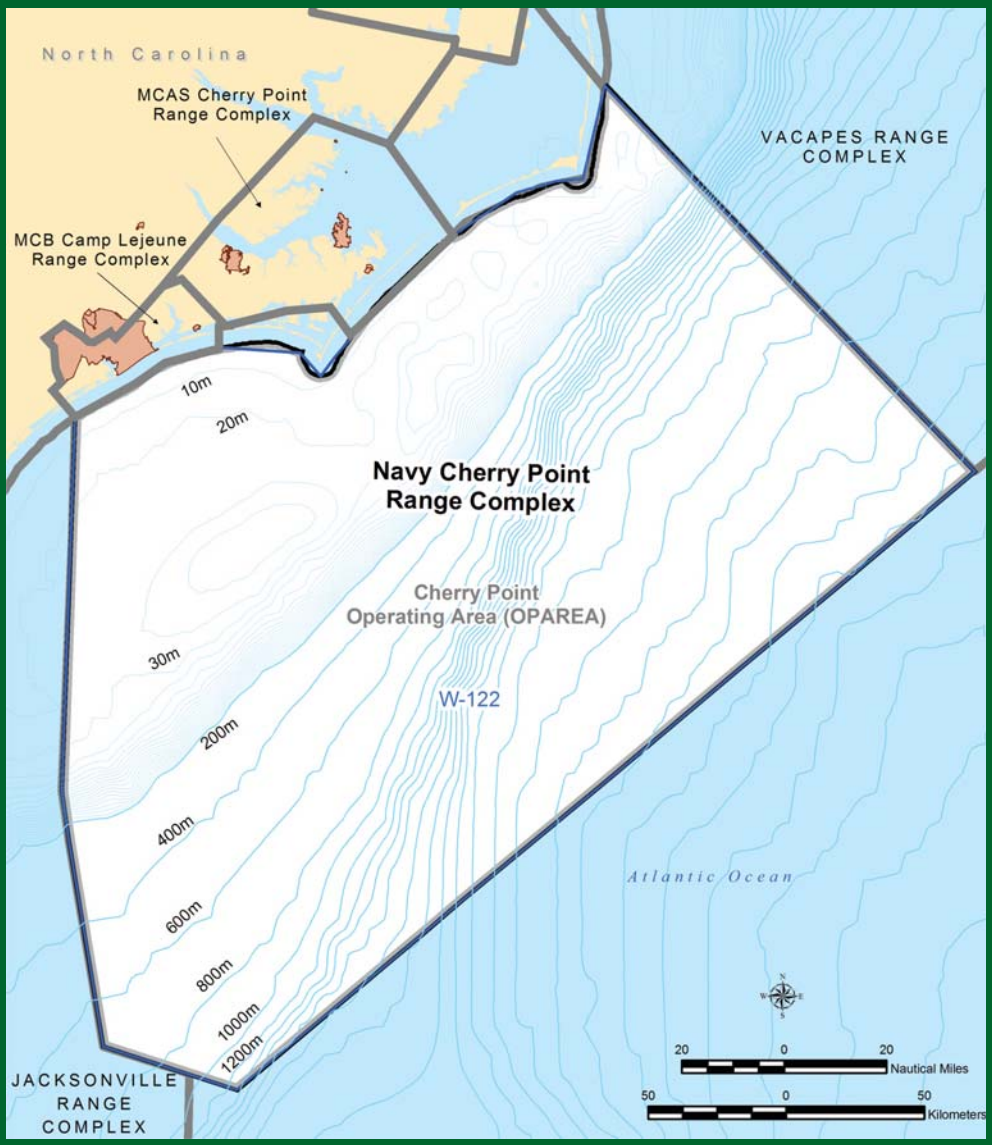
Navy Cherry Point Range Complex Final Environmental Impact Statement/ Overseas Environmental Impact Statement (EIS/OEIS) Volume 2, Appendices



Prepared by:

United States Fleet Forces

April 2009

NAVY CHERRY POINT RANGE COMPLEX FINAL ENVIRONMENTAL IMPACT STATEMENT/ OVERSEAS ENVIRONMENTAL IMPACT STATEMENT

Volume 2, Appendices

Lead Agency
Department of the Navy

Action Proponent:
United States Fleet Forces

For Additional Information:
NAVFAC Atlantic
6506 Hampton Boulevard, Norfolk, VA 23508-1278
Phone: (757) 322-8498

Cooperating Agency
Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway, Silver Spring, Maryland 20910-3226

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APPENDICES

A - Cooperating Agencies and Acceptance Letters

B - Notice of Intent and Notice of Availability

C - Agency Correspondence

D - Current Training Operations Description

E - Weapons Systems Description

F - Agency/Public Comments/Navy Responses and Public Hearing Information

G - Federal Consistency Determinations

H - Overview of Airborne and Underwater Acoustics

I - Statistical Probability Modeling for Munitions Impacts

J - Technical Risk Assessment for the Use of Underwater Explosives

K - Regulatory Framework

L - TOW Missile Guide Wire Corrosion Report

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APPENDIX A

COOPERATING AGENCIES AND ACCEPTANCE LETTERS

This appendix contains the following letter:

1. CNO letter dated 18 May 2007 to NMFS requesting NMFS to be a cooperative agency on Navy Cherry Point Range Complex EIS/OEIS

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DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, DC 20350-2000

IN REPLY REFER TO

5090
Ser N456H/7U158140
18 May 2007

Dr. William T. Hogarth
Assistant Administrator
National Oceanic and Atmospheric
Administration (NOAA) Fisheries
1315 East West Highway
Silver Spring, MD 20910

Dear Dr. Hogarth:

In accordance with the National Environmental Policy Act (NEPA), the Department of the Navy (Navy) is initiating the preparation of an Environmental Impact Statement (EIS) to evaluate potential environmental effects of using the Navy Cherry Point (CP) Range Complex to achieve and maintain Fleet readiness and to support current, emerging and future training and research, development, test, and evaluation (RDT&E). The Proposed Action will further our statutory obligations under Title 10 of the United States Code governing the roles and responsibilities of the Navy.

The Proposed Action for the Navy CP Range Complex EIS/Overseas Environmental Impact Statement (OEIS) is to:

- Maintain current levels of military readiness by training and testing in the Navy CP Range Complex;
- Accommodate future increases in operational training tempo in the Navy CP Range Complex and support the rapid deployment of naval units or strike groups;
- Achieve and sustain readiness so that the Navy can quickly surge significant combat power in the event of a national crisis or contingency operation;
- Support the testing and training needed for new aircraft, vessels, weapons systems and missions; and
- Maintain the long-term viability of the Navy CP Range Complex while protecting human health and the environment.

In order to adequately evaluate the potential environmental effects of this proposed action, the Navy and National Marine Fisheries Service (NMFS) will benefit from working together on assessing potential acoustic effects to marine species protected under the Marine Mammal Protection Act (MMPA) and the Endangered

Species Act (ESA). It is anticipated that the effects will predominantly be related to acoustic effects associated with explosive ordnance use. As you are aware, effects associated with active sonar are being analyzed in the Atlantic Fleet Active Sonar Training environmental planning documentation, and that documentation will be incorporated by reference into the Navy CP Range Complex EIS/OEIS.

To assist in the Navy CP Range Complex planning, and in accordance with 40 CFR Part 1501 and the Council on Environmental Quality Cooperating Agency guidance issued 30 January 2002, the Navy requests NMFS serve as a cooperating agency for the development of this EIS/OEIS. As defined in 40 CFR 1501.5, the Navy is the lead agency for the Navy CP Point Range Complex EIS/OEIS. As NMFS has jurisdiction by law and special expertise over protected marine species potentially affected by the proposed action, the Navy is requesting that NMFS be a cooperating agency as defined in 40 CFR 1501.6.

As the lead agency, the Navy will be responsible for the following:

- Preparing the environmental analysis, background information and all necessary permit applications associated with predominantly explosive acoustic issues on the water ranges.

- Working with NMFS personnel to develop and refine the method of estimating potential effects to protected marine species, including threatened and endangered species.

- Determining the scope of the EIS/OEIS, including the alternatives evaluated.

- Circulating the appropriate NEPA documentation to the general public and any other interested parties.

- Scheduling and supervising public meetings held in support of the NEPA process and compiling and responding to any comments received.

- Participating, as appropriate, in public meetings hosted by NMFS for receipt of public comment on protected species permit applications. This shall also include assistance in NMFS' response to comments.

- Maintaining an administrative record and responding to any Freedom of Information Act (FOIA) requests relating to the EIS/OEIS.

As the cooperating agency, NMFS would be asked to support the Navy in the following manner:

- Providing timely comments after the Agency Information Meeting (which will be held at the onset of the NEPA process) and on working drafts of the EIS documents. The Navy requests that comments on draft EIS documents be provided within 21 calendar days.

- Responding to Navy requests for information.

- Coordinating, to the maximum extent practicable, any public comment periods necessary in the MMPA permitting process with the Navy's NEPA public comment periods.

- Participating, as appropriate, in public meetings hosted by the Navy for receipt of public comment on the NEPA document and environmental analysis.

- Scheduling meetings requested by Navy in a timely manner and adhering to the overall schedule set forth by the Navy.

The Navy views this agreement as important to the successful completion of the NEPA process for the Navy CP Range Complex EIS/OEIS. It is the Navy's goal to complete the analysis as expeditiously as possible, while using the best scientific information available. NMFS' assistance will be invaluable in that endeavor.

My point of contact for this action is Ms. Karen M. Foskey, (703) 602-2859, email: Karen.foskey@navy.mil.

Sincerely,

J. A. SYMONDS
Director, Environmental Readiness Division (OPNAV N45)

Copy to:
ASN (I&E)
DASN (E), (I&F)
OAGC (I&E)
USFLTFORCOM N4/7
Commander, Naval Installations Command
Commander, Navy Region Mid-Atlantic
Commander, Navy Region Southeast

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APPENDIX B

NOTICE OF INTENT AND NOTICE OF AVAILABILITY

This appendix contains the following:

1. Notice of Intent to Prepare an Environmental Impact Statement/Overseas Environmental Impact Statement for the Navy Cherry Point Range Complex and a Notice of Public Scoping Meetings (72 FR 82)
2. Notice of Public Hearing for the Navy Cherry Point Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement (73 FR 178)

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from members of the public is to make these submissions available for public viewing on the Internet at *http://www.regulations.gov* as they are received without change, including any personal identifiers or contract information.

DoD Clearance Officer; Ms. Patricia Toppings. Written requests for copies of the information collection proposal should be sent to Ms. Toppings at WHS/ESD/Information Management Division, 1777 North Kent Street, RPN, Suite 11000, Arlington, VA 2209–2133.

Dated: April 23, 2007.

Patricia L. Toppings,

Alternate OSD Federal Register, Liaison Officer, Department of Defense.

[FR Doc. 07–2092 Filed 4–27–07; 8:45 am]

BILLING CODE 5001–06–M

DEPARTMENT OF DEFENSE

Department of the Navy

Notice of Intent To Prepare an Environmental Impact Statement/Overseas Environmental Impact Statement for Navy Atlantic Fleet Training in the Navy Cherry Point Range Complex and Notice of Public Scoping Meetings

AGENCY: Department of the Navy, DOD.

ACTION: Notice.

SUMMARY: Pursuant to Section (102)(2)(c) of the National Environmental Policy Act (NEPA) of 1969, as implemented by the Council on Environmental Quality Regulations (40 CFR parts 1500–1508), and Executive Order 12114, the Department of Navy (Navy) announces its intent to prepare an Environmental Impact Statement (EIS)/Overseas EIS to evaluate the potential environmental consequences associated with naval training operations in the Navy Cherry Point (CP) Range Complex. The Navy proposes to support current and emerging training and research, development, test, and evaluation (RDT&E) operations in the Navy CP Range Complex by: (1) Maintaining baseline operations at current levels; (2) increasing training operations from current levels as necessary to support the Fleet Readiness Training Plan (FRTP); (3) accommodating mission requirements associated with force structure change; and (4) implementing enhanced range complex capabilities. The EIS/OEIS study area is the Navy CP Range Complex which consists of surface and subsurface operating areas (OPAREAs), special use airspace (SUA), and instrumented ranges. The Navy CP Range Complex encompasses: 18,617 nm^2 of offshore surface and subsurface OPAREA; 12,529 nm^2 of deep ocean area greater than 100 fathoms (600 feet); and 18,966 nm^2 of SUA (warning area). No land ranges or facilities are included within the study area for this EIS/OEIS. The focus of the EIS/OEIS is the exercises and other actions in the ocean environment. Issues associated with land-based ranges will be assessed separately by the U.S. Marine Corps.

The scope of actions to be analyzed in this EIS/OEIS includes current and proposed future Navy training and RDT&E within Navy-controlled operating areas, airspace, and instrumented ranges. It also includes proposed Navy-funded range capabilities enhancements, including infrastructure improvements, which support range complex training and RDT&E. Activities that involve the use of active sonar are conducted in the Navy CP Complex; however, those potential effects are being analyzed in detail in a separate document, the Atlantic Fleet Active Sonar Training EIS/OEIS. That separate sonar EIS/OEIS addresses active sonar use as a whole by the Atlantic Fleet in the eastern Atlantic Ocean (including waters that are part of the Navy CP Complex), and in the Gulf of Mexico. The results of that sonar EIS/OEIS will be incorporated into the Navy CP Range Complex EIS/OEIS to account for active sonar effects that could occur within the geographic area of the Navy CP Range Complex.

Dates and Addresses: Two public scoping meetings will be held, one in Morehead City, North Carolina and one in Wilmington, North Carolina, to receive oral and written comments on environmental concerns that should be addressed in the Navy CP Range Complex EIS/OEIS. Public scoping meetings will be held at the following dates, times, and locations: May 16, 2007, from 5 p.m. to 8 p.m. at West Carteret High School, 4700 Country Club Road, Morehead City, North Carolina, and May 17, 2007, from 5 p.m. to 8 p.m. at New Hanover High School, 1307 Market Street, Wilmington, North Carolina.

FOR FURTHER INFORMATION CONTACT: Kelly Knight, Naval Facilities Engineering Command Atlantic, (757) 322–4398.

SUPPLEMENTARY INFORMATION: The Navy's mission is to maintain, train, and equip combat-ready naval forces capable of winning wars, deterring aggression and maintaining freedom of the seas. For that reason, Title 10 U.S.C. 5062 directs the Chief of Naval Operations to train all naval forces for combat. The Chief of Naval Operations meets that direction, in part, by conducting at-sea training exercises and ensuring naval forces have access to ranges, OPAREAs and airspace where they can develop and maintain skills for wartime missions and conduct RDT&E of naval weapons systems. As such, Navy ranges, OPAREAs, and airspace must be maintained and/or enhanced to accommodate necessary training and testing activities in support of national security objectives.

The purpose of the proposed action is to: Achieve and maintain Fleet readiness using the Navy CP Range Complex to support current, emerging, and future training and RDT&E operations; expand warfare missions; and upgrade/modernize existing range capabilities to enhance and sustain Navy training and testing.

The need for the proposed action is to provide combat capable forces ready to deploy worldwide in accordance with Title 10 U.S.C 5062. Specifically, maintain current levels of military readiness by training and testing in the Navy CP Range Complex; accommodate future increases in operational training tempo in the Navy CP Range Complex and support the rapid deployment of naval units or strike groups; achieve and sustain readiness in ships and squadrons so that the Navy can quickly surge significant combat power in the event of a national crisis or contingency operation and consistent with FRTP; support the testing and training needed for new aircraft, vessels, weapons systems and missions; and maintain the long-term viability of the Navy CP Range Complex while protecting human health and the environment.

Three alternatives will be evaluated in the EIS/OEIS including: (1) The No Action Alternative comprising baseline operations and support of existing range capabilities; (2) Alternative 1 comprising the No Action Alternative plus additional operations, expanded warfare missions, accommodation of force structure changes including training and RDT&E resulting from the introduction of new vessels, aircraft, weapons systems and missions, and the implementation of enhancements to range infrastructure; and (3) Alternative 2, comprising Alternative 1 plus additional increases in training, and implementation of enhancements that will optimize training throughput in support of future contingencies. The EIS/OEIS will evaluate the environmental effects associated with: Airspace; noise; range safety; water resources; air quality; biological resources, including threatened and endangered species; land use;

socioeconomic resources; infrastructure; and cultural resources. The analysis will include an evaluation of direct and indirect impacts, and will account for cumulative impacts from other naval activities in the Navy CP Range Complex. No decision will be made to implement any alternative until the EIS/OEIS process is completed and a Record of Decision is signed by the Assistant Secretary of the Navy (Installations and Environment).

The Navy is initiating the scoping process to identify community concerns and local issues to be addressed in the EIS/OEIS. Federal agencies, State agencies, local agencies, and interested persons are encouraged to provide oral and/or written comments to the Navy to identify specific issues or topics of environmental concern that should be addressed in the EIS/OEIS. Written comments must be postmarked by June 12, 2007 and should be mailed to: Naval Facilities Engineering Command, Atlantic, 6506 Hampton Boulevard, Norfolk, Virginia, 23508–1278, Attention: Ms. Kelly Knight.

R.K. Giroux,

Captain (Sel), Judge Advocate General's Corps, U.S. Navy, Federal Register Liaison Officer.

[FR Doc. E7–8188 Filed 4–27–07; 8:45 am]

BILLING CODE 3810–FF–P

DEPARTMENT OF EDUCATION

Notice of Proposed Information Collection Requests

AGENCY: Department of Education.

SUMMARY: The IC Clearance Official, Regulatory Information Management Services, Office of Management, invites comments on the proposed information collection requests as required by the Paperwork Reduction Act of 1995.

DATES: Interested persons are invited to submit comments on or before June 29, 2007.

SUPPLEMENTARY INFORMATION: Section 3506 of the Paperwork Reduction Act of 1995 (44 U.S.C. Chapter 35) requires that the Office of Management and Budget (OMB) provide interested Federal agencies and the public an early opportunity to comment on information collection requests. OMB may amend or waive the requirement for public consultation to the extent that public participation in the approval process would defeat the purpose of the information collection, violate State or Federal law, or substantially interfere with any agency's ability to perform its statutory obligations. The IC Clearance Official, Regulatory Information Management Services, Office of Management, publishes that notice containing proposed information collection requests prior to submission of these requests to OMB. Each proposed information collection, grouped by office, contains the following: (1) Type of review requested, e.g. new, revision, extension, existing or reinstatement; (2) Title; (3) Summary of the collection; (4) Description of the need for, and proposed use of, the information; (5) Respondents and frequency of collection; and (6) Reporting and/or Recordkeeping burden. OMB invites public comment.

The Department of Education is especially interested in public comment addressing the following issues: (1) Is this collection necessary to the proper functions of the Department; (2) will this information be processed and used in a timely manner; (3) is the estimate of burden accurate; (4) how might the Department enhance the quality, utility, and clarity of the information to be collected; and (5) how might the Department minimize the burden of this collection on the respondents, including through the use of information technology.

Dated: April 25, 2007.

Angela C. Arrington,

IC Clearance Official, Regulatory Information Management Services, Office of Management.

Office of Safe and Drug Free Schools

Type of Review: Reinstatement, with change, of a previously approved collection for which approval has expired.

Title: Alcohol, Other Drug, and Violence Prevention Survey of American College Campuses.

Frequency: On Occasion.

Affected Public: Not-for-profit institutions.

Reporting and Recordkeeping Hour Burden:

Responses: 1,050.

Burden Hours: 875.

Abstract: This survey's purpose is to determine the state of alcohol and other drug abuse and violence prevention in higher education and assess current and emerging needs of institutions of higher education and their surrounding communities.

Requests for copies of the proposed information collection request may be accessed from *http://edicsweb.ed.gov,* by selecting the ''Browse Pending Collections'' link and by clicking on link number 3322. When you access the information collection, click on ''Download Attachments'' to view. Written requests for information should be addressed to U.S. Department of Education, 400 Maryland Avenue, SW., Potomac Center, 9th Floor, Washington, DC 20202–4700. Requests may also be electronically mailed to *ICDocketMgr@ed.gov* or faxed to 202–245–6623. Please specify the complete title of the information collection when making your request.

Comments regarding burden and/or the collection activity requirements should be electronically mailed to *ICDocketMgr@ed.gov*. Individuals who use a telecommunications device for the deaf (TDD) may call the Federal Information Relay Service (FIRS) at 1–800–877–8339.

[FR Doc. E7–8203 Filed 4–27–07; 8:45 am]

BILLING CODE 4000–01–P

DEPARTMENT OF EDUCATION

Office of Special Education and Rehabilitative Services Overview Information; Technology and Media Services for Individuals With Disabilities—Institute on Technology Effectiveness for Children With Disabilities: Web-Supported Instructional Approaches; Notice Inviting Applications for New Awards for Fiscal Year (FY) 2007

Catalog of Federal Domestic Assistance (CFDA) Number: 84.327W.

Dates:

Applications Available: April 30, 2007.

Deadline for Transmittal of Applications: May 30, 2007.

Deadline for Intergovernmental Review: July 30, 2007.

Eligible Applicants: State educational agencies (SEAs); local educational agencies (LEAs); public charter schools that are LEAs under State law; institutions of higher education (IHEs); other public agencies; private nonprofit organizations; outlying areas; freely associated States; Indian tribes or tribal organizations; and for-profit organizations.

Estimated Available Funds: $500,000.

Maximum Award: We will reject any application that proposes a budget exceeding $500,000 for a single budget period of 12 months. The Assistant Secretary for Special Education and Rehabilitative Services may change the maximum amount through a notice published in the **Federal Register**.

Number of Awards: 1.

Note: The Department is not bound by any estimates in this notice.

Project Period: Up to 60 months.

by the action proponent depends on the nature of the proposal being evaluated. One interpretation of the No-Action alternative is that the proposed activity would not take place. This would mean that Navy would not conduct test or training activities in the Range Complex. This interpretation does not meet the purpose and need of the proposed action and would neither be reasonable nor practical. The other interpretation of the No-Action alternative is ''no change from current management direction or level of management intensity.'' This interpretation would meet the purpose and need of the proposed action and would allow the Navy to compare the potential impacts of the proposed action to the impacts of maintaining the status quo. With regard to this EIS/OEIS, the No-Action Alternative represents the regular and historic level of activity on the Range Complex. Thus, the No-Action Alternative serves as a baseline ''status quo'' when studying levels of range use and activity. In the Draft EIS/OEIS, the potential impacts of the current level of RDT&E and fleet activity on the NAVSEA NUWC Keyport Range Complex (defined by the No-Action Alternative) are compared to the potential impacts of activities proposed under the action alternatives.

The Navy analyzed potential effects of its current and proposed activities on marine mammals, fish, sea turtles, marine flora and invertebrates, terrestrial wildlife, sediments and water quality, cultural resources, recreation, land and shoreline use, public health and safety, socioeconomics and environmental justice, and air quality.

No significant adverse impacts are identified for any resource area in any geographic location within the NAVSEA NUWC Keyport Range Complex Study Area that cannot be mitigated, with the exception of exposure of marine mammals to underwater sound. The Navy has requested from NMFS a Letter of Authorization (LOA) in accordance with the Marine Mammal Protection Act to authorize the incidental take of marine mammals that may result from the implementation of the activities analyzed in the NAVSEA NUWC Keyport Range Complex Extension Draft EIS/OEIS. In compliance with the Magnuson-Stevens Fisheries Conservation Management Act, the Navy is in consultation with NMFS regarding potential impacts to Essential Fish Habitat. In accordance with section 7 of the Endangered Species Act, the Navy is consulting with NMFS and U.S. Fish and Wildlife Service (USFWS) for potential impacts to federally listed species. The Navy is coordinating with the Washington Department of Ecology for a Coastal Consistency Determination under the Coastal Zone Management Act. Navy analysis has indicated that under the Clean Air Act requirements, no significant impacts would occur to the regional air quality and under the Clean Water Act there would be no significant impacts to water quality. National Historic Preservation Act analysis indicated that no significant impacts to cultural resources would occur if the proposed action or alternatives were implemented. Implementation of the No Action Alternative or any of the proposed action alternatives would not disturb, adversely affect, or result in any takes of bald eagles. None of the alternatives would result in a significant adverse effect on the population of a migratory bird species.

The decision to be made by the Assistant Secretary of the Navy (Installations & Environment) is to determine which alternatives analyzed in the EIS/OEIS best meet the needs of the Navy given that all reasonably foreseeable environmental impacts have been considered.

The Draft EIS/OEIS was distributed to Federal, State, and local agencies, elected officials, and other interested individuals and organizations on September 12, 2008. The public comment period will end on October 27, 2008. Copies of the Draft EIS/OEIS are available for public review at the following libraries:

- Aberdeen Timberland Library, 121 E. Market St., Aberdeen, WA
- Hoodsport Timberland Library, N. 40 Schoolhouse Hill Road, Hoodsport, WA
- Jefferson County Rural Library District, 620 Cedar Avenue, Port Hadlock, WA
- Kitsap Regional Library, 1301 Sylvan Way, Bremerton, WA
- North Mason Timberland Library, 23801 NE State Rt. 3, Belfair, WA
- Ocean Shores Public Library, 573 Pt. Brown Ave., NW., Ocean Shores, WA
- Port Orchard Library, 87 Sidney St., Port Orchard, WA
- Port Townsend Public Library, 1220 Lawrence St., Port Townsend, WA
- Poulsbo Branch Library, 700 NE Lincoln St., Poulsbo, WA
- Quinault Indian Nation Tribal Library, P.O. Box 189, Taholah, WA
- Skokomish Tribal Center, N 80 Tribal Center Road, Shelton, WA

The NAVSEA NUWC Keyport Range Complex Extension Draft EIS/OEIS is also available for electronic public viewing at: *http://www-keyport.kpt.nuwc.navy.mil.* A paper copy of the Executive Summary or a single CD with the Draft EIS/OEIS will be made available upon written request by contacting Naval Facilities Engineering Command, Northwest, Attention: Mrs. Kimberly Kler (EIS/OEIS PM), 1101 Tautog Circle, Suite 203, Silverdale, WA 98315–1101; facsimile: 360–396–0857.

Federal, State, and local agencies and interested parties are invited to be present or represented at the public hearing. Written comments can also be submitted during the open house sessions preceding the public hearings.

Oral statements will be heard and transcribed by a stenographer; however, to ensure the accuracy of the record, all statements should be submitted in writing. All statements, both oral and written, will become part of the public record on the Draft EIS/OEIS and will be responded to in the Final EIS/OEIS. Equal weight will be given to both oral and written statements. In the interest of available time, and to ensure all who wish to give an oral statement have the opportunity to do so, each speaker's comments will be limited to three (3) minutes. If a long statement is to be presented, it should be summarized at the public hearing with the full text submitted either in writing at the hearing, or mailed or faxed to Naval Facilities Engineering Command, Northwest, *Attention:* Mrs. Kimberly Kler (EIS/OEIS PM), 1101 Tautog Circle, Suite 203, Silverdale, WA 98315–1101; *facsimile:* 360–396–0857. In addition, comments may be submitted on-line at *http://www-keyport.kpt.nuwc.navy.mil* during the comment period. All written comments must be postmarked by October 27, 2008 to ensure they become part of the official record. All comments will be addressed in the Final EIS/OEIS.

Dated: September 3, 2008.

T.M. Cruz,

Lieutenant Commander, Judge Advocate General's Corps, U.S. Navy, Federal Register Liaison Officer.

[FR Doc. E8–21343 Filed 9–11–08; 8:45 am]

BILLING CODE 3810–FF–P

DEPARTMENT OF DEFENSE

Department of the Navy

Notice of Public Hearings for the Navy Cherry Point Range Complex Draft Environmental Impact Statement/ Overseas Environmental Impact Statement

AGENCY: Department of the Navy, DoD.

ACTION: Notice.

SUMMARY: Pursuant to section 102(2)(c) of the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [U.S.C.] 4321); the Council of Environmental Quality (CEQ) Regulations for implementing the procedural provisions of NEPA (Title 40 Code of Federal Regulations [CFR] Parts 1500–1508); Department of the Navy Procedures for Implementing NEPA (32 CFR part 775); Executive Order (EO) 12114, Environmental Effects Abroad of Major Federal Actions; and Department of Defense (DoD) regulations implementing EO 12114 (32 CFR Part 187), the Department of the Navy (Navy) has prepared and filed with the U.S. Environmental Protection Agency a Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) on September 2, 2008. The National Marine Fisheries Service (NMFS) is a Cooperating Agency for the EIS/OEIS. This notice announces the dates and locations of the public hearings for this Draft EIS/OEIS, and provides supplementary information about the environmental planning effort.

The EIS/OEIS evaluates the potential environmental impacts over a 10-year planning horizon associated with Navy Atlantic Fleet and Marine Corps training; research, development, testing, and evaluation (RDT&E) activities; and associated range capabilities enhancements (including infrastructure improvements) within the existing Navy Cherry Point (Navy CHPT) Range Complex. The Navy CHPT Range Complex encompasses 18,617 square nautical miles (nm^2) of offshore surface and subsurface operating area (OPAREA); 12,529 nm^2 of deep ocean area greater than 100 fathoms (600 feet), and 18,966 nm^2 of overlying Special Use Airspace (SUA) off the coast of North Carolina. The geographic scope of the EIS/OEIS, referred to as the Navy Cherry Point Study Area, includes the OPAREA and SUA, plus the 3 NM strip of coastal water from mean high tide line extending seaward to the western OPAREA boundary. A Notice of Intent for this Draft EIS/OEIS was published in the **Federal Register** on April 30, 2007 (Vol. 72, No. 82, pp. 21248–21249).

The Navy will conduct two public hearings to receive oral and written comments on the Draft EIS/OEIS. Federal, state and local agencies and interested individuals are invited to be present or represented at the public hearings. An open house session will precede the scheduled public hearing at each of the locations listed below and will allow individuals to review the information presented in the Navy CHPT Range Complex Draft EIS/OEIS. Navy and Marine Corps representatives will be available during the open house sessions to clarify information related to the Draft EIS/OEIS.

DATES AND ADDRESSES: All meetings will start with an open house session from 5 p.m. to 7 p.m. A formal presentation and public comment period will be held from 7 p.m. to 9 p.m. Public hearings will be held on the following dates and at the following locations: October 14, 2008 at the North Carolina Maritime Museum, 315 Front St., Beaufort, NC and October 15, 2008 at the Best Western Coastline Inn & Convention Center, 503 Nutt St., Wilmington, NC.

FOR FURTHER INFORMATION CONTACT: Naval Facilities Engineering Command, Atlantic, Attention, EV22SA (Navy CHPT EIS/OEIS PM), 6506 Hampton Boulevard, Norfolk, Virginia 23508–1278; *facsimile:* 757–322–4894 or *http://www.navycherrypointrangecomplexeis.com/.*

SUPPLEMENTARY INFORMATION: The Navy has identified the need to support and conduct current, emerging and future training and RDT&E operations in the Navy CHPT Range Complex. The proposed action does not indicate major changes to Navy CHPT Range Complex facilities, operations, training, or RDT&E capacities over the 10-year planning period. Rather, the proposed action would result in relatively small-scale but critical enhancements to the Navy CHPT Range Complex that are necessary if the Navy and Marine Corps are to maintain a state of military readiness commensurate with their national defense mission.

The EIS/OEIS addresses the training strategies described in the Fleet Readiness Training Plan (FRTP) that implements the Fleet Response Plan (FRP), which ensures continuous availability of agile, flexible, trained, and ready surge-capable (rapid response) forces. The recommended range enhancements, and current and future training and testing operations, which have the potential to impact the environment are the primary focus of the EIS/OEIS.

The purpose for the proposed action is to:

- Achieve and maintain Fleet readiness using the Navy CHPT Range Complex to support and conduct current, emerging, and future training and RDT&E operations;
- Expand warfare missions supported by the Navy CHPT Range Complex; and
- Upgrade and modernize existing range capabilities to enhance and sustain Navy and Marine Corps training and RDT&E.

The need for the proposed action is to provide range capabilities for training and equipping combat-capable naval forces ready to deploy worldwide. In this regard, the Navy CHPT Range Complex furthers the Navy's execution of its Congressionally mandated roles and responsibilities under title 10 U.S.C. 5062. To implement this Congressional mandate, the Navy needs to:

- Maintain current levels of military readiness by training in the Navy CHPT Range Complex;
- Accommodate future increases in operational training tempo in the Navy CHPT Range Complex and support the rapid deployment of naval units or strike groups;
- Achieve and sustain readiness of ships and squadrons consistent with the FRP so the Navy and Marine Corps can quickly surge significant combat power in the event of a national crisis or contingency operation;
- Support the acquisition and implementation into the Fleet of advanced military technology. The Navy CHPT Range Complex must adequately support the testing and training needed for new aircraft and weapons systems; and
- Maintain the long-term viability of the Navy CHPT Range Complex while protecting human health and the environment, and enhancing its quality, communication capability and safety.

Support to current, emerging and future training and RDT&E operations, including implementation of range enhancements, entails the actions evaluated in the EIS/OEIS.

These potentially include:

- Increase use of contractor-operated aircraft that simulate enemy aircraft during training (Commercial Air Services Support for Fleet Opposition Forces and Electronic Warfare Threat Training);
- Increase anti-piracy and maritime interdiction training (Anti-terrorism Surface Strike Group Training);
- Support MH–60R/S helicopter warfare mission areas;
- Designate a littoral mine warfare training area for deploying temporary mineshapes in support of Strike Group mine warfare training during major exercises; and,
- Upgrade the Mid-Atlantic Electronic Warfare Range (MAEWR).

The proposed action is to support and conduct current and emerging training and RDT&E in the Navy CHPT Range Complex. To achieve this, the Navy proposes to:

- Maintain baseline training and testing operations at current levels, plus sufficient additional operations to support a surge capability in compliance with FRP.

• Provide flexibility to respond to real-world situations with increased training operations, and to accommodate mission expansion, emerging force structure changes (including those resulting from the introduction of new aircraft and weapons systems), and new range capabilities.

• Eliminate high explosive bombing exercises at sea, and implement enhanced mine warfare training capability within the range complex.

Three alternatives were evaluated in the Navy CHPT Range Complex EIS/OEIS:

No Action Alternative: Maintain training and RDT&E operations at current levels to include surge consistent with the FRTP;

Alternative 1: All operations in the No Action Alternative, plus a 10% increase in most training and testing operations, plus changes in type and quantity of operations and tactical employment of forces to accommodate expanded mission areas, force structure changes and new range capabilities. Specifically:

• Train tailored naval units to conduct rapid response anti-piracy, anti-terrorism and maritime interdiction operations (Maritime Security Surge Surface Strike Group);

• Conduct surface-to-air missile training;

• Conduct MH–60R/S helicopter training;

• Conduct training with new Organic Mine Countermeasures systems;

• Increase use of contractor-operated aircraft to support fleet training (Commercial Air Services); and

• Upgrade electronic warfare anti-ship and anti-aircraft threat emitters (Mid-Atlantic Electronic Warfare Range).

Alternative 2 (Preferred Alternative): All operations in Alternative 1 plus:

• Eliminate bombs at-sea with high explosive warheads.

• Designate mine warfare training areas, some of which can accommodate temporary deployment of training mineshapes, in support of Strike Group mine warfare training events during major exercises.

The Assistant Secretary of the Navy (Installations & Environment) will decide which alternative analyzed in the EIS/OEIS provides the optimum level and mix of training and testing operations and range capabilities enhancements in the Navy CHPT Range Complex that satisfies the purpose and need while considering all reasonably foreseeable environmental impacts.

Three alternatives were considered but eliminated from further consideration. These alternatives are:

1. Alternative Range Complex Locations—No single range complex on the East Coast can accommodate the entire spectrum of Navy and Marine Corps training and testing. To maintain a high level of combat readiness for naval forces at best value to the U.S. taxpayer, the Navy and Marine Corps homeported their forces in multiple concentration areas rather than a single area, in part to ensure the surrounding training and testing areas could support their specific needs. The result is a system of range complexes, each optimized to support the limited set of warfare areas that predominate in that locale. The Navy CHPT Range Complex possesses a number of historical and natural features that make it an indispensable component of the Navy's East Coast system of ranges. Other locations do not provide reasonable alternatives for required training purposes/activities described above, and as a result, alternative training locations were eliminated from further consideration.

2. Conduct Simulated Training Only—Under this alternative, only simulated training would be conducted using computer models and classroom training. While the Navy currently makes extensive use of computer simulation and classroom instruction as effective training tools, they cannot exclusively replace live training. Simulation cannot replicate the environment of live coordinated training and major exercises, where multiple ships, submarines and aircraft, and hundreds or thousands of men and women are participating in training activities in a coordinated fashion to accomplish a common military objective. Because of the need to train as we fight, this alternative would fail to meet the purpose and need of the proposed action and therefore, is not evaluated further in the EIS/OEIS.

3. Practice Ammunition Use—An alternative that would rely entirely on inert, practice ammunition use within the Navy CHPT Range Complex would not achieve the necessary levels of proficiency in firing weapons in a high stress and realistic environment. Inert, practice ammunition is used throughout the Navy CHPT Range Complex, and provides opportunity to implement a successful, integrated training program while reducing the risk and expense typically associated with live ammunition. However, Navy and Marine Corps personnel need to gain proficiency in handling and employment of ordnance with live warheads in a safe, controlled training environment before entering the inherently unsafe environment of live combat. Consequently, this alternative fails to meet the purpose and need of the proposed action and was not carried forward for analysis.

Nineteen resources and issues were described and analyzed in the EIS/OEIS. These include but are not limited to water resources, air quality, marine communities, marine mammals, sea turtles, fish and essential fish habitat, seabirds and migratory birds, cultural resources, regional economy, and public health and safety. The Navy used subject matter experts, public and agency scoping comments, previous environmental analyses, previous agency consultations, laws, regulations, Executive Orders and resource-specific information in a screening process to identify aspects of the proposed action that could act as stressors to resources and issues evaluated in the EIS/OEIS.

The stressors considered for analysis of environmental consequences include, but are not limited to, vessel movements (disturbance and collisions), aircraft overflights (disturbance and strikes), non-explosive practice munitions, and underwater detonations and high explosive ordnance.

In accordance with 50 CFR 401.12, the Navy submitted a Biological Evaluation to assess the potential effects from the proposed action on marine resources and anadromous fish protected by the NMFS under the Endangered Species Act (ESA). In accordance with the Marine Mammal Protection Act MMPA (16 U.S.C. 1371[a][5]), the Navy submitted a request for Letter of Authorization to the NMFS for the incidental taking of marine mammals by the proposed action which was acknowledged by NMFS in a Notice of Receipt published in the **Federal Register** (Vol. 73, No. 131, pp 38991–38993) on July 08, 2008.

The Navy submitted a Consultation Package in accordance with legal requirements set forth under regulations implementing Section 7 of the ESA (50 CFR 402; 16 U.S.C 1536 (c)) for listed species under jurisdiction of the U.S. Fish and Wildlife Service. The analysis of environmental stressors indicated that implementation of the No Action Alternative, Alternative 1, or Alternative 2 would not result in unavoidable significant adverse effects to resources analyzed. The analysis of environmental stressors and alternatives indicated no significant impact to resources in U.S. territorial waters; likewise, no significant harm in non-territorial waters is expected.

The Navy CHPT Draft EIS/OEIS was distributed to Federal, State, and local agencies, elected officials, and other interested individuals and organizations

on September 12, 2008. The public comment period will end on October 27, 2008. Copies of the Navy CHPT Draft EIS/OEIS are available for public review at the following libraries: Hatteras Library, 57690 NC Highway 12, Hatteras, NC; New Hanover County Library, 201 Chestnut Street, Wilmington, NC; Webb Memorial Library Center, 812 Evans Street, Morehead City, NC; Onslow County Library, 58 Doris Avenue East, Jacksonville, NC; Kill Devil Hills Branch Library, 400 S. Mustian St., Kill Devil Hills, NC; Havelock-Craven County Public Library, 301 Cunningham Boulevard, Havelock, NC. The Navy CHPT Draft EIS/OEIS is also available for electronic public viewing at: *http://www.navycherrypointrangecomplexeis.com/.*

A paper copy of the Executive Summary or a single CD with the Navy CHPT Draft EIS/OEIS will be made available upon written request by contacting Naval Facilities Engineering Command, Atlantic Division; *Attention:* Code EV22SA (Navy CHPT EIS/OEIS PM); 6506 Hampton Blvd.; Norfolk, VA 23508–1278. *Facsimile:* 757–322–4894. Federal, State, and local agencies and interested parties are invited to be present or represented at the public hearing. Written comments can also be submitted during the open house sessions preceding the public hearings.

Oral statements will be heard and transcribed by a stenographer; however, to ensure the accuracy of the record, all statements should be submitted in writing. All statements, both oral and written, will become part of the public record on the Draft EIS/OEIS and will be responded to in the Final EIS/OEIS. Equal weight will be given to both oral and written statements. In the interest of available time, and to ensure all who wish to give an oral statement have the opportunity to do so, each speaker's comments will be limited to three (3) minutes. If a long statement is to be presented, it should be summarized at the public hearing with the full text submitted either in writing at the hearing, or mailed or faxed to Naval Facilities Engineering Command, Atlantic Division; Attention: Code EV22SA (Navy CHPT EIS/OEIS PM); 6506 Hampton Blvd.; Norfolk, VA 23508–1278. *Facsimile:* 757–322–4894. In addition, comments may be submitted on-line at *http://www.navycherrypointrangecomplexeis.com/* during the comment period. All written comments must be postmarked by October 27, 2008 to ensure they become part of the official record. All comments will be addressed in the Final EIS/OEIS.

Dated: September 3, 2008.

T. M. Cruz,

Lieutenant Commander, Judge Advocate General's Corps, U.S. Navy, Federal Register Liaison Officer.

[FR Doc. E8–21342 Filed 9–11–08; 8:45 am]

BILLING CODE 3810–FF–P

DEPARTMENT OF DEFENSE

Department of the Navy

Notice of Public Hearings for the Undersea Warfare Training Range Draft Overseas Environmental Impact Statement/Environmental Impact Statement

AGENCY: Department of the Navy, DoD.

ACTION: Notice.

SUMMARY: Pursuant to section 102(2)(c) of the National Environmental Policy Act (NEPA) of 1969 and regulations implemented by the Council on Environmental Quality (40 CFR parts 1500–1508), and Executive Order (EO) 12114, Environmental Effects Abroad of Major Federal Actions, the Department of the Navy (Navy) has prepared and filed with the U.S. Environmental Protection Agency a Draft Overseas Environmental Impact Statement/Environmental Impact Statement (OEIS/EIS) on September 12, 2008. The National Marine Fisheries Service (NMFS) is a Cooperating Agency for the OEIS/EIS.

The Draft OEIS/EIS evaluates the potential environmental impacts of the construction and operation of an Undersea Warfare Training Range (USWTR) associated with Navy Atlantic Fleet training activities. The construction of the proposed USWTR would entail the instrumentation of a 500-square nautical mile (NM^2) area of the sea floor with undersea cables and sensor nodes, connected to the shore via a single trunk cable.

The western edge of the range would be located approximately 50 NM off the coast of Jacksonville, FL. The USWTR would allow ships, submarines, and aircraft to perform anti-submarine warfare (ASW) training in littoral, or near shore, waters. A Notice of Intent (NOI) for the OEIS/EIS was published in the **Federal Register** on May 13, 1996 (**Federal Register**, Volume 61, No. 93, pp 22028). A Revised NOI for this Draft OEIS/EIS and Notice of Request for Public Scoping Comments were published in the **Federal Register** on September 21, 2007 (**Federal Register**, Volume 72, No. 183, pp 54015–54016).

The Navy will conduct four public hearings to receive oral and written comments on the Draft OEIS/EIS. Federal agencies, state agencies, local agencies, and interested individuals are invited to be present or represented at the public hearings. This notice announces the dates and locations of the public hearings for this Draft OEIS/EIS.

An open house session will precede the scheduled public hearing at each of the locations listed below and will allow individuals to review the information presented in the USWTR Draft OEIS/EIS. Navy representatives will be available during the open house sessions to clarify information related to the Draft OEIS/EIS.

Dates and Addresses: Public hearings will be held on the following dates and times at the following locations:

1. September 29, 2008, at the Chincoteague Center (open house poster session from 4 p.m. to 7 p.m. and formal hearing from 7 p.m. to 9 p.m.), 6155 Community Drive, Chincoteague, VA;

2. October 1, 2008 at the Crystal Coast Civic Center (open house poster session from 6 p.m. to 8 p.m. and formal hearing from 8 p.m. to 10 p.m.), 3505 Arendell Street, Morehead City, NC;

3. October 6, 2008 at the Sheraton North Charleston—Convention Center (open house poster session from 5 p.m. to 7 p.m. and formal hearing from 7 p.m. to 9 p.m.), 4770 Goer Drive, North Charleston, SC;

4. October 7, 2008 at the University of North Florida—University Center (open house poster session from 5 p.m. to 7 p.m. and formal hearing from 7 p.m. to 9 p.m.), 12000 Alumni Drive, Jacksonville, FL.

FOR FURTHER INFORMATION CONTACT: Naval Facilities Engineering Command, Atlantic, Attention: EV22LL (USWTR OEIS/EIS Program Manager (PM)), 6506 Hampton Boulevard, Norfolk, Virginia 23508–1278; facsimile: 804–200–5568 or *http://projects.earthtech.com/uswtr/.*

SUPPLEMENTARY INFORMATION: The purpose for the proposed action is to enable the U.S. Navy to train effectively in a shallow water environment (120 to 900 feet in depth) at a suitable location for Atlantic Fleet ASW capable units.

The need for the proposed action is to provide range capabilities for training and equipping combat-capable naval forces ready to deploy worldwide. In this regard, the USWTR furthers the Navy's execution of its Congressionally-mandated roles and responsibilities under Title 10 U.S.C 5062. Training on the USWTR would ensure this Congressional mandate is implemented by allowing the Navy to: effectively equip its forces for deployment to littoral areas worldwide, such as the Arabian Sea; use active sonar to assist in the detection of extremely quiet

APPENDIX C

AGENCY CORRESPONDENCE

This appendix contains the following letters:

1. CNO letter to NMFS dated November 16, 2007, requesting the initiation of early consultation with NMFS under Section 7 of the Endangered Species Act
2. CNO letter dated 4 January 2008 to NMFS, transmitting the draft Biological Evaluation (BE)
3. NAVFAC Atlantic letter dated May 12, 2008 to USFWS transmitting Endangered Species Act Section 7 Consultation package
4. CNO letter dated 5 June 2008 to NMFS requesting a Letter of Authorization for Incidental Take of Marine Mammals
5. CNO letter dated 15 September 2008 transmitting a replacement BE for NMFS consideration
6. US DoI Fish and Wildlife Service letter dated October 7, 2008 concurrence letter
7. NAVFAC letter dated 13 March 2009 to the North Carolina State Historic Preservation Office requesting review and comments on FEIS/OEIS findings
8. US DoI Fish and Wildlife Service letter dated March 13, 2009 confirming change in agreed upon mitigation as referenced in US DoI letter dated October 7, 2008 (#6 above)

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DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, DC 20350-2000

IN REPLY REFER TO

5090
Ser N456/7U158325
November 16, 2007

Mr. P. Michael Payne
Division Chief
Permits, Conservation, and Education Division
Office of Protected Resources
National Marine Fisheries Service (NMFS)
National Oceanic and Atmospheric Administration
B-SSMC3 Room 13821
1315 East-West Highway
Silver Spring, MD 20910-3282

Dear Mr. Payne,

The Commander, U. S. Fleet Forces Command (USFF) is preparing three Environmental Impact Statements /Overseas Environmental Impact Statements (EIS/OEIS) to assess the potential environmental impacts associated with sustainable range usage and enhancements within the Navy's East Coast range complexes for the Virginia Capes (VACAPES), Cherry Point, and Charleston/JAX operational areas (OPAREAS). Specifically, the proposed action is to support and conduct current and emerging training and Research, Development, Testing and Evaluation (RDT&E) activities in these three range complexes and to upgrade and modernize range complex capabilities to enhance and sustain Navy training and testing. A collection of actions will be evaluated within the EISs/OEISs. Specific descriptions of these alternatives are detailed in the Enclosures 1-3.

