel or embayment that may cut off the lines of egress for marine mammals.

(4) Although not as dominant a condition as bathymetric features, the historical presence of a significant surface duct (i.e. a mixed layer of constant water temperature extending from the sea surface to 100 or more feet).

If the major exercise must occur in an area where the above conditions exist in their aggregate, these conditions must be fully analyzed in environmental planning documentation. Navy will increase vigilance by undertaking the following additional protective measure:

A dedicated aircraft (Navy asset or contracted aircraft) will undertake reconnaissance of the embayment or channel ahead of the exercise participants to detect marine mammals that may be in the area exposed to active sonar. Where practical, advance survey should occur within about two hours prior to MFA sonar use, and periodic surveillance should continue for the duration of the exercise. Any unusual conditions (e.g., presence of sensitive species, groups of species milling out of habitat, any stranded animals) shall be reported to the Officer in Tactical Command (OTC), who should give consideration to delaying, suspending or altering the exercise.

All safety zone requirements described in Measure 20 apply.

The post-exercise report must include specific reference to any event conducted in areas where the above conditions exist, with exact location and time/duration of the event, and noting results of surveys conducted.

IV. Coordination and Reporting

27. Navy will coordinate with the local NMFS Stranding Coordinator for any unusual marine mammal behavior and any stranding, beached live/dead or floating marine mammals that may occur at any time during or within 24 hours after completion of mid-frequency active sonar use associated with ASW training activities.

28. Navy will submit a report to the OPR, NMFS, within 120 days of the completion of a Major Exercise. This report must contain a discussion of the nature of the effects, if observed, based on both modeled results of real-time events and sightings of marine mammals.

29. If a stranding occurs during an ASW exercise, NMFS and Navy will coordinate to determine if MFAS should be temporarily discontinued while the facts surrounding the stranding are collected.