Conduct of these activities will likely result in acoustic exposure of marine mammals listed under the Marine Mammal Protection Act (MMPA) from impulsive sources and likely require a Letter of Authorization (LOA). As such, the Navy will be submitting a LOA request to your office in the coming months for these activities.

As an applicant for a MMPA permit, the Navy requests your office initiate early consultation procedures with the Endangered Species Division, in accordance with Section 7 (a) (3) of the ESA, and its implementing regulations at 50 CFR §402.11. In accordance with these regulations, the attached Preliminary Draft Descriptions of the Proposed Action and Alternatives

(DOPAA) for the EISs/OEISs serves as the Navy's proposal outlining the action. As previously stated, the effects of the proposed action for purposes of the MMPA permit will be from exposure to impulsive sources. The level of magnitude for these effects is still being modeled and will be included in the Navy's request for a LOA. A combined ESA Biological Evaluation for all three OPAREAS is proposed.

Title 10, Section 5062 of the United States Code requires the Navy to be "organized, trained and equipped primarily for prompt and sustained combat incident to operations at sea." The current and emerging RDT&E activities in these OPAREAs and proposed upgrades and modernization of these capabilities will be used to meet this legal requirement. Thus, in accordance with 50 CFR §402.11(b), this letter serves as the Navy's certification that it has a definite proposal and intends to implement the proposal should a MMPA authorization be obtained from your office.

In June 2004, the Navy submitted a request for Incidental Harassment Authorization and LOA to your office for the Integrated Maritime Portable Acoustic Scoring and Simulator System (IMPASS) (COMUSFF letter 5090 Ser N774B/038). Since this request Navy has continued to refine its use of this system, resulting in changes not reflected in our original submittal. These changes will be reflected in the three East Coast EISs/OEISs for which we will be submitting an MMPA permit request and are requesting early consultation via this letter. Therefore, it is requested that the previous IMPASS request for permit and any associated consultation with the Endangered Species Division be closed.

Additionally, the Atlantic Fleet Active Sonar Training (AFAST) EIS/OEIS which covers the use of mid-frequency sonar training by USFF on the Atlantic and Gulf coasts will be incorporated by reference into the three East Coast TAP EIS/OEISs.

We appreciate your continued support in helping us to meet our MMPA and Section 7 responsibilities. My point of contact for this matter is Ms. Elizabeth Phelps 703-604-5420 or Elizabeth.phelps@navy.mil, or Commander, U. S. Fleet Forces Command point of contact is Mr. David Noble, 757-836-7147 or William.d.noble@navy.mil.

Sincerely,

Ronald Tickle
Head, Operational Environmental Readiness and Planning Branch
Environmental Readiness Division
(OPNAV N45)

Enclosures:

(1) Preliminary Draft Description of Proposed Action and Alternatives for the VACAPES Range Complex Environmental Impact Statement/Overseas Environmental Impact Statement (September 2007)
(2) Preliminary Draft Description of Proposed Action and Alternatives for the Navy Cherry Point Range Complex Environmental Impact Statement/Overseas Environmental Impact Statement (December 2007)
(3) Preliminary Draft Description of Proposed Action and Alternatives for the Jacksonville Range Complex Environmental Impact Statement/Overseas Environmental Impact Statement (September 2007)

Copy to (w/ enclosures):
Ms. Angela Somma,
Chief, Endangered Species Division, NMFS

Copy to (w/o enclosures):
OPNAV N43
USFF N4/N7

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DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, DC 20350-2000

IN REPLY REFER TO
5090
Ser N456K/7U158356
4 January 2008

Ms. Angela Somma
Division Chief Endangered Species Division
Office of Protected Resources
National Oceanic and Atmospheric Administration
National Marine Fisheries Service (NMFS)
B-SSMC3 Room 13821
1315 East-West Highway
Silver Springs, MD 20910-3282

Dear Ms. Somma:

The Commander, U.S. Fleet Forces is preparing Draft Environmental Impact Statements/Overseas Environmental Impact Statements (EIS/OEIS) to support and conduct current and emerging training and research, development, testing and evaluation (RDT&E) operations and upgrade or modernize capabilities to enhance and sustain Navy training and testing in the Virginia Capes Range Complex (VACAPES Draft EIS/OEIS), Navy Cherry Point Range Complex (NCP Draft EIS/OEIS), and Jacksonville Range Complex (JAX Draft EIS/OEIS). Through our cooperating agency agreement, the Navy and National Marine Fisheries Service (NMFS) are working together to develop these DEISs/OEISs prior to release for public comment.

In a letter dated November 16, 2007, the Navy requested the NMFS' permit division initiate early consultation in anticipation of submitting a Marine Mammal Protection Act (MMPA) request for rulemaking and Letters of Authorization (LOAs). In accordance with 50 CFR §401.12(f), the Navy is submitting relevant chapters of the above mentioned EIS/OEISs as its Biological Evaluation (BE) [Enclosure (1)]. This BE assesses the potential effects of the proposed actions on species protected under the Endangered Species Act that potentially occur in the Range Complexes listed above. These include the following species under NMFS jurisdiction: blue, fin, humpback, North Atlantic right, sei, and sperm whales; green, hawksbill, Kemp's ridley, leatherback, and loggerhead turtles; shortnose sturgeon; and smalltooth sawfish.

In accordance with 50 CFR §401.14(c) the attached BE includes: (1) a description of the proposed action; (2) descriptions of the specific areas where the proposed action will occur (also called Study Area for each of the Range Complexes); (3) descriptions of the listed species and critical habitat that may be affected by

the actions; (4) the potential effects on listed and proposed species or critical habitat; (5) an analysis of cumulative effects; and (6) measures proposed by the Navy to mitigate potential effects of the proposed action.

Additional technical information regarding the process by which the Navy determined the listed species distribution in these geographic areas is detailed in Enclosures 2-6. These reports are in a draft stage, and would benefit from your staff's input, should any technical errors be identified. In addition, Navy utilized density estimates derived from standard reports previously provided to your office (Reference A). We are providing these reports as additional relevant technical information for purposes of consultation under the Endangered Species Act.

The Navy is requesting consultation for the Preferred Alternative (Alternative 2) for each of the Range Complexes. The BE includes a description of the No Action Alternative and Alternative 1 for each Range Complex because in the Draft EIS/OEIS the proposed action in each alternative is additive to the previous alternative (i.e., Alternative 2 includes all activities proposed under Alternative 1 and the No Action Alternative). The Navy will not make its decision of which alternative it will implement until the Record of Decision (ROD) is signed at the conclusion of the NEPA process. Consequently, should the Navy decide to implement an alternative besides Alternative 2 in any or all of the range complexes, the effects to listed species would be the same or less than those evaluated in this consultation.

The following is a brief summary of Navy's determination of effect in each Study Area for each listed species that may occur there:

Virginia Capes (VACAPES) Study Area - One or more stressors associated with Alternative 2 may affect blue, fin, humpback, North Atlantic right, sei, and sperm whales; green, hawksbill, Kemp's ridley, leatherback, and loggerhead turtles; and shortnose sturgeon. Alternative 2 would have no effect on smalltooth sawfish. The Navy requests NMFS provide a Biological Opinion for those species for which we have determined effects.

Navy Cherry Point Study Area - One or more stressors associated with Alternative 2 may affect blue, fin, humpback, North Atlantic right, sei, and sperm whales and green, hawksbill, Kemp's ridley, leatherback, and loggerhead turtles. Alternative 2 would have no effect on shortnose sturgeon or smalltooth sawfish. The determination of no effect to the shortnose sturgeon and smalltooth sawfish is based on data that indicate that these

species are not expected to be present in the Study Area. Accordingly, the BE does not include further analysis of these species (i.e., a fish section is not included for the Navy Cherry Point Study Area). Navy requests NMFS provide a Biological Opinion for those species for which we have determined effects.

Jacksonville Study Area - One or more stressors associated with Alternative 2 may affect blue, fin, humpback, North Atlantic right, sei, and sperm whales; green, hawksbill, Kemp's ridley, leatherback, and loggerhead turtles; shortnose sturgeon; and smalltooth sawfish. Navy requests that NMFS provide a Biological Opinion for each of these listed species.

My staff point of contact for this matter is Elizabeth Phelps who can be reached at 703-604-5420 or via email at Elizabeth.phelps@navy.mil.; Commander, U.S. Fleet Force's point of contact for this matter is David Noble, who can be reached at (757)-836-7147 or via email at William.d.noble@navy.mil.

Sincerely,

Ronald E. Tickle
Head, Operational Environmental
Readiness and Planning Branch
Environmental Readiness Division
(OPNAV N45)

Enclosures:

(1) Biological Evaluation for Virginia Capes, Navy Cherry Point, and Jacksonville Range Complexes.
(2) Narration of the Existing Environment for the Marine Resources of the Mouth of the Chesapeake Bay (Final Report September 2007-CD Copy).
(3) Marine Resources Assessment Update for the Virginia Capes Operating Area (Draft Report June 2007-CD Copy)
(4) Marine Resources Assessment Update for the Cherry Point Operating Area (Draft Report May 2007-CD Copy)
(5) Marine Resources Assessment Update for the Charleston/Jacksonville Operating Area (Draft Report August 2007-CD Copy)

Reference:

(A) Navy OPAREA Density Estimates (NODE) for the Southeast OPAREAS: VACAPES, CHPT, JAX/CHASN, and Southeastern Florida & AUTEC-Andros. (2007).

Copy to (w/Enclosure 1):

Mr. David Bernhart
Assistant Regional Administrator for Protected Resources
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Regional Office
263 13th Avenue South
St. Petersburg, FL 33701

Ms. Mary Colligan
Assistant Regional Administrator for Protected Resources
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Regional Office
One Blackburn Dr.
Gloucester, MA 01930

Copy to (w/o enclosures):
DASN (E)
OPNAV N43
FFC N4/7
CNRSE (N45)

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
ATLANTIC
6506 HAMPTON BLVD
NORFOLK VA 23508-1278

TELEPHONE NO:
(757) 322-4940

IN REPLY REFER TO:
5090
EV53DR:lfm
May 12, 2008

Ms. Gloria Bell, Chief
U.S. Fish and Wildlife Service, Southeast Region
Species and Habitat Assessment Branch
1875 Century Boulevard, Suite 400
Atlanta, GA 30345

RE: ENDANGERED SPECIES ACT SECTION 7 CONSULTATION PACKAGE FOR SPECIES UNDER U.S. FISH AND WILDLIFE SERVICE (USFWS) JURISDICTION AT THREE EAST COAST RANGE COMPLEXES

Dear Ms. Bell:

The Commander, U.S. Fleet Forces is preparing Draft Environmental Impact Statements/Overseas Environmental Impact Statements (EISs/OEISs) in accordance with the National Environmental Policy Act (NEPA) to increase use and enhance capabilities of the Virginia Capes (VACAPES) Range Complex, Navy Cherry Point Range Complex, and Jacksonville (JAX) Range Complex (including JAX Atlantic Ocean, Rodman Range, and Lake George Range study areas) to achieve and maintain Fleet readiness.

In accordance with legal requirements set forth under regulations implementing Section 7 of the Endangered Species Act (ESA) (50 Code of Federal Regulations 402; 16 U.S. Code 1536 (c)) this consultation package includes descriptions of the proposed actions, species accounts and status of the species in the study areas, effects of the actions, conclusions, list of contacts, and references.

The proposed action is described as Alternative 2 (Preferred Alternative) from the EISs/OEISs for each range complex in the attached consultation package. An overview of the proposed actions for each range complex is provided in Appendix A, and more specific details are provided in appendices B, C, and D. Mitigation measures which are implemented to reduce the potential impacts to listed species and critical habitat are presented in Appendix E.

A request for technical assistance was submitted to the USFWS Jacksonville Office on September 27, 2007. The USFWS Jacksonville Office responded to the request in a letter dated December 11, 2007, and provided information regarding threatened and endangered species that may occur on or near the Rodman and Lake George Ranges. While not part of the Section 7 consultation process, a request for technical assistance was also submitted to the Florida Fish and Wildlife Conservation Commission (FFWCC). The FFWCC responded in a letter dated October 15, 2007, and provided information regarding listed species that may occur on or near the Rodman and Lake George Ranges.

5090
EV53DR:lfm
May 12, 2008

Through our cooperating agency agreement, the Navy and the National Marine Fisheries Service (NMFS) are working together to develop the EISs/OEISs prior to release for public comment. The Navy has initiated a separate Section 7 consultation with NMFS for species under their jurisdiction, including listed whales, sea turtles in the marine environment, and fish.

The species addressed in this consultation package include the Bermuda petrel (*Pterodroma cahow*), Florida scrub-jay (*Aphelocoma coerulescens*), red-cockaded woodpecker (*Picoides borealis*), roseate tern (*Sterna dougallii*), wood stork (*Mycteria americana*), West Indian manatee (*Trichechus manatus*) (including designated critical habitat), American alligator (*Alligator mississippiensis*), eastern indigo snake (*Drymarchon corais couperi*), sand skink (*Neoseps reynoldsi*), pondberry (*Lindera melissifolia*), clasping warea (*Warea amplexifolia*), Lewton's polygala (*Polygala lewtonii*), and scrub buckwheat (*Eriogonum longifolium* var. *gnaphalifolium*). The proposed action does not occur in any area where there is sea turtle nesting habitat, so sea turtles are not included in this package. There are no species currently proposed for listing that are expected to occur in the action area.

The Navy has determined that the proposed action would not adversely modify critical habitat and would have no effect on the species listed above, except as indicated below:

VACAPES Study Area. The Proposed Action may affect, but is not likely to adversely affect the Bermuda petrel.

Navy Cherry Point Study Area. The Proposed Action may affect, but is not likely to adversely affect the Bermuda petrel.

JAX Atlantic Ocean Study Area. The Proposed Action may affect, but is not likely to adversely affect the West Indian manatee.

Rodman Range Study Area. The Proposed Action may affect, but is not likely to adversely affect the Florida scrub-jay, wood stork, and eastern indigo snake.

Lake George Range Study Area. The Proposed Action may affect, but is not likely to adversely affect the Florida scrub-jay, red-cockaded woodpecker, wood stork, and West Indian manatee.

We look forward to your timely review of the attached consultation package, and request your concurrence that the proposed action may affect, but is not likely to adversely affect listed species under your jurisdiction. My staff point of contact for this matter is Ms. Deanna Rees, who can be reached at (757) 322-4940 or via email at deanna.rees@navy.mil.

Sincerely,

R. D. CURFMAN
Environmental Business Line Manager

Attachment 1: Endangered Species Act Section 7 Consultation Package for Species Under U.S. Fish and Wildlife Service Jurisdiction at Three East Coast Range Complexes, May 2008 (Bound document with CD in PDF format)

5090
EV53DR:lfm
May 12, 2008

Copy to (w/Attachment 1):
Chief, Division of Endangered Species
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9589
Commander, NAS Jacksonville
Commander, USFF (Dave Noble)
Commander, NAVFAC Southeast (Barbara Howe)
Commander, NAVFAC Southeast (Bernice Snyder)
CNO N45 (Kelly Brock)
CNO N45 (Elizabeth Phelps)

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DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, DC 20350-2000

IN REPLY REFER TO

5090
Ser N456P/8U158174
5 June 2008

Mr. P. Michael Payne, Division Chief
Permits, Conservation and Education Division
Office of Protected Resources
National Oceanic and Atmospheric Administration
National Marine Fisheries Service (NMFS)
B-SSMC3 Room 13822
1315 East-West Highway
Silver Spring, MD 20910-3282

Dear Mr. Payne,

In accordance with the Marine Mammal Protection Act, as amended and 50 CFR Part 216.106, the U.S. Navy requests a Letter of Authorization (LOA) for the incidental take of marine mammals associated with Atlantic Fleet training in the established Navy Cherry Point Range Complex.

The Commander, U.S. Fleet Forces (USFF) is proposing to support and conduct current and emerging training and research, development, test, and evaluation (RDT&E) operations in the Navy Cherry Point Range Complex. In addition, Navy Cherry Point Range Complex capabilities will be upgraded or modernized to enhance and sustain Navy and Marine Corps training and testing. The proposed action will involve explosive operations. There will be no sonar use. All sonar activities are being covered in the AFAST EIS/OEIS and their associated permits. Navy and Marine Corps explosive detonations conducted during mine warfare and surface warfare operations may expose certain marine mammals to underwater sound. Enclosure (1) focuses on the specific information required by the National Marine Fisheries Service for consideration of an incidental take request.

We appreciate your continued support in helping the Navy to meet its environmental responsibilities. My staff point of contact for this action is Ms. Linda S. Petitpas at (703) 604-1233, or e-mail linda.petitpas@navy.mil. Commander, U.S. Fleet Forces point of

contact for this matter is Bryan Murphy at (757) 836-5892 or email bryan.murphy@navy.mil.

Sincerely,

RONALD E. TICKLE
Head, Operational Environmental
Readiness and Planning Branch
Environmental Readiness Division
(OPNAV N45)

Enclosure:

(1) Request for Letter of Authorization for the Incidental Harassment of Marine Mammals Resulting from Navy Training Operations Conducted within the Navy Cherry Point Range Complex (June 2008) delivered via FedEx under separate cover on 5 June 08.

Copy to (w/o enclosure):
DASN (E)
OPNAV N43
CNIC (N45)
NAVFACLANT (EV2)
COMNAVREG MidLant
COMNAVREG SE

DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, DC 20350-2000

IN REPLY REFER TO

5090
Ser N456K/8U158287
15 September 2008

Ms. Angela Somma
Division Chief Endangered Species Division
Office of Protected Resources
National Oceanic and Atmospheric Administration
National Marine Fisheries Service (NMFS)
B-SSMC3 Room 13821
1315 East-West Highway
Silver Springs, MD 20910-3282

Dear Ms. Somma:

On January 4, 2008, the Navy submitted a Biological Evaluation (BE) in support of three range complex Environmental Impact Statements; Virginia Capes (VACAPES), Cherry Point, and Charleston/Jacksonville (CHASN/JAX). The Navy has continued to refine its analysis since this submittal, including some changes to the preferred alternative. Navy previously provided NMFS with an email summarizing these changes, which resulted in a reduction of potential exposures. Those changes are summarized below:

VACAPES:

- Significant reduction of live at-sea BOMBEX to 5 events total (4 Mk-83 bombs per event = 20 per year), new location in Air-Kilo as shown on map. Elimination of live at sea-BOMBEX in 3B1, 3B2, 3B3 and 3B4. Also, these events were remodeled to 177dB to account for multiple explosions.
- Addition of 20 Maverick missiles per year (NEW 100#)

Cherry Point

- Elimination of live at-sea BOMBEX completely
- Addition of 8 TOW missiles per year (NEW 15.3 #)
- Addition of 6 Hellfire missiles per year (NEW 8#)
- Addition of 8 HARM missiles per year (NEW 48#)

CHASN/JAX:

- Elimination of live at-sea BOMBEX completely
- FIREX with IMPASS restricted to BB and CC for spring and summer. No live FIREX with IMPASS during NARW calving season.

To assist in your efforts to review these changes, we have prepared a replacement BE for the January 4, 2008 submittal. This version is a more streamlined version which considers the changes in the proposed action reflected above as well as considering the effects to the species across the three range complexes due to their close proximity. Navy requests for NMFS to utilize this updated information when preparing their biological opinion.

My staff point of contact for this matter is Elizabeth Phelps who can be reached at 703-604-5420 or via email at Elizabeth.phelps@navy.mil.; Commander, U.S. Fleet Force's point of contact for this matter is Hank Eacho, who can be reached at 757-836-7257 or via email at harrison.eacho@navy.mil.

Sincerely,

Ronald E. Tickle
Head, Operational Environmental
Readiness and Planning Branch
Environmental Readiness Division
(OPNAV N45)

Enclosure:
(1) Biological Evaluation for Three East Coast Range Complexes.

Copy to (w/Enclosure 1):

Mr. David Bernhart
Assistant Regional Administrator for Protected Resources
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Regional Office
263 13th Avenue South
St. Petersburg, FL 33701

Ms. Mary Colligan
Assistant Regional Administrator for Protected Resources
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Regional Office
One Blackburn Dr.
Gloucester, MA 01930

Copy to (w/o enclosures):
DASN (E)
OPNAV N43
FFC N4/7
CNRSE (N45)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1875 Century Boulevard
Atlanta, Georgia 30345

In Reply Refer To:
FWS/R4/ES

OCT 7 2008

Mr. R. D. Curfman
Environmental Business Line Manager
Naval Facilities Engineering Command
6506 Hampton Boulevard
Norfolk, Virginia 23508-1278

Dear Mr. Curfman:

On May 12, 2008, we received your consultation request for increased use and enhanced capabilities at three East Coast range complexes. Your consultation package addressed the effects of your preferred action alternative on: Bermuda petrel (*Pterodroma cahow*), Florida scrub-jay (*Aphelocoma coerulescens*), red-cockaded woodpecker (*Picoides borealis*), roseate tern (*Sterna dougallii*), wood stork (*Mycteria americana*), West Indian manatee (*Trichechus manatus*) (including designated critical habitat), American alligator (*Alligator mississippiensis*), eastern indigo snake (*Drymarchoncorais couperi*), sand skink (*Neoseps reynoldsi*), pondberry (*Lindera melissifolia*), clasping warea (*Warea amplexifolia*), Lewton's polygala (*Polygala lewtonii*), and scrub buckwheat (*Eriogonum longifolium var. gnaphalifolium*). In your original consultation package, the Navy concluded that the proposed use and enhancement of the range complexes would have no effect or would not be likely to adversely affect all of the federally-listed species and potentially affected critical habitats considered.

In response to your consultation request, the Fish and Wildlife Service (Service) coordinated your consultation package with all of our affected Field Offices in the Southeast and Northeast Regions. At that time, the Service was unable to concur with your determination and requested clarification of the proposed program or suggested conservation measures, which if incorporated into your proposed action, would ensure that effects of the proposed action would not adversely affect any federally-listed species. On July 7, 2008, the Navy responded with clarification of the proposed action and included conservation measures for the manatee, which would be included in the action to reduce the likelihood for adverse effects. Although the Navy's original consultation package did not specifically address the piping plover *(Charadrius melodus)*, in response to concerns expressed by the Service, the Navy also proposed protective measures to ensure that piping plovers were not affected by the proposed action. Following the Navy's response, the Service had one remaining concern, however, about the Navy's ability to detect and conserve manatees at the Lake George Range.

On September 25, 2008, the Navy contacted our Southeast Region to discuss the results of a site visit with Mr. John Milio of the Service, to the Navy's Range Operations Center in Pinecastle, Florida. As a result of the discussion and site visit, the Service was able to concur that adverse effects to the Florida manatee are highly unlikely.

Our response is based on our review of your consultation package received on May 12, 2008, the clarifications and conservation measures provided by the Navy on July 7, 2008 (copy attached), and information given to the Service during our on-site visit to the Range Operations Center in Pinecastle, Florida, in August 2008. Our response represents both the Northeast and Southeast Regions, and is the result of review by all Service Field Offices within the area affected by your proposed action. We concur that the proposed action (preferred alternative) for increased operations and enhanced capabilities in three East Coast range complexes will have no effect on, or is not likely to adversely affect the federally-listed species or designated critical habitat as determined in your consultation package of May 12, 2008. We greatly appreciate your willingness to clarify the proposed action and include conservation measures for the protection of federally-listed species.

Please be reminded that it may be necessary for you to contact the Service for reconsideration of the effects of this proposed action if:

(1) New information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not considered in your current determination;

(2) The action is later modified in a manner that causes an effect to the listed species or critical habitat not considered in this informal consultation; or

(3) A new species is listed or critical habitat designated that may be affected by this action.

Please address any questions concerning this response to Ken Graham at 404/679-7358.

Sincerely yours,

Franklin J, Arnold III
Acting Assistant Regional Director

Attachment

Section 7 Consultation for three East Coast Range Complexes
7 July 2008

	FWS Request	Navy Response
1.	Aerial manatee watch immediately prior to NEPM sortie and within flight path. (Navy can combine the manatee watch with its pre-sortie aerial safety survey of watercraft that may be within the target area or flight path of the aircraft). Justification: Lake George is a relatively shallow waterbody, manatees may occur in other areas of the lake besides its shoreline more often than in other, deeper waterbodies. There are no guarantees that the NEPM will strike the middle of the target at each sortie. Manatees may be attracted to splash.	Prior to releasing NEPM, P-3 aircraft would do a pass at 300 ft, ~200 knots as a clearing run looking for boats, fishermen, and manatees. To enhance the ability of the P-3 aircrew to spot a manatee near the target area, the aircrew would use the Electro Optic/Infra Red sensors which would enable the aircrew to detect surfacing manatees. Bombs are not dropped in close proximity of space or time. In a sortie, the four NEPM bombs are dropped one per target (4 total), seconds apart and sorties occur hours/days apart. If a manatee were attracted to the splash it would not arrive at the drop point until after all the NEPM is delivered for that sortie.
2.	The survey aircraft will monitor the site throughout the planned sortie and for five minutes following the last sortie to observe any manatee that may have been injured by the exercise.	The tower and range cameras will observe range/impact areas for 5 minutes following the sortie (after the last NEPM is dropped) to observe if any manatee was injured by the exercise.
3.	Survey shall consist of a pilot and aerial observer who has experience in aerial manatee observation	The pilot and at least one observer on board are trained to look for marine mammals and have completed the US Navy Marine Species Awareness Training.
4.	Rotary-winged aircraft is preferable to a fixed-winged aircraft in terms of maneuverability	Sorry, this is not practicable.
5.	Navy provide a statement in its consultation package indicating that it will adhere to the best management practices regarding manatees while within the NSM basin and channel, in accordance with that installation's 2007 INRMP	The Navy concurs that it will adhere to the best management practices regarding manatees while within the NSM basin and channel, in accordance with that installation's 2007 INRMP.

6.	Navy add the following language to part 7 of section 6.3.2 "Operating Procedures and Collision Avoidance", of its consultation package. "While transiting estuarine waters associated with the St. Johns River, vessels will comply with all Federal, State, and local manatee protection speed zones".	Dependent upon current military operations and security threat level, the Navy concurs that during routine transit in estuarine waters associated with the St. Johns River, vessels will comply with all Federal, State, and local manatee protection speed zones as long as it is operationally safe to do so.
7.	If any manatees are observed within the aircraft flight path, or 500 feet on either side of the flight path, the sortie will not commence until the manatee moves out of this area under its own volition.	The Navy concurs.
8.	In case of any harassment, injury, or death involving the manatee from the action, the Navy will immediately halt all remaining sorties and report the incident, including dead or injured animals, to the Florida Fish and Wildlife Conservation Commission, Law Enforcement Division, at 1-888-404-3922. The Navy shall also report the incident to the U.S. Fish and Wildlife Service, Jacksonville Ecological Field Office, at 904-731-3336.	The Navy concurs.
9.	(For piping plovers) In other consultations, we have recommended both horizontal and vertical buffers of up to 1,000 meters or more depending on the activities proposed to avoid and minimize impacts to plovers. However, we don't have a standard buffer distance, and I don't know what buffer distances would be appropriate for the activities proposed at this time. Figure 2.2.3 of Appendix B of the document provided indicates that training may occur close to the shore in that region, though I understand that it won't occur directly over the beach due to water depth requirements. In addition, the configuration of training areas identified in Figure 2.2-4 creates a possibility that helicopters will travel at low altitudes near beaches en route to training areas. FWS would like additional information about the proximity of proposed helicopter flights to the shore of the Chesapeake.	Helicopters will not fly within 1 nautical mile (NM) of the beach.

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND, ATLANTIC
6506 HAMPTON BLVD
NORFOLK, VA 23508-1278

IN REPLY REFER TO:
5090
EV22SMA: paf
13 March 2009

Mr. Peter Sandbeck
Administrator, State Historic Preservation Office
North Carolina Division of Archives and History
507 North Blount Street
Raleigh, North Carolina 27604-1119

Subject: SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT (NHPA), DETERMINATION OF "NO HISTORIC PROPERTIES AFFECTED"FOR THE NAVY CHERRY POINT RANGE COMPLEX TRAINING OPERATIONS

Dear Dr. Sandbeck:

The Navy is preparing a Final Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) to assess the potential environmental impacts over a 10-year planning horizon associated with Navy Atlantic Fleet training, research, development, testing, and evaluation activities, and associated range capabilities enhancements (including infrastructure improvements) in the Navy Cherry Point Range Complex.

The Navy Cherry Point Study Area includes the airspace, seaspace, and undersea space of the Navy Cherry Point Range Complex, including the area from the mean high tide line, up to and extending seaward from the 3 nm western boundary of the OPAREA. Onslow Beach, however, was excluded from the 2009 technical memorandum on underwater cultural resources because MCB Camp Lejeune has already analyzed that geographic area for underwater cultural resources.

For your review, the following attachments are enclosed: Chapter 2 of the EIS/OEIS "Description of Proposed Action and Alternatives" and Chapter 3, Section 3.12 "Cultural Resources." Chapter 2 provides a description of the proposed training operations and their associated locations. Section 3.12 provides an assessment of the impacts to cultural resources as a result of the proposed training operations in the Navy Cherry Point Range Complex.

The EIS/OEIS identifies two areas within the Navy Cherry Point Range Complex where proposed training operations have the potential to impact submerged cultural resources: Underwater Detonation (UNDET), and Mine Instrument Warfare (MIW). Review of available databases identified two known wreck sites (*Suloide* and *W.E. Hutton*), one obstruction and two unknown targets within the UNDET area. The UNDET area is outside state jurisdictional waters and both documented wrecks in the UNDET area fall well outside the 3-mile limit.

For the MIW Training Area, there are four reported, but unverified, wreck sites (*Nutfield, Pulaski, Seaman, and Ellis*). There is no locational data on the four reported, but unverified,

wreck sites. Ten unknown targets have also been recorded in the MIW area, near the New River Inlet (although there may be overlap between the various databases.) Two of the ten unknown targets plot inside the 3 nm line. For the MIW Training Area, one NOAA NavAid (Fig. 8) and two targets from the Global Maritime Wrecks Database (GMWD) (Fig. 9) fall within the 3-mile limit. Although it does appear that the one NOAA NavAid target and one of the GMWD targets (within the 3-mile limit) are one in the same.

Application of the predictive model indicates that both training areas reviewed have a high potential to contain submerged cultural resources. Of the two areas, the UNDET training area is considered a slightly lower probability area to contain submerged cultural resources. One copy of the 2009 technical memorandum describing the results of the literature search and predictive model is enclosed for your review.

As discussed in the draft EIS/OEIS received by the NC Clearinghouse on 16 September 2008, the DoN approach for the protection of submerged cultural resources is avoidance. For UNDET and MIW exercises, side scan sonar and EOD divers determine that there are no shipwrecks where mines will be placed and which would foul the mooring lines. These resources may therefore be safely avoided and thus, preserved in place. This approach will be continued for all future training activities within these potential impact areas in the Cherry Point Range Complex. In addition, the exact locations of the submerged cultural resources will be safeguarded by the DoN as they are considered sensitive information and specifically excluded from public dissemination under Section 304 of the NHPA.

Based on the results of the enclosed technical memorandum, the EIS/OEIS, and the DoN approach to avoid submerged cultural resources, the Navy has made the determination of no historic properties affected by the proposed operation of training activities within the jurisdictional waters of North Carolina. We request that within 30 days you provide your views and comments on our finding of no historic properties affected. If you have any questions, please contact Susan Lang at (757) 322-8498 or Bruce Larson at (757) 322-4885.

Sincerely,

R. Dan Curfman

R.D CURFMAN
Director, Environmental Business Line
By direction of the Commander

Attachments:
(A) Chapter 2 - Description of Proposed Action and Alternatives
(B) Chapter 3, Section 3.12 – Cultural Resources
(C) 2009 Technical Memorandum

Copy to: See page 3

5090
EV22SMA: paf
March 13, 2009

Copy to (w/o attachments):
COMUSFLTFORCOM (N77)
NAVFAC Midlant (MC NC IPT) Attn K.STEVENS
NAVFAC Southeast (REC N40) Bernice Snyder

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
6669 Short Lane
Gloucester, VA 23061

March 19, 2009

Mr. R. D. Curfman
Environmental Business Line Manager
Naval Facilities Engineering Command
6506 Hampton Boulevard
Norfolk, Virginia 23508-1278

Re: Navy conservation measures for
Three East Coast Ranges,
Northampton, County, Virginia

Dear Mr. Curfman:

On February 10, 2009, the U.S. Fish and Wildlife Service (Service) received your request for concurrence with a determination pursuant to the Endangered Species Act of 1973, as amended (87 Stat. 884; 16 U.S.C. 1531 et seq.) made on a modification to protective measures proposed in the Final Environmental Impact Statement on the Navy's Three East Coast Ranges. In our October 7, 2008 letter, the Service provided concurrence that the proposed action would either not affect or would be not likely to adversely affect the Federally listed species identified. In an e-mail dated February 10, 2009 from Ms. Deanna Rees, the Navy stated that the previously proposed conservation measure of avoiding potential habitat of the Federally listed threatened piping plover (*Charadrius melodus*) by one nautical mile during helicopter operation was impracticable under some circumstances. In that e-mail and a subsequent e-mail dated February 26, 2009, the Navy clarified the revised conservation measure, which specified that Navy helicopters transiting from Norfolk Naval Station to off-shore training areas shall avoid overflying the barrier island at the southern tip of the Eastern Shore by at least 3,000 feet vertically and horizontally, and helicopters involved in mine training would avoid plover habitat by one nautical mile.

We have coordinated this response between and on behalf of the Northeast and Southeast Regions of the Service. After reviewing the proposed modification, the Service concurs that the project, incorporating the modified conservation measure, is not likely to adversely affect the piping plover or other listed species. All other aspects of the proposed project and determinations about project effects remain unchanged from those identified in our October 7, 2008 letter.

Please be reminded that it may be necessary for you to contact the Service for reconsideration of the effects of this proposed action if:

(1) New information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not considered in your current determination;

(2) The action is later modified in a manner that causes an effect to the listed species or critical habitat not considered in this informal consultation; or

(3) A new species is listed or critical habitat designated that may be affected by this action.

If you have any questions or need any additional information about this letter or the Service's previous letter, please contact Tylan Dean at 804-693-6694, extension 104 (tylan_dean@fws.gov) or Ken Graham at 404-679-7358 (kenneth_graham@fws.gov).

Sincerely,

Cynthia A Schulz

Cindy Schulz
Supervisor
Virginia Field Office

cc:
Deanna Reese, Navy
John Milio, Jacksonville, FL FO
Melissa Bimbi, Charleston, SC FO
John Hammond, Raleigh, NC FO
Sandy Tucker, Athens, GA FO
Tylan Dean, Gloucester, VA FO

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APPENDIX D

CURRENT TRAINING OPERATIONS DESCRIPTION

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TABLE OF CONTENTS

Page

MINE WARFARE D-2
MINE COUNTERMEASURES D-2
MINE NEUTRALIZATION D-5

SURFACE WARFARE D-7
BOMBING EXERCISE (AIR-TO-SURFACE) (BOMBEX [A-S]) D-7
MISSILE EXERCISE (AIR-TO-SURFACE) (MISSILEX [A-S]) D-9
GUNNERY EXERCISE (AIR-TO-SURFACE) (GUNEX [A-S]) D-10
GUNNERY EXERCISE (SURFACE-TO-SURFACE)-SHIP (GUNEX [S-S] – SHIP) D-12
GUNNERY EXERCISE (SURFACE-TO-SURFACE) (USMC SMALL ARMS TRAINING) D-14
VISIT BOARD SEARCH & SEIZURE / MILITARY INTERDICTION OPERATIONS D-15

ANTI-SUBMARINE WARFARE D-18

AIR WARFARE OPERATIONS D-19
AIR COMBAT MANEUVER (ACM) D-19
GUNNERY EXERCISE (AIR-TO-AIR) (GUNEX [A-A]) D-21
MISSILE EXERCISE (AIR-TO-AIR) (MISSILEX [A-A]) D-22
MISSILE EXERICSE (SURFACE-TO-AIR) (MISSILEX [S-A]) D-23
AIR INTERCEPT CONTROL (AIC) D-24

STRIKE WARFARE D-25
HIGH-SPEED ANTI-RADIATION MISSILE EXERCISE (HARMEX) D-25

ELECTRONIC COMBAT D-26
ELECTRONIC COMBAT OPERATIONS (EC OPS) D-26
CHAFF EXERCISE (CHAFFEX) D-29
FLARE EXERCISE (FLAREX) D-31

AMPHIBIOUS WARFARE D-32
FIRING EXERCISE (FIREX) (LAND) D-33
FIRING EXERCISE (FIREX) WITH INTEGRATED MARITIME PORTABLE ACOUSTIC SCORING AND SIMULATION (IMPASS) SYSTEM D-35
AMPHIBIOUS ASSAULT D-37
AMPHIBIOUS RAID D-39

RESEARCH, DEVELOPMENT, TESTING AND EVALUATION (RDT&E) D-41

MAJOR RANGE EVENTS D-45
CSG COMPTUEX D-46
ESG COMPTUEX D-46
JOINT TASK FORCE EXERCISE (JTFEX) D-46

MISCELLANEOUS RANGE EVENTS D-47
SINKEX D-48

TABLE OF CONTENTS (Continued)

LIST OF TABLES

No. **Title** **Page**

TABLE D-1. BASELINE RDT&E OPERATIONS D-42

LIST OF FIGURES

No. **Title** **Page**

D-1 Locations of Previous SINKEXs (NMFS 2006) D-49

APPENDIX D
CURRENT TRAINING OPERATIONS WITHIN THE NAVY CHERRY POINT RANGE COMPLEX

This Appendix D describes the current training and testing events conducted in the Navy Cherry Point (Navy CP) Range Complex in detail. The training event descriptions include both unit level and major range events. A data strip table is provided for each individual training event, as follows:

- Event or operation title
- Participating platforms
- System or ordnance utilized
- Number of ***baseline*** annual events conducted in the complex

Where new platforms are evaluated as part of this EIS/OEIS, the events performed by such platforms are also described in this Appendix D.

Ordnance used during training is defined in this Appendix as either:

- High Explosive (HE) – explosive ordnance;
- Non-explosive, practice munition (NEPM) – Non-explosive practice munitions may contain spotting charges or signal cartridges for impact locating purposes; or
- Wholly inert – no explosive, propellant, or pyrotechnic component

MINE WARFARE

MINE COUNTERMEASURES

Acoustic, mechanical, electronic, and optical methods of mine hunting and minesweeping exercises are included in this category.

Operation	Platform	System/ Ordnance	Event Duration	Number of Events
Mine Countermeasures[1]	MH-53E	MK-103	1.5 hrs.	18 sorties
		MK-105	1.5 hrs.	18 sorties
		AQS-24A	1.5 hrs.	76 sorties
	MH-60S	OASIS	1.5 hrs.	None
		AQS-20A	1.5 hrs.	108 sorties
		ALMDS	1.5 hrs.	None

Airborne Mine Countermeasures (AMCM)

Helicopters tow surface sleds and submerged equipment through simulated threat minefields with the goal of clearing a safe channel through the minefield for the passage of friendly ships.

AMCM Mine Hunting Systems

- AN/AQS-20 Mine Hunting System. The AQS-20 is an MH-53 or MH-60S helicopter towed body that contains an active high resolution, side-looking, multi-beam sonar system used for mine hunting of deeper mine threats along the ocean bottom. A small diameter electromechanical cable is used to tow the rapidly deployable system that provides real-time sonar images to operators in the helicopter. Operators may then locate, classify, mark, and record mine-like objects and underwater terrain features and pass this information to EOD personnel or other personnel who can neutralize the mine.
- AN/AES-1 Airborne Laser Mine Detection System (ALMDS). ALMDS is an organic mine detection system mounted on and designed for integration into the MH-60S helicopter. The system uses Light Detection and Ranging (LIDAR) blue-green laser technology to detect, classify, and localize floating and near-surface moored mines in shallow water.

AMCM Platforms

- MH-53E Helicopter
- MH-60S Helicopter

AMCM Sweeping Systems

- MK-103 Mechanical Minesweeping System. This system is streamed, towed, and recovered by an MH-53 helicopter. The mechanical minesweeping gear is designed to counter moored mines. The gear consists of a tow wire, sweep wires (with explosive cutters activated by a charge similar to a shotgun shell), floats, a depressor, otters, and float pendants.
- MK-104 Acoustic Minesweeping System. This system is streamed, towed, and recovered by an MH-53 helicopter. The towed acoustic sweep system consists of a cavitating disk within a venturi tube, driven by two self-rotating, cavitating disks. The MK-104 is towed directly behind the helicopter or is attached to the MK-105 sled to provide a combination magnetic/acoustic minesweeping system. The total system weight is 180 pounds; the towed body dimensions are 26 inches wide, 35 high, and 49 long.
- MK-105 Magnetic Minesweeping System. This system is towed by an MH-53 helicopter and is a minesweeping hydrofoil sled that becomes foil-borne at about 13 knots (knots). The sled is

1 Mine Warfare training would be for major exercises only. See Section 2.2.5 for a detailed description.

typically towed at 20 to 25 knots, about 450 feet behind the helicopter. The sled carries a gas turbine generator to power its magnetic sweep gear, which consists of twin magnetic tails. These tails are cables that operate as conventional open-electrode magnetic sweeps about 600 feet long. Launch and recovery of the sled can be from a variety of surface ships (LHD, LHA, LPD, and CV), as well as from shore facilities and beaches. A combined magnetic and acoustic influence sweep may be achieved by adding the MK-104 acoustic system to the sweep array thereby creating the MK-106 system.

- MK-106 Magnetic/Acoustic Minesweeping System. The MK-106 is a helicopter-towed acoustic/magnetic sweep, consisting of the MK-105 sled and the MK-104 acoustic device attached to one of the magnetic tails.
- AN/ALQ-220 Organic Airborne Surface Influence Sweep (OASIS). OASIS is a helicopter deployed, towed-body, 10 feet long with a 20 inch diameter, that is self-contained, may be towed at speeds up to 40 knots in shallow water, and provides both magnetic and acoustic influence sweeping. It can be towed as a single unit or in tandem with other sweeping systems, and allows for emulation of magnetic and acoustic signatures of the ships and platforms that would transit through an assault area or those that would conduct generic minesweeping operations.

AMCM Training Minefields

The use of training minefields, constructed of moored or bottom mines, and of instrumented mines that can record effective minesweeping, enhances feedback to equipment operators and overall quality of training attained.

MH-53E Helicopter with Minesweeping and Mine Hunting Gear

The helicopter may be configured with one or more of the following systems designed to sweep or locate mines for later neutralization:

- MK-103 Mechanical Minesweeping System
- MK-104 Acoustic Minesweeping System
- MK-105 Magnetic Minesweeping System
- MK-106 Magnetic/Acoustic Minesweeping System
- AN/AQS-20 Mine Hunting System

Basic Phase (Unit Level Training) Scenario

One helicopter configured for the mine countermeasures mission to be conducted flies from a shore location or a surface ship, such as an LHA, to the selected mine threat area.

The helicopter will fly within 50 to 75 feet of the water while towing the appropriate system for the tactical situation. Systems are towed on the surface or down to a depth of 150 feet or less for training and at speeds between 8 and 25 knots depending on the system being used.

The use of training minefields of moored or bottom mines enhances feedback to equipment operators and quality of training attained. The typical duration is 1.5 hours

Integrated and Sustainment Phase Training Scenarios

Procedures typically do not differ from the Basic Phase Scenario, but the operation is part of the larger major range event where the process will be coordinated with other events and controlled through a Strike Group Commander.

Training Considerations

The purpose of training is for helicopter crews to practice deployment, employment, and retrieval of the systems. All systems are recovered upon completion of training.

MH-60S Helicopter with Minesweeping and Mine Hunting Gear

The helicopter may be configured with one or more of the following systems:

- AN/AES-1 ALMDS
- AN/AQS-20 Mine Hunting System
- AN/ALQ-220 OASIS

Basic Phase (Unit Level Training) Scenario

One helicopter will fly from a shore location or surface ship, such as an LHA, LHD, or LCS, configured for the MCM mission to be conducted. The helicopter will fly within 50 to 75 feet of the water while using or towing the appropriate system for the tactical situation. The AQS-20 and OASIS systems are towed down to a depth of 150 feet or less for training and at speeds between 8 and 40 knots depending on the system. A typical training stream, tow, and recovery period lasts about 1.5 hours.

The use of training minefields enhances feedback to equipment operators and quality of training attained.

Training Considerations

The purpose of training is for helicopter crews to practice deployment, employment, and retrieval of the systems. All systems are recovered upon completion of training.

MINE NEUTRALIZATION

Most, but not all exercises considered in the mine neutralization category are those that employ explosives for neutralization of the mine itself.

Operation	Platform	System/ Ordnance	Event Duration	Number of Events
Mine Neutralization[2]	MH-60S	AMNS (Non-explosive Practice Munitions (NEPM)	1.5 hrs.	None
		RAMICS	1.5 hrs.	None
	Explosive Ordnance Disposal (EOD)	20 lb NEW charges	6-8 hrs.	20 events

Mine Neutralization-Helicopter (Mine Neutralization-Helo)

Helicopters use specialized weapons to destroy threat moored or bottom mines to create safe channels for friendly shipping.

MH-60S with Airborne Mine Neutralization System (AMNS)

Basic Phase (Unit Level Training) Scenario
The AMNS (AN/ASQ-235) is deployed from an MH-60S helicopter in the area where threat mines have been previously located by other sources. AMNS is lowered into the water by the helicopter where the expendable, self-propelled neutralizer can reacquire the previously located mine with its sonar and video systems. These systems relay their data to the operator in the helicopter through a fiber-optic cable so the operator can then properly position the neutralizer onto the most vulnerable area of the mine. The shaped explosive charge is then detonated to neutralize the mine. The typical duration is 1.5 hours.

For training purposes, inert, recoverable neutralizers are being developed. A target mine shape is required and a range support boat is required to recover the inert neutralizer.

Training Considerations
In most cases, these exercises are not conducted separately from the mine hunting phase of the operation.

MH-60S with Rapid Airborne Mine Clearance System (RAMICS) (AN/AWS-2)

RAMICS uses a 30 mm Bushmaster automatic cannon that fires super cavitating non-explosive, practice munition projectiles.

2 Unit Level Training (ULT) events performed in conjunction with other MIW training during major exercises; up to 10 expendable moored and bottom mine shapes/exercise; training would be segregated from other MIW training in UNDET area.

Basic Phase (Unit Level Training) Scenario
The helicopter flies to the area where the threat surface or near surface moored mines or shallow bottom mines have been previously located and uses its LIDAR system to locate and target the mines. The helicopter must position itself at a safe standoff distance from the threat mine that will be exploded, yet within its targeting and ballistic accuracy envelope. Typically, a 1,500-foot horizontal distance and a 45 to 60 degree field of fire from the helicopter to the mine can be used. LIDAR provides aiming coordinates to the RAMICS, which fires a 30 to 40-shot burst of special 30 mm super cavitating projectiles at the mine and causes immediate and positive mine neutralization through a low-order deflagration. The typical duration is 1.5 hours.

For training, the 30 mm Bushmaster cannon will be fired at simulated threat mine shapes located within a training range facility.

Integrated and Sustainment Phase Training Scenarios
Not typically conducted in these phases.

Training Considerations
In most cases, these exercises are not conducted separately from the mine hunting phase of the operation.

Mine Neutralization-Explosive Ordnance Disposal (EOD)

Explosive Ordnance Disposal personnel use special equipment to evaluate threat mines, then small explosive charges to destroy the mine to create a safe channel for friendly shipping.

EOD Personnel with Mine Neutralization Charges

Basic Phase (Unit Level Training) Scenario
EOD personnel detect, identify, evaluate, and neutralize mines. The EOD mission is typically to locate and neutralize mines after they are initially located by another source, such as an MCM or MHC class ship or an MH-53 or MH-60 helicopter.

Once the mine shapes are located, EOD divers are deployed from a ship via Combat Rubber Raiding Craft (CRRC) to further evaluate and "neutralize" the mine. The neutralization of mines in the water is normally done with an explosive device and may involve detonation of one or two explosive charges of 20 pounds of TNT equivalent. The initiation of the charge is positively controlled by EOD personnel.

Mine training shapes or other exercise support equipment and a range area that will support the use of HE ordnance is required for a 6 - 8 hour window. These operations are normally conducted during daylight hours for safety reasons.

Training Considerations
In most cases, these exercises are not conducted separately from the mine hunting phase of the operation.

SURFACE WARFARE

BOMBING EXERCISE (AIR-TO-SURFACE) (BOMBEX [A-S])

Strike fighter and maritime patrol aircraft deliver bombs against surface maritime targets, day or night, with the goal of destroying or disabling enemy ships or boats.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
Bombing Exercise (BOMBEX) (Air-to-Surface)	F/A-18 (USN or USMC)	MK-82 or GBU-30/38 (500 lb High Explosive [HE] bombs)[3]	1 hr.	23 events (92 bombs)
		MK-83 or GBU-32 (1000 lb HE bombs)[4]	1 hr.	13 events (52 bombs)
		MK-84 (2000 lb HE bombs)	1 hr.	1 Sortie (1 bomb)
	F/A-18 (USN & USMC)	MK-82 or BDU-45 (NEPM)[5]	1 hr.	22 events (85 bombs)
	AV-8B (USMC)	MK-82 or BDU-45 (NEPM)[6]	1 hr.	10 events (80 bombs)
	F/A-18 (USN & USMC)	MK-83 (NEPM)	1 hr.	0 events
	F/A-18 (USN)	MK-76 (25 lb NEPM)[7]	1 hr.	13 events (129 bombs)
	F/A-18 (USMC)	MK-76 (NEPM)[8]	1 hr.	10 events (240 bombs)
	AV-8B (USMC)	MK-76 (NEPM)[9]	1 hr.	10 events (120 bombs)

F/A-18C/E/F or AV-8 with Unguided or Precision-guided Munitions

Unguided munitions: MK-76 and BDU-45 (inert training bombs); MK-80 series (inert or live); MK-20 Cluster Bomb (inert or live).
Precision-guided munitions: Laser-guided bombs (LGB) (inert or live); Laser-guided Training Rounds (LGTR) (inert); Joint Direct Attack Munition (JDAM) (inert or live).

Basic Phase (Unit Level Training) Scenario
A flight of two aircraft will approach the target from an altitude of between 15,000 ft to less than 3,000 ft and, when on an established range, will adhere to designated ingress and egress routes. Typical bomb release altitude is below 3,000 ft and within a range of 1000 yards for unguided munitions, and above 15,000 ft and in excess of 10 nm for precision-guided munitions. Exercises at night will normally be done with captive carry (no drop) weapons because of safety considerations. Laser designators from

3 Assume 4 bombs per event = 2 F/A-18s dropping 2 MK-82 or GBU-30/38 (Joint Direct Attack Munitions [JDAM]) each. Target is MK-58 marine marker (smoke float).
4 Assume 4 bombs per event = 2 F/A-18s dropping 2 MK-83 or GBU-32 each; target is MK-58.
5 F/A-18 (USN/USMC), 4 bombs per event = 2 aircraft dropping 2 bombs each; all use MK-58 as target.
6 F/A-18 (USMC), 8 bombs per event = 2 aircraft dropping 4 bombs each; all use MK-58 as target.
7 F/A-18 (USN), 10 bombs per event = 2 aircraft dropping 5 bombs each; MK-58 as target.
8 F/A-18 (USMC), 24 bombs per event = 2 aircraft dropping 12 bombs each; MK-58 as target.
9 AV-8 (USMC), 12 bombs per event = 2 aircraft dropping 6 bombs each; MK-58 as target.

either own aircraft, a support aircraft, or ground support personnel are used to illuminate certified targets for use with lasers when using laser guided weapons. The typical sortie duration is 1 hour.

Integrated and Sustainment Phase Training Scenarios
Typically involves an at-sea simulated strike scenario with a flight of four or more aircraft, with or without a designated opposition force (OPFOR).

Training Considerations
Strike fighter pilots can fulfill this training requirement against either a land or water target. It rarely involves dropping live ordnance in the open ocean.
Unguided munitions: Usually conducted at land ranges with inert or live ordnance, or water ranges with grounded ship hulks available for targets. MK-76 and BDU-48 inert bombs are the most common weapon allocation.
Precision-guided munitions: The very large safety footprints of these bombs limit their employment to impact areas on large land ranges, such as the Fallon Training Range Complex, or at-sea during a Sinking Exercise (SINKEX). Each squadron's training allowance is very small (only one or two per year), severely limiting the total fleet-wide annual expenditure of these weapons.

MISSILE EXERCISE (AIR-TO-SURFACE) (MISSILEX [A-S])

Fixed winged aircraft and helicopter crews launch missiles at surface maritime targets, day and night, with the goal of destroying or disabling enemy ships or boats.

Operation	Platform	System/ Ordnance	Event Duration	Number of Events
Missile Exercise (MISSILEX) (Air-to-Surface)	AH-1W (USMC)	AGM-114 Hellfire[10]	1 hr.	4 sorties (3 HE); (1 NEPM)
		TOW Missile(all HE)[11]	1 hr.	4 sorties (4 missiles)

Helicopters with Hellfire and TOW Missiles

Basic Phase (Unit Level Training) Scenario
One or two helicopters approach and acquire an at-sea surface target, which is then designated with a laser to guide the Hellfire missile to the target. The laser designator may be onboard the helicopter firing the missile, another helicopter, or another source. The helicopter launches a missile from an altitude of about 300 feet against a specially prepared target with an expendable target area on a non-expendable platform. The missile passes through the expendable target without damaging the platform and explodes very near the surface of the water. The platform fitted with the expendable target could be a stationary barge, a remote controlled speed boat, or a jet ski towing a trimaran. The typical sortie duration is 1 hour.

For the TOW missile, the pilot optically acquires the target, launches the missile and guides it to the target by placing the optics reticle (eyepiece with crosshairs) on the target. Commands to the missile are provided by wire attached from the missile to the helicopter.

Integrated and Sustainment Phase Training Scenarios
Typically do not differ from the Basic Phase Scenario.

Training Considerations
In the last several years, the Navy has had very few NEPM Hellfire missiles in its inventory, which has required the expenditure of HE Hellfire missiles during training exercises. As a result, training shots have been limited to minimum qualification vice proficiency.

10 Uses stationary or towed surface targets; 1 missile per sortie.
11 Uses stationary or towed surface targets; 1 missile per sortie.

GUNNERY EXERCISE (AIR-TO-SURFACE) (GUNEX [A-S])

Strike fighter aircraft and helicopter crews, including embarked NSW personnel use guns to attack surface maritime targets, day or night, with the goal of destroying or disabling enemy ships, boats, or floating or near-surface mines.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
Gunnery Exercise (GUNEX) (Air-to-Surface)	AH-1W (USMC)	20 mm cannon	1 hr.	24 sorties (7,200 rounds)
	UH-1W (USMC)	.50 cal machine gun	1 hr.	24 sorties (36,000 rounds)
		7.62 mm machine gun	1 hr.	24 sorties (36,000 rounds)
	F/A-18 (USMC)	20 mm cannon	1 hr.	6 sorties (2,000 rounds)
	AV-8B (USMC)	25 mm cannon	1 hr.	6 sorties (2,000 rounds)

Helicopters with Side Door-Mounted .50 cal, 7.62 mm, and 5.56 mm Machine Guns

Basic Phase (Unit Level Training) Scenario
A single helicopter typically carries several air crewmen needing gunnery training. The aircraft flies various gunnery patterns around the sea target at approximately 300 ft AGL. Initial qualifications require gunners to expend 400 rounds of .50 cal and/or 800 rounds of 7.62/5.56 mm ordnance in each exercise. The target is normally a non-instrumented floating object such as an expendable smoke float, steel drum, or cardboard box, but may be a remote controlled speed boat or jet-ski type target. Gunners will shoot special target areas or at towed targets when using a remote controlled target to avoid damaging them. The exercise lasts about 1 hour.

Integrated and Sustainment Phase Training Scenarios
Re-qualification requires each gunner to expend 200 .50 cal rounds and/or 400 7.62 mm rounds of ordnance.

Training Considerations
MH-60S helicopters have a mission to support NSW operations, so they will also train with embarked NSW personnel. NSW personnel use .50 cal and 7.62 mm during this exercise.

F/A-18C/E/F with Vulcan M61A1/A2 20 mm Cannon or AV-8B with 25 mm Cannon

Basic Phase (Unit Level Training) Scenario
A flight of two aircraft will begin its descent to the target from an altitude of about 3,000 ft while still several miles away. Within a distance of 4,000 ft from the target, each aircraft will fire a burst of about 30 rounds before reaching an altitude of 1,000 ft, then break off and reposition for another strafing run until each aircraft expends its exercise ordnance allowance of about 250 rounds.

Integrated and Sustainment Phase Training Scenarios
Typically do not differ from the Basic Phase Scenario.

Training Considerations

Strike fighter pilots can fulfill this training requirement against either land (most often) or water targets, such as grounded ship hulks at water ranges or at specially prepared floating ship hulks during the occasional Sinking Exercise (SINKEX). F/A-18s will only rarely strafe into the ocean.

GUNNERY EXERCISE (SURFACE-TO-SURFACE)-SHIP (GUNEX [S-S] – SHIP)

Ship gun crews engage surface targets at sea with their main battery 5-inch and 76 mm guns as well as smaller surface targets with 25 mm, .50 cal, or 7.62 mm machine guns with the goal of disabling or destroying the threat ship.

Operation	Platform	System/ Ordnance	Event Duration	Number of Events
GUNEX (Surface-to-Surface) (ship)	LHA, LHD, LSD, and LPD[12]	.50 cal, 9 mm, .45 cal, MK-19 and 40 mm TP machine gun	3 hrs.	16 events (38,400 rounds)
		25 mm machine gun	3 hrs.	16 events (25,600 rounds)
	CG and DDG[13]	5" guns (NEPM) [14]	3 hrs.	24 events (1,026 rounds)
	FFG[15]	76 mm (NEPM)[16]	3 hrs.	6 events (171 rounds)

CG and DDG with 5-inch and FFG with 76 mm Guns

There are three types of main battery shipboard guns currently in use: 5-inch/54 (CG and DDG), 5-inch/62 (DDG-81 and newer), and 76 mm (FFGs). Both 5-inch guns use the same types of 5-inch projectiles for training exercises. The difference between the 5-inch guns is the longer range of the 5-inch/62 because of the larger powder propulsion charge.

Basic Phase (Unit Level Training) Scenario

A slow (5 knots) or high (30 knots) speed simulated enemy ship or boat approaches the CG/DDG/FFG from about 10 nm, is detected by the ship's radar and determined to be hostile. The target is tracked by radar, and when it is within 5 - 9 nm, it is engaged by approximately 60 rounds of 5-inch or 76 mm, fired with an offset so as not to actually hit the targets over a duration of about 3 hours. Live or NEPM training rounds may be used. After impacting the water, the HE rounds are expected to detonate within 3 feet of the surface. Inert rounds and fragments from the HE rounds will sink to the bottom of the ocean.

The main battery guns have a requirement to attack high-speed, maneuvering, towed or remotely controlled surface targets such as the QST-35 Seaborne Powered Target (SEPTAR), High Speed Maneuverable Surface Target (HSMST), or a remote controlled Jet Ski.

Integrated and Sustainment Phase Training Scenarios

These two scenarios will be similar to each other and the Basic Phase Scenario, but will have more "friendly" ships (3 to 5) participating. Additional ships will increase the number of rounds fired proportionally.

[12] Amphibious Assault Ship (LHA, LHD; Amphibious Transport Dock (LPD); Dock Landing Ship (LSD); Targets are 55 gal drum, balloon (weather, Mylar or target), or FAST.
[13] Cruiser (CG); Guided Missile Destroyer (DDG)
[14] Targets are HSMST, MK-33 SEPTAR, trimaran or radar reflective surface balloon (Killer Tomato).
[15] Guided Missile Frigate (FFG)
[16] Targets are HSMT, MK-33 or Killer Tomato

LHA, LHD, LPD, and LSD with 25 mm, .50 cal, .45 cal, MK-19, 9mm, 40 mm TP or 7.62 mm Machine Guns

While main battery guns are designed for both offensive and defensive use against larger, ship-sized targets, these smaller caliber machine guns are designed to provide close range defense against patrol boats, smaller boats, swimmers, and floating mines.

Amphibious ships, such as LHA, LHD, LPD, and LSD use 25 mm machine guns as their principal gun to provide a defensive gunfire capability for the engagement of a variety of smaller surface targets. Most of these amphibious ships are also equipped with .50 cal or 7.62 mm machine guns.

Basic Phase (Unit Level Training) Scenario

Ships use machine guns to practice defensive marksmanship, typically against stationary floating targets. Targets are engaged after closing the target to within about 2,000 yards for 25 mm, 900 yards for .50 cal, and 400 yards for 7.62 mm; between 200 and 800 rounds are typically expended.

The target is typically a Floating At-Sea Target (a 10-foot diameter red balloon tethered by a sea anchor, also known as a "Killer Tomato"), a 50-gallon steel drum, or other available target, such as a cardboard box. Targets are expended during the exercise and are not recovered. The event is conducted over a period of about 3 hours.

Integrated and Sustainment Phase Training Scenarios

Typically do not differ from the Basic Phase Scenario.

GUNNERY EXERCISE (SURFACE-TO-SURFACE) (USMC SMALL ARMS TRAINING)

Marine Corps personnel use small arms and small unit tactics to defend unit positions or attack simulated enemy positions with the goal of defending the unit position or clearing an area of a threat.

Small arms training exercises are used to train personnel, beyond basic introductory skills, in the use of all small arms weapons for the purpose of ship self defense and security.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
GUNEX (Surface-to-Surface) (USMC small arms training)[17]	LHA, LHD, LSD, and LPD	9 mm/.45 cal pistol	1-2 hrs.	25 events (10,000 rounds)
		M-16, M-4, M-249 squad Automatic Weapon, M-240G machine gun, MK-19, .50 cal machine gun (5.56/7.62 mm/50 cal rounds), 40 mm TP	1-2 hrs.	25 events (10,000 rounds)
		M-40 sniper rifle (308 cal)	1-2 hrs.	3 events (30 rounds)

USMC personnel with Small Arms

Small arms training exercises may involve the use of various weapons including, but are not limited to: 9 mm/.45 cal pistols, 12-gauge shotguns, .50 cal, 7.62 mm, 5.56 mm rifles and machine guns, M-240G machine gun, MK-19, 40 mm TP, and 40 mm grenades.

Basic Phase (Unit Level Training) Scenario
A squad, or other size unit, of personnel uses small unit tactics and small arms to approach a simulated hostile target area manned by an opposing force. The opposing force in this case may be popup targets and other targets designed to improve the marksmanship of the individual squad members.

Training Considerations
Basic small arms marksmanship operations are strictly controlled and regulated by specific individual weapon qualification standards and typically occur on specific small arms ranges. While marksmanship exercises can occur on designated small arms ranges ashore, they are also scheduled on live fire or maneuver ranges ashore, MOUT areas ashore, or aboard surface ships at sea firing into the sea. The event typically lasts 1 - 2 hours.

17 Targets are paper Echo Silhouette or barrel on a pallet.

VISIT BOARD SEARCH & SEIZURE / MILITARY INTERDICTION OPERATIONS

During VBSS/MIO events, helicopters and/or surface ships intercept/disrupt potentially illegal activities in littoral areas, or on the high seas. Operations may include the delivery of boarding parties to suspect surface vessels to inspect and examine the vessel's papers or examine it for compliance with applicable resolutions or sanctions. Seizure of the vessel (that is confiscating or taking legal possession of the vessel and contraband (goods or people)) could result, if the vessel is found in violation of any applicable resolutions or sanctions.

Operation	Platform	System / Ordnance	Event Duration	Number of Events/Sorties
Visit Board Search & Seizure / Military Interdiction Operations (VBSS/MIO) – Ship[18]	Rigid Hull Inflatable Boat (RHIB) or smaller boat, and CG, DDG, FFG, LPD or LSD	N/A-no ordnance is used	2-3 hrs.	14 events
VBSS/MIO-Helicopter[19]	H-60 and CG, DDG, FFG, LPD, or LSD	N/A-no ordnance is used	1.5 hrs.	7 events (21 sorties)

VISIT BOARD SEARCH & SEIZURE / MILITARY INTERDICTION OPERATIONS (VBSS/MIO) – SHIP

CG, DDG, FFG, LPD, LSD with Shipboard or Naval Special Warfare (NSW) Boarding Teams with Small Arms (Non-Firing)

VBSS/MIO events are a subset of training events included in Maritime Security (MS) Operations. Maritime Security (MS) Operations may include, for example, Maritime Interception Operations (MIO), Expanded Maritime Interception Operations (EMIO), Special Operations Forces (SOF) support, anti-piracy operations, theater security cooperation operations, and Information Operations (IO). In response to rapidly changing world events, such as the rise of global terrorism and piracy, variations of a VBSS/MIO may be necessary to train our forces to the emergent requirement. Any variation of a VBSS/MIO considered will involve similar environmental stressors, similar environmental effects, and will employ similar mitigation measures.

Basic Phase (Unit Level Training) Scenario
Ships will typically be on patrol in a designated littoral, ocean, or restricted area to watch for vessels that may need to be inspected or seized. When a suspect vessel(s) is sighted, the ship will approach the suspect vessel(s) at a speed of 20 knots or more while preparing to launch its organic helicopter or small boat and/or using its radio or other hailing device to talk to the suspect vessel to get it to assume an assigned course and slow speed. A cooperative boarding will allow the armed boarding party to board and conduct the inspection. An uncooperative boarding is the more typical training scenario and may actually require a clandestine approach to the suspect vessel and use of force. An organic helicopter and small boat may be used to board the suspect vessel, but shipboard or NSW boarding teams with armed force may be required

18 This is a non-firing ULT event. Each ship must conduct one VBSS/MIO every six months. Target vessels are typically another strike group ship, Mobile Sea Range (MSR) vessel such as Prevail, or contracted support craft. To ensure realism, target vessels may be traveling at speed in access of 20 knots.
19 This is a non-firing ULT & major exercise events. Naval Special Warfare (NSW) personnel perform fast-rope onto target vessel from the first helicopter. A second helicopter flies close cover. A third helicopter flies surveillance.

to make the boarding. Small arms with inert blanks may be used. The entire exercise may last 2 to 3 hours.

Training Considerations

A range support vessel or other commercial style vessel can be used as the suspect vessel to be intercepted/disrupted/boarded and may be staffed with opposing forces to create a better training environment. To ensure realism, the target vessel/vessels may be traveling at speeds in access of 20 knts.

VISIT BOARD SEARCH & SEIZURE / MILITARY INTERDICTION OPERATIONS (VBSS/MIO) – HELICOPTER

SH-60B/F, HH-60H, MH-60R/S with Machine Guns and Shipboard or NSW Boarding Teams with Small Arms (Non-Firing)

Basic Phase (Unit Level Training) Scenario
Helicopters supply the transportation for the boarding party from a surface ship to the suspect vessel to be boarded, as described above, and provide added fire power from onboard 7.62 mm or .50 Cal machine guns (see GUNEX (A-S)) if required in an uncooperative mission. The helicopter will approach the suspect vessel, use an appropriate insertion/extraction method (see Insertion/Extraction - HELO) for the tactical situation to place the boarding party on the suspect vessel, and then standby in a hover or close proximity flight pattern to provide armed support as required. Despite the notional description provided herein, in the Navy CP Range Complex this is a non-firing event. The typical event duration is 1.5 hours.

Training Considerations
A range support vessel or other commercial style vessel can be used as the suspect vessel to be boarded and may be staffed with opposing forces to create a better training environment.

ANTI-SUBMARINE WARFARE

NOTE: All anti-submarine warfare descriptions are found in the Atlantic Fleet Active Sonar EIS/OEIS.

AIR WARFARE OPERATIONS

AIR COMBAT MANEUVER (ACM)

Strike fighter aircraft perform intricate flight maneuvers to achieve a gun or missile firing position from which an attack can be made on a threat aircraft with the goal of destroying the adversary aircraft.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
Air Combat Maneuvers (ACM)	F/A-18, AV-8B, F-15 and F-16 (USAF)	captive carry missile or telemetry pod[20]	1 hr.	700 sorties

ACM is the general term used to describe an A-A event involving two or more aircraft. These aircraft may be similar or dissimilar. Aircraft are considered similar if they are of the same aircraft type and model. For example, an F/A-18C is similar to an F/A-18E, whereas an F/A-18 and an F-15 are dissimilar.

Unit Level ACM training consists of three levels: Basic Fighter Maneuvering (BFM), intermediate level Offensive Counter Air (OCA), and Defensive Counter Air (DCA) training. No HE-weapons are fired during ACM operations.

BFM. During BFM, two aircraft (one versus one) will engage in offensive and defensive maneuvering against each other.

OCA and DCA. During OCA or DCA training, three or more aircraft (one versus two, two versus two, two versus three, or three versus one) will engage in offensive and defensive maneuvering. Participating aircraft will be separated at the start by distances up to 50 nm. During OCA training, a force of two or more aircraft will attempt to establish and maintain air superiority over a defined battle space by defeating a force of defending aircraft. During DCA training, a force of two or more aircraft will attempt to retain air superiority over a defined battle space by defeating a force of aggressor aircraft. Unit level OCA and DCA training, which is a precursor to joint and combined integrated range operations, involves high airspeeds (from high subsonic to supersonic) and rapidly changing aircraft altitudes and attitudes.

F/A-18C/E/F and AV-8B with Captive Carry Training Missiles (CATM-9)

Basic Phase (Unit Level Training) Scenario
Typically two aircraft, operating from 5,000 to 30,000 feet, begin their maneuvers from a separation distance of 2 to 3 nm and, throughout an "engagement," will normally not separate beyond visual range (6 to 8 nm). Aircraft airspeeds will range from very low (less than 100 knots) to high subsonic (less than 600 knots). Their maneuvers will be continuous proactive and reactive changes in aircraft attitude, altitude, and airspeed to gain advantage over the adversary aircraft, resulting in its simulated destruction from guns or missiles. The typical sortie duration is 1 hour.

This scenario builds through several basic levels as the pilot becomes more experienced and will include:
- Defensive fighter maneuvers - one versus one adversary is described above
- High aspect fighter maneuvers - one versus one adversary that starts from a offensive, defensive or neutral position
- Dissimilar fighter maneuvers - one versus one adversary of a different type of adversary aircraft

20 No ordnance launched during ACM; typical flight altitude 10,000 feet – 30,000 feet.

- Section fighter maneuvers - two versus one adversary or more.

Integrated and Sustainment Phase Training Scenarios
Typically not conducted during these phases, as these scenarios do not normally have adversary aircraft operating within visual range of friendly aircraft.

Training Considerations
The preferred ACM training location is on a Tactical Aircrew Combat Training System (TACTS) Range. TACTS provides real-time display and post mission debrief of air combat maneuvering (ACM), simulated air-to-ground ordnance deliveries, simulated missile employment and electronic warfare systems missions.

Aircraft flying a TACTS training mission are equipped with a pod that provides continuous information to the ground station tracking system who passes the positional information to a host computer for processing and display. TACTS aircraft-to-ground-to-aircraft communication occurs via multilateration tracking by TACTS-equipped towers. An aircraft must be in communication with at least 2, preferably 3, towers at all times to provide accurate tracking solutions.

The Cherry Point TACTS consists of 8 land-based towers.

The TACTS equipment will be replaced by the Tactical Combat Training System (TCTS). TACTS equipment is obsolete and long-term support is not feasible. TCTS is the next generation system that utilizes GPS-based instrumentation for air and surface participants. It can communicate with a ground relay in order to provide real-time monitoring of events. Additionally, each participant records their own positional information as well as the positional information of any other participant within data link connectivity. This feature allows for replay of the events if participants are not in connectivity with a ground relay and live monitor.

TCTS air-to-ground data link is capable of up to 125 nmi and the air-to-air data link is up to 80 nmi. This expanded capability will allow flexibility in the training and greater coverage for live monitor. Participants will not be restricted to a TACTS-like geographic boundary. However, it is not expected that this enhanced feature will change the areas currently used to train. Aircraft will continue to utilize the existing airspace as before, due to the ability to schedule these exclusive use areas.

TCTS will utilize only one or two of the land-based towers associated with the Cherry Point TACTS. Current TCTS system performance indicates that the current master tower located at Merrimon, NC, will remain as the primary TCTS tower for Cherry Point.

GUNNERY EXERCISE (AIR-TO-AIR) (GUNEX [A-A])

Strike fighter aircraft attack a simulated threat target aircraft with its cannon (machine gun) with the goal of destroying the other aircraft.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
GUNEX (Air-to-Air) [21]	F/A-18 (USMC)	20 mm cannon	1 hr.	6 sorties (2,000 rounds)
	AV-8B (USMC)	25 mm cannon	1 hr.	6 sorties (2,000 rounds)

F/A-18C/E/F with Vulcan M61A1/A2 20 mm Cannon and AV-8B with 25 mm Cannon

Basic Phase (Unit Level Training) Scenario
A flight of two aircraft operating well above 3,000 feet will approach a target from several miles away and when within 6,000 feet can open fire. Approximately 250 rounds of 20 mm ammunition are expended against the target in bursts of about 30 rounds for each of about eight attacks on the target. Attacks are made from various aspects, such as from above, below, or level with the target, until all the allotted rounds have been expended.

A banner target is normally towed by a commercially contracted aircraft, such as a Lear jet, but may be towed by an unmanned aerial target drone (BQM-34 and BQM-74). The banner is recovered and if target drones are used, they deploy a parachute, float on the surface of the water, and are recovered by boat. The exercise is usually conducted above 3,000 feet, outside of 12 nm, if conducted at sea, and lasts about 1 hour.

Integrated and Sustainment Phase Training Scenarios
Typically do not differ from the Basic Phase Scenario.

21 Live fire against banner (TDU-34) towed by commercial air service aircraft.

MISSILE EXERCISE (AIR-TO-AIR) (MISSILEX [A-A])

Strike fighter aircraft attack a simulated threat target aircraft with its air-to-air missile with the goal of destroying the other aircraft.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
MISSILEX (Air-to-Air)	F/A-18 (USMC)	AIM-7 Sparrow (NEPM)[22]	1 hr.	2 sorties (2 missiles)
		AIM-9 Sidewinder (HE)[23]	1 hr.	2 sorties (2 missiles)
	AV-8B (USMC)	AIM-7 Sparrow (NEPM)	1 hr.	2 sorties (2 missiles)
		AIM-9 Sidewinder (HE)	1 hr.	2 sorties (2 missiles)
	AH-1W (USMC)	AIM-9 Sidewinder (HE)	1 hr.	2 sorties (2 missiles)

F/A-18 or AV-8B with AIM-7 Sparrow; AIM-9 Sidewinder (Live or Captive Carry)

Basic Phase (Unit Level Training) Scenario
A flight of two aircraft operating between 15,000 to 25,000 feet and at a speed of about 450 knots will approach a target from several miles away and, when within missile range, will launch its missile against the target. The Sidewinder missiles have HE warheads and the Sparrow missiles have an NEPM telemetry head package. The missiles fired are not recovered.

The target is an unmanned aerial target drone (BQM-34; BQM-74) or Tactical Air-Launched Decoy (TALD). BQM targets deploy parachutes, float on the surface of the water, and are recovered by boat. TALDs are expended. The exercise lasts about 1 hour, is conducted in a Warning Area at sea outside of 12 nm and well above 3,000 feet.

Integrated and Sustainment Phase Training Scenarios
Typically do not differ from the Basic Phase Scenario.

22 1 missile per sortie; uses subsonic or supersonic drone target.

23 1 missile per sortie; all HE warheads; uses a flare target.

MISSILE EXERICSE (SURFACE-TO-AIR) (MISSILEX [S-A])

Surface ships engage threat missiles and aircraft with missiles with the goal of disabling or destroying the threat.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
MISSILEX (S-A)	CG, DDG	SM-2 (HE)	2 hrs.	0 events (0 missiles)
	LHA, LHD	Sea Sparrow (HE)	2 hrs.	0 events (0 missiles)

CG, DDG with Standard Missile (SM-2); and LHA and LHD with Sea Sparrow Missiles

CGs and DDGs use the Standard Missile (SM-2) to defend the force against threat missiles and aircraft. These ships are tactically stationed to defend the aircraft carrier, amphibious ships, or logistic ships of the force, as well as themselves, from the air threat. The LHA and LHD ships utilize the Sea Sparrow missiles.

Basic Phase (Unit Level Training) Scenario
The scenario for this exercise is the same as for the main battery gun exercise above, but the simulated threat missile is engaged with the Standard Missile system. One live or telemetered-inert-missile is expended against a target towed by a commercial air services Lear jet after two or three tracking runs. The exercise lasts about two hours.

The BQM-74 target is used an alternate target for this exercise. The BQM target is a subscale, subsonic, remote controlled ground or air launched target. A parachute deploys at the end of target flight to enable recovery at sea.

AIR INTERCEPT CONTROL (AIC)

Surface ships and fixed winged aircraft use their air search radar capability to direct strike fighter aircraft toward threat aircraft where the threat aircraft may be engaged and destroyed by the strike fighter's missiles or guns.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
Air Intercept Control[24]	F/A-18	Air Search and Fire Control Radars	1-2 hrs.	21 events (54 sorties)

F/A-18s and Air Search and Fire Control Radars

Basic Phase (Unit Level Training) Scenario
The goal of the AIC exercise is the training of both the controllers and the aircraft pilots to intercept and simulate destruction of an opposing aircraft with its own force aircraft using either the aircraft's missile or gun systems.

Air intercept controllers embarked in CVN, CG, DDG, E-2C, and sometimes in Navy school houses, use air search radars to track both the friendly strike fighter interceptor and the threat aircraft at altitudes typically well above 15,000 feet. Friendly and threat aircraft may be 100 nm apart at the start of this exercise. When the threat aircraft is detected by the controller's air search radar, a course and speed is provided to the strike fighter to intercept and engage the threat aircraft. Speeds in excess of 450 knots may be used. No HE ordnance is used, but captive carry missiles may be used when strike fighters participate, and thereby complete MISSILEX (A-A) or GUNEX (A-A) exercises. Several intercepts are usually conducted over 1-2 hours.

Fleet aircraft often are not available for this training, so commercial air services aircraft are often used to provide the level of training required by controllers.

Integrated and Sustainment Phase Training Scenarios
Typically do not differ from the Basic Phase Scenario, except that two to four interceptors may be directed toward larger numbers of threat aircraft.

24 AIC occurs during major exercises only; 2-4 aircraft sorties per event with 5 intercepts /sortie; no ordnance is launched.

STRIKE WARFARE

HIGH-SPEED ANTI-RADIATION MISSILE EXERCISE (HARMEX)

Strike fighter and electronic attack aircraft use sensors to detect radar signals from a simulated threat radar site and either simulate or actually launch an NEPM or HE HARM with the goal of destroying or disabling the threat radar site.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
HARM Missile Exercise (HARMEX) (Air-to-Surface)	F/A-18 (USMC)	AGM-88 HARM (HE)[25]	1 hr.	6 sorties (6 missiles)

A HARMEX scenario may require the launching aircraft to employ the missile either offensively or defensively. In the offensive role, the HARM is employed against an electronic emitter (either actual threat radar equipment or a threat simulator) during a Suppression of Enemy Air Defenses (SEAD) mission. The HARM aircraft precedes the strike group, "baiting" the enemy's Integrated Air Defense System (IADS) to radiate its radar, so these threat weapons systems can be engaged and destroyed by HARM. In the defensive role, HARM is employed reactively and spontaneously against a previously unidentified emitter that poses an immediate threat to the strike group or launching aircraft.

F/A-18C/E/F with HARM (AGM-88)

Basic Phase (Unit Level Training) Scenario
Two to four aircraft approach the threat radar site at an altitude well above 3,000 feet. With a range greater than 57 nm, HARM allows the launching aircraft to stay outside the range of many antiaircraft weapons that may be defending the threat radar site. Once the target is located with onboard sensors, the HARM is launched against an active radar emission.

This training operation normally uses a captive carry training missile on a range equipped with a variety of electronic threat emitters suitable for the real world anticipated threat, as HARM is a "launch and leave" weapon. This characteristic and the resulting inability of the launch aircraft to alter the missile's flight path after launch reduce the requirement for NEPM or HE ordnance expenditures, although they may be expended against specially configured barges in OPAREAs at sea outside of 12 nm. The typical sortie duration is 1 hour.

The at-sea target is typically a barge that is towed to the OPAREA by a tug or range boat, set adrift, then recovered after the exercise and returned to port. The barge has a tower with an electronic emitter that the HARM will seek when it has been fired from the launch aircraft. The NEPM HARM will pass near the emitter and crash into the sea, where the impact will break it apart and the pieces will sink to the bottom. The HE HARM will explode about 30-60 feet above the sea surface, near the emitter, and the remaining pieces will sink to the bottom.

Integrated and Sustainment Phase Training Scenarios
Both of these phases would typically combine the HARM launching aircraft with E-2 and F/A-18 aircraft conducting a strike mission against a land target in a scenario driven event

25 High-speed Anti-Radiation Missile (HARM); Target is stationary barge with elevated emitters intended to preclude barge destruction; missile detonates approximately 60 feet above the water.

ELECTRONIC COMBAT

ELECTRONIC COMBAT OPERATIONS (EC OPS)

Aircraft, surface ships, and submarines attempt to control critical portions of the electromagnetic spectrum used by threat radars, communications equipment, and electronic detection equipment to degrade or deny the enemy's ability to defend its forces from attack and/or recognize an emerging threat early enough to take the necessary defensive actions.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
Electronic Combat Operations (EC Ops)[26]	AOE, CG, CVN[27], DDG, FFG, LHA, LHD, LPD, LSD[28]	SLQ-32	1.5 hrs.	45 events
	EA-6B, EA-18G[29]	AN/ALQ-218. AN/ALQ-99, and AN/USQ-113	1.5 hrs.	108 sorties
	All Navy and Marine Corps Fixed-wing aircraft[30]	Multiple fixed and mobile SA, ZSU and EW threat emitters	1.5 hrs.	2,230 sorties

EC OPS can be active or passive, offensive or defensive.

- Active EC OPS use radio frequency (RF) transmissions in the 2-12 gigahertz frequency spectrum to conduct jamming and deception.
  - Jamming bombards a radio or radar receiver with sufficient RF energy to cause the internal automatic gain setting of the receiving equipment to adjust the signal-to-noise threshold setting downward to a point where the desired RF return (for example, a radio voice, datalink transmission, or a target's radar return) is "lost" in the background noise of the RF spectrum.
  - Electronic deception may generate false targets that appear to be real, thereby causing the recipient of the false targets to commit forces or weapons to attack those targets, and, in the process, not attack the real target. Another type of deception allows the defender to deny the attacker's weapon system from successfully acquiring and engaging a valid target.
- Passive EC OPS use the enemy's electromagnetic transmissions to obtain intelligence about their operations and to recognize and categorize an enemy threat and take steps to defend against it.
- Offensive EC OPS use active or passive installed EC systems against enemy search, EC, and weapons systems. Electronically, this process is active (overpowering enemy receiver systems) or passive (chaff) jamming.
- Defensive EC OPS use active or passive installed EC systems in reaction to enemy threat systems. These installed EC systems are programmed to recognize an enemy threat signal and will automatically send a false return signal to the enemy threat system or dispense chaff and/or flares in immediate reaction to receiving an enemy threat signal. Missile, gun, or search radar signals are common threat signals that can initiate an automatic response.

26 Both the Mid-Atlantic Electronic Warfare Range (MAEWR) and Commercial Air Services aircraft configured with EC pod provide the threat emitters.
27 AOE is a Fast Combat Support Ship; CVN is a nuclear aircraft carrier
28 Major exercises only.
29 Major exercises only; offensive jamming.
30 ULT and major exercises.

Navy units can conduct EC OPS training as stand alone events, but they are often embedded in other training events, such as fighting through enemy jamming to deliver ordnance on targets or ejecting chaff and flares in response to enemy missile threat radars.

Training ranges need an EC OPS training capability that can generate threat signals that will exercise the full range of every platform's EC capability and also be able to evaluate the effectiveness of both the equipment and operator's tactical responses to those signals.

EC OPS are also categorized in several other NTAs where they are described as the primary exercise discussed. These NTAs include:

- NTA 3.2.4 - HARMEX, destruction of enemy threat radars.
- NTA 3.2.8 - Chaff Exercise, disruption of enemy threat search or guidance radars.
- NTA 3.2.8- Flare exercise, seduction of enemy threat missile guidance systems or infrared systems.

CG, DDG, FFG, LHA, LHD, LPD, LSD, CVN with SLQ-32

The SLQ-32 provides early warning, identification, and direction of threat targeting radars and weapon emitters to own ship systems that will engage hard kill weapons (*e.g.*, CIWS), automatically disperse chaff and flare decoys, and use active electronic emissions to counter inbound missiles.

Basic Phase (Unit Level Training) Scenario

Surface ships detect and evaluate threat electronic signals from threat aircraft or missile radars, evaluate courses of action concerning the use of passive or active countermeasures, then use ship maneuvers and either chaff, flares, active electronic countermeasures, or a combination of them to defeat the threat. The typical event duration is 1.5 hours.

Integrated and Sustainment Phase Training Scenarios

Typically do not differ from the Basic Phase Scenario.

Training Considerations

Threat signals are commonly provided by a commercial air service Lear Jet with a threat signal simulator pod that flies an appropriate threat missile profile.

Some ranges, such as the San Clemente Island Range Complex (SCIRC) in California offer a wide range of land based electronic threat signals that will exercise the full range of EC equipment installed in ships.

F/A-18C/D with ALQ-165 and F/A-18E/F with ALQ-214 Jamming System

- The AN/ALQ-165 is an automated active deception jammer designed to contribute to the electronic self-protection of the host aircraft from a variety of A-A and S-A radar threats.
- The AN/ALQ-124 is an Integrated Defensive Electronic Countermeasures (IDECM) Radar Frequency Countermeasures system that uses autonomous active techniques that deny, disrupt, delay, and degrade missile launch and firing solutions from a variety of air-to-air and surface-to-air radar and infrared threats. This system includes an onboard radio frequency countermeasures system as well as the ALE-55 Fiber Optics Towed Decoy, which is trailed behind the aircraft at varying lengths.

Basic Phase (Unit Level Training) Scenario

The F/A-18 will typically fly well above 3,000 feet at about 400 knots toward the threat signal generators used by the training range. When a threat signal is received the pilot reacts to the enemy missile threats by maneuvering and employing autonomous active jamming against the threat search radars or missiles. The typical sortie duration is 1 hour.

Integrated and Sustainment Phase Training Scenarios

Typically do not differ from the Basic Phase Scenario, except that it is employed during a major range event, at sea, and in conjunction with other friendly forces.

CHAFF EXERCISE (CHAFFEX)

Ships, fixed-winged aircraft, and helicopters deploy chaff to disrupt threat targeting and missile guidance radars and to defend against an attack.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
Chaff Exercise	MH-60S	RR-144 A/AL	1 hr.	65 sorties (1,950 canisters)
	F/A-18, AV-8B[31]	RR-144 A/AL	1 hr.	460 sorties (4,600 canisters)
	CG, DDG, FFG, LCC, LHA, LHD, LPD, LSD	MK-214 (seduction chaff)	3 hrs.	50 events (300 canisters)
		MK-216 (distraction chaff)	3 hrs.	16 events (96 canisters)

The chaff exercise trains aircraft in the use and value of chaff to counter an enemy threat. Chaff is a radar reflector material made of thin, narrow, metallic strips cut in various lengths to elicit frequency responses, which deceive enemy radars. Chaff is employed for a number of different tactical reasons, but the end goal is to create a target from the chaff that will lure enemy radar and weapons system away from the actual friendly platform.

Chaff may be employed offensively, such as before a major strike to "hide" inbound striking aircraft or ships, or defensively in reaction to being detected by an enemy targeting radar. Defensive chaff training is the most common exercise used for training both ships and aircraft. In most cases, the chaff exercise is training for the ship or aircraft that actually deploys the chaff, but it is also a very important event to "see" the effect of the chaff from the "enemy" perspective so radar system operators may practice corrective procedures to "see through" the chaff jamming, so exercises are often designed to take advantage of both perspectives.

Chaff exercises are often conducted with flare exercises, as well as other exercises, rather than as a standalone exercise.

F/A-18C/E/F; AV-8B; H-60 series[32] with Defensive Chaff

There are various types of chaff; the type used varies based on the anticipated threat frequencies to be countered. Typical chaff includes:

- RR-144A/AL - designed specifically for training and used by all naval airframes.

Basic Phase (Unit Level Training) Scenario

Aircraft detect electronic targeting signals from threat radars or missiles, dispense chaff, and immediately maneuver to defeat the threat. The chaff cloud deceives the inbound missile, and the aircraft clears away from the threat.

The chaff disperses with the winds over a wide area and eventually settles in limited concentrations over the surrounding land or sea areas where it was dispensed. The typical event duration is 1 hour for aircraft.

31 No sorties dedicated to chaff; 33% of ACM sorties and 10% of EC sorties use chaff.
32 H-60 series includes any variant in this series.

Integrated and Sustainment Phase Training Scenarios
Typically do not differ from the Basic Phase Scenario.

CG, DDG, FFG, LCC, LHA, LHD, LPD, LSD with MK-214 or MK-216 Super Rapid Bloom Off-board Chaff (SRBOC) Defensive Chaff
Defensive chaff deployed from ships is typically MK-214 (Seduction Chaff) or MK-216 (Distraction Chaff) from the MK-36 SRBOC launcher. The specific type and amount of chaff deployed depends on the specific tactical situation.

Basic Phase (Unit Level Training) Scenario
A surface ship detects an electronic targeting signal or the ship's search radar detects an inbound threat missile. Chaff rounds are fired automatically or manually, depending on the setting selected for the tactical situation, from the MK-36 Super Rapid Bloom Off-board Countermeasures (SRBOC) Chaff and Decoy Launching System, or other similar systems. The chaff forms a cloud that presents a ship size "target," forcing the inbound missile to make a choice between the chaff and the real ship. With the employment of additional countermeasure tactics, the ship may maneuver away from the cloud and cause the missile to choose the chaff "target."

The chaff disperses with the winds over a wide area and will eventually settle in limited concentrations over the surrounding sea areas where it was dispensed. The typical duration is 3 hours for ships.

Integrated and Sustainment Phase Training Scenarios
Typically do not differ from the Basic Phase Scenario.

Training Considerations
The chaff exercise trains shipboard personnel in the use and value of chaff to counter an enemy threat. Chaff is a radar reflector material made of thin, narrow, metallic strips cut in various lengths to elicit frequency responses, which will deceive enemy radars. Chaff is employed for a number of different tactical reasons, but the end goal is to create a target from the chaff that will lure enemy radar and weapons system away from the actual friendly ship.

FLARE EXERCISE (FLAREX)

Fixed-winged aircraft and helicopters deploy flares to disrupt threat IR missile guidance systems to defend against an attack.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
Flare Exercise	MH-60S	MK-46 MOD 1C, MJU-8A/B, MJU-27A/B, MJU-32B, MJU-53B, SM-875/ALE	1 hr.	65 sorties (1,950 flares)
	F/A-18, AV-8B[33]	MK-46 MOD 1C, MJU-8A/B, MJU-27A/B, MJU-32B, MJU-53B, SM-875/ALE	1 hr.	30 sorties (150 flares)

Flare exercises principally train aircraft personnel in the use of defensive flares that are designed confuse infrared sensors or infrared homing missiles, thereby causing the sensor or missile to lock onto the flares instead of the real aircraft. Aircraft decoy flares use a magnesium extruded flare grain.

Flare exercises are often conducted with chaff exercises, as well as other exercises, rather than as a standalone exercise.

F/A-18C/E/F; AV-8B; H-60 series[34] with Defensive Flares

Types of flares used by aircraft and helicopters include:

- MK-46 MOD 1C - used on SH-60B/F; MH-60R/S; HH-60H; MPA.
- MJU-8A/B - training flare used on tactical aircraft and MH-53E.
- MJU-27A/B - used on SH-60B/F; MH-60R/S; HH-60H; F/A-18D/E/F.
- MJU-32B - used on SH-60B/F; MH-60R/S; HH-60H; MPA.
- MJU-53B - replacing MJU-7A/B, used on F/A-18E/F.
- SM-875/ALE - simulator flare, used on all naval airframes.

Basic Phase (Unit Level Training) Scenario

Aircraft detect electronic targeting signals from threat radars or missiles or see a threat missile plume when it is launched, then dispense flares and immediately maneuver to defeat the threat. Typically an aircraft will expend five flares in an exercise while operating above 3,000 ft. Each flare is completely consumed while it is in the air. The typical event duration is 1 hour.

Integrated and Sustainment Phase Training Scenarios

Typically do not differ from the Basic Phase Scenario.

33 No sorties dedicated solely to flares; 1% of EC sorties use flares.
34 The H-60 series includes any variant in this series

AMPHIBIOUS WARFARE

Amphibious Warfare (AMW) is the set of friendly force offensive and defensive tactics and operations associated with providing expeditionary forces capable of projecting power ashore from the sea to accomplish a specific objective. AMW involves establishing and sustaining landing forces ashore for extended periods (Amphibious Assault), or putting landing forces ashore for a short period to accomplish a limited objective before withdrawing them (Amphibious Raid). Operational Maneuver from the Sea (OMFTS), which provides the doctrinal underpinning for AMW, describes Expeditionary Maneuver Warfare and Ship To Objective Maneuver, and could include virtually every type of ship, aircraft, weapon, special operations force, and landing force employed in concerted military efforts.

The Navy-Marine Corps team organizes, trains and deploys its AMW capability around an Expeditionary Strike Group (ESG) with an embarked Marine Expeditionary Unit (MEU). Typical composition:

ESG.

- 1 each LHA or LHD, LPD, LSD
- 1 CG and up to 3 DDG and 2 FFG
- 3-5 landing craft-air cushion (LCAC), and 4-6 landing craft-utility (LCU)

MEU. About 2200 Marines organized into following elements:

- Ground Combat Element: A Battalion Landing Team (BLT) composed of infantry, combat engineers, artillery, armor, mechanized assets [12 amphibious assault vehicles (AAV), 8 light armored vehicles (LAV)/light armored reconnaissance vehicles (LAR)]
- Air Combat Element: About 30 aircraft, a mix of fixed wing [vertical takeoff and landing (VTOL) and cargo planes] and helicopters [medium and heavy lift, armed and reconnaissance planes]
- Combat Service Support Element: Civil engineers, maintenance and logistics personnel, trucks, field generators, water purification plant, cargo, and so on.

A specific ESG will marry up with a specific MEU about six months prior to deployment to train as a team. A typical training cycle will involve deploying the entire MEU on the ESG ships for three training periods of 1 to 3 weeks each in the Cherry Point OpArea near Onslow Beach:

1. Unit Level Training. Group Sail during which the individual ESG and MEU units come together for the first time and practice safely operating with each other. This phase will include basic strike group ship-handling exercises, flight operations (primarily ship landing qualifications), and ship to shore amphibious operations in an unopposed environment.
2. Integrated Level Training. ESG COMPTUEX/Certification Exercise (CERTEX) described in detail in Appendix D below.
3. Sustainment Level Training. JTFEX/Supporting Arms Coordination Exercise (SACEX) described in Appendix D below.
4. Interspersed with these three ESG deployments are several single-ship training opportunities.