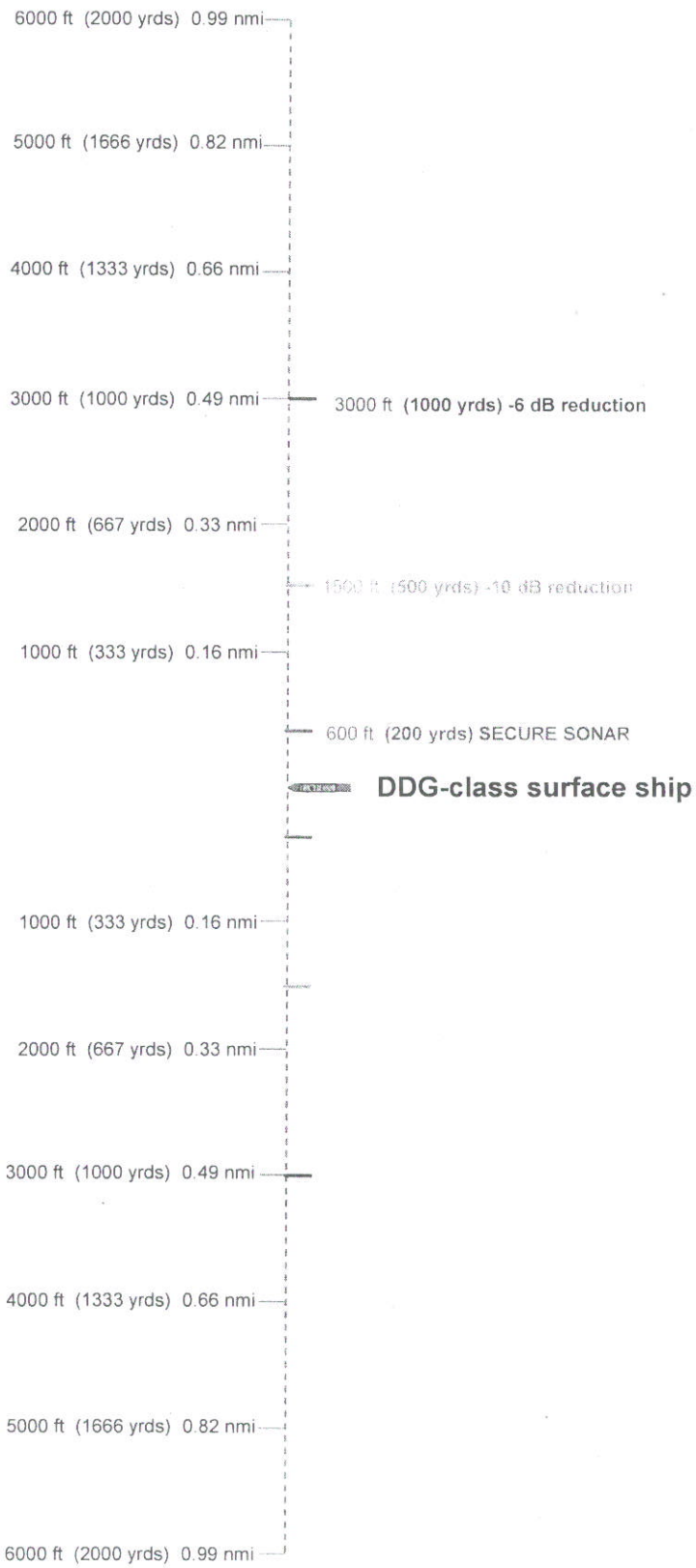


Figure A-5. Diagram of NDE sonar safety ranges. Ranges are to scale based on a DDG-class surface ship.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, MD 20910

JAN 9 2008

MEMORANDUM FOR: Conrad C. Lautenbacher, Jr.
Vice Admiral U.S. Navy (Ret.)
Under Secretary of Commerce for
Oceans and Atmosphere

THROUGH: John Oliver
Acting Assistant Administrator for Fisheries

FROM: James H. Lecky
Director, Office of Protected Resources

SUBJECT: Effects of Navy training exercises on marine mammals in and adjacent to the Navy's Southern California Operating Area

We have been asked to review the environmental effects of Navy's request for a Presidential exemption under the Coastal Zone Management Act for Navy's use of mid-frequency active (MFA) sonar during the remaining Composite Training Unit (COMPTUEX) and Joint Task Force Exercises (JTFEX) scheduled to occur through January 2009 off Southern California. These exercises include 29 conditions, developed in consultation with the National Marine Fisheries Service (NMFS), and adopted as mitigation measures for the purposes of a National Defense Exemption (NDE) under the Marine Mammal Protection Act (MMPA) invoked by the Department of Defense in January 2007.[1]

Generally, we agree with Navy's findings regarding anticipated effects on marine mammal populations likely to be exposed to these exercises. In arriving at this conclusion, we reviewed our Biological Opinion on the exercises (issued February 9, 2007), the 29 conditions adopted in January 2007 as part of the NDE, and the California Marine Mammal Stranding Network database.

Marine Mammals Listed as Endangered or Threatened

During 2006 and early 2007, NMFS and Navy consulted pursuant to section 7 of the Endangered Species Act to assess the effects of these anticipated training exercises on marine mammals listed as endangered or threatened. In consulting on the action, NMFS considered Navy's August 2006 and February 2007 draft Environmental Assessments (final February 2007 Environmental Assessment available at

[1] The National Defense Authorization Act of 2004 amended the MMPA by inserting an exemption from the moratorium on taking of marine mammals for national defense activities provided the Secretary of Defense determines, after conferring with the Secretary of Commerce, that an exemption is necessary for the national defense. Such exemption may be invoked for a period of up to two years. The Department of Defense invoked the NDE in January 2007 for two years to provide time to process incidental take authorization for its major training ranges pursuant to section 101(a)(5)(A) of the MMPA, 16 U.S.C. § 1371(a)(5)(A).

ATTACHMENT H

http://www.navydocuments.com) for the training activities and included the set of 29 conditions adopted in January 2007 for the NDE as part of the action.

On February 9, 2007, NMFS issued its biological opinion in which it concluded that Navy's proposed COMPTUEX and JTFEX exercises in waters off the State of California from February 2007 through January 2009 are not likely to jeopardize the continued existence of the threatened and endangered species under NMFS jurisdiction. Species reviewed in the biological opinion were certain baleen whales (blue, fin, sei, and humpback whales), sperm whales, and Guadalupe fur seals.