FIRING EXERCISE (FIREX) (LAND)

Surface ships use main battery guns to support forces ashore in their battle against threat forces.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
Firing Exercise (FIREX) (Land)	CG, DDG	5" guns (HE)	8-16 hrs.	30 events (3,000 rounds)

Naval Surface Fire Support (NSFS) normally consists of the bombardment of a target within an impact area, by one or more ships. The ship is often supported by Navy, Marine, or NSW spotters ashore, or by spotters embarked in fixed-wing aircraft or helicopters in the air, to call for the fire support from the ship, and to adjust the fall of shot onto the target.

The locations and opportunities for live-fire from a ship at sea to targets ashore are very limited, and often the training range area is not adequate to establish and maintain surface fire support proficiency. A technology solution has been developed to precisely determine the impact of rounds fired at a simulated or virtual land area containing virtual targets located in the ocean, which enables ships to complete NSFS training in the absence of a land target or impact area.

CG and DDG with 5-inch Guns

FIREX (Land Target) (FIREX (Land))

This exercise uses a land area where live and inert ordnance is authorized to impact and is often supported by target shapes such as tanks, truck, trains, or aircraft on the ground. These targets add to the realism for both the spotters and the ships involved in the exercise.

Basic Phase (Unit Level Training) Scenario
The ship positions itself about four to six nm from the target area to receive information concerning the target and the type and exact location of the target from the assigned spotter. One or more rounds are fired at the target. The fall of the round is observed by the spotter, who then tells the ship if the target was hit or if the ship needs to adjust where the next round should fall. More shots are fired, and once the rounds are falling on the target, then the spotter will request a larger number of rounds to be fired to effectively destroy the target. Typically five rounds are fired in rapid succession (about one round every five to seven seconds). Ten or more minutes will pass, and then similar missions will be conducted until the allocated number of rounds for the exercise has been expended.

About 70 rounds of 5-inch inert or high explosive ordnance (typically 53% live and 47% inert), in addition to about 5 rounds of illumination are expended by the CG or DDG during a typical exercise. Portions of the exercise are conducted during both the day and the night to achieve full qualification. A ship will normally conduct three FIREXs at different levels of complexity over several months to become fully qualified.

A Shore Fire Control Party (SFCP) may consist of about 10 personnel who supply target information to the ship. From positions on the ground, the Navy, Marine, or NSW personnel who make up the SFCP provide the target coordinates at which the ship's crew directs its fire. As the rounds fall, the SFCP records where the rounds falls and provide adjustments to the fall of shot, as necessary, to ensure the target is "destroyed."

Integrated and Sustainment Phase Training Scenarios
Typically does not differ significantly from the Basic Phase Scenario with respect to the NSFS procedures and ordnance used.

If NSFS training is conducted as part of an ESGEX, in could be part of several independent or coordinated missions being conducted simultaneously, including CAS, Marine Corps artillery fires, and troop movements, that are being coordinated by the Expeditionary Strike Group Commander embarked in the LHA. In a training environment, it is expected that NSFS is only combined with Marine Corps artillery fires as a live or inert ordnance exercise in the same area.

FIRING EXERCISE (FIREX) WITH INTEGRATED MARITIME PORTABLE ACOUSTIC SCORING AND SIMULATION (IMPASS) SYSTEM

Surface ships use main battery guns to support forces ashore in their battle against threat forces. With the Integrated Maritime Portable Acoustic Scoring and Simulation System (IMPASS) system (discussed below), the shore area is simulated at sea.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
FIREX (IMPASS) [35]	CG, DDG	5" guns (70 rounds/event [39 HE , 31 NEPM)	8 hrs.	2 events (140 rounds [78 HE, 62 NEPM])

Naval Surface Fire Support (NSFS) normally consists of the bombardment of a target within an impact area, by one or more ships. The ship is often supported by Navy, Marine, or NSW spotters ashore, or by spotters embarked in fixed-wing aircraft or helicopters in the air, to call for the fire support from the ship, and to adjust the fall of shot onto the target.

The locations and opportunities for live-fire from a ship at sea to targets ashore are very limited, and often the training range area is not adequate to establish and maintain surface fire support proficiency. A technology solution has been developed to precisely determine the impact of rounds fired at a simulated or virtual land area containing virtual targets located in the ocean, which enables ships to complete NSFS training in the absence of a land target or impact area.

CG and DDG with 5-inch Guns

FIREX with IMPASS

This exercise follows the same scenario as a Firing Exercise (FIREX) (Land), except that the entire exercise is conducted at sea, and all of the spotters are simulated. The scenario is as follows: The ship positions itself about four to six nm from the target area to receive information concerning the target and the type and exact location of the target from the assigned spotter. One or more rounds are fired at the target. The fall of the round is observed by the spotter, who then tells the ship if the target was hit or if the ship needs to adjust where the next round should fall. More shots are fired, and once the rounds are falling on the target, then the spotter will request a larger number of rounds to be fired to effectively destroy the target. Typically five rounds are fired in rapid succession (about one round every 5 - 7 seconds). Ten or more minutes will pass, and then similar missions will be conducted until the allocated number of rounds for the exercise has been expended.

About 70 rounds of 5-inch NEPM or high explosive ordnance (typically 53% HE and 47% NEPM), in addition to about 5 rounds of illumination are expended by the CG or DDG during a typical exercise. The exercise is conducted during the day a minimum of 12 nm from shore. A ship will normally conduct three FIREXs at different levels of complexity over several months to become fully qualified.

The current training system is supported by the IMPASS system. The training system is an onboard computer system that provides a realistic presentation, such as a land mass with topography, to the ship's systems. The scoring system is deployed by the firing ship and consists of five sonobuoys set in a

35 Integrated Maritime Portable Acoustic Scoring and Simulator (IMPASS).

pentagon-shaped arrangement at 1.3 km intervals. Within the ship's combat system, the training system creates a virtual land mass that overlays the array and simulates land targets. The ship fires its ordnance into this target area; the sonobuoys detect the bearing to the acoustic noise resulting from the impact of a high explosive or NEPM round landing in the water, then transmit their GPS position and their bearing information to the ship. From the impact location data collected, the training system computer triangulates the exact point of impact of the round and, from that data, the exercise may be conducted as if the ship were firing at an actual land target. When the training is complete, the IMPASS buoy system is recovered by the ship.

Basic Phase (Unit Level Training) Scenario
The FIREX with IMPASS exercise is conducted very similarly to the FIREX (Land) exercise from the ship perspective, even though the exercise is conducted completely at sea. Approximately five to 70 rounds of 5-inch NEPM or high explosive ordnance and five rounds of illumination are expended per exercise over several hours. All exercises are conducted in daylight and outside of 12 nm from land in order to have sufficient sea space to maneuver the ship and lay out the IMPASS sonobuoy pattern.

Integrated and Sustainment Phase Training Scenarios
Typically does not differ significantly from the Basic Phase Scenario with respect to the NSFS procedures and ordnance used.

AMPHIBIOUS ASSAULT

Marine amphibious forces move from amphibious ships at sea, by watercraft or aircraft, over the beach into hostile territory, establish a beachhead, then occupy the area or move further inland for an extended period. The ESG/MEU team is a highly capable and balanced combat organization able to concentrate forces and effective supporting arms from land-based, air, and maritime combat elements to strike at selected points in the hostile defense.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
Amphibious Assault	1 LHA or LHD, 1 LPD, 1 LSD, 1 CG, up to 3 DDG & 2 FFG, with tailored MAGTF[36]	11-14 AAV/EFV or LAV/ LAR;4-8 landing craft (3-5 LCACs; 1-3 LCU[37]; 22 aircraft (4 H-53, 12 H-46/MV-22, 4 AH-1, 2 UH-1, 4 AV-8)	72 hrs.	4 events[38] (52 AAVs and LAVs, 144 LCACs, 96 LCUs, 36 H-53, 64 H-46 or MV-22, 36 AH-1, 24 UH-1, 16 AV-8)
	1-3 amphibious ships (1 LHA or LHD, 1 LPD, 1 LSD), partial MAGTF	4-14 AAV/EFV or LAV/LAR; 2-8 LCAC/LCUs, 22 aircraft (4 H-53, 12 H-46/MV-22, 4 AH-1, 2 UH-1, 4 AV-8)	72 hrs.	6 events[39] (42 AAVs and LAVs; 28 LCACs, 8 LCUs, 18 H-53, 32 H-46 or MV-22, 18 AH-1, 12 UH-1, 8 AV-8)

The ESG will approach hostile territory, but remain far enough off-shore to maintain an element of surprise before launching the assault. The Marine landing team will move from ship to shore in a combination of medium lift (CH-46E and MV-22) and heavy lift (CH-53E) helicopters, LCACs, LCUs, AAVs (may be replaced by expeditionary fighting vehicles (EFV) which are in the testing and evaluation phase), and LAV/LARs. As the Marine forces move from ship to shore and establish a beachhead, the ESG will coordinate supporting arms from Naval Surface Fire Support (NSFS) from CGs or DDGs, Close Air Support (CAS) from AV-8B and AH-1Ws, CAS and strike support from Carrier Strike Group (CSG) F/A-18 strike fighters (if available), and from Marine artillery after a beachhead is established.

After the assault forces have secured the beachhead, control of the amphibious area is transferred from the embarked ESG to the Amphibious Assault commander ashore, who is responsible for organizing his forces to prosecute the assault forward to secure the objective.

LHA or LHD, LPD, LSD, Marine Expeditionary Unit (MEU) with Landing Vehicles
Basic Phase (Unit Level Training) Scenario

36 Marine Air-to-ground Task Force (MAGTF)
37 AAV: Amphibious Assault Ship; LAV: Light Armored Vehicle; LAR: Light Amphibious Reconnaissance; LCAC: Landing Craft Air Cushion; LCU: Landing Craft Utility.
38 Assumes one assault per major exercise; two assaults with up to 2,000 Marines and two assaults with 500-1,000 Marines; assume 13 AAV/LAV, 36 LCAC and 24 LCU round trips per assault.
39 All Unit Level Training (ULT); two 3-ship amphibious landing rehearsals, each with 13 AAV/LAVs, 4 LCACs, 2 LCUs, 9 H-53, 16 H-46 or MV-22, (AH-1, 6 UH-1, 4 AV-8 round trips/rehearsal , and four 1-ship events each with 4 AAV/LAVs, 5 LCACs, and 1 LCU round trips per/event.

Events ranging in size from individual units to the full ESG/MEU will begin early in the training cycle with straightforward, deliberate exercises involving personnel and equipment movement from ship to shore to familiarize all concerned with safe loading, unloading, and movement within the ESG and operating area. Events gradually increase in complexity with addition of command and control and supporting elements that would be involved in a full scale event.

Integrated and Sustainment Phase Training Scenario
Major exercises involve employing the full suite of ESG/MEU capabilities to move advance forces, combat, combat support, and combat service support units from the ESG to the objective area ashore. The landing is conducted in waves and is focused on concentrating forces quickly in order to establish the battlefield. Typically, up to two reinforced companies from the BLT will go ashore via mechanized amphibious assets (AAV, LAR, LAV, EFV), landing craft (LCAC, LCU), and assault support aircraft (CH-46, CH-53). Included within the initial waves are the landing support and beach operations personnel. Follow-on waves include fire support (155mm howitzers) assets, armored units (tanks), service support elements, and the reserve company if necessary. Fixed-wing and rotary-wing aircraft provide CAS. Once the beachhead is established, all units assemble at a prescribed staging area prior to moving out. Units embarked on amphibious ready vehicles (AAV and LAV) traverse the beach and continue on to their objective area. Non-amphibious ready vehicles (High Mobility Multipurpose Wheeled Vehicle [HMMWV] and seven-ton trucks) proceed administratively from the beach and assemble at a second staging area to provide combat service support.

AMW Vessel Speed and Distances
Table shows typical vessel speeds and transit distances during Expeditionary Strike Group (ESG) exercises involving amphibious assaults and raids from Onslow Bay to Onslow Beach on MCB Camp Lejeune. Important to note that table does not list maximum speed or ranges, and even within a given exercise, vessels may exceed these speeds and distances.

VESSEL CLASS	TYPICAL SPEED (knots)	TYPICAL TRANSIT DISTANCE (nm)
LHA	Either anchored or 3-5 knots, although up to 12 knots during flight operations	About 90% of exercise spent in ESG Ops Box, rarely closer than 3 nm to beach
LPD/LSD	Either anchored or 3-5 knots	About 90% of exercise spent in ESG Ops Box, but will transit briefly closer than 3nm to beach to discharge and recover amphibious vehicles
LCAC	35 knots	2-25 nm
LCU	Up to 12 knots	1-12 nm
AAV	7 knots	1-2 nm
LAV	5 knots	1-2 nm
EFV	Up to 25 knots	1-20 nm (not yet in the inventory, Initial Operational Capability to be determined)

Other vessels involved in ESG exercises, such as CGs and DDGs, are not necessarily confined to the ESG Operations Box, nor will their transit speeds differ significantly from their typical operations.

AMPHIBIOUS RAID

Small, agile Marine amphibious forces make swift incursions into or temporarily occupy a hostile territory or area for a specified purpose and a specified time, then make a planned withdrawal. Raids are often conducted against objectives requiring specific results that may not be achieved by any other means.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
Amphibious Raid	1-3 amphibious ships (1 LHA or LHD, 1 LPD, 1 LSD), reinforced company (100-150 Marines)	4-14 AAV/EFV or LAV/LAR; 2-8 LCAC/LCUs; and small boats; 22 aircraft (4 H-53, 12 H-46 or MV-22, 4 AH-1, 2 UH-1, 4 AV-8	12 hrs.	24 raids[40] (72 AAV/EFV or LAVLAR; 120 LCACs; 24 LCUs; 36 H-53, 36 H-46 or MV-22, 36 AH-1, 36 UH-1, 36 AV-8)

Typical missions include:

- Security, stability, transition, and reconstruction operations (SSTR)
- Theater security cooperation activities
- Humanitarian assistance
- Non-combatant evacuation operations (NEO)
- Tactical recovery of aircraft and personnel (TRAP)
- Airfield operations from expeditionary sea or shore-based sites
- Airfield and/or port seizure operations
- Joint and combined operations

Additionally, the MEU must certify a specially structured unit as Special Operations Capable (MEU (SOC)), capable of operating against expected threat force structures to achieve specific mission requirements:

- Direct action
- Special reconnaissance

The mix of aviation, infantry, engineering, and fire support units in a Marine amphibious raid force will vary, depending on the specific mission. Because these forces typically lack the ability to overwhelm a forewarned and well-armed defender, the riskiest phases of an Amphibious Raid are the insertion and extraction phases. These phases depend on the availability of sufficient and dependable intelligence to allow the raid force to approach the target without en route engagement, complete the mission expeditiously, and withdraw before the enemy can respond.

40 ULT and major exercise. Event is either a raid and Logistics Over the Shore (LOTS); 18 raid events, each with 4 AAV/LAV, 5 LCAC, 1 LCU, 2 H-53, 2 H-46/MV-22, 2 AH-1, 2 UH-1, 2 AV-8 round trips and 6 LOTS, each with 5 LCAC and 1 LCU round trips.

MEU (SOC) with Small Boats, Landing Craft or Mechanized Assault Craft and Blank Small Arms Ammunition

Basic Phase (Unit Level Training) Scenario
A typical Amphibious Raid force may be comprised of a reinforced company (100-150 personnel) landed by small boat or mechanized assault craft on a beachhead, or inserted by assault support aircraft into a landing zone (LZ). The company would then proceed to a designated objective area to carry out the assigned mission. When the mission is successfully accomplished, the company would then proceed to an extraction point for return to the ESG.

Integrated and Sustainment Phase Training Scenario
The size of the Amphibious Raid force for a major exercise is the same as for a ULT event, but the availability of additional support forces from the ESG allows more complex scenarios and challenging missions.

RESEARCH, DEVELOPMENT, TESTING AND EVALUATION (RDT&E)

RDT&E is conducted principally by Naval Air Systems Command (NAVAIR), Naval Sea Systems Command (NAVSEA), Space and Naval Warfare Systems Command (SPAWAR), and the various commands that report to them. NAVSEA conducts RDT&E on various surface and subsurface systems, and SPAWAR focuses on engineering and fleet support for command, control and communications systems and ocean surveillance. NAVAIR conducts testing of aircraft, aircraft weapons, and the "Integration Testing" of all subsystems (including weapons) with the aircraft.

RDT&E operations can be further categorized within at least three subcategories:

- Operational Test & Evaluation (OT&E)
- Developmental Test & Evaluation (DT&E)
- Production Acceptance Test & Evaluation.

The principal output of RDT&E range operations is data. All Operational T&E and live-fire T&E activities require some method for data collection/capture/recording and debrief, and therefore require sophisticated range instrumentation and advanced range communications. In many cases, this equipment can be used for both RDT&E and unit training by providing more detailed feedback to the units being trained.

Tests include a wide variety of aircraft, ships, ocean engineering, missile firings, torpedo testing, manned and unmanned submersibles, unmanned aerial and underwater vehicles, electronic warfare and other Navy weapons systems. Tests are used principally for equipment maintenance and to ensure that unit equipment works well in coordination. Table D-1 describes RDT&E events in greater detail.

Table D-1. Baseline RDT&E Operations

Mission Area	Operation	Operation Description
Planned Testing & Evaluation Operations	Testing and Evaluation Operations	Chief of Naval Operations (CNO) designated activities, torpedo, torpedo defense, submarine and periscope detection, ship-defense systems, missile defense, and other miscellaneous programs (such as gunnery/special weapons tests). These programs involve the testing and evaluation of enhancements on systems already used in exercises conducted in the range complex.
	Ocean Engineering	Ocean Engineering research and development testing involves ocean deployment of hardware, cabling, mine countermeasures equipment (including HE ordnance testing), underwater tools and equipment and related components. Test items are placed in appropriate locations in the water and/or on the sea floor to measure long-term effects of exposure to the marine environment, with test durations running from days to decades depending on the item being tested. Items undergoing testing can be continuously monitored via underwater video, electronics, or other passive means. Monitoring is also periodically performed with SCUBA divers or with remotely operated vehicles piloted from the pier or a small boat. Removal of marine growth from the items being tested is required periodically.
	Anti-Air Warfare RDT&E	Testing and training on Aegis capable ships after refurbishment or overhaul.
	Aircraft Flight Tests	These flights involve similar tasks and maneuvers that are part of the AIC mission; *i.e.,* maneuvering flight, use of radar, navigation, data links, sensors, fire control systems, *etc*. Flights can involve various fixed wing and rotary wing aircraft, including UAVs. Speeds are typically between 50 and 500 knots, but can reach supersonic (Mach 1.4) on occasion.
	Surface Ship Radiated Noise Measurements	Surface Ship Radiated Noise Measurements (SSRNM) are assessments conducted on surface ships at a specified periodicity to determine a ships radiated noise in the water while operating underway. The data collected in the SSRNM can be used to reduce a ship's radiated noise and thereby increase the ship's threat detection capability, reduce mutual ship interference, reduce the ability of a passive torpedo to acquire the ship, and reduce the chance of the ship detonating an acoustically-activated mine.
	Anti-Submarine Warfare (ASW)	ASW typically involves the use of sonobuoys deployed from aircraft to detect submerged threats. Other equipment used can include explosives (SUS MK61, SUS MK64, Marine markers, and dipping sonars. Typical aircraft involved include helicopters, P-3s, and Multi-mission Maritime Aircraft.
	Sonobuoy Quality Assurance/Quality Control	Sonobuoys are expendable devices used for the detection of underwater acoustic sources and for conducting vertical water column temperature measurements. The Navy's sonobuoy QA/QC program is a test and evaluation effort to ensure manufacturer compliance with operational and technical specifications. Four types of sonobuoys are tested: passive, active, bathythermograph and explosive. Those sonobuoys that perform satisfactorily are scuttled and not recovered. Those that fail testing are recovered for analysis and rework. A boat in the vicinity of the impact area monitors the area for safety and recovers malfunctioning sonobuoys.
	Combat System Ship Qualification Trial	Conducted for new ships and for ships that have undergone modification and/or overhaul of their combat systems, can include operating any or all of a ship's combat systems.
	RDT&E Bombing Exercises (BOMBEX)	BOMBEX involves aircraft employing bombs (98% NEPM) and the release of other inert stores such as empty fuel tanks, launch rails, mass models, and other similar objects on various types of stationary and mobile targets.
	Electronic Combat/Electronic Warfare	Tests designed to assess how well EC/EW training exercises are performed. Includes signal identification, electronic systems operations, and the deployment of chaff, flares, and decoys.
	Acoustic Trials	Acoustic testing, meant to increase ship survivability in threat environments, identifies a ship's quiet operating speeds, defines the ship's radiated acoustic signature, outlines noise problems and isolates sources of classifying tones.
	High Frequency	Use of high frequency radio signals and the evaluation of their effectiveness.

Table D-1. Baseline RDT&E Operations

Mission Area	Operation	Operation Description
Planned Testing & Evaluation Operations	At Sea Bearing Accuracy Tests (ASBAT)	ASBAT determines the accuracy of submarine radio direction finding equipment, and provides test signal generation or Radio Direction Finding signals for electronic surveillance measures shipboard sensors as well as underwater tracking, communications, and surveillance radar.
	Missile and Gunfire RDT&E	General air-to-air, air-to-surface, surface-to-air, and surface-to-surface missile exercises. Various missiles may be tested including AIM-120 AMRAAM, AIM-9 Sidewinder, AIM-132 ASRAAM, and AIM-7 Sparrow. Various targets may be employed, and chaff and flares may also be incorporated into the missile tests. In Air-to-Surface missile events, the following missiles may be used: AGM-45 Shrike; AGM-114 Hellfire; AGM-88 HARM; AGM-65 LSR Maverick; AGM-119 Penguin; BQM 34/74 Firebee/Chukar; GQM-163 Coyote; AGM-62 Walleye; AGM-84 Harpoon. The Firebee/Chukar and Coyote are airborne targets launched from Wallops Island. Gunfire events at sea can include expenditure of predominantly 20mm projectiles; however, .50 cal, 7.62 mm, 25mm, 30mm and 40mm are used on occasion.
	Weapon System Accuracy Trials	WSAT are conducted aboard Anti-Submarine Warfare (ASW) capable ships to demonstrate their performance after construction, conversion, or overhaul. The WSAT is a comprehensive test of the complete ASW combat system and is the final examination before Combat System Certification. Functions tested include target acquisition and tracking, fire control solution, weapons launch, and weapons delivery accuracy. WSATs dynamically evaluate the accuracy of ship ASW, navigation, and weapon system errors; determine system adequacy, and are used to align systems and to improve design. The WSAT uses differential Global Positioning System (GPS), microwave underwater tracking, and/or optical theodolites to determine the ship's position and heading accurately. Data are collected on each of the ship's sensors and merged with tracking data to computer range and bearing errors and to evaluate alignment.
	Airborne Mine Countermeasures RDT&E	These events involve deployment and operation of mine detection equipment from helicopters at sea. Mine detection equipment can include: AN/ASQ-20A, Airborne Laser Mine Detection System (ALMDS), Airborne Mine Neutralization System (AMNS), and Rapid Airborne Mine Clearance System (RAMICS) may also be included.
	Joint Task Force Wide Area Relay Network	Demonstration of advanced Command, Control and Communications technologies in a highly mobile, wireless, wide-area relay network in support of tactical forces.
	Test Unmanned Surface Vehicles	Remote-controlled boats equipped with modular packages to potentially support surveillance and reconnaissance activities, mine warfare, anti-terrorism/force protection, port protection, Special Forces operations, and possibly anti-submarine warfare.

Table D-1. Baseline RDT&E Operations

Mission Area	Operation	Operation Description
Planned Testing & Evaluation Operations	Test Unmanned Aerial Vehicles	Remotely piloted or self-piloted aircraft that include fixed-wing, rotary-wing, and other vertical takeoff vehicles. Can carry cameras, sensors, communications equipment, weapons, or other payloads. Could support: intelligence, surveillance, and reconnaissance; suppression of enemy air defenses; electronic attack; anti-surface ship and anti-submarine warfare; mine warfare; communications relay; and derivations of these themes.
	NAVAIR Events in Support of NAVSEA	The NAVSEA RDT&E operations that NAVAIR supports include test operations such as Ship Self Defense Systems (SSDS), Combat Surface Ship Qualification Trials (CSSQT), Cooperative Engagement Capability (CEC), Theater High Altitude Air Defense, Ship Survivability Tests, Electronic Warfare, Littoral Combat Ship (LCS) and DDX Trials, and similar scenarios. These support operations include target presentation, support aircraft flights, data collection, analysis, range safety, electronic warfare support, reconnaissance, ship ground station interface, and other aviation related support to MISSILEX and TRACKEX events. BQMs, Coyotes and AQMs are launched from NASA Wallops, Dam Neck or NAWC38 vessel, *etc*. Aerial Target Presentations in support of Live MISSILEX Events. BQM-34/74 (subsonic) aerial targets. BQM denotes surface launched, AQM denotes air-launched. Coyote is a supersonic aerial target. Several other types of missiles may be launched from the NAVSEA platform under test. They could include SM-1, SM-2, Rolling Airframe Missile, Sea Sparrow, Tomahawk, or other types of surface launched weapons. The Phalanx weapons systems may also be deployed during certain exercises.
Naval Undersea Warfare Center Ranges	Shipboard Electronic Systems Evaluation Facility (SESEF) Quick Look Tests	Evaluate ship, shore, and aircraft systems that emit or detect electronic emissions. These systems include those used for radio communications, data transfer, navigation, radar, and identification of friend and foe.
	SESEF System Performance Tests	Provide accuracy checks of ship and submarine sonar, both in active and passive modes, and to evaluate the accuracy of a ship's radar
	Fleet Operational Readiness Accuracy Check Site (FORACS) Tests	Provide accuracy checks of ship and submarine sonar, both in active and passive modes, and to evaluate the accuracy of a ship's radar.
Future RDT&E Operations	Directed Energy	Develop the necessary standard operating procedures and range safety requirements necessary to provide safe operations associated with future high energy laser tests.

MAJOR RANGE EVENTS

A Major Range Event is a significant operational employment of live forces during which live training is accomplished.

- It is a major field and/or at-sea exercise with multiple training objectives.
- It usually occurs over an extended period of days or weeks.
- It is typically composed of multiple range operations, each with its own mission, objective, and time period.
- The composition and timing of range operations may be driven by a scenario to create an anticipated real-world situation.

Major range events, typically include:

- Carrier Strike Group Composite Training Unit Exercise (CSG COMPTUEX)
- Expeditionary Strike Group Composite Training Unit Exercise (ESG COMPTUEX)
- JTFEX.

Major range events:

- Are significant operational employments during which range operations are conducted involving multiple NTAs/MCTs, units, and capabilities.
- Normally involve a large number of personnel and air, surface, subsurface and ground assets in multi-dimensional exercises designed to train a force for deployment.
- Typically occur across a broad area of a range complex or in multiple range complexes.

Participants typically include as many as:

- Ten surface ships (CVN or LHA/LHD, LPD, and LSD, and CGs, DDGs, and FFGs)
- Three submarines (SSN)
- One hundred aircraft, both fixed winged and helicopters
- Eight thousand personnel embarked in the ships and aircraft.

A major range event is essentially a number of "unit level" range operations conducted by several units operating together and directed by a centralized command and control commander, such as a Strike Group commander. For example, a Carrier Strike Group could conduct a coordinated antisubmarine operation in which several units (CVN, CG, DDG, SH-60B/F, MH-60R, MPA, SSN) work together to find and "destroy" an "enemy" submarine within a larger scenario where other units conduct an air strike against a target ashore.

Any of the range operations included in this publication could feasibly be included in a major range event. Range operations are chosen to be included in the major range event based on the anticipated operational missions that will be performed during the Strike Group's deployment and the state of readiness already achieved by the participating units.

CSG COMPTUEX

The CSG COMPTUEX is an Integrated Phase, at-sea, major range event that integrates the aircraft carrier and carrier air wing with surface and submarine units in a challenging environment. Commander Strike Force Training Atlantic schedules and conducts the CSG COMPTUEX in accordance with a schedule of events plan. It is nominally 26 days long with two scenario-driven "mini" multi-threat battle problems, one that is about 24 hours long and the other about 18 hours long.

The operations included in the scenario are specifically tailored for the operational training that is needed by the Strike Group prior to their deployment, and they are held at various times of the year depending on the rotational nature of the Strike Group's deployment. Typically, live-fire operations that take place during COMPTUEX include long-range air strikes, NSFS, and other surface gunnery and missile exercises.

ESG COMPTUEX

The ESG COMPTUEX is an Integrated Phase, at-sea, major range event that is a standard part of every MEU's pre-deployment training program and lasts for about 18 days. The exercise centers on situational training exercises in which the MEU is issued a series of orders that are designed to replicate the types of missions they are likely to face during their deployment. The MEU then quickly plans and executes the missions to test their rapid-response capabilities. An ESG COMPTUEX is sometimes held during the same time frame as the JTFEX.

Typically, the first half of the ESG COMPTUEX focuses on preparing the amphibious ships of the ESG for the missions they will perform while on deployment. The embarked Marines normally launch ship-to-shore raids and conduct urban-combat training at areas ashore. Over the next several days, the MEU's equipment and its ground combat element are loaded into the amphibious ships of the ESG by landing craft from the beach.

JOINT TASK FORCE EXERCISE (JTFEX)

JTFEX is a scenario-driven, sea control, power projection exercise with the purpose of evaluating the readiness of naval forces and testing the interoperability and proficiency of these forces in realistic scenarios ranging from military operations other than war to armed conflict. JTFEX typically encompasses operations from in port to sea-air-land combat, to special warfare, to humanitarian assistance operations.

JTFEX is a dynamic and complex major range event that is the culminating exercise in the Sustainment Phase training for the Carrier Strike Group (CSG) or Expeditionary Strike Group (ESG). Commander Third Fleet and Commander Second Fleet have specified hundreds of Sustainment Phase training objectives contained within most warfare mission areas for CSGs and ESGs to accomplish through the range operations that are included in their tailored JTFEX. JTFEX may be conducted simultaneously with CSGs and ESGs working together, but this opportunity is infrequent because of their differing schedules.

JTFEX emphasizes mission planning and effective execution by all primary and support mission elements, including command and control, surveillance, intelligence, logistics support, and the integration of tactical fires. JTFEXs are complex and evaluate a strike group in all warfare skills. JTFEX is

nominally 10 days long, not including a 3-day in port Force Protection Exercise, and can be the last at-sea exercise for the CSG prior to deployment.

JTFEXs usually involve one CSG or ESG made up of the following participants:

- CSG: 1 CVN with Carrier Air Wing, 1 CG, 1-2 DDG, 1-2 FFG, 1 AOE, 1 SSN or SSGN
- ESG: 1 LHA or LHD with Air Wing, 1 CG, 1-2 DDG, 1-2 FFG, 1 LPD, 1 LSD, 1 AOE, 1 SSN or SSGN, Embarked Marines.

The vast majority of range operations specified for a JTFEX can be completed within the training areas of a single range complex, but depending on the exercise scenario, they may expand to include the use of other nearby ranges.

MISCELLANEOUS RANGE EVENTS

A Miscellaneous Range Event is an operational employment of live forces during which live training is accomplished and usually:

- Has a smaller number of forces than a major range event;
- Is more focused on a specific type of training, such as antisubmarine warfare;
- Has multiple training objectives; and
- Occurs over one or just a few days.

Like a major range event, each operation may have its own mission, objective, and time period, or be scenario driven. Examples include:

- Sink Exercise (SINKEX)
- Air Defense Exercise (ADEX)
- Maritime Integrated Tailored Training (MITT) Exercise
- Southeastern Antisubmarine Warfare Training Initiative (SEASWTI)
- Tailored Training Threat Exercise (T3EX)
- Surge Exercise (SURGEX)
- Expeditionary Fires Exercise (EFEX)
- Special Operations Capable exercise (SOCEX)
- Certification Exercise (CERTEX)
- Supporting Arms Coordination Exercise (SACEX)

Since 1999, the Navy completed 16 SINKEXs in the western North Atlantic Ocean, including waters offshore of Puerto Rico (NMFS 2006). Figure D-1 shows the locations of these SINKEXs, and the area of primary activity.

SINKEX

A SINKEX is typically conducted by aircraft, surface ships, and submarines in order to take advantage of a full size ship target and an opportunity to fire HE weapons. For detailed information on the SINKEX program please refer to the Programmatic Overseas Environmental Assessment for Sinking Exercises (SINKEX) in the Western North Atlantic Ocean prepared by NAVSEA for United States Fleet Forces in November 2006.

The target is typically a decommissioned combatant or merchant ship that has been made environmentally safe for sinking. It is placed in a specific location so that when it sinks it will serve another purpose, such as a reef, or be in deep water where it will not be a navigation hazard to other shipping.

Ship, aircraft, and submarine crews typically are scheduled to attack the target with coordinated tactics and deliver HE ordnance to sink the target. Inert ordnance is often used during the first stages of the event so the target may be available for a longer time. The duration of a SINKEX is unpredictable because it ends when the target sinks, but the goal is to give all forces involved in the exercise an opportunity to deliver HE ordnance. Sometimes the target will begin to sink immediately after the first weapon impact and sometimes only after multiple impacts by a variety of weapons. Typically, the exercise lasts for 4 to 8 hours and possibly over 1 to 2 days, especially if NEPM ordnance, such as 5-inch gun projectiles or MK-76 dummy bombs, is used during the first hours.

A SINKEX occurs only occasionally, maybe once a year per coast, probably during a JTFEX, and is conducted under the auspices of a permit from the U.S. Environmental Protection Agency (USEPA).

The participants and assets could include:

- One full-size target ship hulk
- One to five CG, DDG, or FFG firing ships
- One to 10 F/A-18, or MPA firing aircraft
- One or two HH-60H, MH-60R/S, or SH-60B Helicopters
- One E-2 aircraft for Command and Control
- One firing submarine
- One to three range clearance aircraft.

Some or all of the following weapons could be employed:

- Two to four Harpoon surface-to-surface or air-to-surface missiles
- Two to eight air-to-surface Maverick missiles
- Two to 16 MK-82 General Purpose Bombs
- Two to four Hellfire air-to-surface missiles
- One or two SLAM-ER air-to-surface missiles
- Fifty to 500 rounds 5-inch and 76 mm gun
- One MK-48 heavyweight submarine-launched torpedo
- Two to Ten Thousand rounds .50 cal and 7.62 mm.

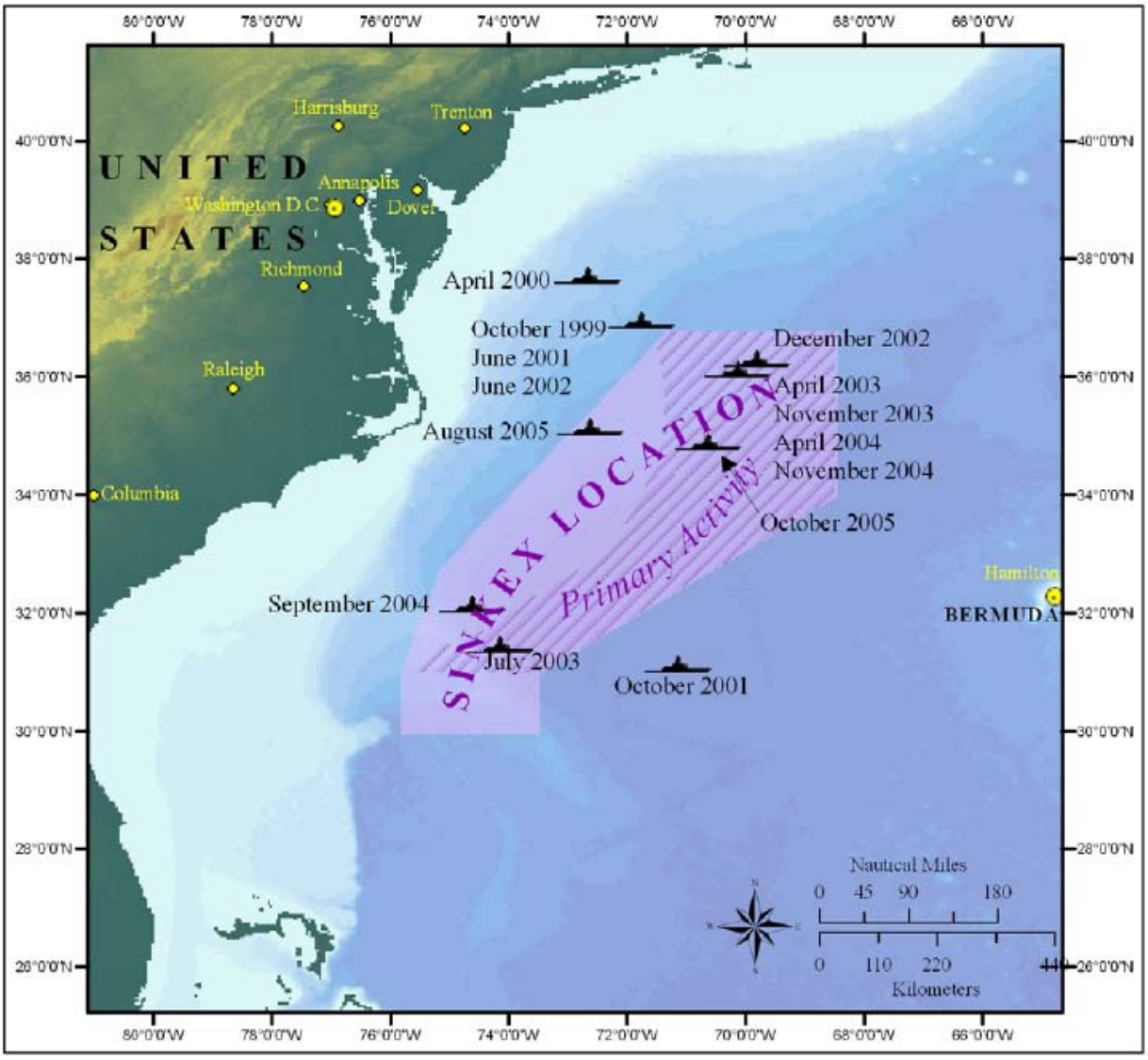

Figure D-1: Locations of Previous SINKEXs (NMFS 2006)

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APPENDIX E

WEAPONS SYSTEMS DESCRIPTION

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APPENDIX E
WEAPON SYSTEMS

Table E-1. Typical Missile Exercise Weapons Used in the Navy CP Range Complex

TYPE	CHARACTERISTICS				
	Weight	**Length**	**Diameter**	**Range**	**Propulsion**
Air-to-Air Missiles					
		Short Range			
Sidewinder (AIM-9)	84.4 kg (186 lb)	2.9 m (9 ft 6 in)	127 mm (5 in)	18.5 km (10 nm)	Solid fuel
		Medium Range			
Sparrow (AIM-7)	231 kg (510 lb)	3.6 m (11 ft 10 in)	203.2 mm (8 in)	55.6 km (30 nm)	Solid fuel
Air-to-Surface Missiles					
		Medium Range			
Hellfire (AGM-114)	45.77 kg (100.9 lb)	1.63 m (64 in)	17.78 cm (7 in)	8000 m (4.3 nm)	Solid fuel
HARM (AGM-88)	366.1 kg (807 lb)	4.2 m (13 ft 9 in)	254 mm (10 in)	18.5 km (10 nm)	Solid fuel
TOW (BGM-71)*	18.9 kg (41.67 lb)	1.16 m (3.81 ft)	0.152 m (0.50 ft)	3,750 m (2.02 nm)	Solid fuel
Surface-to-Air Missiles					
		Short Range			
Sea Sparrow (RIM-7)	204 kg (450 lb)	3.7 m (12 ft)	203 mm (8 in)	14.8 km (10.6 nm)	Solid fuel
		Medium Range			
Standard SM-2 (RIM-66C)	612 kg (1,350 lb)	4.4 m (14 ft 7 in)	342.9 mm (13.5 in)	74.1 km (53 nm)	Solid fuel
		Long Range			
Standard SM-2 ER (RIM-67A/B and 67-C/D)	1,325 kg (2,920 lb)	8.2 m (27 ft)	342.9 mm (13.5 in)	166.7 km (90 nm)	Solid fuel
Standard SM-2 AER (RIM-67B)	1,452 kg (3,200 lb)	6.7 m (22 ft)	342.9 mm (13.5 in)	150 km (107.1 nm)	Solid fuel

Source: U.S. Department of the Navy, 1998a

Notes:

* Describes the Variant BGM-71B.

ft	feet	lb	pounds
in	inches	m	meters
kg	kilograms	mm	millimeters
km	kilometers	nm	nautical miles

Table E-2. Typical Aerial Target Drones Used in the Navy CP Range Complex

TYPE	CHARACTERISTICS			
	Length	**Speed (Maximum)**	**Operational Altitude (Maximum)**	**Time on Station (Maximum)**
Subsonic				
TALD/ITALD	2.34 m (7ft 8in)	Mach 0.84	12,200 m (40,000 ft)	23.2 minutes
BQM-34S	7 m (23 ft)	Mach 0.9	15,240 m (50,000 ft)	60 minutes
BQM-74E	4 m (13 ft)	525 knots	12,308 m (40,000 ft)	68 minutes
Supersonic				
AQM-37C	4.1 m (13.6 ft)	Mach 4.0	30,480 m (100,000 ft)	N/A

Source: U.S. Department of the Navy, 1998a

Notes:

ft: feet; m: meters; N/A: Not Applicable; TALD: Tactical Air Launched Decoy; ITALD: Improved TALD.

Table E-3. Typical Existing Target Systems Used in the Navy CP Range Complex

Type	Category	Name	Propellant Type
Balloon			
	Aerial	Balloon	N/A
Towed			
	Aerial	TDU-34A	N/A
Surface			
		MK-58 (Smoke Float)	N/A
		High Speed Maneuvering Surface Target	Liquid
		HULK (TBD)	N/A
		ISTT (Improved Surface Towed Target)	N/A
		Mk-33 Seaborne Powered Target (SEPTAR)	Liquid
		Floating-at-Sea Target	N/A
		Stationary Barge with Elevated Emitters	N/A
		Trimaran	N/A
		Radar Reflective Surface Balloon (Killer Tomato)	N/A
		Paper Echo Silhouette or Barrel on a Pallet	N/A

Source: U.S. Department of the Navy, 1988a; Notes: N/A Not Applicable

Table E-4. Typical Existing Weapons Used in the Navy CP Range Complex

Type	Category	Name	Propellant Type (Liquid/Solid)
Underwater Charges			
	EOD Divers	20 lb (C-4) charges	N/A
Missiles			
	Ship	SM-2 (RIM-66/RIM-67)	Solid
	Ship	Sea Sparrow (RIM-7)	Solid
	Air	Hellfire (AGM-114)	Solid
	Air	TOW (BGM-71)	Solid
	Air	Sparrow (AIM-7)	Solid
	Air	Sidewinder (AIM-9)	Solid
	Air	HARM (AGM-88)	Solid
Guns			
	Ship	Large Caliber Naval Guns (5” and 76mm)	N/A
	Ship	MK-38 25 mm Machine Gun	N/A
	Ship	Phalanx/Vulcan (20mm)	N/A
	Ship	9 mm/.45 cal pistol	N/A
	Ship	5.56/7.62 mm/.50 caliber guns	N/A
	Ship	Small Caliber (M-16, M-4, M-249 squad automatic weapon, M-240G machine gun, 40 mm TP)	N/A
	Ship	M-40 sniper rifle (308 cal)	N/A
	LCAC/LCU/AAV	Small Caliber (M-16, 9 mm/.45 cal pistol, shotgun, .50 cal machine gun, MK-19 40 mm grenades)	N/A
	LARC	Small Caliber (M-16, 9 mm/.45 cal pistol, shotgun)	N/A
	Air	AMNS, RAMICS (30 mm)	N/A
	Air	Small Caliber (.50 cal, 7.62 mm, 9 mm, 5.56 mm, .308 cal)	N/A
	Air	20 mm cannon and 25 mm cannon	N/A
Bombs			
	Air	MK-82 or GBU-30/38 (HE and NEPM)	N/A
	Air	MK-83 or GBU-32 (HE and NEPM)	N/A
	Air	MK-84 (HE)	N/A
	Air	BDU-45 (NEPM)	N/A
	Air	MK-76 (NEPM)	

Source: Adapted from U.S. Department of the Navy, 1998a; Note: N/A Not Applicable.

Table E-5. Typical Electronic Warfare Assets Used in the Navy CP Range Complex

TYPE	CHARACTERISTICS	
	Frequency Bands	Power Output (Maximum)
Threat Simulators (Airborne)		
AN/AST6DPT-1(V)	Version V10 7.8-8.5 GHZ	15 MW
	Version V20 8.5-9.6 GHZ	20 MW
	Version V30 14-15.2 GHZ	25 MW
	Version V42 15.5-17.5 GHZ	30 MW
AN/AST 9	Version India (M) 8.5-9.6 GHZ	20 MW
	Version India (T) 8.5-9.6 GHZ	115 KW
	Version Juliet (M) 14-15.2 GHZ	25 MW
	Version Juliet (T) 14-15.2 GHZ	115 KW
Radar Jamming Systems (Airborne)		
AN/ALQ 167	Version V38 425 to 445 MHZ	800 W
	Version V39 902-928 MHZ	800 W
	Version V46 2.9-3.5 GHZ	800 W
	Version V15a/6X 9-10.2 GHZ	800 W
Multi-Band Advanced DRFM Jammer (MADJAM)		
	Version 1 9.0 – 10.2GHz single DRFM	
	Version 2 9.0 – 10.2 GHz dual DRFM	
	Version 3 420 – 535 MHz	
	Version 3 420 – 535 MHz 2.9 – 3.5 GHz 9.0 – 10.2 GHz Internal to Lear Jet, Dual DRFM	
Communications Jamming System (Airborne)		
AN/USQ-113	Version V1 20-500 MHZ	400 W
Chaff (Passive system)		
RR-144A/AL	N/A	N/A
MK-214	N/A	N/A
MK-216	N/A	N/A
Flares (Infrared Countermeasures)		
MK-46 MOD 1C	N/A	N/A
MJU-8A/B	N/A	N/A
MJU-27A/B	N/A	N/A
MJU-32B	N/A	N/A
MJU-53B	N/A	N/A
SM-875/ALE	N/A	N/A

Source: Adapted from U.S. Department of the Navy, 1998a.

Notes:

ft	feet	in	inches	kW	kilowatts	m	meters	mm	millimeters
GHz	gigahertz	kg	kilograms	lb	pounds	MHz	megahertz	W	watts

TYPICAL EXISTING TARGET SYSTEMS USED IN THE NAVY CHERRY POINT RANGE COMPLEX

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AIR TARGETS

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NORTHROP GRUMMAN

DEFINING THE FUTURE™

BQM-74E

Delivering High Performance at Low-Cost and Supporting More Than 80 Percent of the U.S. Navy's Target Missions

The BQM-74E is a turbojet-powered aerial target with high performance capabilities. While emulation of enemy anti-ship cruise missiles is the primary mission; others include simulation of aircraft for training naval aviators in air-to-air combat and support of the test and evaluation of new weapon systems. The BQM-74E and its ground support system are highly portable. This attribute enables shipboard operations in support of deployed naval combatants where maximum flexibility and rapid turnaround are required.

The BQM-74E can carry a variety of internal and wing tip-mounted payloads in support of mission requirements. Payloads include passive and active radar augmentation, infrared (IR) flares, electronic countermeasures (ECM), seeker simulators, scoring, IFF, and dual wing tip-mounted tow bodies. The Integrated Avionics Unit, with its integral Inertial Measurement Unit (IMU), Air Data Computer, and Global Position System (GPS), provides a highly accurate navigation solution. Recently incorporated Low Altitude Control Enhancement (LACE II) software allows the vehicle to perform complex, programmable, 3-dimensional maneuvers and operate down to altitudes of 7 feet.

The BQM-74E can be used with multiple command and control systems, including the Integrated Target Control System (ITCS), Multiple Aircraft GPS Integrated Command Control (MAGIC2), Vega, and System for Naval Target Control (SNTC). It can be employed in either a manual mode or a pre-programmed (hands off) mode.

Since 1968, the MQM/BQM-74 series of aerial targets has been the workhorse of the Navy's subsonic aerial target inventory. Due to its exceptional performance and mission reliability, the BQM-74E has provided over 80 percent of all U.S. Navy target presentations.

Specifications

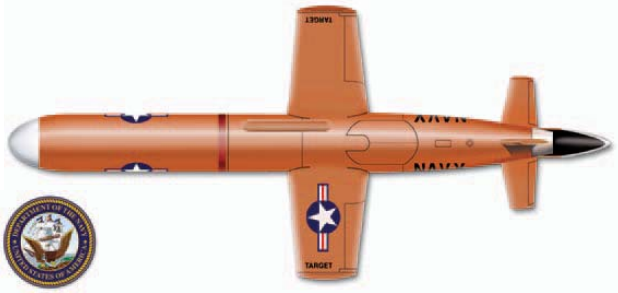
Length	12.95 ft (4.0 m)
Wingspan	5.78 ft (1.8 m)
Range	>350 nm (648.6 km)
Altitude	
Low	7 ft (2.1 m)
High	40,000 ft (12.2 km)
Speed	>515 Knots at Sea Level
Weight	455 lbs (206.4 kg)
Endurance	78 Minutes
Navigation	GPS/IMU
Fuel	Jet Fuel (JP-5, JP-8, or Jet A-1)

The Navy's Premier Aerial Target

The linchpin in RDT & E and training operations since 1978.

Payloads

- Passive or Active Radar Augmentation
- Seeker Simulators
- Infrared Augmentation
- Tow Systems
- Scoring Systems
- IFF
- Electronic Countermeasures



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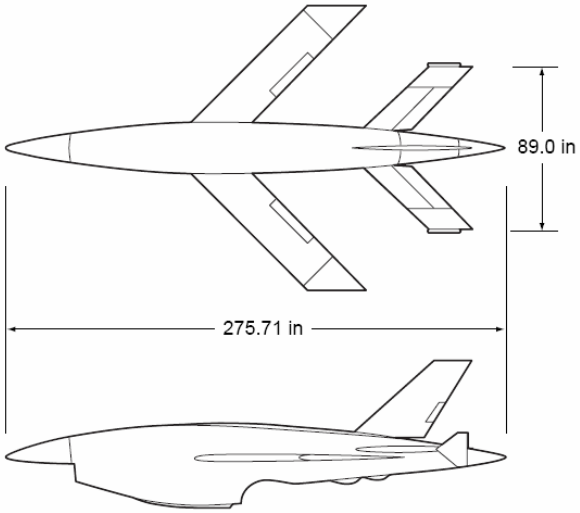
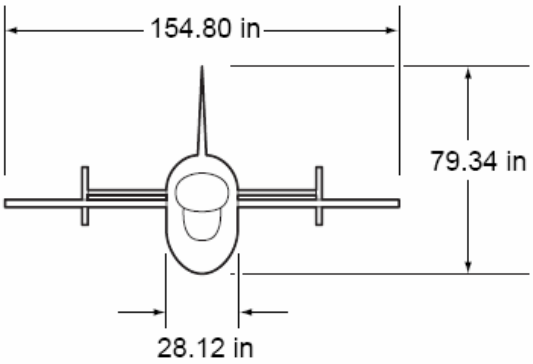
BQM-34S Firebee

Description

The BQM-34S Firebee subsonic fixed-wing family consists of a recoverable, remote-controlled, subsonic platform. The target is controllable through normal flight maneuvers with capabilities of performing up to 5g turns. The BQM-34 can be controlled using the Fixed Ground Control Station (FGCS), Drone Formation Control System (DFCS) or the Target Tracking and Control System (TTCS) at WSMR or the Integrated Target Control System (ITCS) at Point Mugu and China Lake or the System for Navy Target Control (SNTC) at major Navy ranges. The BQM-34 can accommodate a variety of Target Auxiliary/Augmentation Systems (TA/AS), including radar and infrared augmentation, threat emitters, countermeasures, scoring, location and navigation, and visual augmentation. The target is capable of formation flight using the DFCS. The Navy's BQM-34S total gross weight limit is 2,500 pounds for ground launches. This allows for just less than 300 pounds of payloads, ballast, and TA/AS equipment. Top speed is Mach 0.95 with a service ceiling of 60,000 ft. Endurance is up to 115 minutes. Thrust is provided by a GE J85-100 producing 2,850 lbs of thrust or a J-69 producing 1960 lbs of thrust.

Physical Characteristics





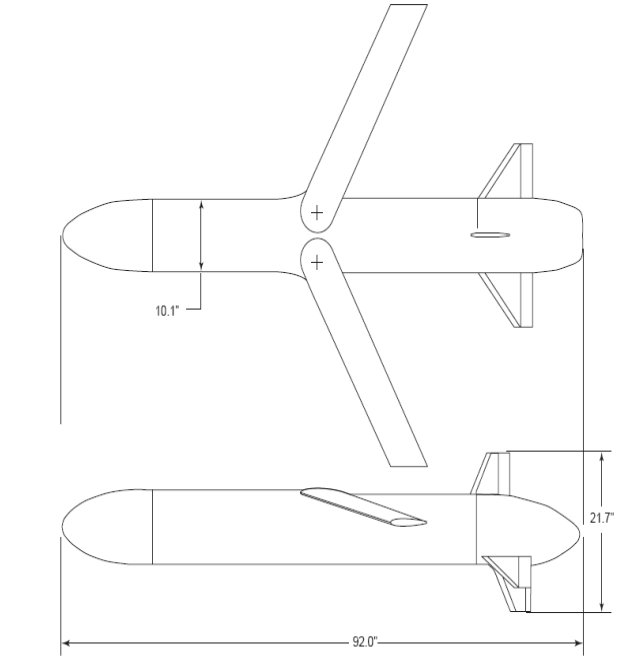
AN-ADM-141A/B Tactical Air-Launched Decoy (TALD)

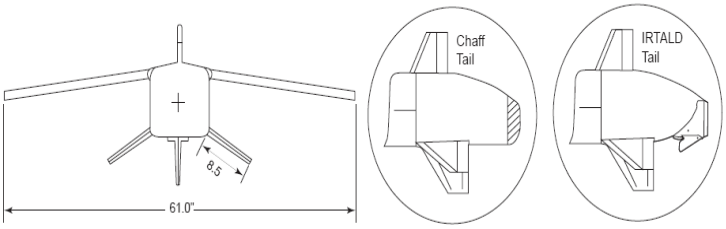
Description

The TALD (AN-ADM-141A/B) is an expendable glide vehicle with a square fuselage, flip-out wings, and three tail control surfaces. The wings, which are folded during carriage, open 3 seconds after launch. The necessary command sequences are pre-programmed on the ground. The AN-ADM-141A has passive and active radar enhancers.

The TALD is cleared for launch from S-3, A-4, F-4, A-6, A-7, F-14, F/A-18, AV-8 & UK GR7 platforms.

Physical Characteristics





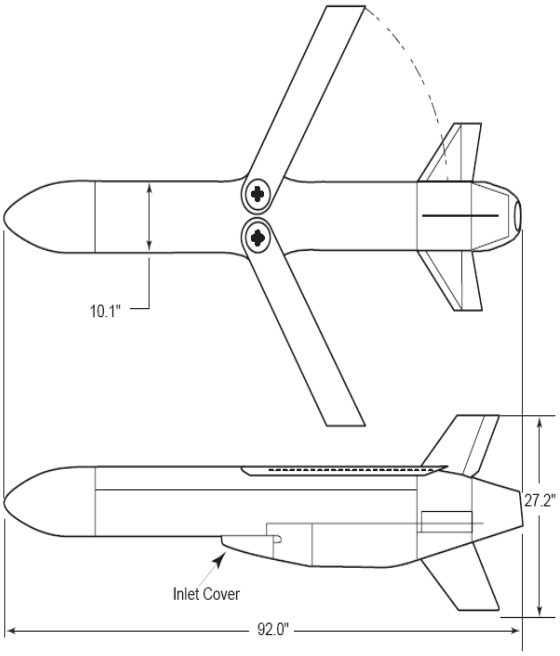
AN-ADM-141C Improved Tactical Air-Launched Decoy (ITALD)

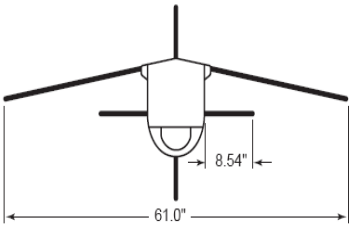
Description

The ITALD (AN-ADM-141C) is a modified propelled version of the TALD which incorporates a turbojet engine, the Teledyne CAE J700-CA-400. The engine starts after launch produces 170 lbs, has a 5.7 gallon fuel bladder and uses JP-10. This engine provides three constant airspeed settings. The necessary command sequences are pre-programmed on the ground. The ITALD is capable of climbs and descents, left or right turns, or an offset maneuver.

The ITALD is only carried on the F/A18C&D. It carries a max loadout of 6 ITALDs.

Physical Characteristics



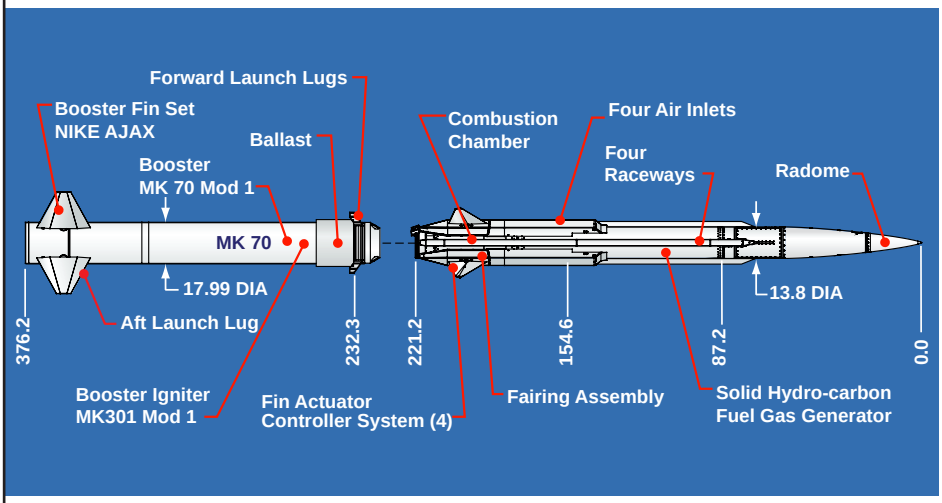


Wing Area: 2.74 ft²
Overall Length: 92 inches
Gross Weight: 375 lbs

FACT SHEET

GQM-163A Coyote

Supersonic Sea Skimming Target

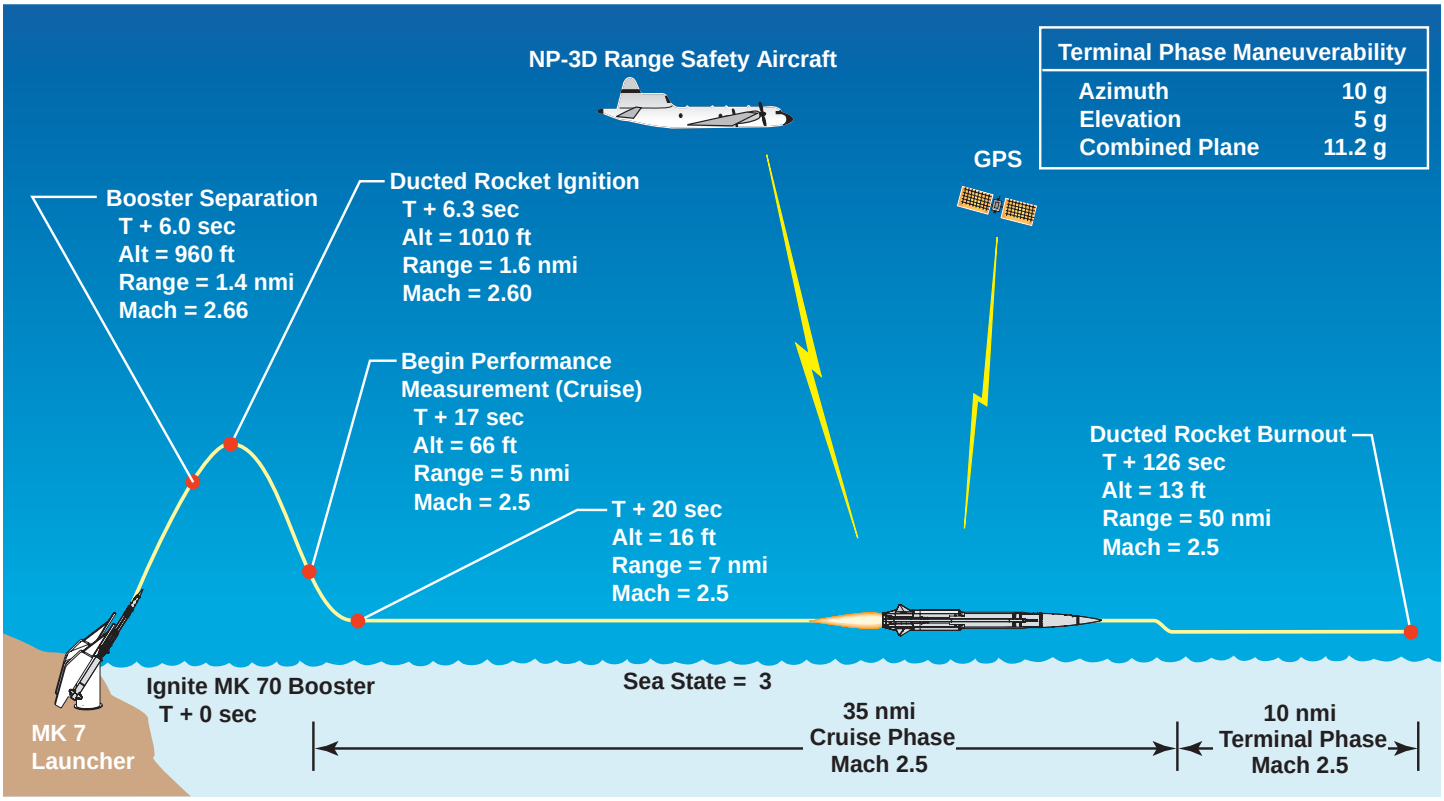


GQM-163A Program Overview

On 29 June 2000, Orbital Sciences Corporation, Launch Systems Group was awarded a $34 million Engineering and Manufacturing Development (EMD) contract for the GQM-163A Supersonic Sea Skimming Target system. Orbital's proven TMD and NMD ballistic missile target design philosophy of maximizing residual missile assets and off-the-shelf hardware and technology is being applied to cruise missile targets. This approach provides the U.S. Navy with the best value, lowest risk and highest performing GQM-163A system.

The GQM-163A MK 70 Booster/Ducted Rocket Sustainer configuration makes judicious use of residual Standard Missile assets and the $80 million U.S. Government investment in solid-fueled ducted rockets/ramjets. Major subcontractors, Aerojet and CEi, complement Orbital's systems engineering and integration strengths. The GQM-163A ducted rocket sustainer is based on technology developed by ARC under the U.S. Air Force's Variable Flow Ducted Rocket (VFDR) program. The GQM-163A avionics and front end structure are derivatives of the U.S. Navy AQM-37D Aerial Target System.

GQM-163A Coyote



Representative GQM-163A Mission Profile and System Performance

Customer: Program Executive Office for Strike Weapons and Unmanned Aviation, PEO(W)
Aerial Targets and Decoys Program Office, PMA-208

Objectives: Provide a Cost-Effective Target To Simulate the Supersonic Sea Skimming Anti-Ship Cruise Missile (ASCM) Threat

Support RDT&E of Ship Defense Systems and Support Fleet Training Exercises

Operational: October 2005

Prime Contractor: Orbital Sciences Corporation – Launch Systems Group, Chandler, Arizona

Major Subcontractors:

Aerojet, Camden, AR
- Solid Fuel Ducted Rocket Subsystem

CEi, Sacramento, CA
- Front End Subsystem
- Aerial Target Test Set

Point of Contact:

Mark Ogren, VP of Business Development
Telephone: 480.814.6605
ogren.mark@orbital.com

Orbital Sciences Corporation
Launch Systems Group
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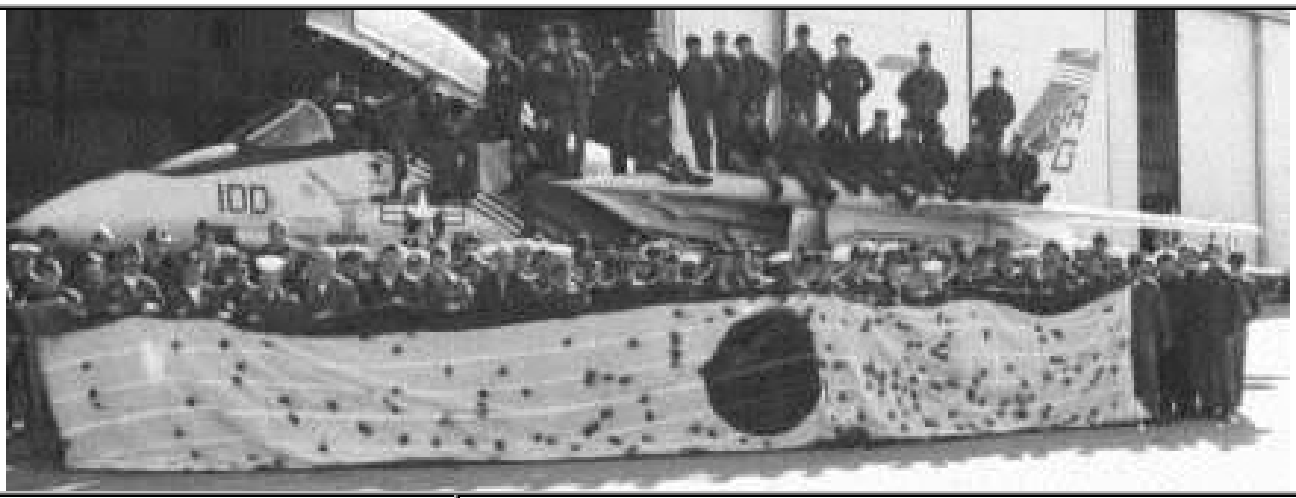
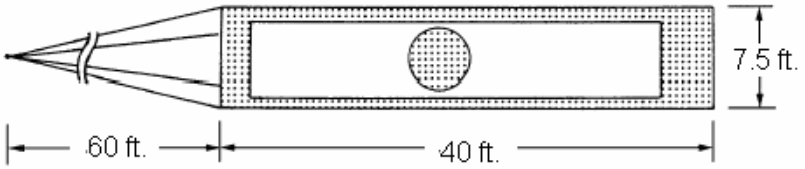
TDU-32A/B Rigid Tow Target



Description

The TDU-32A/B and TDU-32B/B aerial banner tow targets are effective low-cost devices for air-to-air and surface-to-air gunnery training. They are constructed of nylon fabric and are rectangular in shape. The TDU-32B/B is laser retroflective and used with the laser air-to-air gunnery system (LATAGS), while the TDU-32A/B is radar reflective. The TDU-32A/B and TDU-32B/B banner tow targets have a weighted steel tow bar and bridle assembly attached to the rectangular fabric panel. There is 60-foot safety nylon webbing bridle attached between the tow bar and tow cable. Both nonradar and radar-reflective panels are 7 1/2 feet by 40 feet. For visual tracking, the panels have a 12-inch orange border and a 48-inch orange bull's eye centered on the white portion. The targets, attached approximately 1,800 feet behind the tow aircraft, are launched from the runway by standard drag takeoff procedures. Target recovery is accomplished by dropping the target in a recovery area following the mission.

Physical Characteristics



Color:	white, orange border and bull's eye

Performance Data

Maximum Towing Velocity:	250 kts.
Tow Aircraft:	F/A-18

COMMERCIAL AIR SERVICES AIRCRAFT

Propeller Aircraft

Description

Mission Support

- Air Intercept Control training
- Internal Large Area Tracking Range
- Low Slow Flyer
- ASTAC

Physical Characteristics

Aircraft Specifications

- Max Speed at 30,000 ft. 295 kts
- Min Air Speed at 30,000 ft. 230 kts
- Max Air Speed at 200 ft. 250 IAS
- Min Air Speed at 200 ft. 100 IAS
- Endurance: 7.0 hours

Lear Jets

Description

Mission Support

- Air Intercept Control training
- Electronic Warfare
- Detect to Engage
- Target Tow (IR and TLX)
- Banner Tow
- Tracking Exercises

Physical Characteristics

Aircraft Specifications

- Max Speed at 30,000 ft. 460 kts
- Min Air Speed at 30,000 ft. 300 kts
- Max Air Speed at 200 ft. 300 IAS
- Min Air Speed at 200 ft. 200 IAS
- Endurance: 4.0 hours

Subsonic Aircraft

Description

Mission Support

Complex, high subsonic speed threat simulation of sea-skimming cruise missiles, or highly maneuverable threat fighter/bomber aircraft.

- **Air Intercept Control training**
- **Electronic Warfare**
- **Detect to Engage**
- **Target Tow (IR and TLX)**
- **Banner Tow**
- **Tracking**

Physical Characteristics

Aircraft Specifications

- **Type:** **Hawker Hunters**
- **Max Speed:** **620 KIAS**
- **Max Rng:** **1000 NM**
- **G-limits:** **+7.0g / -3.0g**
- **Ceiling:** **50,000 ft**
- **Max Climb Rate:** **16,000+ fpm**
- **Endurance:** **2.5 hours**

Supersonic Jets

Description

Mission Support

Complex, supersonic speed threat simulation of cruise missiles, or highly maneuverable threat fighter/bomber aircraft.

- **Air Intercept Control training**
- **Electronic Warfare**
- **Detect to Engage**
- **SFARP**
- **NSAWC**
- **Tracking**

Physical Characteristics

Aircraft Specifications

- **Type:** **KFIR**
- **Max Speed:** **1100 KIAS**
- **Max Rng:** **1300 NM**
- **G-limits:** **+7.0g / -3.0g**
- **Ceiling:** **55,000 ft**
- **Max Climb Rate:** **35,000+ fpm**
- **Endurance:** **2.5+ hours**

Description

Mission Support

Complex Multiple scenario Jammer including Radar, Comm Jamming and CHAFF dispensing Pods.

- **Airborne Refueling**
- **Exercise Support**
- **Cross Country Drags**

Physical Characteristics

Aircraft Specifications

- **Type: KC-707**
- **Max Speed: 480 KIAS**
- **Refuel Speed: 220-290 KIAS**
- **Give limits: 70-90k**
- **Endurance: 3-4 hours based on give**
- **Turn around time: 2-3 hours**
- **Crew day: 14-16 hours**

EW Aircraft

Description

Mission Support

Complex Multiple scenario Jammer including Radar, Communication Jamming and CHAFF dispensing Pods.

- **Electronic Warfare**
- **Tracking**
- **Stand Off Jammer**
- **ASMD Record/Playback**

Physical Characteristics

Aircraft Specifications

- **Type:** **G-1 Gulfstream**
- **Max Speed:** **225 KIAS**
- **Max Rng:** **1300 NM**
- **G-limits:** **+2.5g**
- **Ceiling:** **25,000 ft**
- **Endurance:** **5.0+ hours**

SURFACE TARGETS

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High-Speed Maneuverable Seaborne Target (HSMST)

Description

The High-Speed Maneuverable Seaborne Target has an aluminum hull and a foam-filled collar that surrounds the deck area. The target has replaced the QST-33 SEPTAR (2) and the Interim HSMST to represent high speed maneuvering threats in normal sea states (up to Sea State 3), providing up to 46 knots in calm seas. The propulsion system consists of two 200 HP outboard engines.

The target may be transported to the operations area on the deck of a ship. Remote control equipment can be located ashore, or on seaborne or airborne platforms.

HSMST can accommodate augmentation systems that include passive radar return enhancement, location and navigation systems and visual enhancement. Direct live fire on HSMST is authorized for large caliber surface ship guns only. All other direct live fire requires formal TYCOM/claimant authority. HSMST's can be utilized for multiple, independent target presentations in numbers greater than 10.

Physical Characteristics

Length:	26 ft.
Beam:	9 ft.
Freeboard:	1.7 ft.
Draft:	2.7 ft.
Hull Construction:	Aluminum, Foam Filled Collar, or Non-Foamed for High Explosive

Performance Data

Maximum Speed:	46 kts. Sea State 1
	25 kts. Sea State 3

Improved Surface Tow Target (ISTT)

Description

The Improved Surface Tow Target (ISTT) is a medium weight tow target designed to be towed behind a QST-35. It was designed to provide the user with a tow target capable of simulating various threat scenarios. The ISTT allows the user to conduct direct fire and/or bomb drop operations. Additionally, the ISTT can be configured to accomplish RCS and IR signature enhancements.

It supports requirements associated with the following weapons and/or weapons systems: Mk-86 Gun Fire Control System, rockets, fleet surface gunnery exercises, IR Maverick Missile System, Hellfire, and armed helicopter for aerial gunnery.

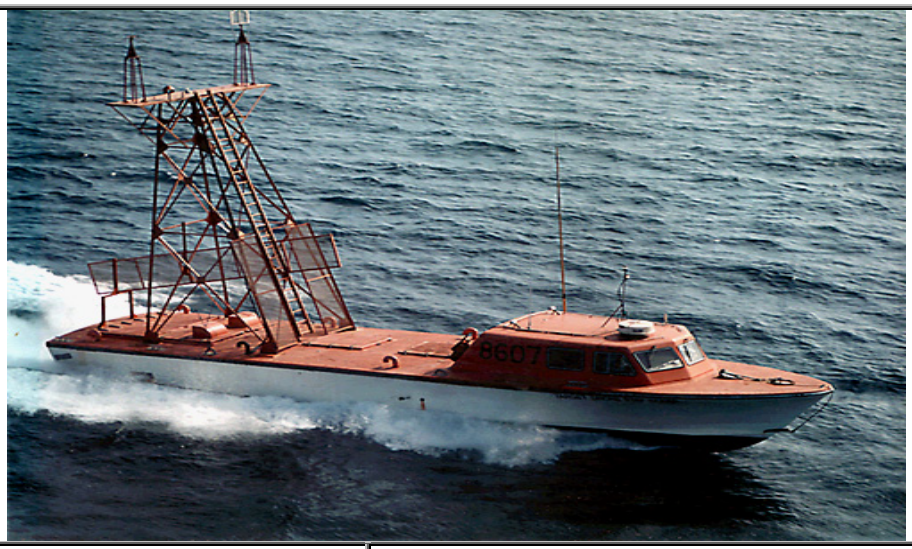
Physical Characteristics

Length:	28 ft.
Beam:	8 ft.
Freeboard:	2 ft.
Draft:	1 ft. (keel)
Hull Construction:	Fiberglass Reinforced Plastic

Performance Data

Maximum Speed:	25 kts. Sea State 1
	10 kts. Sea State 3

QST-35A Seaborne Powered Target (SEPTAR)



Description

The QST-35A Seaborne Powered Target (SEPTAR) is a high speed, remote controllable surface target designed to simulate the threat posed by patrol boats having a surface launch missile firing capability.

The QST-35A consists of a fiberglass planning hull powered by four Mercury Marine engines which produce up to 300 horsepower each. The maximum safe speed of the QST-35A is 30 knots in a very smooth sea state and declines to about 8 to 10 knots as the sea state builds to 3 or 4.

Target Augmentation Systems installed on the QST-35A are generally tailored to the particular operation it is supporting, such as radars, threat emitters, rocket launchers and scoring. There are currently 26 operational QST-35As.

Physical Characteristics

Length:	56 ft.
Beam:	14 ft.
Freeboard:	3 ft.
Draft:	2.4 ft.
Hull Construction:	Fiberglass Reinforced Plastic

Performance Data

Maximum Speed:	30 kts. Sea State 1

Ship Deployable Surface Target (SDST)

Description

The Ship Deployable Seaborne Target (SDST) is a high-speed commercial personnel watercraft. It is designed to provide a remotely controlled target, which can be augmented to present various threat scenarios.

SDST is unique in that it can be launched from Navy ships as well as any standard boat launch ramp. It can operate in at approximately 40 knots in sea state 1 and in a sea state 2 at approximately 20 knots.

Physical Characteristics

Length:	10.8 ft.
Beam:	4 ft.
Freeboard:	N/A
Draft (when static):	1.7 ft.
Hull Construction:	Fiberglass Reinforced Plastic

Performance Data

Maximum Speed:	40 kts. Sea State 1
	20 kts. Sea State 2

Williams Sled

Description

The Williams Sled Tow Target is a surface gunnery target consisting of a tubular framework mounted on two pontoons. The target is towed by approximately 5,000 feet of double-braided nylon line by a seagoing tug at approximately 10 knots or utilized as a freely drifting target. Wire fabric screens are mounted on both sides of the upper quarter of the framework to provide radar augmentation.

Physical Characteristics

Length:	27.8 ft.
Beam:	14 ft.
Freeboard:	10 in. to top of pontoon
Draft:	1.0 ft.
Hull Construction:	Steel

Performance Data

Maximum Tow Speed:	10 kts. Sea State 2

Trimaran Surface Towed Target

Description

- Can be towed behind the QST-35 or HSMST
- Can be deployed as a free floating target
- Myriad of mountable target augmentation systems

Physical Characteristics

- Fiberglass hull
- 14 ft long
- 7 ft 10 in wide
- 500 lbs

Low Cost Tow Target (LCTT)

Description

The Low Cost Tow Target (LCTT) was designed to be towed behind other remote seaborne targets. It was intended to support a variety of surface warfare (SUW) training events. Among other requirements were: able to be towed by the HSMST and larger platforms, to be self-righting, able to support missions at tow speeds from 4 to 30 knots, to be reasonably priced and survivable from small caliber impacts.

The LCTT can be towed behind any of the powered Surface Targets, but is intended primarily for use with the HSMST and the SDST.

Physical Characteristics

Length:	16 ft.
Beam:	4 ft.
Freeboard:	1.5 ft.
Draft:	0.3 ft.
Hull Construction:	Fiberglass Reinforced Plastic

Performance Data

Maximum Speed:	45 kts. Sea State 1

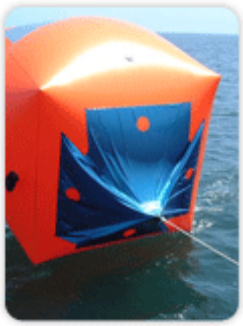
Radar Reflective Surface Balloon (Killer Tomato™)

Description

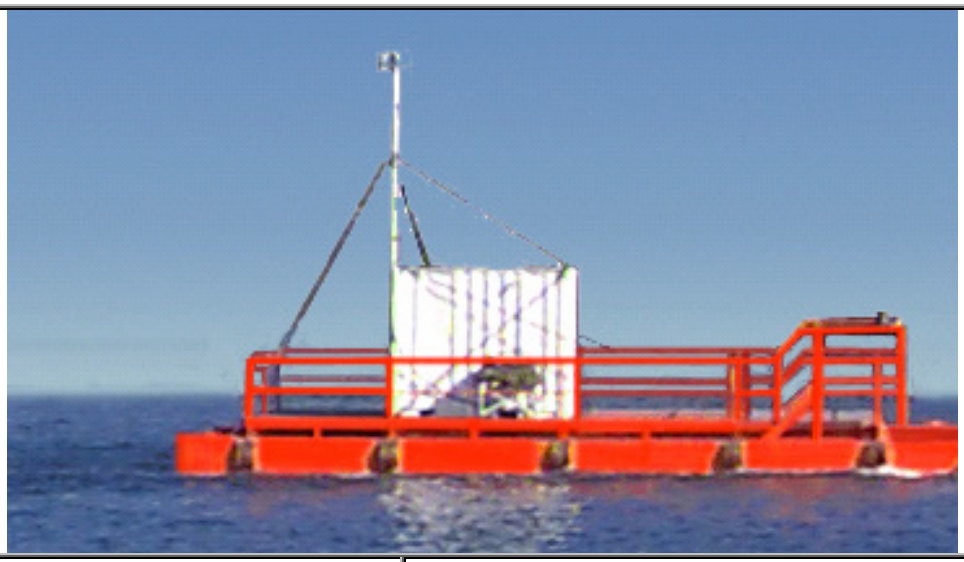
Killer Tomato™ Naval Gunnery Target balloon is an adrift target designed to stand upright on the wave surface without tumbling over in moderate sea states. Yields a radar signature to ship borne radar equipment from corner reflectors mounted in top corners of target. Can be detected 10+ miles away depending on radar equipment and sea state.

Physical Characteristics

This target has a self filling integrated drogue chute / skirt secure bottom of target to sea surface. It is air inflated, bright orange, 3 m^3 (10 x 10 x 10 feet) in size. Made with 12 mil PVC. Stainless steel metal “D-rings” for tie down, handling, minor towing, or floating trip line for recovery purposes. Integrated, self-deploying, drogue chute (no external sea anchor to buy and rig) reduces target wind drift and keeps target useful in more demanding sea state situations. Can be towed once chute is disabled or water ballast is tipped out using tie line. Radar reflective.



High-Speed Anti-Radiation Missile/Infrared Radiation (HARM/IR) Barge



Description

The HARM/IR Missile Target provides a highly survivable target for accurate missile systems. The development of this target is based on a twin pontoon or catamaran design in which each of the hulls is of welded steel construction with integral foam to improve buoyancy in the event of a breach. The enclosure contains a diesel generator electrical power source, the electronics for the Anti-Radiation Missile Emitter (ARME), and a large compartment that is heated by internal sources or by the sun. The temperature can be thermostatically controlled to provide the appropriate IR emissions.

This platform can support a wide variety of augmentation to satisfy any anti-ship or anti-radiation weapon system.

The enclosure with its vertical mast and the ARME antenna is removable for use as a HARM/IR Missile Target Augmentation Kit. This enclosure is suitable for use on any target platform large enough and with deck space to support it.

The heated enclosure can be used as an IR missile target without the ARME. This augmentation kit can be remotely activated and secured.

Physical Characteristics

Length:	45 ft.
Beam:	20 ft.
Freeboard:	1 ft.
Draft:	2 ft.
Hull Construction:	Welded Steel

Performance Data

Maximum Sea State:	3 (in tow)
	5 (when deployed)

Mk 42 Floating At-Sea-Target (FAST)

Description

The Floating At-Sea-Target (FAST) MK42 Mod 0 is a polygon (isodecahedron) shape of 20 sides approximately 6 feet in diameter. It consists of 20 equilateral triangular panels, which are reflector panels. Each reflector panel has nine integral corner reflectors which are coated with conductive paint that provides a radar reflective characteristic simulating the size of a destroyer or frigate-type vessel.

FAST is a reusable shipboard assembled target, deployable and recoverable from any Navy ship in weather conditions up to Sea State 3. FAST uses a Sea anchor to maintain stability. Once deployed, FAST can be used as a target in weather conditions of Sea State 4 or 5. In calm seas, the FAST has a visible range of up to 3.5 miles and can be used for surface to surface gunnery training.

Physical Characteristics

Height:	5.4 ft.
Width:	5.4 ft.
Hull Construction:	Aluminum/Plastic

Performance Data

N/A

TYPICAL EXISTING WEAPONS USED IN THE NAVY CHERRY POINT RANGE COMPLEX

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Vertical Launch Anti-Submarine Rocket ASROC (VLA) Missile

Description

Description

The Vertical Launch Anti-Submarine Rocket (ASROC) (VLA) is a missile designed to deliver the Mk46 Mod 5A (SW) torpedo to a water-entry point.

Background

The VLA is intended to provide vertical-launch-capable surface combatants with an all-weather, 360-degree quick-reaction, and standoff antisubmarine weapon capability. It is carried by Aegis-equipped ships (cruisers and destroyers) equipped with the Mk41 Vertical Launching System (VLS) and the SQQ-89 ASW Combat System. VLA includes a solid-propellant booster with thrust vector control (TVC) to guide the missile from a vertical orientation through a pitch-over maneuver into a ballistic trajectory intended to deliver the torpedo to an aim point on the ocean surface. Originally deployed with the MK46 Mod 5A(S) torpedo, all VLAs have been upgraded with the Mk46 Mod 5A (SW) torpedo. This variant of the Mk46 torpedo provides improved performance in shallow water. With Initial Operational Capability (IOC) of the Mk54 Lightweight Torpedo in 2004, a program is currently underway to upgrade the VLA inventory with the Mk54 Lightweight Torpedo.

U.S. Navy Fact Sheet Last Update: 17 January 2009

Physical Characteristics

- **General Characteristics, VLA Missile**
- **Contractor:** Lockheed Martin
- **Propulsion:** Solid propellant rocket
- **Length:** 16.7 feet
- **Diameter:** 14.1 inches
- **Weight:** 1,650 pounds
- **Range:** over 10 miles
- **Warhead:** 96.8 pounds, high-explosive

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Harpoon Block II

Description & Purpose:
Harpoon Block II expands the capabilities of the Harpoon anti-ship weapon. Harpoon, the world's most successful anti-ship missile, features autonomous, all-weather, over-the-horizon capability.

Customer(s):
Twenty-eight countries are Harpoon customers.

General Characteristics:

Length:	182.2 in. ship launch, 151.5 in. air launch
Diameter:	13.5 in.
Weight:	1,160 lb. Air configuration 1,459 lb. ASROC configuration 1,520 lb. TARTAR configuration 1,523 lb. Capsule/canister configuration
Range:	In excess of 67 NM
Propulsion:	Air-breathing turbojet engine (cruise), solid-propellant booster
Guidance:	Terminal: Active Radar Midcourse: GPS-aided inertial navigation
Warhead:	Penetration, high-explosive blast
System Elements:	Missile - Common for all launch platforms Booster - For surface, sub and land based applications Launch Support Structure and Canisters Command and Launch System - Provides engagement planning and launch control
Platforms:	Air, land, surface and sub-surface applications

Harpoon Block II provides accurate long-range guidance for land and ship targets by incorporating the low-cost inertial measuring unit from the Boeing Joint Direct Attack Munition (JDAM) program; and the software, mission computer, integrated Global Positioning System/Inertial Navigation System, GPS antenna and receiver from the Standoff Land Attack Missile Expanded Response (SLAM-ER).

The multi-mission Block II is deployable from all current Harpoon missile system platforms with either existing command and launch equipment or the commercially available Advanced Harpoon Weapon Control System (AHWCS).

Background:
Harpoon Block II is capable of executing both anti-ship and land-strike missions. To strike targets on land and ships in port, the missile uses GPS-aided inertial navigation to hit a designated target aimpoint. The 500-pound blast warhead delivers lethal firepower against a wide variety of land-based targets, including coastal defense sites, surface-to-air missile sites, exposed aircraft, port/industrial facilities and ships in port. For conventional anti-ship missions, such as open-ocean and near-land, the GPS/INS eliminates midcourse guidance errors enroute to the target area. The accurate navigation solution coupled with launch system improvements combine to offer better discrimination of target ships from islands, nearby land masses or other ships. These Block II improvements maintain Harpoon's high hit probability against ships very close to land or traveling in congested sea lanes.

Miscellaneous:
More than 7,000 Harpoons have been produced.

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August 2008

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Harpoon Block III

Description & Purpose:
Harpoon Block III takes the world's most successful anti-ship missile to a whole new level. With the addition of a robust data link system, Harpoon Block III provides in-flight target updates, positive terminal control and connectivity with future network architecture, resulting in more control after the weapon is released. The data link is the perfect addition to a missile that already provides autonomous, all-weather, over-the-horizon capability.

Customer(s):
The Harpoon Block III Weapon System will provide the U.S. Navy and its allies with Surface Warfare (SuW) capabilities from ships and aircraft. Harpoon Block III creates a highly-capable weapon for the open water and littoral warfare environment, adding Global Positioning System capability, littoral performance improvement and a precision moving target solution.

General Characteristics:

Length:	182.2 in. ship launch, 151.5 in. air launch
Diameter:	13.5 in.
Weight:	1,160 lb. air configuration 1,523 lb. surface launch capsule/canister configuration
Range:	In excess of 67 NM
Propulsion:	Air-breathing turbojet engine (cruise), solid-propellant booster
Guidance:	Terminal: Active Radar Midcourse: GPS-aided inertial navigation and In-Flight Target Updates (IFTU) via secure data link.
Warhead:	Penetration, high-explosive blast
System Elements:	Missile - Common for all launch platforms Booster - Added for surface applications Launchers - Uses existing equipment or the Harpoon Canister Launcher Command and Launch System - Provides engagement planning and launch control

Launch Platforms:	Air, surface applications
Ships	Guided Missile Destroyers (DDG) Conventional/Nuclear Guided Missile Cruisers (CG)
Aircraft	F/A-18E/F Super Hornet Multi-Mission Maritime Aircraft (MMA)

The 500-pound blast warhead delivers lethal firepower for conventional anti-ship missions, such as open-ocean, near-land or ships in port. The datalink updated Global Positioning System/Inertial Navigation System improves midcourse guidance to the target area. The accurate navigation solution allows users to discriminate target ships from islands, other nearby land masses, obstructions or ships.

Harpoon Block III will be deployable from Harpoon missile system platforms with existing command and launch equipment, the F/A-18E/F Super Hornet and the Multi-Mission Maritime Aircraft (MMA). Block III is ready to meet the over-the-horizon threat and provide our customers with the right weapon for today's environment.

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August 2008

Raytheon

AIM/RIM-7 Sparrow

Cost-Effective Medium-Range Missile System

The AIM/RIM-7 Sparrow medium-range, radar-guided missile provides a versatile and cost-effective solution for the world's air-defense needs.

Benefits

- Multimission capability
- Combat-proven air defense and air superiority
- Proven reliability
- Committed full-service support program

The AIM/RIM-7 Sparrow missile is a medium-range, all-weather, all-aspect, semiactive guided missile used in multiple roles by the United States and more than 25 international customers.

The AIM/RIM-7M model was developed around a digital monopulse seeker, which greatly improved seeker capability under heavy electronic countermeasures (ECM) and adverse weather conditions. The latest version of Sparrow, the AIM/RIM-7P, has a new higher capacity computer and uplink capability for command midcourse guidance. The AIM/RIM-7P computer incorporates a reprogrammable digital processor with software that may be modified to optimize effectiveness against enemy countermeasures. AIM/RIM-7P software continues to be upgraded for new scenarios and can be loaded via external means.

The RIM-7 Sparrow is the surface-launched (sea or land) version of Sparrow used for ship, airfield and facility self-defense. It can be launched in trainable or vertical launcher configurations. In the vertical launch variant, the RIM-7M/P uses a jet vane control to provide initial missile flight control.

Sparrow continues to be a central element in the air-defense process for the U.S. Navy and many international armies, navies and air forces. Because of its capability and flexibility, Sparrow will remain in service for many years in the future. Raytheon is committed to providing product support for the Sparrow family through 2025.

AIM/RIM-7 Sparrow

Upgradeable

Legacy AIM/RIM-7M configurations can be upgraded to AIM/RIM-7M/P configurations:

AIM-7M F1	**Baseline:** Increased memory More prelaunch messages — improve kill probability Trajectory shaping Better multiple target performance
AIM/RIM-7P Computer Kit	**All factory H-build improvements plus:** Reprogrammable circuit cards More memory and throughput increase Improved trajectory shaping performance Improved ground clutter performance Improved ECM
Full AIM/RIM-7P	**All above plus:** Improved low-altitude guidance Will accept 7P++ software

Maintenance Support

Intermediate Level	In-country test capability using the AN/DSM-162B or AN/DSM-156D test set • AN/DSM-162B test set for AIM-7 (Air Force) operations • AN/DSM-156D test set for RIM-7 (Navy/remote test) operations
Depot Level	Raytheon Missile Systems — Tucson, Arizona Sole existing full-service Sparrow depot Proven, experienced, rapid turnaround, low cost

AIM/RIM-7 Specifications

Length:	AIM/RIM without JVC	12 ft	3.66 m
	RIM with JVC	12 ft 7 in	3.85 m
Diameter:	8 in	0.2 m	
Weight:	AIM/RIM without JVC	502 lb	228 kg
	RIM with JVC	650 lb	295 kg
Wing Span:	3 ft 4 in	1 m	
Guidance System:	Semiactive compatible with continuous wave or pulsed Doppler radar illumination		
Warhead:	Annular blast fragmentation expanding continuous rod		
Fuzing:	Proximity and impact fuzing		
Power Plant:	MK-58 boost-sustain solid propellant rocket motor with manual or remote safe and arm		

Sparrow provides customers with:

- Intercepts against high- and low-altitude threats
- Intercepts of aircraft, missiles and surface targets
- Engagements of maneuvering targets in both forward and rear hemispheres
- Engagements of targets in clutter and ECM environments
- Intercepts in snap-up and shoot-down conditions
- Intercepts against multiple closely-spaced threats
- Superior operational ready rate and reliability

Raytheon is fully committed to Sparrow full-service support, including depot repair of AIM/RIM-7M/P Sparrow missiles, through 2025.

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Standard Missile-2
International Fleet Defense

SM-2

The world's premier fleet/air defense weapon.

Benefits

- Rail or vertical launch
- Inertial or command midcourse guidance
- Semiactive terminal homing
- Blast fragmentation warhead

The Standard Missile-2 (SM-2) is the latest in a long history of highly capable antiair warfare weapons. The lineage of SM-2 can be directly traced back over 50 years to the original Talos, Tartar and Terrier air defense missiles.

The current generation of SM-2, Blocks IIIA and IIIB, capitalizes on communication techniques, advanced signal processing and propulsion improvements to substantially increase the intercept range and provide high- and low-altitude intercept capability and performance against the advanced antiship missile threat.

SM-2 also employs an ECM resistant monopulse receiver for semiactive radar terminal guidance, while long-range intercepts are accomplished through the use of Inertial Midcourse Guidance (Tartar) and Command Midcourse Guidance (Aegis). The Tartar and Aegis flight profiles allow the missile to approach the target without the need for a shipboard illuminator until the terminal engagement phase. Target updates are provided through a weapon fire control system for Tartar missiles, while Command Guidance is accomplished via a link for Aegis missiles. A significant advantage of midcourse guidance is the resultant increase in firepower.

The SM-2 Block IIIB configuration incorporates a side-mounted imaging infrared seeker into the proven Standard Missile guidance system. This adjunct sensor provides a significant improvement to the missiles terminal engagement performance against stressing antiship missile threats.

SM-2 is compatible with the MK13 and MK26 rail launchers as well as the MK41 Vertical Launching System.

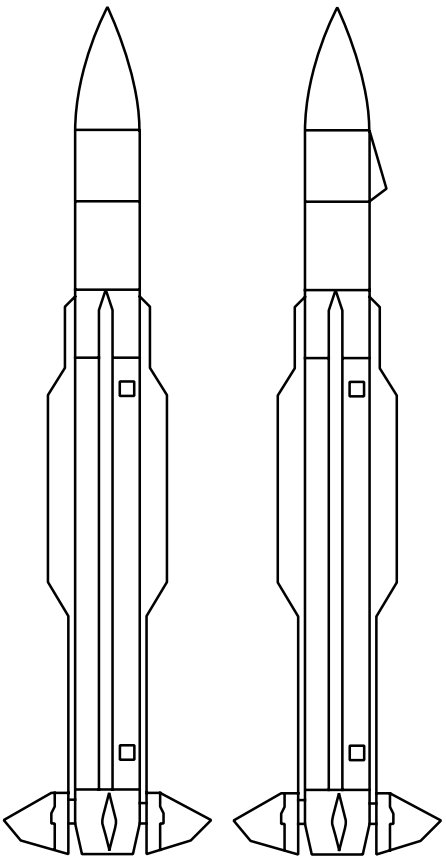
The SM-2 family continues to grow, as Canada, Japan, Germany, Korea, The Netherlands and Spain are deploying compatible surface combatants, and several other navies are in the process of defining requirements and ship configurations to support SM-2 applications.