With respect to baleen whales, their hearing is sensitive in low frequency ranges. While they are likely able to hear MFA sonar, they are not likely to be injured by it. Therefore, while individuals within the baleen whale populations may experience disturbance sufficient to cause temporary movement away from exercise areas, these temporary movements are not expected to result in adverse effects. Information on trends in abundance indicates that baleen whale populations off California are increasing despite the level of human activity in coastal waters of California. While information on trends is not dispositive, it does demonstrate that the history of coastal development, including military training using MFA sonar, has not precluded recovery of these stocks over the last several decades. NMFS' opinion is that the proposed COMPTUEX and JTFEX actions are not expected to appreciably reduce the likelihood for any of the listed baleen whales of surviving and recovering in the wild.

Sperm whale hearing in the range used by MFA sonar is more sensitive than for baleen whales. Sperm whales are deep diving species that forage well below the photic zone and are dependent on echolocation for finding prey. Available information on the effects of MFA sonar on sperm whales is reviewed in detail in the biological opinion. This information suggests that the behavioral responses of sperm whales to anthropogenic sounds are highly variable, but do not appear to result in the death or injury of individual whales or result in reduction in the fitness of individuals involved. In some circumstances, sperm whales respond by swimming away from the sound source, ceasing calling, and changing dive patterns. In other circumstances, no apparent response was noted. As with other marine mammals, behavioral responses to sound appear to be context specific (i.e., is the animal motivated to be in an area and willing to tolerate a sound, is it experienced and knows the sound is not threatening, or is the animal naive and cautiously avoids unfamiliar sound sources). Based on the literature reviewed in the biological opinion, the short duration of any particular exercise, limited geographic scope of each exercise, and employment of mitigation measures, NMFS concluded that the proposed COMPTUEX and JTFEX actions are not likely to adversely affect individual sperm whales in ways or to a degree that would reduce their fitness nor would we expect a reduction in viability of the populations those individual whales represent. Consequently, NMFS' opinion is that the proposed COMPTUEX and JTFEX actions are not expected to appreciably reduce the sperm whales' likelihood of surviving and recovering in the wild.

There is little information on the response of pinnipeds, such as the Guadalupe fur seal, to sonar. Given the rarity of Guadalupe fur seals in most of the Southern California Operations Area and the results from Navy's modeling exercise using a more common pinniped species, the likelihood that Guadalupe fur seals may be exposed to the MFA sonar employed during COMPTUEX and JTFEX exercises is low. As a result, we conclude that the proposed COMPTUEX and JTFEX exercises are not likely to adversely affect individual Guadalupe fur seals in ways or to a degree that would reduce their fitness, and therefore are unlikely to affect the species' likelihood of surviving and recovering in the wild.

Marine Mammals Not Listed as Endangered or Threatened

While NMFS' biological opinion pursuant to section 7 of the Endangered Species Act evaluated the impacts of the Navy's training exercises on listed marine mammals, the biological opinion did not address the impacts on unlisted marine mammals. (Unlisted marine mammals include the deep-diving toothed whales, such as beaked whales, that appear to be particularly susceptible to injury from MFA sonar). However, NMFS was consulted on the development of the 29 conditions to mitigate impacts on listed and unlisted marine mammals before the Department of Defense invoked the NDE in January 2007. As noted above, these 29 NDE conditions will be part of the COMPTUEX and JTFEX exercises.

Among other things, the 29 conditions provide that watch standers and other key participants in the exercises off Southern California are trained in the identification of marine mammals. This ensures mammals in the vicinity of the exercise are likely to be observed so that various safety measures may be employed. Passive acoustic capabilities will be employed to listen for marine mammals in the training area and at night, lookouts will employ night vision techniques to look for marine mammals in the safety zones. As part of the letters of instructions for each operation, communication measures are implemented to ensure timely communication among all vessels participating in the exercise of the presence of marine mammals and a timely and appropriate response to implement safety measures. These safety measures include safety zones, power down zones, and shut down zones to protect marine mammals from exposure to injurious levels of sound.