Standard Missile-2

System/Subsystem	Characteristics
Overall System	All-weather, ship-launched, medium-to-long range, fleet air defense missile system
Airframe	Cylindrical body with ogive nosecone, cruciform trapezoidal tail control fins with inlne long chord, fixed dorsal fins immediately forward
Propulsion	Dual-thurst, solid-propellant rocket motor (MK104)
Guidance/Control	Monopulse, solid-state, semi-active radar terminal guidance with digital computer. Inertial or command midcourse guidance. Control effected through electrically activated tail fins
Fuzing	MK45 direct action and proximity fuze
Warhead	Common high-explosive fragmentation warhead (MK125)

Standard Missile-2 Specifications

Length:	15.5 ft	4.72 m
Diameter:	1.1 ft	34.3 m
Span:	3.0 ft	91.5 cm
Weight:	1,558 lb	708 kg
Range, Max:	> 50 mi	> 80.45 km
Altitude:	> 65,000 ft	> 20,000 m
Speed:	Mach 3+	
Other:	MK125 high-velocity fragmentation warhead	



SM-2 Block IIIA SM-2 Block IIIB

Final video frame from target cockpit camera.

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PD077-099

TS0539-30-03.4

PD079-029

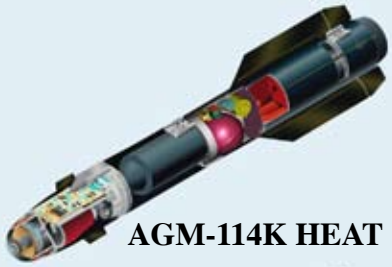
HELLFIRE II®

The HELLFIRE II modular missile system defeats advanced armor and urban point targets in the presence of severe electro-optical countermeasures. It can be launched from multiple air, sea and ground platforms, autonomously or with remote designation.

Apache, Kiowa Warrior, Cobra, Seahawk and Tiger helicopters are all equipped with the HELLFIRE system. HELLFIRE has also been successfully fired from several wheeled and armored vehicles and from various small boats and ships, as well as ground-mounted tripods. The tripod-mounted system is currently in service with the Swedish and Norwegian defense forces.

HELLFIRE II is a combat-proven weapon system for precision kill of high-value armor, air defense, ships, waterborne and fixed targets, with minimal collateral damage. The missile may be employed by lock-on before or lock-on after launch for increased platform survivability. Its multi-mission, multi-target capability with precision-strike lethality and fire-and-forget survivability provides field commanders maximum operational flexibility.

PD079-107; PD079-109

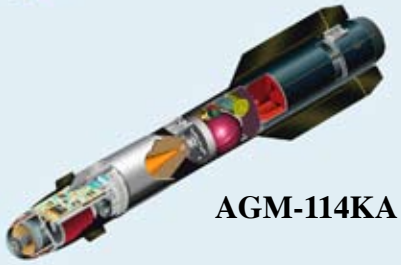


AGM-114K HEAT

AGM-114M
Blast Fragmentation

PD079-108; PD079-110

AGM-114N MAC



AGM-114KA

Specifications

Range	0.5 to 8+ km
Guidance	Semi-active laser seeker
Warheads	HEAT, augmented HEAT, blast fragmentation, and MAC
Platforms	Helicopters, tripods, boats, vehicles (from pedestal-mounted to full integration)

AGM-114K (HEAT)

Weight	45.4 kg (100 lb)
Length	163 cm (64 in)
Diameter	17.8 cm (7 in)

AGM-114KA (Augmented HEAT)

Weight	47.3 kg (104 lb)
Length	163 cm (64 in)
Diameter	17.8 cm (7 in)

AGM-114M (Blast Frag)

Weight	48.2 kg (106 lb)
Length	163 cm (64 in)
Diameter	17.8 cm (7 in)

AGM-114N (MAC)

Weight	48.2 kg (106 lb)
Length	163 cm (64 in)
Diameter	17.8 cm (7 in)

Features

- Modular HELLFIRE offers four variants: AGM-114K high-explosive anti-tank (HEAT) warhead neutralizes even the most advanced armored threats; AGM-114KA augmented HEAT warhead defeats lightly armored threats, as well as soft targets in the open; AGM-114M blast fragmentation warhead defeats ships, light armor and urban targets; AGM-114N metal augmented charge (MAC) warhead is highly effective against enclosed structures (caves and bunkers)
- Software driven – digital electronics for seeker growth applications
- Electro-optical countermeasures immunity proven by test; reprogrammable
- Effective target tracking in presence of backscatter, dust, water vapor, smoke and sea spray
- Trajectory shaping for performance in degraded weather
- Automatic target reacquisition after loss of track in low clouds
- Combat proven against a wide array of targets

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Front top: PD079-189

Raytheon

AGM-65 Maverick

Man-in-the-Loop Precision, Low Collateral Damage, Anti-tank, Anti-ship, Close Air Support Weapon

AGM-65 Maverick is the precision strike missile-of-choice for the U.S. Air Force, Navy, Marine Corps and 33 international customers.

Benefits

- Launch-and-leave capability with combat-proven high single-pass probability of kill
- Low collateral damage
- Proven capability against high-speed moving and maneuvering targets
- Modular design provides various combinations of seekers and warheads

Today's Maverick provides aircrews with launch-and-leave capability across a wide span of employment ranges and speeds. With its one-meter precision accuracy and lethal warhead, Maverick gives a high single-pass probability of success, with low collateral damage — attributes of the modern battlefield. Its modular design provides nine configurations with choices of three different seeker/guidance options, two different warheads and fuzing options, plus a rocket motor safe-arm option for naval flight deck operations.

Maverick is certified on more than 25 types of aircraft and is effective against nearly all air-to-ground target sets in battlefield, urban and maritime, including field fortifications, bunkers, tanks, armored personnel carriers, parked or taxiing aircraft, radar or missile sites, port facilities, ships, high-speed vehicles, swarming boats and other time sensitive threats. Maverick continues to evolve, providing cost effective solutions to meet current and future capability needs for network centric warfare.

TV Maverick

The first Maverick produced was the television (TV) guided AGM-65A, delivered in 1972, followed in 1975 by the AGM-65B, with scene magnification optics. AGM-65A and B versions are now being upgraded to the newer H, J, JX and K configurations for U.S. and international customers. The newer configurations incorporate modern charge-coupled-device (CCD) TV technology, circuitry and associated software to more than triple the lock-on and launch range of the original versions. The CCD seeker's sharper image gives the aircrew longer acquisition and launch ranges, allowing greater use of the aerodynamic envelope of the missile. The tracking software and cockpit display symbology are the same as those used successfully in infrared (IR) guided missiles. The superior service life of Maverick's center-aft section makes upgrading AGM-65B to AGM-65H missiles a viable and highly affordable option.

Infrared Maverick

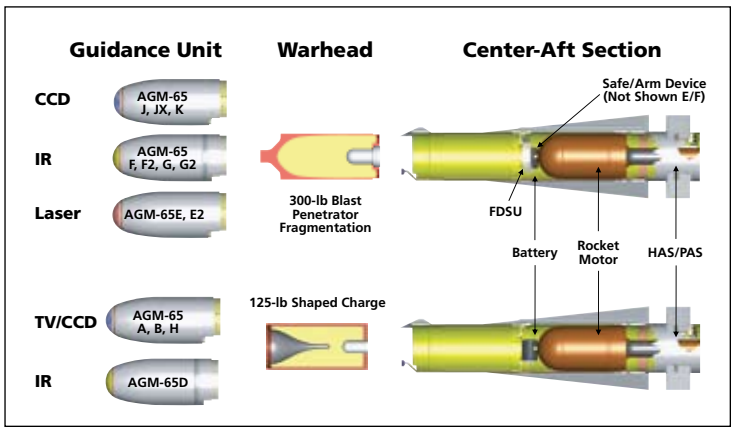
The U.S. Air Force's AGM-65D, G and G2 and the Navy's AGM-65F are equipped with IR seekers that work in both day and night situations. The IR seeker presents a TV-like image on the cockpit display as it senses small differences in heat energy between target objects and the surrounding background. The tracking software for the IR missile has evolved to effectively accommodate a wide spectrum of land and maritime targets.

Laser Maverick

The current Laser Maverick (AGM-65E) uses a semi-active laser (SAL) seeker that

Before

After



Maverick Guidance Warhead Family Chart

AGM-65 Maverick Specifications

Fuze:	Contact (Shaped-charge warhead)	Selectable Delays (Penetrator warhead)
Length:	98.0 in	249 cm
Wing Span:	28.5 in	72 cm
Diameter:	12.0 in	30.5 cm
Weights:		
125-lb Shaped Charge Warhead		
D (IR)	485 lb	220 kg
H (TV)	466 lb	211 kg
300-lb Blast Fragmentation Penetrator Warhead		
E (Laser)	645 lb	293 kg
F, F2, G, G2 (IR)	670 lb	304 kg
J, JX, K (TV)	654 lb	297 kg
Single-Rail Launcher		
LAU-117	135 lb	61 kg

Precision Against High-Speed Moving Targets

tracks laser energy reflected from a target being illuminated by a laser designator device, either airborne or ground-based. It was designed in the 1980s for defeating armored targets and providing close air support beyond the line of battle. Its analog SAL seeker provides long-range, lock-on, fire-and-forget capability that incorporates safety features for collateral damage avoidance by flying long and deactivating the warhead upon loss of laser designation. It remains extremely effective in dynamic combat operations requiring high reliability and surgical lethality.

Warheads

Two warheads are available for the Maverick. The A, B, D and H versions use a 125-pound warhead with a forward-firing, conical-shaped charge for armor penetrations. The E, E2, F, F2, G, G2, J, JX and K versions employ a 300-pound blast fragmentation/penetrator warhead that was developed for maximum effectiveness against larger, reinforced targets. Selectable fuzing gives the aircrew the option of detonating the warhead on impact or after penetration.

The Future of Laser Maverick

Raytheon is designing a new laser guidance and control section (GCS) to allow production of Laser Maverick (AGM-65E2) missiles. This next-generation Laser Maverick uses digital Semi-Active Laser (dSAL™) seeker technology that allows tighter tracking against high-speed moving targets and greater precision in tough urban environments, while minimizing collateral damage. The new Laser Maverick GCS uses key components from existing Mavericks, to include: circuit card assemblies, autopilot, and electrical interfaces. The new GCS can mate to existing Maverick center-aft sections and retains Maverick shape and mass properties to reduce cost and schedule time. The missile uses built-in-test to limit test equipment requirements. Laser Maverick requires no aircraft operational flight program changes and no change in launch aircraft. Incorporating GPS/INS features is under consideration to improve end-game accuracy, permit adverse weather employment, and offer an expanded engagement envelope.

Surgical Precision

Assured Destruction

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LASER MAVERICK

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Customer Success Is Our Mission

AIM-132 Advanced Short-Range Air-to-Air Missile (ASRAAM)

Description

ASRAAM (Advanced Short Range Air-to-Air Missile) is the most agile, modern air-to-air missile designed to dominate the combat mission from Within Visual Range to near Beyond Visual Range. The combat concept behind **ASRAAM** is designed to give the pilot the ability to engage the enemy, fire and get away without risking himself or his aircraft in a dogfight. **ASRAAM** unique capabilities enable it to defeat all short-range missiles, existing or planned, in close-in combat.

The missile system performance is attributed to a revolutionary design concept and state-of-the-art technology providing fast reaction time from button press to end game performance and giving **ASRAAM** the highest speed of any short-range missile.

ASRAAM high speed is achieved by means of a combination of low drag and rocket motor size. By using a 166mm (6.5ins) diameter motor, compared with other missiles which use a 127mm (5ins) motor, **ASRAAM** has approximately 70% more thrust and can maintain a high speed throughout its flight time.

Designed to outmaneuver target aircraft in short-range aerial engagements and to allow launch at high off-bore sight angles during such engagements, **ASRAAM** is a highly agile missile. The exceptional maneuverability is provided by a sophisticated control system using innovative body lift technology coupled with tail control.

Physical Characteristics

• **Length**	**2.90 m (9 ft 6 in)**
• **Finspan**	**45 cm (17.7 in)**
• **Diameter**	**16.6 cm (6.5 in)**
• **Weight**	**87 kg (192 lb)**
• **Speed**	**Mach 3+**
• **Range**	**15 km (8 nm)**
• **Propulsion**	**Dual-thrust (boost/sustain) solid-fueled rocket**
• **Warhead**	**10 kg (22 lb) blast-fragmentation**

- **Length** 2.90 m (9 ft 6 in)
- **Finspan** 45 cm (17.7 in)
- **Diameter** 16.6 cm (6.5 in)
- **Weight** 87 kg (192 lb)
- **Speed** Mach 3+
- **Range** 15 km (8 nm)
- **Propulsion** Dual-thrust (boost/sustain) solid-fueled rocket
- **Warhead** 10 kg (22 lb) blast-fragmentation

Reference: http://www.mbda.co.uk/

Raytheon

AIM-9M Sidewinder

A Proven History of Success in Air-to-Air Combat

AIM-9M Sidewinder

Combat-proven, advanced infrared-tracking, short-range air-to-air missile

Benefits

- Advanced countermeasure features
- Improved identification of targets against background clutter
- Improved tracking against low-signal level targets
- Reduced-smoke rocket motor

For more than 40 years, the Sidewinder missile's effectiveness and all-aspect capabilities have been combat proven in several theaters and conflicts around the world.

Manufactured Since 1964

Raytheon has manufactured Sidewinder guidance control sections continuously since 1964 and has provided coalition nations with equipment for in-country missile repair. Since 1971, Raytheon has been the U.S. Navy's Development Industrial Support Contractor. Raytheon has delivered more than 45,000 Sidewinder guidance sections.

Enhanced Performance

The AIM-9M provides significant performance improvements over its predecessor, the AIM-9L. These include advanced countermeasure features, improved identification of targets against background clutter, improved tracking against low-signal level targets and a reduced-smoke rocket motor.

The AIM-9M is configured for easy installation on a wide range of modern tactical aircraft, including the F-4 Phantom II, F-5 Tiger, F-14 Tomcat, F-15 Eagle, F-16 Fighting Falcon, and F/A-18 Hornet fighters; the A-4 Skyhawk, A-6 Intruder, A-7 Corsair II, AV-8B Harrier II, and A-10 Thunderbolt II attack aircraft; and the AH-1 Cobra helicopter. Sidewinder is also integrated on the JAS-39 Gripen, JA-37 Viggen, FA2 Sea Harrier, Tornado GR4, and Jaguar GR3.

Raytheon's Sidewinder reliability has been thoroughly demonstrated, consistently achieving 400 percent above contractual mean time between failure requirements.

AIM-9M Sidewinder

AIM-9M Features

- Combat-proven
- Demonstrated high-kill probability
- High reliability
- Multiple applications
- Minimal size, low drag and weight
- Low per-round cost
- Simplicity
- Adaptability

AIM-9M Specifications

Length:	113 in	2.9 m
Diameter:	5.0 in	12.7 cm
Wing Span:	25 in	63.5 cm
Canard:	22.3 in	56.6 cm
Weight:	190 lb	86 kg
Warhead:	25 lb	11.3 kg
Guidance:	Passive infrared	
Fuzing:	Proximity and content	
Launcher:	Rail	

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AIM-9X Sidewinder

Fifth Generation High Off-boresight, Thrust-Vectored Air-to-Air Missile

AIM-9X Sidewinder provides first-shot/first-kill capability to ensure air combat victory.

Benefits

- Low cost of development and ownership
- Superior performance exceeds tactical requirement
- In production and in the fleet now
- Selected by numerous coalition air forces

AIM-9X Sidewinder

The AIM-9X is the newest member of the AIM-9 Sidewinder short-range missile family in use by more than 40 nations around the world. This next-generation Sidewinder missile passed operational evaluation in November 2003 and was approved for full-rate production in May 2004.

Enhanced Capability

The AIM-9X acquisition plan addresses the urgent warfighting requirement for the development and deployment of a next-generation Sidewinder to replace the AIM-9M. AIM-9X is a launch-and-leave air combat missile that uses passive infrared (IR) energy for acquisition and tracking. The AIM-9X can be employed in both near beyond visual range and within visual range arenas. Complemented by the Advanced Medium-Range Air-to-Air Missile (AMRAAM), the AIM-9X equipped warfighter has offensive firepower that is unmatched by any other weapon systems in the world. The AIM-9X program addresses the requirement for evolutionary improvements to the AIM-9 series missile through revolutionary advancements. This extends the operational effectiveness of existing inventories at an affordable cost while continuing the evolution of the AIM-9 series.

AIM-9X provides the warfighter with the following capabilities: full day/night employment, resistance to countermeasures, extremely high off-boresight acquisition and launch envelopes, greatly enhanced maneuverability and improved target acquisition ranges. The AIM-9X airframe coupled with other advanced features gives fighter pilots a significant tactical advantage in the dogfight arena. The AIM-9X uses an extremely agile thrust vector controlled airframe. Configured with a mature and high-performance staring focal plane array (FPA) sensor and existing AIM-9M components (rocket motor, warhead and fuze), AIM-9X evolutionary design is a low-cost, low-risk, all-up-round evolutionary design with robust performance. The digital design architecture of the AIM-9X provides growth capability to ensure air superiority in the future.

AIM-9X Development AIM-9X is a joint U.S. Navy and U.S. Air Force program with the Navy designated as the Executive Service. Several nations have already selected AIM-9X as their next short-range missile, and potential exists for procurement by numerous other coalition nations. The first AIM-9X air launch was accomplished in March 1999. This milestone was the first in a series of separation and control test vehicle and guided launches. From 1999 to 2001, the AIM-9X program launched 19 separation and control test vehicles and 18 guided launches from U.S. Navy F/A-18 and U.S. Air Force F-15 aircraft. Of the 18 guided firings, 14 resulted in direct hits against QF-4 unmanned drones. The AIM-9X engineering and manufacturing development (E&MD) phase completed the development of the missile

SIDEWINDER AIM-9X

AIM-9X

Unprecedented . . . Fifth Generation . . . Smarter

tactical system design and established the weapons system interface with the F-15C and F/A-18C/D aircraft and the joint helmet-mounted cueing system. U.S. government development and operational testing plans include extensive captive carry reliability testing and free-flight guided launches. In addition to the F/A-18C/D and the F-15C, AIM-9X will be integrated on the Navy F/A-18E/F and the Air Force F-15E, F-16, the Joint Strike Fighter, and the F-22 during Follow-on Test and Evaluation. AIM-9X is fully compatible with the LAU-12X series and the LAU-7 launchers.

The Threat

For more than 40 years, U.S. and coalition fighter pilots have enjoyed air superiority in short-range engagements. Now, however, current threat missiles, aircraft and environments may eclipse this advantage ... demanding a new fifth generation Sidewinder Missile — the AIM-9X.

AIM-9X – The Answer

In modern short-range air-to-air combat, first-shot/first-kill capability is necessary to ensure victory in today's high technology battlefield. Coalition fighter pilots will enter the fight with AIM-9X, a missile that retains the essence of Sidewinder heritage, while employing a fifth-generation seeker and thrust vectoring control for unprecedented performance. The Raytheon team's experience in advanced IR technologies, weapons systems integration and affordable missile production provides an AIM-9X that ensures air superiority for the 21st century.

Unprecedented

Superior Performance Exceeds Tactical Requirement

- Greatly enhanced acquisition ranges in blue sky and clutter
- IR countermeasures resistance to meet the threats of today and tomorrow
- Extremely high off-boresight capability gives the pilot the first-shot first-kill opportunity
- Highly agile airframe
- Inherent growth potential

Fifth Generation

Leadership in Advanced IR Missiles and Weapon Systems Integration Brings the Warfighter Unprecedented Technology Today — AIM-9X

Raytheon's commitment and acknowledged leadership in advanced IR missile design enabled a low-risk, low-cost development phase that ensures air superiority for the U.S. and coalition warfighter. Mature enabling technologies that include staring FPAs, adaptive compensation techniques, and advanced IR signal processing permit a low risk E&MD phase. The Raytheon AIM-9X team is a world leader in advanced digital aircraft weapons integration. This weapon system design experience includes the AMRAAM; the AMRAAM/AIM-9X compatible digital launcher; the F-14D, F/A-18E/F and F-15 advanced radars; and the F-22 weapon system. Raytheon understands the digital combat environment and the critical weapon system parameters necessary to fight and win in the pre- and post-merge arena.

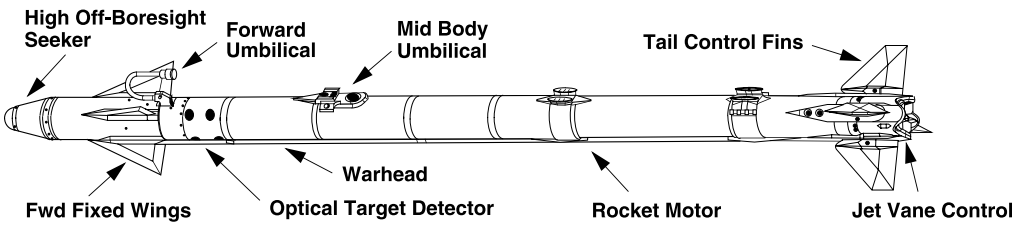
Smarter

Revolutionary Ideas Through Evolutionary Development

The critical path of any missile development is through the seeker. The payoff from leveraging an in-production seeker and Raytheon's extensive commitment to advanced fifth-generation IR technologies is a low-cost, low-risk AIM-9X development. Raytheon's advanced, mature IR FPA sensor and innovative guidance and control design combined with reuse of existing components presents an AIM-9X that is affordable and lethal. Features such as a cryoengine and an extended warranty significantly reduce the cost of ownership while increasing the AIM-9X tactical utility and availability. Raytheon's integrated product team culture and lean manufacturing techniques are combined with acquisition reform initiatives to produce an affordable, low-risk, and highly reliable AIM-9X design.

AIM-9X Sidewinder Specifications

Weight:	118 lb	85 kg
Length:	119 in	3 m
Diameter:	5 in	12.7 cm
Fin Span:	17.5 in	44.45 cm
Wing Span:	13.9 in	35.31 cm



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AMRAAM

Advanced Medium-Range Air-to-Air Missile

Advanced Medium-Range Air-to-Air Missile
Combat-proven performance and reliability.

Benefits

- Highest dependability at lowest cost of ownership
- Maximizes operational flexibility
- Multi-shot capability
- State-of-the-art active radar guidance
- Dual use from the same missile (air and surface launch)
- Cost effective life cycle support for both ATA and SL missiles
- Planned performance software upgrades to combat emerging technologies

AMRAAM

The Advanced Medium-Range Air-to-Air Missile (AMRAAM) is combat proven, scoring victories over the skies of Iraq, Bosnia, and Kosovo. AMRAAM operational reliability is measured in thousands of hours — an order of magnitude improvement beyond other systems — with mean-time-between-failure rates in excess of 1500 hours of operation. AMRAAMs are currently flown by the majority of coalition air forces. Attesting to AMRAAM reliability, the U.S. Air Force has recently exceeded one million captive carry hours while maintaining field availability well above requirements.

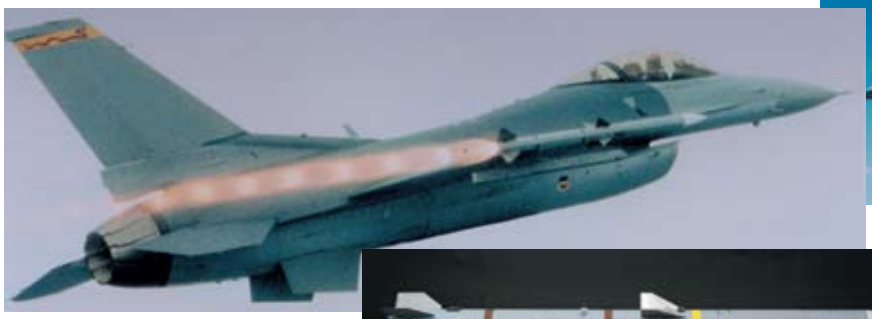
With state-of-the-art active radar guidance, AMRAAM packs unprecedented performance into a lightweight package. AMRAAM's incorporation of the latest digital technology and microminiaturized solid-state electronics makes this remarkable weapon more reliable and maintainable, resulting in the highest dependability at the lowest cost of ownership throughout the intended service life of the missile.

AMRAAM's unprecedented air combat flexibility, including its multi-shot capability, provides pilots the ability to launch at an enemy aircraft day or night, in all weather. In beyond visual range (BVR) engagements, AMRAAM is guided initially by its inertial reference unit and microcomputer. During this midcourse phase of flight, AMRAAM receives target position updates directly from the launch radar system. In the terminal phase of flight, without further reliance on the launching aircraft, the internal active radar seeker acquires the target and independently guides the missile to intercept.

AMRAAM's autonomous guidance capability provides the pilot with critical range preserving launch and leave capability. This substantially improves a pilot's overall survivability by allowing immediate maneuver following missile launch. Immediate post-launch maneuver allows the pilot faster engagement of follow-on targets, as well as the option to maximize his separation from the original engaged threat.

AMRAAM's multi-shot capability is also designed to improve pilot survivability by allowing multiple simultaneous threat engagements. AMRAAM operational capabilities include quick flyout, robust immunity to countermeasures, and improved capability attacking low-altitude targets. The low-smoke, high-impulse rocket motor effectively reduces the visual signature of the missile and thus reduces the overall probability of an enemy pilot's sighting either the launch or the incoming missile.

AMRAAM is operational on the F-22, Eurofighter, F-15, F-16, F/A-18, the German F4F, the United Kingdom's Sea



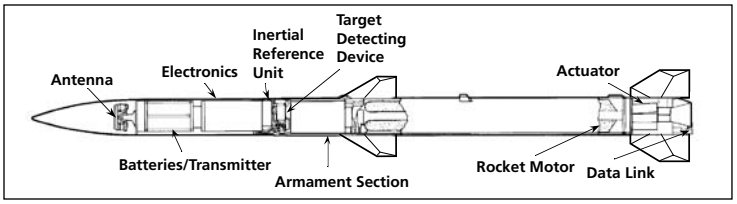
Harrier, Tornado, Harrier II Plus, the JAS-39 Gripen, JA-37 Viggen, and the Norwegian Advanced Surface-to-Air Missile System (NASAMS). Raytheon is currently integrating AMRAAM on the Joint Strike Fighter.

AMRAAM sets the global, beyond visual range standard. With more than 33 countries procuring the missile, AMRAAM has attained a level of international procurement that enriches interoperability, ensures commonality, and improves overall logistic support which ensures effective coalition operations.

AMRAAM has demonstrated equally outstanding surface-to-air performance. Surface-launch operators find AMRAAM performance extremely effective through increased long-range firepower, multiple target capability, and resilient ECCM features. The NASAMS was the first surface-launch system to take advantage of these unique air defense capabilities and has been operational with the Royal Norwegian Air Force since 1994. The Spanish army has also procured NASAMS. In 1998, NASAMs became the NATO Response Force standard for mobile/deployable netted air-defense systems to counter modern threats.

Recently, the U.S. Army approved an Operational Requirements Document (ORD) for a similar Surface-Launch AMRAAM (SLAMRAAM) capability. The Army expects to field its system in the near future. Internationally, Raytheon promotes SL-AMRAAM capability for HAWK/SHORAD upgrades and air defense systems employing the Mobility and Canister launcher on a variety of alternative vehicles.

The AMRAAM program is a model defense acquisition reform process managed by the Air-To-Air Missile Systems Wing at Eglin Air Force Base, Florida. AMRAAM is in full-rate production at Raytheon's Tucson, Arizona, facility. Raytheon's innovative evolutionary spiral development began early in the AMRAAM program. This remarkably successful spiral development process continues to extend AMRAAM's world-renowned capability well into the future. Performance, reliability, and affordability with state-of-the-art technology are Raytheon's commitments as the producer of the world's preeminent air-to-air missiles.



AMRAAM AIM-120C-7 Specifications

Length:	12 ft	3.65 m
Diameter:	7 in	17.8 cm
Wing Span:	17.5 in	44.5 cm
Fin Span:	17.6 in	44.7 cm
Weight:	356 lb	161.5 kg
Warhead:	45 lb	20.5 kg
Guidance:	Active radar	
Fuzing:	Proximity and contact	
Launcher:	Rail and eject	

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GUNS

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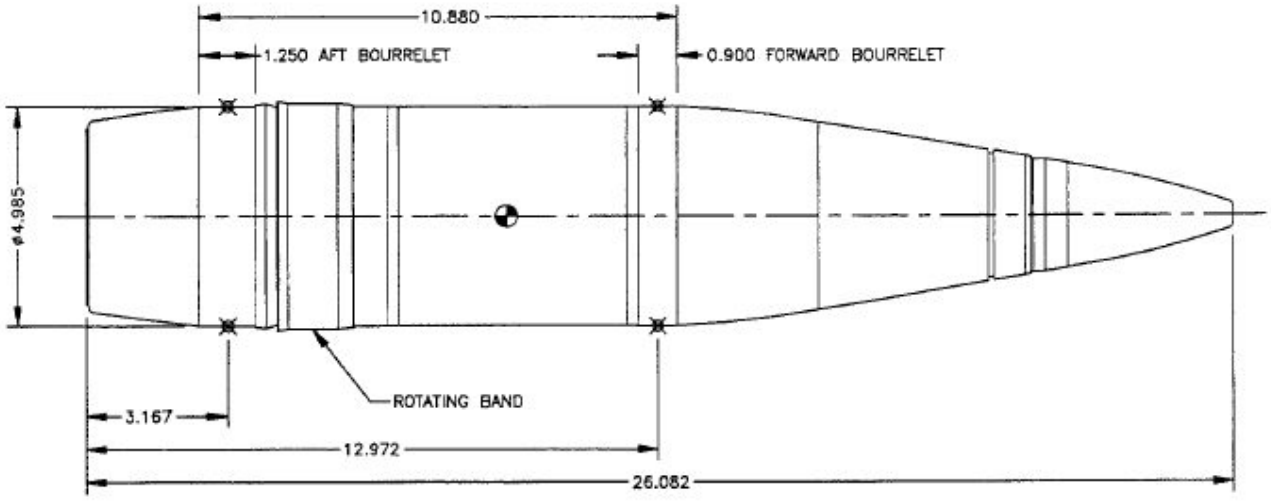
Mk-64 5” / 54 Caliber Blind, Loaded, & Plugged Naval Projectile



Description

The MK64 5 inch 54 caliber naval projectile is the basic round of ammunition for the U.S. Navy's main armament systems.

The forged steel projectiles have a long and streamlined outline, especially the ogive, together with a distinctive boat tail and flat base. The single, wide rotating band is made of copper.

The 5"/54 MK64-2 Projectile Body (MPTS) is a component of the 5"/54 Caliber Blind, Loaded and Plugged (BL&P) MK92-1 Projectile which is a training round that lacks a fuse and is filled with sand.

Physical Characteristics

Reference: www.navweaps.com, www.globalsecurity.com

76mm

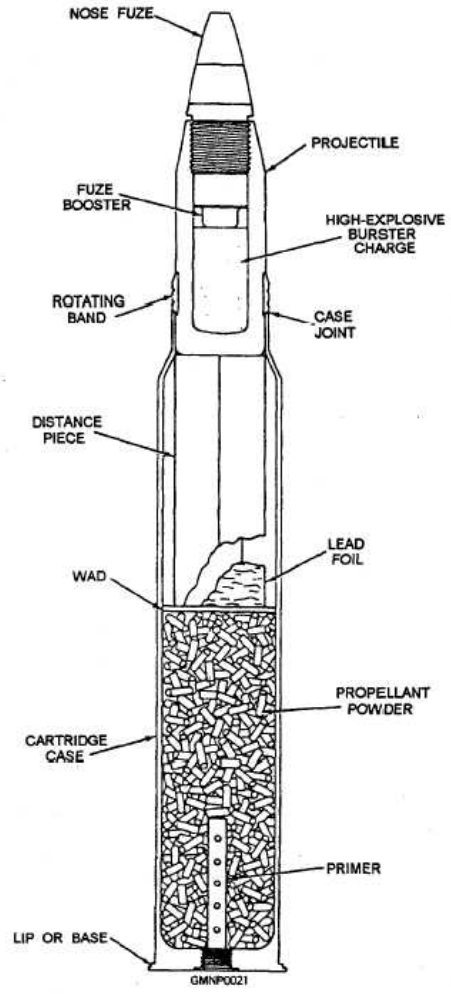
Description

All 76mm round are essentially the same in that they are made of approx. 10 lbs of iron casing with approx. 4 lbs of filler material. The current training allocation show that mostly BL-P (blind load and plug) rounds are used, MK201. As such, the 4 lbs of inert filler in the MK201 rounds is usually sand or cement. Some of the training rounds may contain spotting charges. These rounds are put together as a full up cartridge meaning they are all one piece (Projectile + Casing). The casing has approx. 4 lbs of nitrocellulose propellant.

*Note: the diagram at right shows a live round and not a BL&P round.

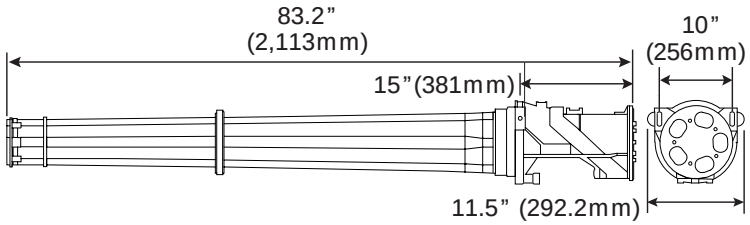
Reference: www.navweaps.com, www.globalsecurity.com, www.diehl-bgt-defence.de

Physical Characteristics



GAU-12/U

25mm gatling gun



Specifications

Gun type	Five-barrel, 25mm, externally powered Gatling gun
Weight	270 pounds (123 kg)
Rate of fire	Up to 4,200 shots per minute
Dispersion	5 milliradians diameter, 80 percent circle
Muzzle velocity	
(TP, HEI ammunition)	3,560 feet (1,085m) per second
(API ammunition)	3,400 feet (1,036m) per second
Average recoil force	5,000 pounds (22 kN)
Drive system	Hydraulic, electric, pneumatic
Feed system	Linked or linkless

The 25mm GAU-12/U produced by General Dynamics Armament and Technical Products is an externally powered Gatling gun adaptable for air, land and sea platforms.

The GAU-12/U has significant muzzle energy and combat lethality. These factors, when combined with a maximum firing rate of 4,200 shots per minute, provide an effective weapon for a variety of combat missions.

Each of the GAU-12/U’s five barrels contain its own breech bolt assembly, which fires once per gun revolution. This ensures extended barrel life by distributing firing loads over all five barrels.

Continuous rotary motion reduces impact loads on gun components, providing extended parts life and high reliability.

The GAU-12/U provides air-to-air, ground-to-air and air-to-ground firepower for the U.S. Marine Corps AV-8B Harrier II aircraft, the Light Armored Vehicle - Air Defense (LAV-AD) and the U.S. Air Force AC-130U Gunship.

A derivative of the GAU-12/U known as the GAU-22/A is currently being developed for application on the U.S. Military's Joint Strike Fighter.

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Approved for Public Release 07/2003 (DFOISR 04-S-0144)

MK19

40mm grenade machine gun

General Dynamics Armament and Technical Products produces the MK19 MOD 3 air-cooled system, a blow-back operated, belt-fed, crew-served 40mm grenade machine gun. Highly portable within small soldier units, the weapon's high lethality and broad versatility make it the prime choice of the U.S. Armed Forces as an essential weapon in both offensive and defensive operations.

Firing M430 High Explosive Dual Purpose grenades, the MK19 provides lethal fire against a variety of targets, including lightly armored vehicles and dismounted infantry. It will penetrate 75mm rolled homogenous armor at a maximum range of 2,050 meters. Dismounted personnel, within a radius of 15 meters from impact, will be immobilized by blast and fragmentation.

Features:

- Sustained automatic or single-shot firing
- Dual spade grips for stable control
- Removable barrel
- No headspace or timing adjustments required
- Open-bolt firing eliminates cook off, enhances cooling between bursts and allows sustained firing at three- to five-round bursts
- Simple design for easy maintenance
- Mean rounds between failure exceeds 20,000 rounds

Specifications	
Caliber	40mm
Weight	72.5 pounds (33 kg)
Length	43.1 inches (1,095mm)
Width	13.4 inches (340mm)
Rate of fire	300-400 rounds per minute
Ammunition	M430 high explosive dual purpose (anti-armor and anti-personnel); MK281 MOD 0 TP Cartridge (TP-training); CS/OC (non-lethal); M918 (flashbang, training)
Maximum effective range	1,650 yards (1,500m)
Maximum range	2,242 yards (2,050m)
Muzzle velocity	790 feet (241m) per second

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Ordnance Technical Data Sheet
U.S. PROJECTILE, 20 MM

Nomenclature: 20 MM Projectile
Ordnance Family: Small Arms
DODIC: A773
Propellant: Nitrocellulose/Nitroglycerin
Propellant weight: 585 grains
Item weight: 3,900 grains (case weight is 1,855 grains and the projectile weighs 1,580 grains)
Diameter: .79 in for projectile
Length: 6.62 in
Maximum Range: N/A

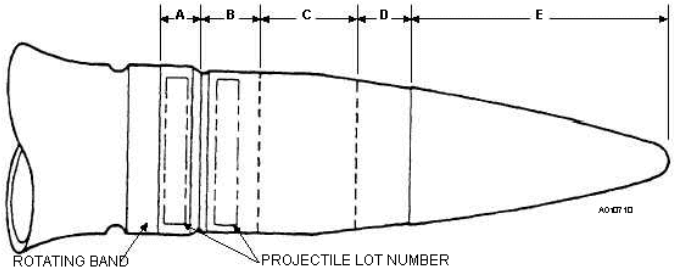
Usage: The PGU-28/B is the only projectile currently used by the Air Force and Navy for fixed wing air-to-air combat. This projectile is fired from the M61A1 gun system that is utilized by the F-14, F-15, F-16, and F/A-18 aircraft.

Description: The improved 20-mm (PGU) configuration ammunition for the M61A1/A2 aircraft guns is issued in the form of cartridges. All service cartridges have matched ballistics and are electrically primed. Initially procured ammunition is not graded, and all accepted lots are serviceable for issue and use in applicable weapons. The M103 brass cartridge cases are marked longitudinally or circumferentially with the caliber/case designation on the first line. The manufacturer symbol is on the second line. The interfix number, lot serial number, and year of manufacture are on the third line. All projectiles have essentially the same external configuration. The rotating band is copper alloy swaged into a circumferential groove near the aft end of the steel body. Ammunition type is identified by the color the projectile is painted and by the lettering on the body of the projectile.

PGU-27/B Target Practice (TP)
The PGU-27/B projectile consists of a steel body with a solid aluminum nosepiece swaged or crimped to the steel body. This cartridge has no explosive filler in the projectile. The cartridge is used in practice firing, for boresighting of weapons, and testing of new guns. The projectile shape and ballistic properties are similar to those of other PGU configuration ammunition.

PGU-28/B Semi-Armor Piercing High Explosive Incendiary (SAPHEI)
The PGU-28/B projectile consists of a steel body with an internal cavity filled with a sponge Zirconium pallet, composition A-4 and RS 40 incendiary mix. The aluminum nose contains RS 41 incendiary mix and is swaged to the steel body. This cartridge is for use against aircraft and light material targets, and functions with semi-armor piercing, high explosive, and incendiary effect.

PGU-30/B Target Practice-Tracer (TP-T)
The PGU-30/B consists of a steel body with an aft cavity containing the tracer pellet. The aluminum nose is swaged or crimped to the steel body. Tracer A tracer pellet is loaded into a cavity machined in the base of the TP-T projectile used in the assembling of the PGU-30/B cartridge. The heat and pressure of the propelling charge ignite the tracer pellet. The tracer is visible for approximately 3.2 seconds during projectile flight. This cartridge is virtually the same as the PGU-27/B projectile, except it incorporates a tracer in the base of the projectile.



Projectile Type	Color of Painting					Color of Marking
	Locations (See Figure 7-10)					
	A	B	C	D	E	
Target Practice (TP) PGU-27/B	No paint (copper)	Blue	Blue	Blue	Blue	White
Semi-Armor Piercing High Explosive Incendiary (SAPHEI) PGU-28/B	No paint (copper)	Black	Yellow	Red	No paint (chromate)	White
Target Practice Tracer (TP-T) PGU-30/B	No paint (copper)	Blue	Blue	Blue	Blue	White with Orange T's (location D)

References: The Aviation Ordnanceman; TRI-DDS website; MIDAS; Global Security.org.

20MM MK 149 (APDS)

PHALANX CIWS (CLOSE-IN WEAPON SYSTEM)

- General Dynamics Ordnance and Tactical Systems is the Sole Developer and Qualified Producer of the MK149 20mm Armor-Piercing, Discarding Sabot Cartridge
- General Dynamics Ordnance and Tactical Systems has Produced in Excess of 20 Million Rounds of Ammunition for the U.S. NAVY's PHALANX Anti-Ship Missile Defense System
- Compatible with all M61 And M197 Gun Systems
- Compatible with all MK15 PHALANX Systems and Block MOD Upgrades
- Increased Impact and Residual Energy at Target over the M50 Series
- Approved for Export

GENERAL DYNAMICS
Ordnance and Tactical Systems

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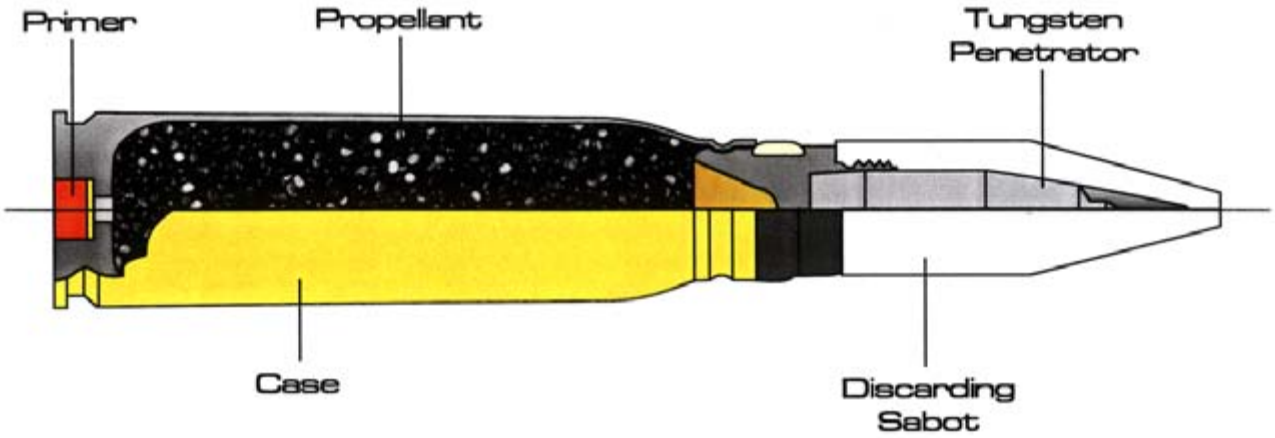
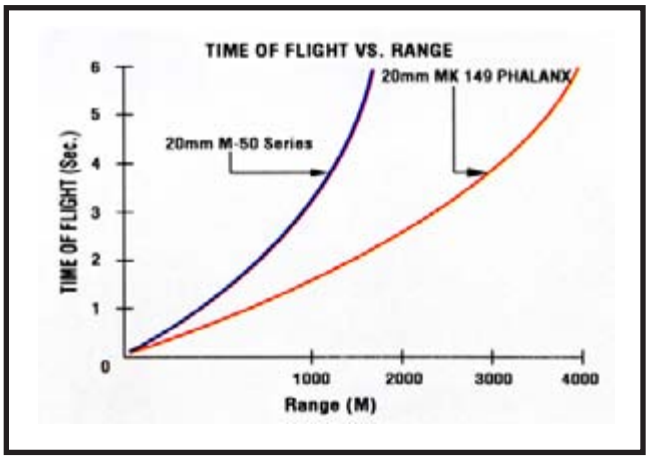
Approved for Public Release 09/30/05

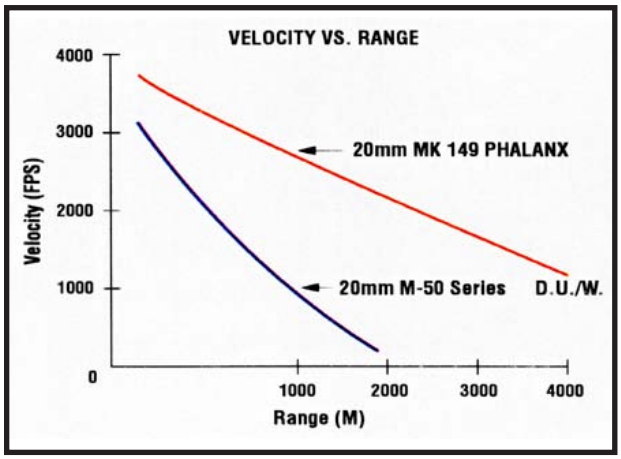
U.S. NAVY PHALANX AMMUNITION

20MM APDS-MK149

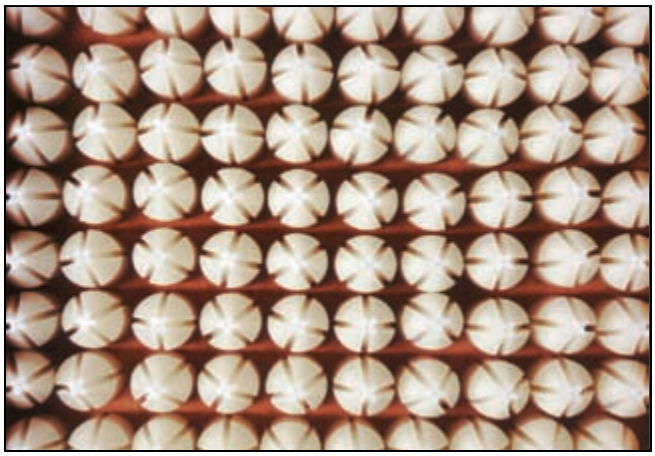




Short Time of Flight to Target



Optimized Exterior Ballistic Performance

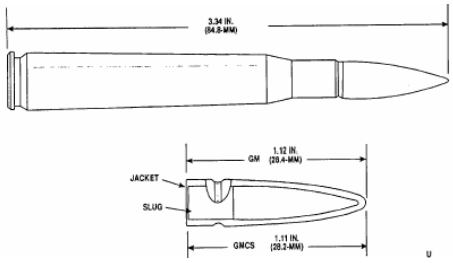


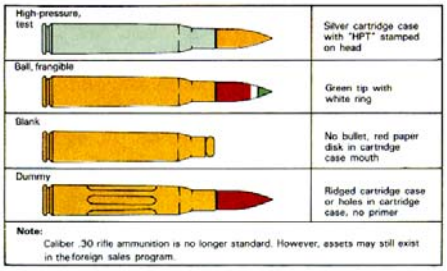
Over 20,000,000 Rounds Produced by
General Dynamcis Ordnance and Tactical Systems

GENERAL DYNAMICS
Ordnance and Tactical Systems

Ordnance Technical Data Sheet

U.S. Cartridge, .30 Caliber Ball, M2





Caliber .30 Cartridges, Colors and Shapes.

Nomenclature:	M2 Cartridge, .30 Caliber, Ball
Ordnance Family:	Small Arms
DODIC:	A212
Filler:	Single or Double Base Powder*
Filler weight:	Mission dependent
Item weight:	26.96 g (416 gr)
Diameter:	7.62 mm (.30 in)
Length:	84.80 mm (3.34 in)
Range:	3475 m (3800 yds)

Usage: Machine Guns, Caliber .30, M37, M1919A4 and M1919A6; and Rifle, Caliber .30, M1. The cartridge is intended for use against personnel or unarmored targets.

Description: Ball Cartridge. The bullet is copper clad and identified by a plain bullet tip.

Reference: TM 43-0001-27

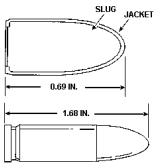
* **Single Base Propellant:** Single base propellants contain nitro cellulose as their chief ingredient. Single-base compositions are used as low-pressure propellants, such as those used in small arms ammunition. They may contain a stabilizer, inorganic nitrates, nitro-compounds, metallic salts, metals, carbohydrates and dyes.

Double Base Propellant: Double base propellants contain nitrocellulose and a liquid organic nitrate, such as nitroglycerine. As with single base, stabilizers and additives may be present. Double base propellants are used in cannon, small arms, mortars, rockets, and jet propulsion units.

Ordnance Technical Data Sheet

U.S. Cartridge .30 Caliber, Ball

CARTRIDGE, CALIBER .30, CARBINE, BALL, M1



Nomenclature:	Cartridge, .30 caliber, Ball
Ordnance Family:	Small Arms Ammunition
DODIC:	A182
Propellant:	Single or Double Base Powder**
Filler:	Lead or Copper Clad Lead
Filler weight:	Not Provided
Item Weight:	Not Provided
Diameter:	7.62 mm (.30 in)
Length:	42.67 mm (1.68 in)
Maximum Range:	2012.00 m (2,200 yds)
Fuze:	Percussion

Usage: Standard general purpose small arms ammunition for the M-1 and M1A1 .30 caliber Carbine.

Description: The cartridge case is brass comprised of 70 percent copper and 30 percent zinc. The bullet is copper clad lead. The propelling charge is either single or double base powder. Ball ammunition is unpainted; tracer ammunition has the tip painted either orange or red.

Reference: Army Technical Manuel TM 9-1300-200.

* Single-base propellant - Contains only one explosive ingredient, normally nitrocellulose.

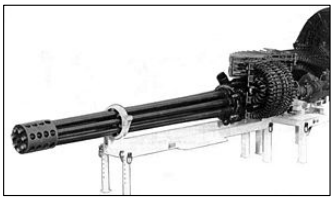
* Double-base propellant - Contains two explosive ingredients, commonly nitrocellulose and nitroglycerin.

Ordnance Technical Data Sheet
U.S. PROJECTILE, 30 MM

Nomenclature: 30 MM Projectile
Ordnance Family: Small Arms
DODIC: B109
Propellant: Nitrocellulose
Propellant weight: 610 grains
Item weight: 3,934 grains
Diameter: 30 mm
Length: 113 mm or 173mm
Maximum Range: 4500 m

Usage: The 30mm lightweight family of ammunition was developed to optimize the air-to-ground mission of the U.S. Army AH-64 Apache helicopter. It is also used by the A-10. Tanks are the common real world target for 30 mm rounds.

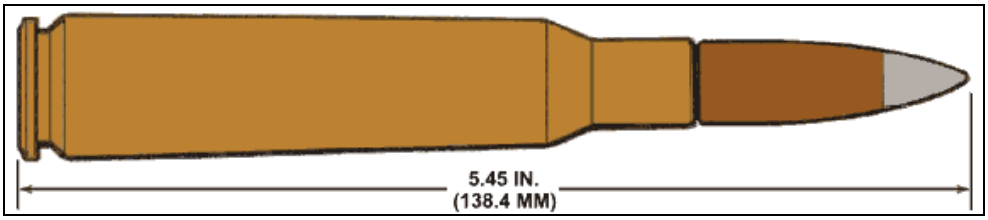
Description: Two airframes use a 30 mm round. The AH-64 Apache Helicopter which uses the M230 chain gun (see picture). The M788 is the practice 30mm round employed and is 30 x 113 mm with an effective range or 1,500 m and a max range of 4,500 m. Several ordnance variants are available, including: M788 Target Practice (TP); M789 High Explosive Dual Purpose (HEDP); and M799 High Explosive Incendiary (HEI).



The A-10 uses the GAU-8A Avenger, 30mm cannon (See picture). It uses PGU-15 30 x 173mm 30 mm ammo. The training round is the PGU-15B. The gun fires 3,900 rpm (rounds per minute).

References: TRI-DDS website; MIDAS; Global Security.org.

Ordnance Technical Data Sheet
U.S. Cartridge, .50 Caliber, Ball M8



Nomenclature: M8, Cartridge, .50 Caliber, Ball
Ordnance Family: Small Arms
DODIC: A576
Propellant: WC860 **-** Single or Double Base Powder*
Filler: Lead, Steel and/or Copper cladding
Filler weight: ± various
Cartridge weight: 1764 grains
Diameter: 12.70 mm (.50 in)
Length: 138.40 mm (5.45 in.)
Projectile Weight: 622.5 grains
Velocity: 2,910 fps (887 mps)

Usage: Machine Guns, Caliber .50, M2 and M85. The cartridge is intended for use against personnel or unarmored targets. Used by M2 and M85 machine guns, and the M107 Long Range Sniper Rifle. The cartridge combines the functions of the M2 armor piercing bullet and the incendiary bullet, and is used against flammable targets and light-armored or unarmored targets, concrete shelters, and similar bullet-resisting targets.

Description: Ball Cartridge. The cartridge is identified by an aluminum bullet tip.

Single Base Propellant: Single base propellants contain nitro cellulose as their chief ingredient. Single-base compositions are used as low-pressure propellants, such as those used in small arms ammunition. They may contain a stabilizer, inorganic nitrates, nitro compounds, metallic salts, metals, carbohydrates and dyes.
Double Base Propellant: Double base propellants contain nitrocellulose and a liquid organic nitrate, such as nitroglycerine. As with single base, stabilizers and additives may be present. Double base propellants are used in cannon, small arms, mortars, rockets, and jet propulsion units.

Reference: Army Technical Manual TM 43-0001-27; Midas; navy.mil

Ordnance Technical Data Sheet
U.S. Cartridge, 7.62 mm, Ball M80

Nomenclature: U.S. Cartridge, 7.62 mm, Ball M80
Ordnance Family: Small Arms
DODIC: A130
Propellant: 46 grains – WC846 **-** Nitrocellulose/Nitroglycerin
Cartridge weight: 392 grains
Projectile weight: 146 grains
Diameter: 7.62 mm
Cartridge Length: 2.8 in (71.1 mm)
Velocity: 2,750 fps (838 mps)

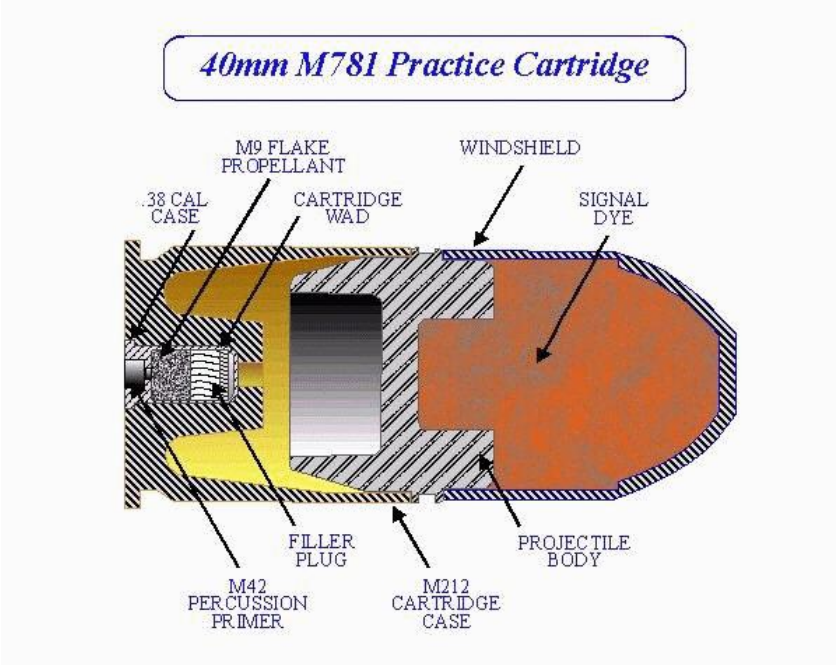
Usage: This cartridge is intended for use against personnel and unarmored targets.

Description: Full metal jacketed bullet and brass cartridge case, center-fired NATO standard small arms.

Single Base Propellant: Single base propellants contain nitro cellulose as their chief ingredient. Single-base compositions are used as low-pressure propellants, such as those used in small arms ammunition. They may contain a stabilizer, inorganic nitrates, nitro-compounds, metallic salts, metals, carbohydrates and dyes.
Double Base Propellant: Double base propellants contain nitrocellulose and a liquid organic nitrate, such as nitroglycerine. As with single base, stabilizers and additives may be present. Double base propellants are used in cannon, small arms, mortars, rockets, and jet propulsion units.

References: ORDATA Online, MIDAS, Army Technical Manuel TM 9-1306-200, Navy.mil

M781 40mm Practice round



Description

This round is blue zinc or aluminum with white markings. It is used for practice and produces a yellow or orange signature on impact

Physical Characteristics

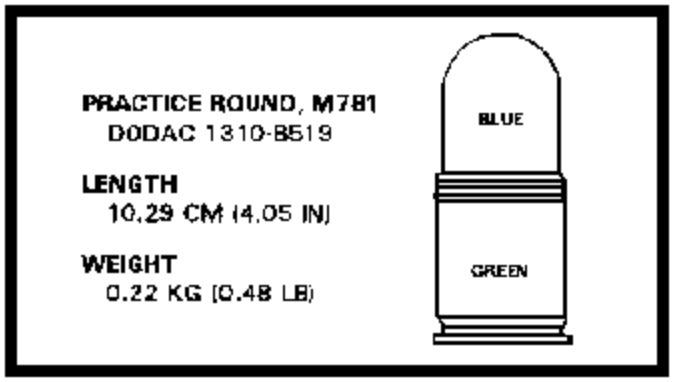


Figure 3-13. Practice round.

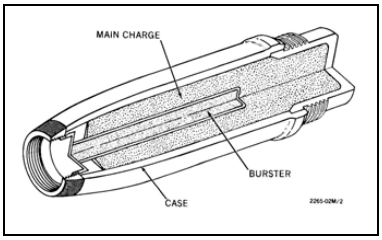
Ordnance Technical Data Sheet
U.S. ROCKET Warhead, 2.75 in, Practice, M156

Nomenclature: Rocket 2.75 Inch Smoke, WP, M156
Ordnance Family: Rockets
DODIC: H486
Propellant: Nitrocellulose/Nitroglycerin
Explosive weight: 999 grams
Item weight: 4000 grams
Diameter: 70 mm
Length: 328 mm
Frag Range: 300 m

Usage: These are non-explosive practice munition warheads used with 2.75-inch practice rockets for target practice, or with dummy rockets for instruction and display. This is a white phosphorus smoke warhead used primarily for target marking.

Description: The warhead is painted and marked in either of the following methods: (1) New color coding is light green overall, with a yellow band around the nose, and nomenclature and loading information stenciled on the side in light red. (2) Older color coding is olive drab overall, with either a light-green band around the nose or the entire nose area painted light green, and a yellow band directly behind the light-green area. The letters WP are stenciled in light red on the light-green area, and nomenclature and loading information stenciled on the side, in black. The warhead is steel.

Hazards: Cocked-Striker; EMR; Explosive (HE); Frag; Movement; Proximity (VT); White Phosphorus (WP)



Reference: ORDATA Online.

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AIR DEPLOYED UNDERWATER CHARGES

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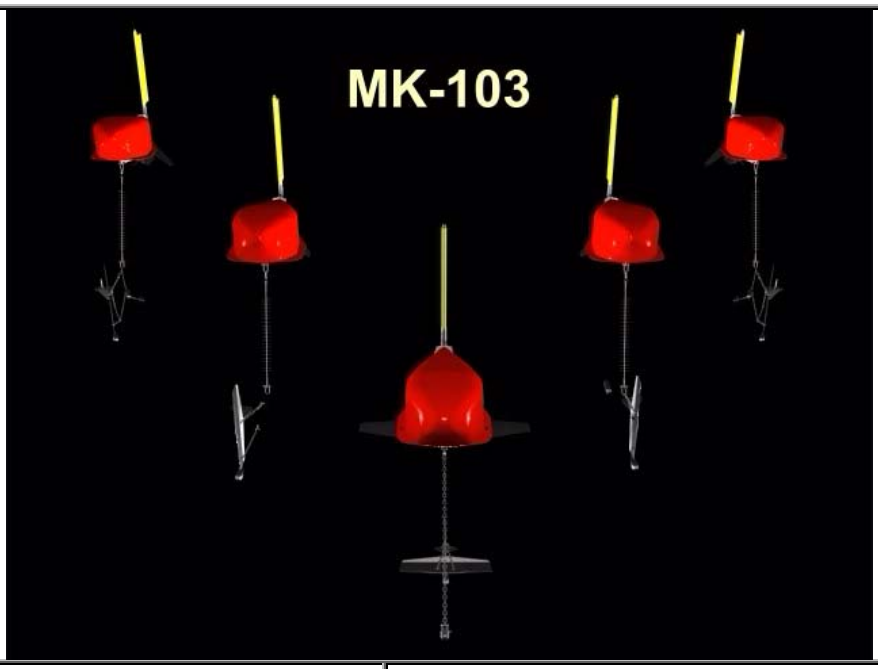
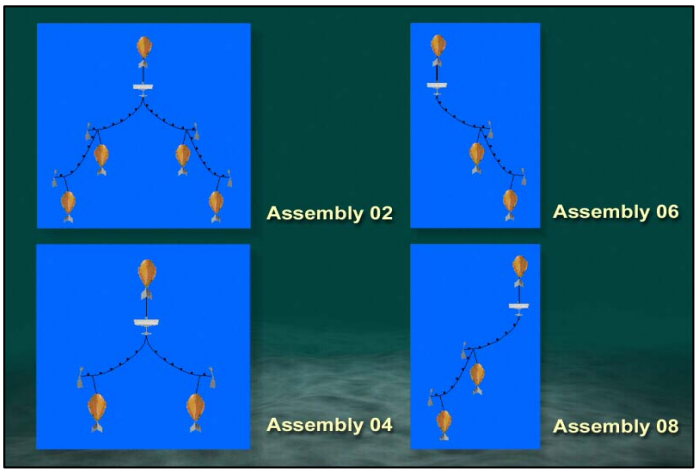
Mk-103 Mine Countermeasure System



Description

The MK-103 Mine Countermeasure Array is an extremely effective towed array used to cut the mooring lines of moored mines. Once the mine has been cut free from its mooring, it is then neutralized by an Explosive Ordnance and Disposal team. The MK-103 Mine Countermeasure System uses a towed cable system outfit with MK-17 explosive cutters set at different distances along the cable. The system has four operational depths and is towed at a speed of 12 knots.

Physical Characteristics



Raytheon

AN/ASQ-235 Airborne Mine Neutralization System (AMNS)
for Optimum Warfighter Safety

AMNS neutralizes anti-shipping mines safely and efficiently by operating from sea- and land-based MH-60S helicopters.

Benefits

- Neutralizes moored and bottom mines (four per MH-60S sortie)
- Accelerates the neutralization process by moving quickly from detection to engagement
- Minimizes human involvement in hazardous minefields; divers and ships are not needed to detonate mines
- Integrates seamlessly with existing MH-60S AMCM equipment
- Positively identifies bottom mines through use of real-time video
- Operates from the air to optimize personnel safety
- Designed to rigorous military standards
- Small logistic footprint

The Navy Standard for Airborne Mine Neutralization

Seaborne mines continue to menace naval and maritime forces worldwide. Mines are used to attack ships approximately 200 times more than any other weapon. Raytheon's Airborne Mine Neutralization System (AMNS), the U.S. Navy's standard for organic airborne mine clearance, has been designed to counter this threat.

AMNS neutralizes moored and bottom mines while operating from sea- and land-based MH-60S helicopters. By using helicopters as a central platform, mine clearance has not only become safer, but nearly 10 times more efficient.

Mines are first identified by the AN/AQS-20A sonar system or other mine countermeasure assets. The AMNS then identifies the location of the mines and neutralizes the target.

AMNS consists of the following removable mission equipment:

- Launch and Handling System
- Common neutralizer vehicle
- Common console display
- Carriage, Stream, Tow and Recovery System

Launch and Handling System Easily Deployed From Aircraft

The mine neutralization begins with the deployment of the Launch and Handling System (LHS) from the MH-60S helicopter. Because it's compatible with MH-60S mechanical and electrical interfaces and supports easy on/off kit reconfiguration, the LHS is easily deployed from the aircraft.

The highly effective LHS integrates many diverse high-tech capabilities into a single system, including a stable platform from which to launch the neutralizer vehicle.

Common Neutralizer Vehicle Ensures Safe Handling

The neutralizer vehicle is released from the LHS under the control of the sensor operator on the aircraft. The operator guides the lightweight (15.5 kg) and highly maneuverable vehicle to the target location using on-board sonar. After the target is viewed and positively identified with an on-board video camera, the operator fires an armor-piercing warhead from the vehicle to neutralize the mine.

The neutralizer's state-of-the-art electronics and sensors also provide a robust, high-speed fiber optic data link, track responder and echo sounder. An inert unit with strobe light, acoustic beacon and recovery section is used for training.

The Archerfish™ has been selected by the U.S. Navy as the common neutralizer vehicle.

Airborne Mine Neutralization System (AMNS)

Common Console Is Human System Interface

The common console, which is aft of the helicopter's cockpit, interfaces with a number of important functions during the mine neutralization process, including sensor operator control, vehicle control, sonar, video and status.

The console displays timely and accurate information about the positions of the target and the neutralizer vehicle. It also displays the bearing and range from the LHS to the neutralizer. This information allows the sensor operator to monitor and adjust the neutralizer's approach to the target.

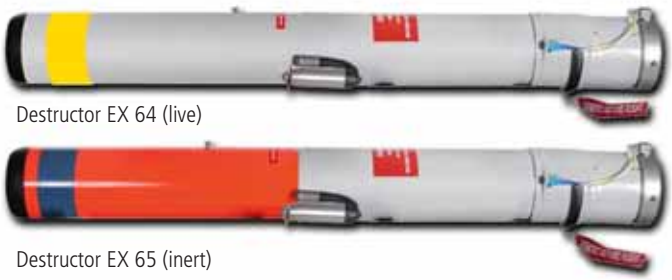
Reliable Recovery Is Ensured

Each MH-60S helicopter is outfitted with a removable Carriage, Stream, Tow and Recovery System (CSTRS), which is used to deploy the Launch and Handling System (LHS) from the aircraft and recover it from the water. The CSTRS, which is also used on the AN/AQS-20A, consists of a winch, AQS-20A tow cable and guillotine.

Designed to Rigorous Safety Standards

Numerous safety precautions were built into the design of the AMNS. The system's key components are designed and tested to strict military standards for explosive system devices. The U.S. Navy has also successfully conducted extensive training and simulation exercises to validate the system's capability and reliability.

Common Neutralizer



Destructor EX 64 (live)

Destructor EX 65 (inert)

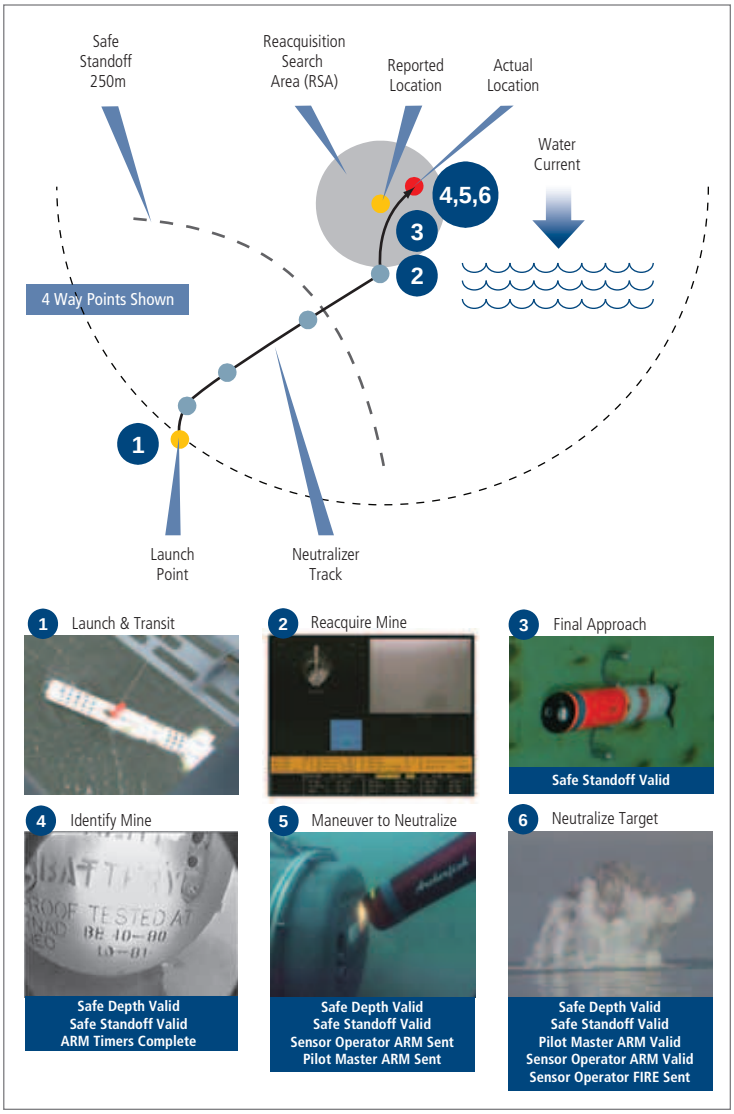
Launch Handling Subsystem Specifications

Length	11.3 ft
Width	15.5 in. diameter
Weight	753 lb (air) with 4 neutralizers, 606 lb empty
	223.5 lb (water) with 4 neutralizers, 217 lb empty
Power	0.6 kW

Destructor Specifications

Weight	36.5 lb (in air)/0.9 lbs (in water)
Length	41.3 in. (after launch)
Diameter	5.3 in. (hull)
Speed	-0.5 to ≥ 6 knots
Fiber Optic Cable	2,000 m (Ntr Spool)/1,500 m (LHS Spool)
Battery	16.8 V, 20 Ah Lithium-ion

Typical Mine Neutralization Scenario



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EOD DIVER DEPLOYED UNDERWATER CHARGES

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M112 Composition C4 Block Demolition Charge

Description

M112 composition C-4 block demolition charge is used primarily for cutting and breaching all types of demolition work. Because of its moldability and high brisance, the charge is ideally suited for cutting irregularly shaped targets such as steel. The adhesive backing allows the charge to be attached to any relatively flat, clean, dry surface that is above freezing point.

Physical Characteristics

The M112 block demolition charge consists of 1.25-pounds of Composition C4 packed in a Mylar-film container with a pressure-sensitive adhesive tape on one surface. The tape is protected by a peelable paper cover. In blocks of recent manufacture, Composition C4 is white and packed in an olive-drab, Mylar-film container. Relative effectiveness factor is 1.34.

Reference: www.globalsecurity.com, www.omniexplosives.com

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BOMBS

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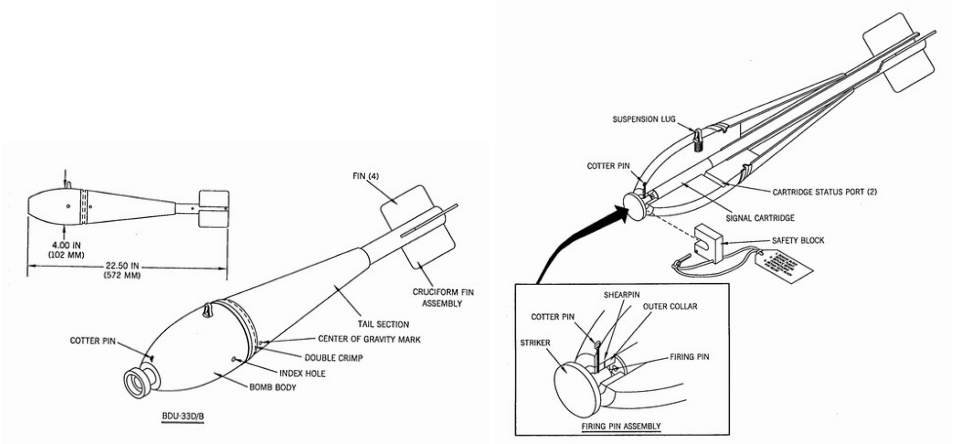
Ordnance Technical Data Sheet

U.S. Bomb, Practice, 25 lb, BDU 33D/B



Nomenclature:	BDU-33D/B Practice Bomb
Ordnance Family:	Bomb
DODIC:	Not Provided
Filler:	Signal Cartridge (see MK 4 Signal Cartridge)
Filler weight:	14.00 g (.49 oz)
Item weight:	11.00 kg (24.25 lbs)
Diameter:	102.00 mm (4.01 in)
Length:	527.00 mm (20.75 in)
Maximum Range:	Not Provided
Fuze:	Impact

Usage: These bombs are signal-generating; impact- or impact-inertia-fired practice/simulated bombs.

Description: The BDU-33D/B bombs are painted light blue; additionally, the BDU-33D/B has white stenciled markings only.

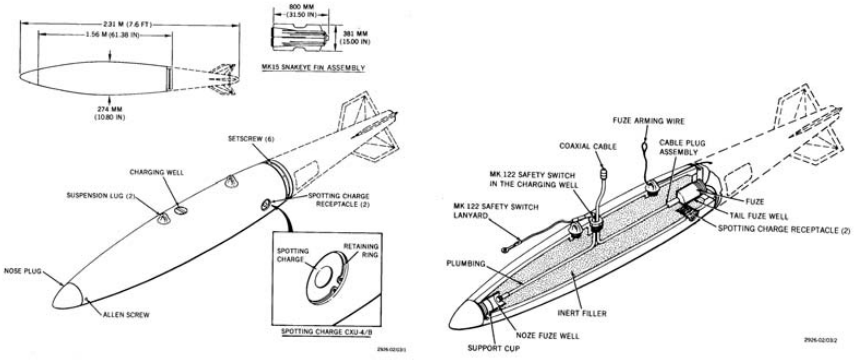
Reference: ORDATA Online.

***Titanium tetrachloride** is a colorless to pale yellow liquid that has fumes with a strong odor. If it comes in contact with water, it rapidly forms hydrochloric acid, as well as titanium compounds.

Titanium tetrachloride is not found naturally in the environment and is made from minerals that contain titanium. It is used to make titanium metal and other titanium-containing compounds, such as titanium dioxide, which is used as a white pigment in

Ordnance Technical Data Sheet

U.S. Bomb Unit, 500 lb, Simulated, BDU-45/B, Quiet Bomb



Nomenclature:	BDU-45/B, Bomb Unit, 500 lb, Simulated, Quite Bomb
Ordnance Family:	Bomb
DODIC:	Not Provided
Filler:	None
Filler weight:	Not Provided
Item Weight:	239.00 kg (500 lbs)
Diameter:	274.00 mm (10.79 in)
Length:	1.54 m (5.05 ft)
Maximum Range:	Not Provided
Fuze:	None

Usage: The bomb is a low drag type of the same size and shape as a Mk 82 bomb container. This is a signal generating simulated bomb used for pilot proficiency training with provisions for visual spotting of bombing accuracy. The bomb is loaded with an inert filler and contains no hazardous components. For the hazards of the fuze(s), TDD or sensing element, spotting charge adapter, and spotting charges refer to the appropriate reference.

Description: The bomb is painted blue with the designation BDU-45/B stenciled in white on the forward end of the bomb. Early models of the bomb are stamped with Mk 82 designations between the suspension lugs and with Mk 82 designation, ordnance drawing number, and loading data stenciled in white on the side of the bomb. The bomb fin assembly is painted olive drab.

Reference: ORDATA Online.

Ordnance Technical Data Sheet
U.S. BOMB, PRACTICE BDU-48/B

Photography by John Pitcher, 2007.

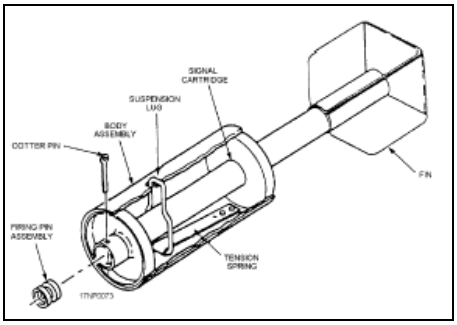
Nomenclature:	U.S. Bomb, Practice, BDU-48/B
Ordnance Family:	Bomb
DODIC:	E962
Filler:	Signal Cartridge, MK-4 MOD 3 or CXU-3A/B
Filler weight:	Not Provided
Item weight:	9.8 lbs
Diameter:	98.00 mm (3.86 in)
Length:	562.00 mm (22.13 in)
Maximum Range:	Not Provided
Fuze:	Impact or impact-inertia fired

Usage: These are air-dropped, impact or impact-inertia-fired signal-generating practice bombs used to train aircrews in the bombing of surface targets.

Description: The BDU-48/B is a 10-pound practice bomb. It is a thin-cased cylindrical bomb used to simulate retarded weapon delivery. The bomb is composed of the bomb body, a retractable suspension lug, a firing assembly, and box-type conical fins. The firing device consists of a firing pin assembly and a cotter pin. The BDU-48/B is painted blue. Identification nomenclature is stenciled in white letters on the bomb body. The bomb can use signal cartridge MK-4 Mod 3, or CXU-3A/B. While handling or transporting bombs, loaders should avoid placing their bodies in line with either end of the bomb.

*__Titanium tetrachloride__ is a colorless to pale yellow liquid that has fumes with a strong odor. If it comes in contact with water, it rapidly forms hydrochloric acid, as well as titanium compounds. Titanium tetrachloride is not found naturally in the environment

and is made from minerals that contain titanium. It is used to make titanium metal and other titanium-containing compounds, such as titanium dioxide, which is used as a white pigment in paints and other products and to produce other chemicals. Military use it as a component of spotting charges. Titanium tetrachloride is very irritating to the eyes, skin, mucous membranes, and the lungs. Breathing in large amounts can cause serious injury to the lungs. Contact with the liquid can burn the eyes and skin.



HAZARDS:

- Explosive
- Red phosphorus or Titanium tetrachloride
- Smoke/incendiary

References: ATSDR; The Aviation Ordnanceman; TRI-DDS website; MIDAS; Global Security.org.

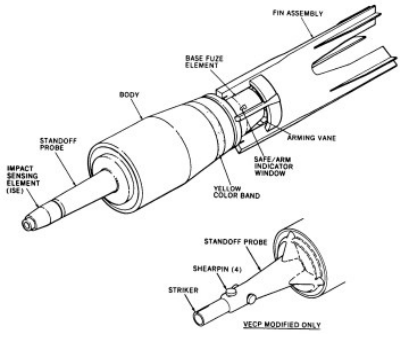
MK-20 Rockeye

Description

The MK-20 Rockeye is a free-fall, unguided cluster weapon designed to kill tanks and armored vehicles. The system consists of a clamshell dispenser, a mechanical MK-339 timed fuze, and 247 dual-purpose armor-piercing shaped-charge bomblets. The bomblet weighs 1.32 pounds and has a 0.4-pound shaped-charge warhead of high explosives, which produces up to 250,000 psi at the point of impact, allowing penetration of approximately 7.5 inches of armor. Rockeye is most efficiently used against area targets requiring penetration to kill. Fielded in 1968, the Rockeye dispenser is also used in the Gator air-delivered mine system. During Desert Storm US Marines used the weapon extensively, dropping 15,828 of the 27,987 total Rockeyes against armor, artillery, and antipersonnel targets. The remainder were dropped by Air Force (5,345) and Navy (6,814) aircraft.

Physical Characteristics

Length:	7.5 ft (2.3 m)
Diameter:	13.2 in (335 mm)
Tail Span	2.8 ft (0.85 m)
Weight:	485 lbs (220 kg)
Filling:	247 bomblets



Drawing: via ORDATA Online Website

Bomb MK 118 MOD 0

Data for MK 118 MOD 0:

Length: 34.3 cm (13.5 in)
Diameter: Body: 53 mm (2.1 in)
Fin assembly: 57 mm (2.25 in)
Weight: 590 g (1.3 lb)
Explosive: 170 g (0.37 lb) Oct

Reference: www.fas.org

Ordnance Technical Data Sheet
U.S. BOMB, 25-LB, PRACTICE, MK-76

Nomenclature:	U.S. Bomb, 25-lb, Practice, MK-76
Ordnance Family:	Bomb
DODIC:	E9AF, E9AE
Filler:	Signal Cartridge, typically MK-4 MOD 3 (red phosphorus), CXU-3A/B or CXU-2/B (titanium tetrachloride)
Filler weight:	Various (.16 lbs to .38 lbs)
Item weight:	25 lbs (11,000 grams)
Diameter:	4.00 in
Length:	Dependent on Mod (22.5 in to 25.07 in)
Fuze:	Impact or impact-inertia fired

Spotting Charge. Photo by J. Pitcher

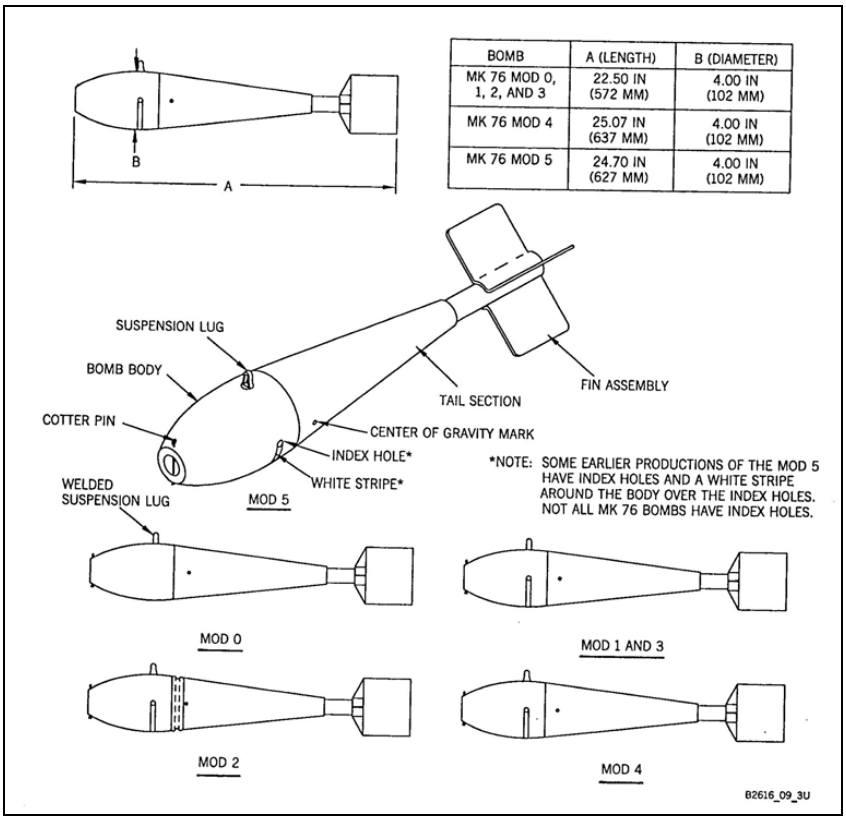
Usage: These are air-dropped, impact or impact-inertia-fired signal-generating practice bombs used to train aircrews in the bombing of surface targets.

Description: The Mk 76-series bombs are painted black or blue. The Mk 76 Mods 1, 2, 3, 4, and some Mod 5 bombs have a 0.25-inch (6-millimeter) white stripe over the index holes. The bombs contain no hazardous components. Hazardous components are contained in the signal cartridge or spotting charge. These bombs are signal-generating, impact-or impact-inertia-fired practice/simulated bombs. These bombs use either the Mk 4-series, Mk 5 Mod 0, CXU-3/B, CXU-3A/B signal cartridge, or the CXU-2/B spotting charge. The Mk 76-series and BDU-33-series bombs are cast iron with sheet steel fin assemblies.

*__Titanium tetrachloride__ is a colorless to pale yellow liquid that has fumes with a strong odor. If it comes in contact with water, it rapidly forms hydrochloric acid, as well as titanium compounds. Titanium tetrachloride is not found naturally in the environment and is made from minerals that contain titanium. It is used to make titanium metal and other titanium-containing compounds, such as titanium dioxide, which is used as a white

pigment in paints and other products and to produce other chemicals. Military use it as a component of spotting charges. Titanium tetrachloride is very irritating to the eyes, skin, mucous membranes, and the lungs. Breathing in large amounts can cause serious injury to the lungs. Contact with the liquid can burn the eyes and skin.

***Red Phosphorus** may be harmful if absorbed through skin, ingested, or inhaled, and may cause irritation of the skin, eyes, upper respiratory tract, gastrointestinal tract, and mucous membranes. Inhalation of red phosphorus dust may cause bronchitis. Ingestion of red phosphorus may also cause stomach pains, vomiting, and diarrhea. Effects may vary from mild irritation to severe destruction of tissue depending on the intensity and duration of exposure. Prolonged and/or repeated skin contact may result in dermatitis. Chronic exposure may cause kidney and liver damage, anemia, stomach pains, vomiting, diarrhea, blood disorders, and cardiovascular effects. Chronic ingestion or inhalation may induce systemic phosphorus poisoning. If red phosphorus is contaminated with white phosphorus, chronic ingestion may cause necrosis of the jaw bone ("phossy-jaw").



BOMB	A (LENGTH)	B (DIAMETER)
MK 76 MOD 0, 1, 2, AND 3	22.50 IN (572 MM)	4.00 IN (102 MM)
MK 76 MOD 4	25.07 IN (637 MM)	4.00 IN (102 MM)
MK 76 MOD 5	24.70 IN (627 MM)	4.00 IN (102 MM)

HAZARDS: Explosive; Red phosphorus or Titanium tetrachloride; Smoke/incendiary.

References: ATSDR; The Aviation Ordnanceman; TRI-DDS website; MIDAS; Global Security.org.

Ordnance Technical Data Sheet
U.S. BOMB, 500-LB, PRACTICE, MK-82

Nomenclature:	MK-82, 500-lb, Practice Bomb
Ordnance Family:	Bomb
DODIC:	E9an or F243
Filler:	None (maybe fitted with spotting charge/signals)*
Filler weight:	Not Provided
Item weight:	226.80 kg (500 lbs)
Diameter:	274.00 mm (10.79 in)
Length:	1.67 m (65.90 in)
Fuze:	Impact
Hazards:	Ejection; EMR: Explosive; Frag; Movement; Proximity; Smoke/Incendiary

Usage: The MK-81 through MK-84 concrete or sand-filled practice bombs are used to train pilots in delivery techniques. These bombs normally do not contain an explosive filler or spotting charge. Explosive-loaded practice bombs have been found; therefore, all MK-81 through MK-84 concrete and sand-filled bombs should be treated as suspect. These bombs may contain live internal fuzes with boosters, live external fuzes and adapter-boosters, or a spotting charge adapter with a signal cartridge installed. They are all designed to function on impact, producing blast and fragmentation or a puff of white smoke.

Description: The MK-82 (modified) bomb has a welded nose plate and the BDU-50/B bomb has a threaded nose with a plastic plug installed. The aft end of the MK-82 (modified) bomb is closed with a removable tail plate for filling operations and the BDU-50/B bomb is closed with a base plate, neither of which contain a threaded fuze well. The bomb body, conical fin assembly, and closure plugs are steel.

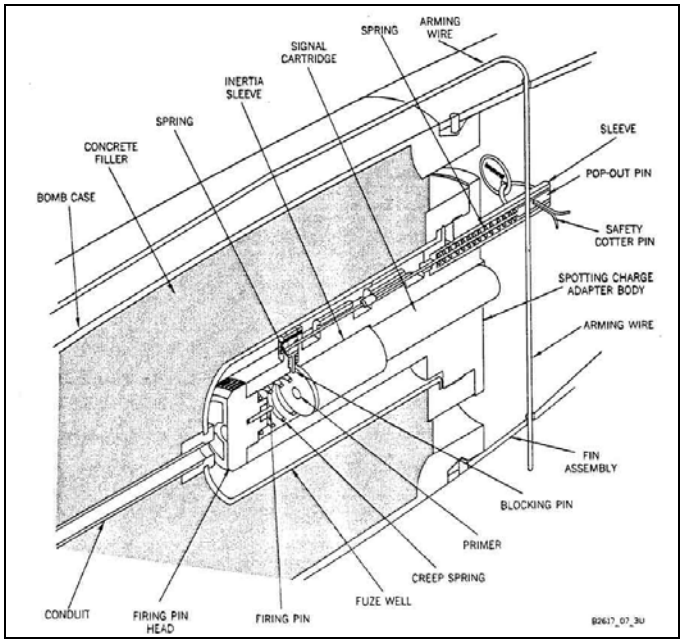
The MK-82 inert bomb is painted olive drab with a 38-millimeter (1.50-inch)-wide yellow band followed by a 51-millimeter (2.00-inch)-wide blue band on the nose. The markings SPOTTING CHARGE INSTALLED, (the date), and 6.25 POUNDS COMPOSITION C4, are stenciled in white on each side of the bomb next to the suspension lugs.

***Titanium tetrachloride** is a colorless to pale yellow liquid that has fumes with a strong odor. If it comes in contact with water, it rapidly forms hydrochloric acid, as well as titanium

compounds. Titanium tetrachloride is not found naturally in the environment and is made from minerals that contain titanium. It is used to make titanium metal and other titanium-containing compounds, such as titanium dioxide, which is used as a white pigment in paints and other products and to produce other chemicals. Military use it as a component of spotting charges. Titanium tetrachloride is very irritating to the eyes, skin, mucous membranes, and the lungs. Breathing in large amounts can cause serious injury to the lungs. Contact with the liquid can burn the eyes and skin.

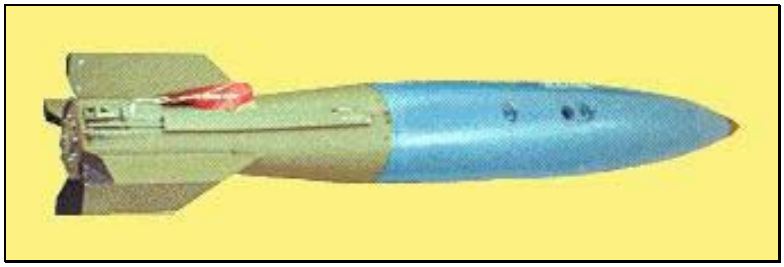
****Pyrotechnic** and screening devices contain combustible chemicals which, when ignited, rapidly generate a flame of intense heat, flash, infrared radiation, smoke or sound display (or combinations of these effects) for a variety of purposes. Compared to other explosive substances, pyrotechnics are more adversely affected by moisture, temperature, and rough handling. Some compositions may become more sensitive, and even ignite, when exposed to moisture or air. Mixtures which contain chlorates and sulfur are susceptible to spontaneous combustion. Most pyrotechnics produce a very hot fire that is difficult to extinguish and most burn without serious explosions. Many chemicals used in pyrotechnics produce toxic effects when ignited. Other pyrotechnics, which contain propelling charges, create an extremely hazardous missile hazard if accidentally ignited.

*** **Composition C-4**: This is a (91/9) RDX and plastic explosive composition. It is semi-plastic putty-like material, dirty white to light brown in color, less sensitive, more stable, less volatile and more brisant than composition C-3. It is a non-hydroscopic material that has found application in demolition blocks and specialized uses.



Reference: ORDATA Online, MIDIAS.

Ordnance Technical Data Sheet
U.S. BOMB, 1,000-LB, PRACTICE, MK-83



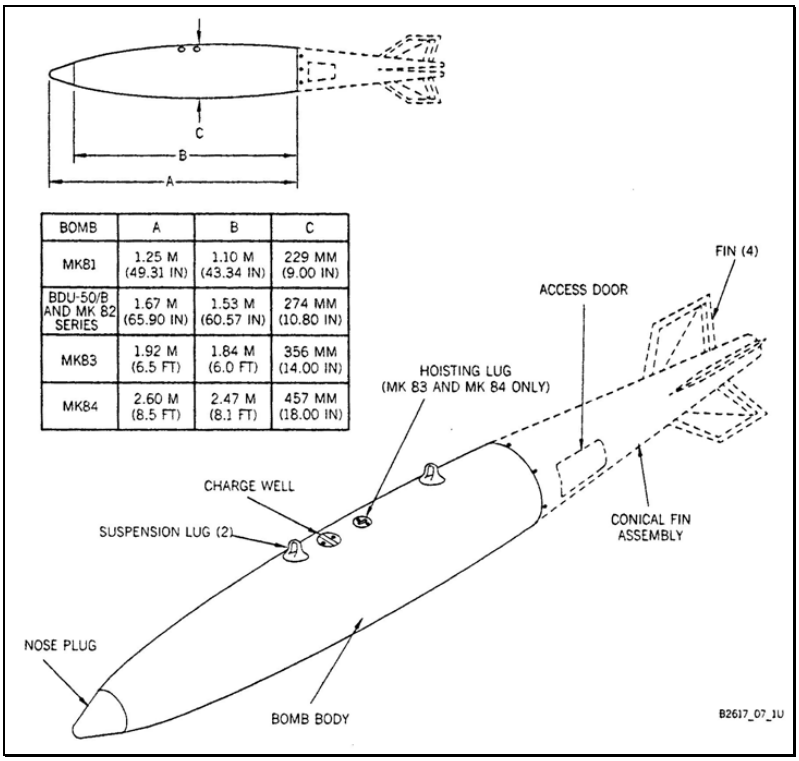
Nomenclature:	U.S. BOMB, 1,000-LB, PRACTICE, MK-83
Ordnance Family:	Bombs
DODIC:	E511
Explosive:	None
Item weight:	1,054 lbs
Diameter:	14 in (356 mm)
Length:	6.5 ft (1.92 m) nose to end of bomb body (does not include fin)
Frag Range:	20 m
Hazard:	Ejection; EMR; Frag; Explosive (HE); Movement; Proximity (VT); Smoke/Incendiary
Explosive Weight:	0 gm
Component Materials:	The bomb body, conical fin assembly, and closure plugs are steel.

Usage: The MK-81 through MK-84 concrete or sand-filled practice bombs are used to train pilots in delivery techniques. These bombs normally do not contain an explosive filler or spotting charge. Explosive-loaded practice bombs have been found; therefore, all MK-81 through MK-84 concrete and sand-filled bombs should be treated as suspect. These bombs may contain live internal fuzes with boosters, live external fuzes and adapter-boosters, or a spotting charge adapter with a signal cartridge installed. They are all designed to function on impact, producing blast and fragmentation or a puff of white smoke.

Description: The tail fuze cavity will be closed with a closure plug, spotting charge adapter, fuze, or conical plug. The nose fuze cavity will be closed with a fuze or nose plug. The nose plug will be either conical with two wrench flats, or streamlined with a spanner hole. Depending on the fuzing, the bombs may have an arming wire assembly, a lanyard, a cable, or an electrical charging receptacle installed. The charging well between the suspension lugs may be closed by a plug or may be fitted with an electrical charging receptacle, a lanyard lock, a fuze initiator, or an arming safety switch. The suspension lugs are 356 millimeters (14.00 inches) apart, except on the MK-84 they are 762 millimeters (30.00 inches) apart. The bombs may be fitted with conical or retarding fin assemblies. The bombs can be internally or externally fuzed. The arming assembly for a

mechanical tail fuze may extend through the base or the side of the conical fin assembly, depending on the arming assembly used. An empty fuze cavity may be closed by a closure plug; however, the presence of a closure plug in a fuze cavity does not indicate the absence of a fuze. Bombs with certain fuzes have a closure plug screwed into the fuze cavity, making direct identification of the fuze impossible. When the fuze is not exposed, identification may be aided by observation of certain fuze-related features such as the type of closure plug in the fuze cavities and the components installed in the charging well. Other features such as the presence of arming vanes and reach rods may also aid in determining the type of fuze used.