Some of the conditions are also being employed to minimize the likelihood of circumstances occurring like those in which MFA sonar has been implicated as a contributing factor in strandings of beaked whales, such as multiple vessels transmitting sonar at the same time in areas characterized by steep bathymetry adjacent to deep water and confined geography with limited escape routes for whales trying to avoid sonar sources. In Southern California, Navy is proposing to conduct most of its sonar activities well off shore where it will not encounter these circumstances. The Navy will avoid areas in which an animal's ability to avoid sonar sources would be limited. These mitigation measures will minimize the likelihood of beaked whales being caught in circumstances that characterize known strandings of beaked whales.

While NMFS and Navy continue to review after-action reports and evaluate the effectiveness of various mitigation measures, and NMFS expects that mitigation measures will improve or additional measures may be added as future actions are considered for authorization after the NDE expires, NMFS believes the mitigation measures being employed for the Southern California exercises will reduce the risk of adverse effects to the marine mammals in the area.

Information from strandings

We explored the stranding network database for evidence that historical MFA sonar activities may have been implicated in mass stranding events. Marine mammal strandings in California are common events, but the vast majority is of seals and sea lions. The causes of seal and sea lion strandings are predominately associated with disease, exposure to toxins from harmful algal blooms, and fishery interactions. Strandings also appear to spike during El Niño events when forage species are less abundant. Again, these strandings are predominantly pinnipeds. While beaked whales have stranded in Southern California, they are relatively rare events. Between 1982 and 2007, thirteen beaked whales representing four different species (Blainville's, Hubb's, Cuvier's, and Stejneger's beaked whales) stranded from San Diego to Santa Barbara County (California Marine Mammal Stranding Network Database 2006). As with most strandings, the cause of mortality is not always apparent, but for six of these the cause was determinable. Three were disease-related, two were from entanglement in fishing gear, and one was from a boat collision. One other animal exhibited a lethal injury, missing tail flukes, which could be attributable to either a vessel interaction or a fishery interaction. The cause of mortality for the remainder was not determinable; however, they stranded individually (as opposed to mass strandings associated with MFA sonar exercises), and they were not coincident with MFA sonar activity.

As noted above, deep diving toothed whales, in particular several species of beaked whales (none of which is listed under the Endangered Species Act), appear to be particularly susceptible to injury, as documented by several mass stranding events in locations other than California in the last several years. The events shared several common factors; among these were steep bathymetry adjacent to islands or other shallow areas, confined geography (e.g., narrow canyons or box canyons), multiple MFA sonar vessels active at the same time, and a strong surface duct (a hydrological condition conducive to sound transmission). However, the mechanism by which MFA sonar appears to be injurious to beaked whales is poorly understood. There are several competing hypotheses but little definitive information is available. While Navy, NMFS, and several other institutions initiated a cooperative investigation of this issue in 2007, an understanding of these whales' behavioral responses to MFA sonar is likely years away. In the meantime, monitoring each event, identifying common contributing factors, and implementing mitigation measures to avoid those circumstances is a reasonable way to minimize risk to this group of marine mammals. In addition, Navy will support stranding network response to any unusual marine mammal stranding events that occur during or shortly after MFA sonar exercises to facilitate collection of information that might further inform our understanding of the effects of MFA sonar on marine mammals.

Conclusion

For the reasons stated above, NMFS anticipates that the exercises in question are likely to elicit temporary behavioral responses from marine mammals in and adjacent to exercise areas, and that these responses will vary from alerting responses to the sounds, modifications of migration courses to avoid close approaches to sound sources, temporary movement away from sound sources, or temporary cessation of feeding or breeding activities. While there is some potential for injury, NMFS thinks the mitigation measures employed during the exercises will minimize that risk. Therefore, NMFS does not expect the COMPTUEX and JTFEX exercises over the next 13 months to result in adverse population level effects for any of these marine mammal populations.

Pursuant to the NDE, NMFS is continuing to work, as a cooperating agency, with Navy to conduct a thorough environmental review of the effects of these activities in an Environmental Impact Statement, including evaluation of the implementation and the effectiveness of the mitigation measures. NMFS anticipates issuing regulations and a letter of authorization authorizing take of marine mammals incidental to training exercises in Southern California by December 2008. As new information becomes available, including analyses of mitigation measures in after-action reports, NMFS and Navy may modify the mitigation measures currently being proposed by Navy in the expected December 2008 regulations and letter of authorization.