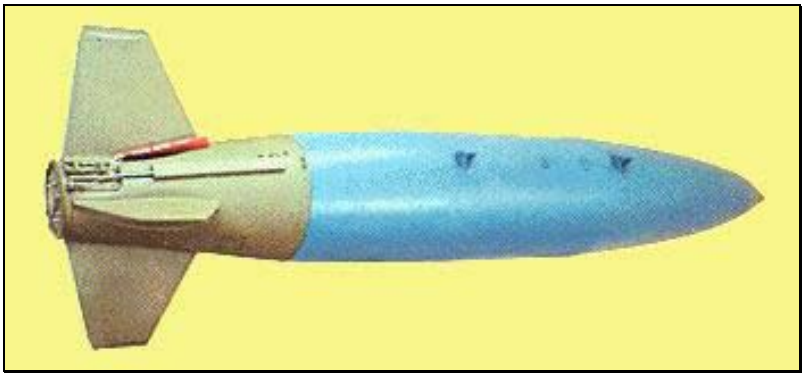
The MK-81 through MK-84 concrete- or sand-filled bombs are painted blue or olive drab, with white or black markings. Bombs fitted with a signal charge will have a brown or yellow band no wider than 76 millimeters (3.00 inches) circumscribed near the nose of the bomb. However, explosive-loaded practice bombs may be found without markings or color band indicating the explosive content. Inert-loaded MK-82 Mod 2 practice bombs may be found with an olive drab thermal coating and a 76-millimeter (3.00-inch)-wide blue nose band. Loading information is stenciled on the thermal coating. Thermally protected practice bombs are also die-stamped on the base plate to indicate their inert filler.



BOMB	A	B	C
MK81	1.25 M (49.31 IN)	1.10 M (43.34 IN)	229 MM (9.00 IN)
BDU-50/B AND MK 82 SERIES	1.67 M (65.90 IN)	1.53 M (60.57 IN)	274 MM (10.80 IN)
MK83	1.92 M (6.5 FT)	1.84 M (6.0 FT)	356 MM (14.00 IN)
MK84	2.60 M (8.5 FT)	2.47 M (8.1 FT)	457 MM (18.00 IN)

References: ORDATA Online; MIDAS.

Ordnance Technical Data Sheet
U.S. BOMB, 2,000-LB, PRACTICE, MK 84

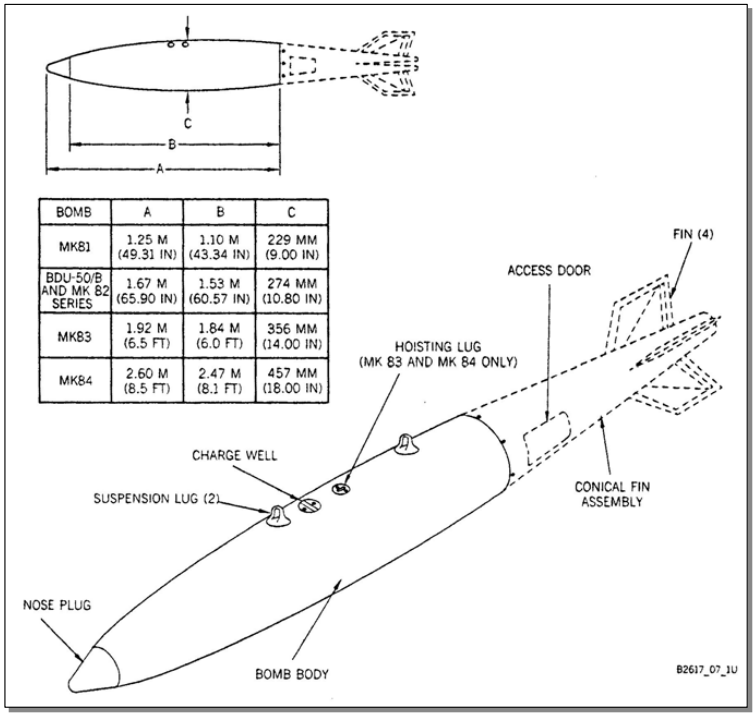


Nomenclature: U.S. BOMB, 2,000-LB, PRACTICE, MK 84
Ordnance Family: Bombs
DODIC: E9bd
Filler: Signal cartridge MK-4 Mod 3 (red phosphorus)
Item weight: 2,039 lbs
Diameter: 18 in (457 mm)
Length: 8.5 feet (2.6 m) without fin
Frag Range: 20 m
Hazard: Ejection; EMR; Frag; Explosive (HE); Movement; Proximity (VT); Smoke/Incendiary

Usage: The MKs 81 through 84 concrete or sand-filled practice bombs are used to train pilots in delivery techniques. These bombs normally do not contain an explosive filler or spotting charge. Explosive-loaded practice bombs have been found; therefore, all MK-81 through MK-84 concrete and sand-filled bombs should be treated as suspect. These bombs may contain live internal fuzes with boosters, live external fuzes and adapter-boosters, or a spotting charge adapter with a signal cartridge installed. They are all designed to function on impact, producing blast and fragmentation or a puff of white smoke.

Description: MK-81 through MK-84 and MK-82 inert bombs. The tail fuze cavity will be closed with a closure plug, spotting charge adapter, fuze, or conical plug. The nose fuze cavity will be closed with a fuze or nose plug. The nose plug will be either conical with two wrench flats, or streamlined with a spanner hole. Depending on the fuzing, the bombs may have an arming wire assembly, a lanyard, a cable, or an electrical charging receptacle installed. The charging well between the suspension lugs may be closed by a plug or may be fitted with an electrical charging receptacle, a lanyard lock, a fuze initiator, or an arming safety switch. The suspension lugs are 356 millimeters (14.00 inches) apart, except on the MK-84 they are 762 millimeters (30.00 inches) apart. The

bombs may be fitted with conical or retarding fin assemblies. The bombs can be internally or externally fuzed. The arming assembly for a mechanical tail fuze may extend through the base or the side of the conical fin assembly, depending on the arming assembly used. An empty fuze cavity may be closed by a closure plug; however, the presence of a closure plug in a fuze cavity does not indicate the absence of a fuze. Bombs with certain fuzes have a closure plug screwed into the fuze cavity, making direct identification of the fuze impossible. When the fuze is not exposed, identification may be aided by observation of certain fuze-related features such as the type of closure plug in the fuze cavities and the components installed in the charging well. Other features such as the presence of arming vanes and reach rods may also aid in determining the type of fuze used.



The MK-81 through MK-84 concrete- or sand-filled bombs are painted blue or olive drab, with white or black markings. Bombs fitted with a signal charge will have a brown or yellow band no wider than 76 millimeters (3.00 inches) circumscribed near the nose of the bomb. However, explosive-loaded practice bombs may be found without markings or color band indicating the explosive content. Inert-loaded MK-82 Mod 2 practice bombs may be found with an olive drab thermal coating and a 76-millimeter (3.00-inch)-wide blue nose band. Loading information is stenciled on the thermal coating. Thermally protected practice bombs are also die-stamped on the base plate to indicate their inert filler.

References: ORDATA Online; MIDAS.

BOEING

Backgrounder

Integrated Defense Systems
P.O. Box 516
St. Louis, MO 63166
www.boeing.com

Joint Direct Attack Munition

Description & Purpose:
The Joint Direct Attack Munition (JDAM) is a low-cost guidance kit produced by Boeing that converts existing unguided free-fall bombs into accurately guided "smart" weapons. The JDAM kit consists of a tail section that contains a Global Positioning System/Inertial Navigation System and body strakes for additional stability and lift.

Additional growth to the JDAM low-cost family of weapons includes Laser JDAM, the incorporation of a laser sensor that improves JDAM's current near-precision accuracy to precision accuracy and facilitates prosecution of targets of opportunity (including moving targets); JDAM Extended Range (JDAM ER), the incorporation of a low-cost wing set to extend JDAM's standoff range to greater than 40 miles, and the incorporation of JDAM guidance on other warheads such as naval mines, heavy penetrator warheads and new specialty warheads.

Customer(s):
Both the U.S. Air Force and U.S. Navy employ JDAM. Its first operational use was during Operation Allied Force in the Balkans in 1999. JDAM has been used extensively in Operation Enduring Freedom (OEF) and Operation Iraqi Freedom. The first international sale was made to Israel in 2000. Since then, 18 additional international customers have purchased JDAM.

General Characteristics:
Currently, MK-84 2,000-pound and BLU-109 2,000-pound (900-kg) bombs (GBU-31); MK-83 (GBU-32); and MK-82 500-pound (225-kg) bombs (GBU-38) are in production to make the cost-effective JDAM. When employed, these weapons have proven highly accurate and can be delivered in any flyable weather. JDAM can be launched from more than 15 miles from the target with updates from GPS satellites to help guide the weapon to the target.

The JDAM production team includes Honeywell Inc. (inertial measurement unit); Rockwell Collins (global positioning system receiver); HR Textron (tail actuator subsystem); Lockheed Martin Tactical Defense Systems (mission computer); Lockely (tail fairing); Enser and Eagle-Picher (battery); and Stremel (strakes and cable cover).

Background:
The full-scale production decision (milestone III) for JDAM was made by the U.S. Department of Defense (DoD) in March 2001. In November 2004, Boeing delivered the 100,000th JDAM to the U.S. military. As of June 2008, Boeing has delivered more than 195,000 JDAM tail kits and still produces over 1,200 JDAMs every month. The DoD now plans to procure about 217,000 JDAM kits in several configurations to fit the various warheads.

Contact: Tim Deaton
Global Strike Systems
The Boeing Company
(314) 232-5886
timothy.r.deaton@boeing.com

August 2008

Raytheon

JSOW
Family of Precision Strike Weapons

The Joint Standoff Weapon is a modular, affordable, highly-lethal weapon revolutionizing strike warfare.

Benefits

- Increased weapon and platform survivability
- Multiple launch capability
- Tactical flexibility
- Jointness and interoperability
- Cost effective

Joint Standoff Weapon (JSOW)
This new generation glide weapon ensures warfighter survivability by enabling precision air strike launches from well-beyond most enemy air defenses, at kinematic standoff ranges up to 70 nm (130 km). JSOW Block II development significantly reduced JSOW unit costs and added Selective Availability/ Anti-Spoofing Module (SAASM) Global Positioning System (GPS) capability. It was completed in 2006.

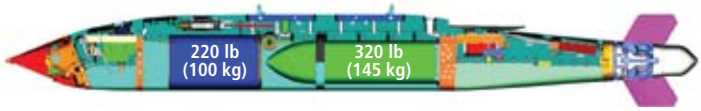
The family of JSOW precision strike weapons is modular in design with variants that can integrate different lethal submunitions, and a blast/ fragmentation unitary warhead and a hardened target penetrator that can be programmed for blast and fragmentation effects. JSOW targets vary from all types of area targets to hard point targets. JSOW's low radar cross section and infrared signature are key stealth features and ensure a high probability of survival en route to heavily defended targets.

The blast/fragmentation unitary variant incorporates the insensitive 500-pound BLU-111 (MK-82). The BROACH penetrator/blast/fragmentation variant incorporates an uncooled Imaging Infrared (IIR) autonomous terminal seeker and tracker, and integrates the BROACH dual-stage blast/ fragmentation and/or penetrator warhead. This variant enables precision attack of point targets.

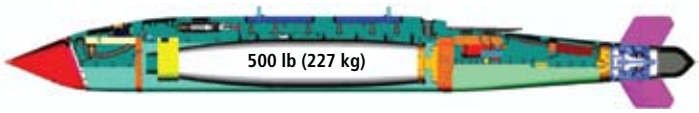
Since 1999, JSOW has been combat proven in operations Southern Watch, NATO Allied Force, Enduring Freedom and Iraqi Freedom with more than 400 weapons employed. More than 3,400 JSOWs have been produced.

Operations
Today, JSOW variants can engage and destroy virtually the entire target set for U.S. forces spanning a range of threat environments. All JSOW variants are guided to the target area by a highly-integrated GPS and Inertial Measurement System. JSOW receives the targeting information in preplanned mode, in the cockpit with data received while airborne through onboard sensors, or through other third-party targeting assets. After the AGM-154C BROACH variant arrives in the target area, it utilizes the IIR seeker for autonomous guidance in the terminal phase of the flight to attack with precision accuracy.

Modularity/Growth
JSOW is designed to take advantage of new developments in payloads and sensors through design modularity of the air vehicle. The payload bay can accommodate lethal and nonlethal payloads — from warheads to pamphlets to sensor packages. The terminal seeker space can accept the latest sensors as they are developed.



JSOW-C with the BROACH Warhead



JSOW-A-1 with the BLU-111 Warhead

A technology demonstration phase is currently underway leading to a spring 2009 JSOW Extended Range (ER) Free Flight Test.

Performance

JSOW demonstrated all standoff accuracy and lethality requirements in a highly-successful development and operational test program. This demonstrated the ability to launch from high or low altitudes and accurately navigate to the target area via selected waypoints, further enhancing weapon and aircrew survivability.

JSOW A-1 (BLU-111) is currently in production for FMS only. JSOW C is currently in production for four international FMS customers.

The AGM-154C (BROACH) has demonstrated precision accuracy within approximately four feet in developmental and operational tests. The weapon is in full-rate production and achieved initial operating capability in February 2005.

JSOW C-1 adds a two-way datalink and moving maritime target capability, is in full-scale development and scheduled for initial operation capability in FY 2010.

JSOW is integrated on the F-15E, F-16, F/A-18, B-2 and B-52 aircraft. JSOW is also a threshold internal bay weapon for the F-35 Joint Strike Fighter initial operational capability. The aircraft compatibility built into the JSOW design will minimize integration costs for future aircraft platforms. The maturity and proven capabilities within the JSOW make this a user-friendly, highly-reliable, cost-effective system.

JSOW Specifications

Length:	160 in	(4.1 m)
Weight:	~1,050 lb	(475 kg)

Aircraft Compatibility:

- F-16, F-15E, F/A-18, B-2, B-52, P-3, F-35 (JSF), JAS 39 Gripen, Eurofighter 2000, Tornado
- Multiple carriage capable on BRU-55/BRU-57 twin launchers
- MIL-STD-1553/1760 and NATO STANAG 3837 AA interface for full capability

Range (unpowered):

- Low altitude 500-ft launch 12 nm (22 km)
- High altitude 40,000-ft launch 70 nm (130 km) maximum kinematic range

JSOW-ER (powered): – In technology demonstration phase

- ~155 nm (290 km) — Spiral 0

Warheads:

- 500-lb BROACH — Blast/fragmentation and/or penetrating warhead Demonstrated 5 ft (1.5 m) concrete penetration
- 500-lb BLU-111 — Unitary blast/fragmentation warhead

Raytheon Company
Missile Systems
Air Warfare Systems
P.O. Box 11337
Tucson, Arizona
85734-1337 USA
520.663.8999 phone
520.663.8138 fax

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Customer Success Is Our Mission

APPENDIX F

AGENCY AND PUBLIC COMMENTS ON DEIS/OEIS AND PUBLIC HEARING INFORMATION

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APPENDIX F
PUBLIC INVOLVEMENT

F1: CORRESPONDENCE FROM GOVERNMENTAL AGENCIES, ORGANIZATIONS, AND PRIVATE ENTITIES AND INDIVIDUALS

During the public review process for the DEIS/OEIS, 86 comments were received; 15 from federal agencies, 30 from state agencies, 29 from non-governmental organizations, and 12 from individuals or private entities.

F2: PUBLIC HEARINGS

Two public hearings were held 14-15 October 2008 to receive public comments on the Navy Cherry Point Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement (DEIS/OEIS). The hearings were held in Beaufort and Wilmington, North Carolina.

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DRAFT RESPONSES, For Official Use Only

Correspondence from Government Agencies, Organizations, and Private Entities and Individuals on

Navy Cherry Point Range Complex Draft EIS/OEIS

Comment Tracking Code	Date	Affiliation	Author
Federal Agencies			
F1	October 14, 2008	US Department of the Interior, Office of Environmental Policy and Compliance	Gregory Hogue
F2	October 15, 2008	Congress of the United States	Hon. Mike McIntyre
F3	October 27, 2008	US Environmental Protection Agency, Region 4	Heinz J. Mueller
F4	October 29, 2008	Marine Mammal Commission	Timothy J. Regan, Ph.D.
State Agencies			
S1	October 8, 2008	North Carolina Department of Environment and Natural Resources, Division of Coastal Resources	Stephen Rynas
S2	October 20, 2008	North Carolina Wildlife Resources Commission	Maria Dunn
S3	October 22, 2008	North Carolina Department of Environment and Natural Resources, Division of Marine Fisheries	Patricia Murphy
S4	October 23, 2008	North Carolina Department of Environment and Natural Resources	Dr. Charles Peterson
S5	October 1, 2008	North Carolina Department of Administration, Division of Environmental Health	Kelly Johnson
Organizations			
O1	October 6, 2008	Natural Resources Defense Council	Taryn G. Kiekow
O2	October 15, 2008	North Carolina For Responsible Use of Sonar	John R. Spruill
O3	October 15, 2008	North Carolina For Responsible Use of Sonar	John R. Spruill
O4	October 15, 2008	PenderWatch & Conservancy (letter)	James Milne, John R. Spruill, and Allie Sheffield
O5	October 15, 2008	PenderWatch (verbal comment at Public Hearing)	Allie Sheffield
O6	October 25, 2008	Cetacean Society International	William Rossiter
O7	October 25, 2008	New York Whale and Dolphin Action League	Taffy Williams
O8	October 27, 2008	Provincetown Center for Coastal Studies	Richard F. Delaney
O9	October 27, 2008	Animal Welfare Institute	Susan Millward
O10	October 27, 2008	Natural Resources Defense Council	Taryn Kiekow
Private Entities/Individuals			
P1	October 3, 2008	private	Candis M. Harbison
P2	October 3, 2008	Lynch and Eatman, L.L.P	Jerome R. Eatman, Jr.
P3	October 8, 2008	private	Wayne Johnson, PhD
P4	October 14, 2008	private	LTC Sam Booher
P5	October 14, 2008	private	Susan Davis (verbal comment at Public Hearing)
P6	October 19, 2008	private	Frances T. Armstrong

P7	October 27, 2008	private	Janisse Ray
P8	Undated	private	Dr. Stephanie A. Sellers
P9	October 6, 2008	private	Jacqueline Eckert
P10	October 19, 2008	private	Mary Brown
P11	October 26, 2008	private	Debra Fried
P12	October 24, 2008	White County Intermediate School	Third Grade Class (31 letters)

Comment #F1

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Richard B. Russell Federal Building
75 Spring Street, S.W.
Atlanta, Georgia 30303

TAKE PRIDE IN AMERICA

ER 08/971
9043.1

October 14, 2008

Naval Facilities Engineering Command, Atlantic Division
Attention: Code EV22SA (Navy CHPT EIS/OEIS PM)
6506 Hampton Boulevard
Norfolk, Virginia, 23508–1278

Re: Comments for Draft Environmental Impact Statement/Overseas Environmental Impact Statement, for the Navy Cherry Point Range Complex, NC

The U.S. Department of the Interior has reviewed the subject Draft Environmental Impact Statement/Overseas Environmental Impact (DEIS/OEIS) and offers the following comment.

SPECIFIC COMMENT

Section 3.1 References, Bathymetry and Sediments, page 7-3

The reference below is corrected as shown in **bold** below:

Hollister, C.D. 1973 Atlantic continental shelf and slope of the United States; texture of surface sediments from New Jersey to southern Florida: USGS Prof. Pap. **529-M**, 23 p.

Thank you for the opportunity to review and comment on the DEIS/OEIS. If you have any questions concerning our comment, please contact Lloyd Woosley, Chief of the USGS Environmental Affairs Program, at (703) 350-8797 or at lwoosley@usgs.gov. I can be reached on (404) 331-4524 or at gregory_hogue@ios.doi.gov.

Sincerely,

Gregory Hogue
Regional Environmental Officer

cc:
USGS - Virginia
OEPC - WASH

Comment #F2

MIKE McINTYRE
7TH DISTRICT, NORTH CAROLINA

COMMITTEE ON AGRICULTURE
CHAIRMAN
SUBCOMMITTEE ON SPECIALTY CROPS, RURAL DEVELOPMENT AND FOREIGN AGRICULTURE

COMMITTEE ON ARMED SERVICES
SUBCOMMITTEE ON AIR AND LAND FORCES
SUBCOMMITTEE ON TERRORISM, UNCONVENTIONAL THREATS AND CAPABILITIES

U.S. HELSINKI COMMISSIONER
ORGANIZATION FOR SECURITY AND COOPERATION IN EUROPE

BOARD MEMBER
UNITED STATES NAVAL ACADEMY

Congress of the United States
House of Representatives
Washington, DC 20515–3307

WEB PAGE:
www.house.gov/mcintyre

SENIOR WHIP
CO-CHAIRMAN
SPECIAL OPERATIONS FORCES CAUCUS
CO-CHAIRMAN
CONGRESSIONAL WATERWAYS CAUCUS
CO-CHAIRMAN
COALITION TASK FORCE ON BUSINESS AND TECHNOLOGY
CO-CHAIRMAN
CONGRESSIONAL CAUCUS ON YOUTH SPORTS
STEERING COMMITTEE
RURAL HEALTH CARE COALITION

October 15, 2008

Reply to: Washington

22-10-08A07:21 RCVD

Capt. Earl Gay, House Liaison Office
Department of the Navy
B-324 Rayburn House Office Building
U.S. House of Representatives
Washington, DC 20515

Dear Captain Gay:

I am writing to you on behalf of The Karen Beasley Sea Turtle Hospital and the PenderWatch & Conservancy regarding their request for an extension of the comment period for the Cherry Point Range Complex Draft EIS and the Undersea Warfare Training Range Draft Overseas EIS. To allow for written comments and consideration of any new information, they are requesting an extension until January 15, 2009.

Enclosed for your reference is a copy of the recent correspondence to me relative to this request. I would appreciate your giving this matter every possible consideration and keeping me informed until a final disposition has been rendered.

Thank you in advance for your assistance with this request.

Sincerely,

Mike McIntyre

Mike McIntyre
Member of Congress

MM:mes

Enclosure

2437 RAYBURN HOUSE OFFICE BUILDING
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201 NORTH FRONT STREET, SUITE 410
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(910) 815–4959
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By Overnight Mail and Fax

REQUEST FOR EXTENSION OF PUBLIC COMMENT PERIOD

October __, 2008

Naval Facilities Engineering Command Atlantic
Attention: Code EV22SA
6506 Hampton Boulevard
Norfolk, VA 23508
Fax: (757) 322-4894

Re: *Petition for Extension of Public Comment Period on Navy Cherry Point Range Complex Draft Environmental Impact Statement/ Overseas Environmental Impact Statement*

To the Naval Facilities Engineering Command Atlantic:

I am writing to petition the Navy for an extension of the public comment period on its Cherry Point Range Complex Draft Environmental Impact Statement (DEIS). On September 12, 2008, the Navy released a DEIS for sonar and other naval training exercises off the coast of North Carolina, in the Cherry Point Operating Area. Despite the fact that the DEIS is nearly 700 pages long, the Navy has limited the time in which the public may submit comments to a 45-day period.

On the same day, the Navy released its latest draft environmental impact statement (EIS) for its planned development of an Undersea Warfare Training Range off the southeast coast of the United States. Once again, although the draft EIS over 1,000 pages long, the Navy limited its comment period to 45 days.

In light the simultaneous issuance of related documents, the dense information provided by the Navy in justifying its plans, and the extensive range of activity proposed, I respectfully request an extension to submit written comments until January 15, 2009. Such an extension will fully protect the public interest by giving citizens the time to thoroughly analyze the Navy's proposals and submit comments on these critical issues. Because this is the only chance for the citizens of North Carolina to review and comment on the Navy's Cherry Point DEIS, I would very much appreciate the courtesy of time to comment in a meaningful way.

Very truly yours,

Jack Spruill
PenderWatch & Conservancy

The Karen Beasley Sea Turtle
Rescue & Rehabilitation Center

PO Box 3012 822 Carolina Blvd. Topsail Beach, NC 28445
phone: (910)328-3377 fax: (910)328-1000
visit our website at www.seaturtlehospital.org

My thanks to the Congressman (and for your help) for making some comments on this issue. It is a complicated issue and includes many concerns that are not covered in DEIS at the depth required. This plan has the potential to severely impact endangered right whales, several species of dolphin, many species of fish, endangered corals, and others. Of course a topic of great concern for us is the impact on sea turtles. Here are just a few

- The beach which is proposed as a staging area has been used by nesting sea turtles.
- The planned area is very close to several important North Carolina sea turtle rookeries.
- The plan area touches on and includes a designated sea turtle sanctuary created by the state legislature.
- The electrical cables which would be strung out over the area will create electromagnetic fields which may interfere with sea turtles' ability to read the magnetic bands of the earth by which they navigate.
- The proposed area encroaches on what is identified as a major "hang out area" for juvenile Loggerheads during the cold weather months. This has been determined through research done with satellite tags attached to turtles prior to their release.
- The area is in the migratory route of sea turtles foraging and moving from one critical habitat to another.
- Even ordinance without explosives can, when fired, kill sea turtles .

- The constant sonar pinging has the potential to adversely affect the hearing of sea turtles. No research has been done to prove this one way or the other.
- Debris fields with ordinance parts, parachutes, and other unrecovered equipment can pose a threat to sea turtles who will try to eat almost everything.
- The many lines and cables pose a risk of entanglement. Sea Turtle are air breathers and will suffocate if not allowed to surface to breathe.
- The patrol boats which will be very active in this area pose a risk of hitting endangered sea turtles.

There are others but I think this gives some of the main points. I think one of the most aggravating things is that several DEIS are being produced which cover activities in the same waters which makes it vey difficult to follow. Michelle Knowlin of the Duke University Law School is great at putting the finger on this. By the way, when the Coastal Federation held a hearing on local concerns the commercial fishermen were very upset about the potential destruction of traditional fishing grounds. A fish biologist from East Carolina spoke in depth about the impact on the mating ability of some of the fish species which are already in decline. Until I hear his talk I never knew that male fish of certain species issue mating calls (I heard recordings of them) to attract females. I learn something new every day.

The Navy now says that they are going to activate their plan for the sonar range off Florida rather than using the Onslow Bay site. What they don't say is that the other activities they have planned for the same waters would be just as destructive to marine life. Besides, they can switch back to Onslow Bay at any time.

This is so hurried! I hope it makes sense. Again, my thanks!

Best regards,

Jean

CETACEAN SOCIETY INTERNATIONAL – EARTHJUSTICE – THE HUMANE SOCIETY OF THE UNITED STATES – INTERNATIONAL FUND FOR ANIMAL WELFARE – NATURAL RESOURCES DEFENSE COUNCIL – OCEAN FUTURES SOCIETY – OCEAN MAMMAL INSTITUTE – CITIZENS OPPOSING ACTIVE SONAR THREATS – PENDERWATCH & CONSERVANCY – DUKE ENVIRONMENTAL LAW AND POLICY CLINIC – THE KAREN BEASLEY SEA TURTLE RESCUE & REHABILITATION CENTER – TOPSAIL TURTLE PROJECT – N.C. COASTAL FEDERATION – SOUTHERN ENVIRONMENTAL LAW CENTER

By Overnight Mail and Fax

REQUEST FOR EXTENSION OF PUBLIC COMMENT PERIOD

October 6, 2008

Naval Facilities Engineering Command Atlantic
Attention: Code EV22LL (USWTR OEIS/EIS Program Manager PM)
6506 Hampton Boulevard
Norfolk, VA 23508
Fax: 804-200-5568

Re: *Petition for Extension of Public Comment Period on Draft Overseas Environmental Impact Statement/ Environmental Impact Statement for the Undersea Warfare Training Range*

Dear Sir or Madam:

On behalf of the Natural Resources Defense Council ("NRDC"), The Humane Society of the United States, International Fund for Animal Welfare, EarthJustice, Cetacean Society International, Ocean Mammal Institute, Ocean Futures Society, Citizens Opposing Active Sonar Threats, PenderWatch & Conservancy, Animal Welfare Institute, Duke Environmental Law and Policy Clinic, The Karen Beasley Sea Turtle Rescue & Rehabilitation Center, Topsail Turtle Project, N.C. Coastal Federation, and Southern Environmental Law Center, and our millions of members and activists, I am writing to petition the Navy for an extension of the public comment period on its Undersea Warfare Training Range Draft Overseas Environmental Impact Statement/ Environmental Impact Statement ("DEIS").

Notice of the comment period was published in the Federal Register on September 12, 2008. See 73 Fed. Reg. 52973. The public has been given *only 45 days* to submit comments by October 27, 2008. To fully protect the public interest and allow meaningful consideration of new information, we respectfully request an extension until January 15, 2009, or a minimum of at least 45 additional days, to submit written comments.

The proposed Undersea Warfare Training Range ("USWTR") is an extremely controversial project involving more than 470 exercises per year (DEIS at 2-15) over 500 square nautical miles of ocean (DEIS at 2-2). The Navy's first USWTR DEIS, issued in October 2005, proved so controversial that it was withdrawn the following year and completely revised. See 70 Fed. Reg. 62102 (Oct. 28, 2005). In preparing the current document, the Navy switched its preferred site from waters off North Carolina (south of Cape Hatteras) to waters off Florida (east of Jacksonville), raising many new concerns. Notably, the area lies very close to critical habitat and breeding grounds for the endangered North Atlantic right whales. The public, as well as the scientific community, needs sufficient time to identify, analyze, and comment on this new site and on the Navy's revised analysis.

Because of the sheer size of the USWTR DEIS and the many issues it raised, in 2005 the Navy appropriately extended its initial two-month comment period an extra month, thus providing a full 90 days for comments. We believe at the very least that a similar extension is warranted here. Therefore, we strongly urge you to grant this petition and extend the comment period. As always, we would welcome discussion with the Navy at any time.

Very truly yours,

Taryn G. Kickow
Staff Attorney, Marine Mammal Program
Natural Resources Defense Council

Comment F3

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

October 27, 2008

Susan Admire
Naval Facilities Engineering Command
Atlantic Division
6506 Hampton Boulevard
Norfolk, Virginia 23508-1278

SUBJECT: Draft Environmental Impact Statement/Overseas Environmental Impact Statement for the Navy's Proposed Training at the Cherry Point Range Complex in North Carolina; CEQ Number 20080345

Dear Ms. Admire:

The U.S. Environmental Protection Agency (EPA) has reviewed the referenced Draft Environmental Impact Statement (EIS)/Overseas EIS in accordance with its responsibilities under Section 309 of the Clean Air Act and Section 102(2)(C) of the National Environmental Policy Act (NEPA). The U.S. Department of the Navy (Navy) prepared a Draft EIS/Overseas EIS to assess the potential environmental impacts over a 10-year planning horizon associated with Navy Atlantic Fleet training; research, development, testing, and evaluation (RDT&E) activities; and associated range capabilities enhancements (including infrastructure improvements) in the Cherry Point operating areas, hereafter referred to as the Cherry Point Range Complex.

A range complex, such as the Cherry Point Range Complex, is a set of co-located areas of sea space, undersea space, land ranges and overlying special use airspace (SUA) designated for military training and testing operations. Range complexes provide a controlled and safe environment with threat representative targets where military ships and aircraft can train in realistic combat-like conditions throughout the graduated buildup needed for combat ready deployment. The Cherry Point Range Complex geographically encompasses offshore, nearshore, and onshore operating areas and training ranges. This complex is made up of approximately 31,146 square nautical miles (nm^2) of sea space and 18,966 nm^2 of SUA off the coast of North Carolina.

The Navy has identified the need to support and conduct current and emerging training and RDT&E operations in the Cherry Point Range Complex. The proposed action does not include major changes to Cherry Point Range Complex facilities, operations, training, or RDT&E capacities over the 10-year planning period. Rather, the proposed action would result in relatively small-scale but critical enhancements to the Cherry Point Range Complex that are necessary if the Navy is to maintain a state of military readiness commensurate with its national defense mission. Three alternatives were considered in the Draft EIS: 1) no action alternative –

maintain current training operations within the Cherry Point Range Complex; 2) Alternative 1 – increase and modify operational training to include expanded warfare missions, accommodate force structure changes, and enhance range complex capabilities; and 3) Alternative 2 – same as Alternative 1 with the elimination of high explosive bombing exercises at-sea and designation of two mine warfare training areas in the complex. Alternative 2 was identified as the preferred alternative.

In general, EPA supports the purpose and need for the action proposed in the Draft EIS. EPA understands the need to conduct realistic training on accessible training ranges and other appropriate facilities. EPA appreciates the Navy's comprehensive approach to analyze the impacts of their ongoing operations and project the impacts into the future based on reasonably foreseeable training needs. However, based on our review of the Draft EIS, EPA has environmental concerns about the effect of the Navy's training activities primarily associated with the deposition of expended training materials, their accumulation over time, and their potential impacts over time to reef complexes and hard bottom habitat. This was identified in the Draft EIS as the greatest impact of Navy training activities. The accumulation of these expended materials in this area from past use plus the additive environmental impact associated with the proposed action's 10-year plan raises concerns about the long-term impacts to the aquatic environment. EPA offers the following specific comments for your consideration in development of the Final EIS for this project:

Noise/Air Quality

As part of the proposed action, the Navy proposes to increase the number, type and operations of commercial air services (CAS) within the Cherry Point Range Complex. The Draft EIS suggests that the increased use of CAS training would not substantially increase aircraft numbers, emissions, etc. However, the Draft EIS does not identify the location from which these aircraft would originate. It is conceivable that there would not be a significant increase in the number of sorties/events; however there could be significant adverse noise or air quality impacts associated with these CAS events if they are originating from different locations that are not currently experiencing this level of engagement. What additional impacts from the use of CAS to supplement Navy training would be reasonably foreseeable? EPA recommends that the Final EIS address this issue.

Endangered Species

The Draft EIS identifies a number of mitigation measures that were put in place as part of the 1997 Biological Opinion (BO) from the National Marine Fisheries Service (NMFS) on Navy training impacts to marine mammals and several endangered species, primarily the North Atlantic Right Whale. This includes avoidance of transits through the critical habitat, establishment of buffer zones around the critical habitat, cautious vessel operation, marine mammal lookouts posted aboard ships, and ordnance drops restricted to a designated area with other special restrictions during the calving season of the right whale. It also included an incidental take statement for sea turtles. The Draft EIS does not include any information about the success of these measures. How well are they currently working? What are the results from

any monitoring conducted in accordance with these protocols? Since these measures will be included as part of the proposed action and are important to minimize impacts to these species, EPA recommends that the Final EIS include a thorough description of the historical results of this important mitigation/monitoring commitment. In addition, EPA recommends that the Final EIS documents the consultation record with the U.S. Fish and Wildlife Service and NMFS as part of Navy's compliance with the Endangered Species Act, Marine Mammal Protection Act, and Magnuson-Stevens Fishery Conservation Management Act.

Hazardous Materials

The Draft EIS states that, "The Navy makes every effort to minimize its use of hazardous material during training, and recovers and reuses unexpended training material to the extent practicable." What percent of training material is recovered and how does the expended training material contribute to marine debris? There are very few specifics about the extent to which material is recovered and reused as part of overall training activities. Furthermore, there are no specific commitments to make this a part of normal training operations protocols to minimize long-term impacts from deposition of expended or unexploded material.

Guidance issued by the Council on Environmental Quality (CEQ) on integrating pollution prevention in Federal planning under NEPA states that Federal agencies should use every opportunity to include pollution prevention features in NEPA planning and decisions and reflect such considerations in their NEPA documents. The Draft EIS identifies the contamination from munitions, including oils, heavy metals, and chemical stimulants, that will be left in the water column and sediments. The preferred alternative involves significant increases of materials expended that include liquid and soluble hazardous materials.

Consistent with CEQ guidance, the Final EIS should describe what actions the Navy is taking to reduce the introduction of pollutants during range complex activities. EPA requests additional information and a discussion of efforts to minimize and reduce the amounts of hazardous materials deposited into the aquatic environment from training activities. We strongly recommend that the Navy perform its training in a manner that minimizes the deposition of pollutants into soils and the water column. EPA recommends that the Navy commit to specific measures to reduce pollutant loadings and include these mitigation measures in the Final EIS and Record of Decision (see comments below on mitigation and monitoring).

Mitigation and Monitoring Measures

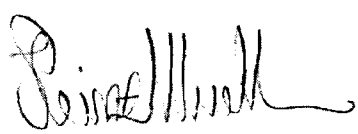
The Draft EIS includes a comprehensive chapter on proposed mitigation and monitoring programs. The commitment on the part of the Navy to develop an Integrated Comprehensive Monitoring Program (ICMP) is important given the magnitude of proposed training activities and the geographic size of the training areas. EPA supports the development of a comprehensive monitoring program to ensure that the ongoing impacts from these training activities are assessed and appropriately addressed/mitigated once identified. However, it appears that the focus of the ICMP will be limited to marine mammals and other threatened and endangered species.

Since there have been no specific, quantitative studies of the extent and impacts of military expended material (MEM) in the Cherry Point Range Complex, EPA recommends that the ICMP be expanded to include a commitment to study and monitor impacts of MEM in the aquatic environment similar to the study cited in the Draft EIS of impacts at a Canadian Test Range near British Columbia. This commitment would also serve to provide information in the future to support the conclusions in the EIS that the MEM would have no significant impact on bottom topography, sediment, and water quality. An expanded ICMP could also include programs for damage inspections followed by damage assessments and repair to assist in developing long-term mitigation for continuing operations and the ability to reevaluate conditions in the future. EPA recommends more specificity in the Final EIS on the content of the ICMP, with an intent to include these specific commitments in the Record of Decision for the project.

EPA understands this is not a trivial expansion of monitoring commitments on the part of the Navy. However, given the significant increase of range training activities at several locations along the east and west coasts of the United States and Gulf of Mexico, as described in the recently developed EISs for these proposed actions, EPA views this commitment as an opportunity to conduct important impact assessment monitoring and utilize adaptive management to adjust training activities in the future depending on the outcome. At a minimum, EPA recommends that the Navy consider a pilot monitoring project on one of the expanded training ranges. EPA stands ready to assist you in developing a monitoring protocol that would meet the above objectives.

We rate this document EC-2 (Environmental Concerns – enclosed is a summary of definitions for EPA ratings). We have concerns that the proposed action has the potential for environmental impacts that should be avoided/minimized. EPA requests additional monitoring commitments to address these concerns. We appreciate the opportunity to review the proposed action and are prepared to assist you in implementing any of the measures, described in our comments, to help in addressing the potential impacts of the proposed action. Please contact Ben West of my staff at (404) 562-9643 if you have any questions or want to discuss our comments.

Sincerely,



Heinz J. Mueller, Chief
NEPA Program Office
Office of Policy and Management

Enclosure

U.S. ENVIRONMENTAL PROTECTION AGENCY
ENVIRONMENTAL IMPACT STATEMENT (EIS) RATING SYSTEM CRITERIA

EPA has developed a set of criteria for rating Draft EISs. The rating system provides a basis upon which EPA makes recommendations to the lead agency for improving the draft.

RATING THE ENVIRONMENTAL IMPACT OF THE ACTION

- LO (Lack of Objections): The review has not identified any potential environmental impacts requiring substantive changes to the preferred alternative. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposed action.

- EC (Environmental Concerns): The review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact.

- EO (Environmental Objections): The review has identified significant environmental impacts that should be avoided in order to adequately protect the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). The basis for environmental objections can include situations:

    1. Where an action might violate or be inconsistent with achievement or maintenance of a national environmental standard;
    2. Where the Federal agency violates its own substantive environmental requirements that relate to EPA's areas of jurisdiction or expertise;
    3. Where there is a violation of an EPA policy declaration;
    4. Where there are no applicable standards or where applicable standards will not be violated but there is potential for significant environmental degradation that could be corrected by project modification or other feasible alternatives; or
    5. Where proceeding with the proposed action would set a precedent for future actions that collectively could result in significant environmental impacts.

- EU (Environmentally Unsatisfactory): The review has identified adverse environmental impacts that are of sufficient magnitude that EPA believes the proposed action must not proceed as proposed. The basis for an environmentally unsatisfactory determination consists of identification of environmentally objectionable impacts as defined above and one or more of the following conditions:

    1. The potential violation of or inconsistency with a national environmental standard is substantive and/or will occur on a long-term basis;
    2. There are no applicable standards but the severity, duration, or geographical scope of the impacts associated with the proposed action warrant special attention; or
    3. The potential environmental impacts resulting from the proposed action are of national importance because of the threat to national environmental resources or to environmental policies.

RATING THE ADEQUACY OF THE ENVIRONMENTAL IMPACT STATEMENT (EIS)

- 1 (Adequate): The Draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

- 2 (Insufficient Information): The Draft EIS does not contain sufficient information to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the Draft EIS, which could reduce the environmental impacts of the proposal. The identified additional information, data, analyses, or discussion should be included in the Final EIS.

- 3 (Inadequate): The Draft EIS does not adequately assess the potentially significant environmental impacts of the proposal, or the reviewer has identified new, reasonably available, alternatives, that are outside of the spectrum of alternatives analyzed in the Draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. The identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. This rating indicates EPA's belief that the Draft EIS does not meet the purposes of NEPA and/or the Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised Draft EIS.

Comment #F4

MARINE MAMMAL COMMISSION
4340 EAST-WEST HIGHWAY, ROOM 700
BETHESDA, MD 20814-4447

29 October 2008

Navy Facilities Engineering Command, Atlantic Division
Attn.: Code EV22SA
Navy CHPT EIS/OEIS PM
6506 Hampton Blvd.
Norfolk, VA 23508-1278

To whom it may concern:

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the Draft Environmental Impact Statement/Overseas Environmental Impact Statement (DEIS) submitted by the U.S. Navy. The applicant is seeking comments on the potential environmental consequences arising from military readiness training operations in the Cherry Point Range Complex off the coasts of North and South Carolina from 29 May 2009 through 28 May 2014. The Commission also has reviewed the National Marine Fisheries Service's 8 July 2008 *Federal Register* notice announcing receipt of the Navy's application for an incidental harassment authorization under the Marine Mammal Protection Act. We have appended the Commission's 7 August 2008 letter to the National Marine Fisheries Service on the Navy's application.

The planned training operations would expose various species of marine mammals within the Cherry Point Range Complex to explosive and acoustic effects from underwater detonations and to taking incidental to the development, testing, and evaluation of weapons systems, vessels, and aircraft. The types of ordnance to be used include Hellfire and tube-launched, optically tracked, wire-guided missiles (net explosive weights of 8 and 15.33 lbs, respectively), 20-lb net explosive weight charges, and 5-in guns.

RECOMMENDATION

The Marine Mammal Commission recommends that the Navy—

F4-1
- working with the National Marine Fisheries Service, take steps to ensure that the contemplated incidental take rule under section 101(a)(5) of the Marine Mammal Protection Act and any letter of authorization issued under that rule cover all marine mammal species that may be taken by Level A or Level B harassment as a result of the proposed activities;

F4-2
- re-label its so-called "No Action" alternative to indicate that the least level of activity being proposed still exceeds that which has been conducted on the range historically and is therefore neither a true no-action alternative nor an alternative that offers any curtailment or reduction from historical levels of activity. As required by the National Environmental Policy Act (NEPA), the Navy should include and analyze a true no-action alternative even if it believes that selecting that option would result in serious adverse consequences for national security readiness;

F4-3
- perform an external peer review of its marine mammal density estimates for the Cherry Point operating area (based on the NODE report, reference DoN, 2007c of the subject DEIS);

PHONE: (301) 504-0087
FAX: (301) 504-0099

F4-4 • revise its analysis of exposure to explosive ordnance to provide a more realistic assessment of potential occurrences and outcomes;

F4-5 • continue to develop its Integrated Comprehensive Monitoring Program and provide the Commission with additional details regarding the program, including an estimated time frame for its implementation;

F4-6 • develop and implement a plan to calibrate and verify the performance of monitoring and mitigation measures being proposed to enable the Navy, the National Marine Fisheries Service, and other interested parties to evaluate the reliability of proposed monitoring and mitigation measures;

F4-7 • in its DEIS, assess alternatives that would require it to suspend an activity if marine mammals are seriously injured or killed and the injuries or deaths could be associated with the activity. Any injury or death should be investigated to determine the cause, assess the full impact of the activity (e.g., the total number of animals involved), and determine how the activity should be modified to avoid future injuries or deaths; and

F4-8 • in its DEIS, add a requirement for annual reports providing full documentation of methods, results, and interpretation pertaining to all monitoring tasks and the dates and locations of operations, marine mammal sightings, and estimates of the amount and nature of potential takes of marine mammals by harassment or in other ways.

RATIONALE

In concert with its proposed activities in the Cherry Point Range Complex, the Navy is requesting authorization to incidentally take by Level B harassment bottlenose dolphins and Atlantic spotted dolphins. Although the Commission has commented separately to the National Marine Fisheries Service on that requested authorization, some of the same comments and recommendations are included here so that they can be considered by the Navy as part of its review under the National Environmental Policy Act. The DEIS indicates that 30 other cetacean species (including 6 species listed as endangered under the Endangered Species Act) and 1 pinniped species occur predictably in the operating area. The Navy is not requesting authorization to take these other marine mammal species based on low density estimates for them in the area where it proposes to use explosive ordnance. The Navy states that a consultation under the Endangered Species Act has been initiated in support of its request. The Marine Mammal Commission recommends that the Service and the Navy take steps to ensure that the contemplated incidental take rule under section 101(a)(5) of the Marine Mammal Protection Act and any letter of authorization issued under that rule cover all marine mammal species that may be taken by Level A or Level B harassment as a result of the proposed activities.

No-Action Alternative

In this and several prior NEPA documents for its other ranges, the Navy has used the term "no action" to refer to a level of activity on the range consistent with historical use or, as in this DEIS, historical use plus "surge" activities and other increased levels of readiness training. The no-action alternative in the Cherry Point DEIS is contrasted with two alternatives that propose even

greater increases in readiness and technology acquisition and testing activities that pose a risk to the environment, thus providing a choice among three options, all offering more training activity and more environmental risk but no true no-action alternative, reduced action alternative, or even an alternative of continuing at recent historical levels. The DEIS provides no supporting information regarding recent historical levels of activity to verify the Navy's claim that the proposed level of activity does indeed correspond to historical levels. The DEIS also does not provide any quantitative expression of exactly how much more activity the proposed no-action alternative offers relative to past use. The DEIS does not contain an alternative of reduced or no naval readiness activities, and no analysis is offered of the differential environmental and readiness consequences of such an alternative. The Commission supports the Navy's efforts to ensure military readiness and national security. The Commission also understands that the Navy might find any reduction in readiness training and defense technology acquisition and testing undesirable. Nonetheless, the Commission does not believe that the Navy's preferences should preclude consideration of alternatives of reduced training and reduced environmental consequences as required under the National Environmental Policy Act. To follow guidance published by the Council on Environmental Quality, the Navy at least should consider an alternative that does not represent an increase over the current level of activity.

Density Estimation

The Navy's DEIS states that the marine mammal density estimates provided are derived from its report for the southeast operating area (the NODES report, reference DoN 2007c in the DEIS, p. 7-16). Because the risk analysis and take estimates in the DEIS depend on the accuracy of that report, the Marine Mammal Commission recommends that the Navy perform an external peer review of its marine mammal density estimates to ensure their accuracy and consistency with current and best scientific practices. This recommendation is consistent with previous Commission comments and recommendations on Navy operations.

Explosive Ordnance Exposure Analysis

The DEIS analyzes the effects of infrequent explosive events by assuming that those events and their effects will be distributed evenly over four seasons, resulting in fractional annual totals. The Commission does not believe that assessing the effect of 0.25 or 0.5 events per season provides a realistic range of likely outcomes because neither the events nor the densities of marine mammals may be evenly distributed over those seasons. For example, if only two events are conducted per year, each event could be conducted in a different season or both could be conducted in the same season, but in no case would a fractional number of events occur in a given season. Similarly, animal densities may vary as a function of movement and migration patterns. The Navy should be able to provide a more realistic range of likely outcomes when the number of events is so low. The Marine Mammal Commission therefore recommends that the Navy revise its analysis of exposure to explosive ordnance to provide a more realistic assessment of potential occurrences and outcomes.

Monitoring and Mitigation

The Commission notes that the Navy is developing an Integrated Comprehensive Monitoring Program to facilitate the collection and synthesis of data from range-specific monitoring efforts and research and development studies that are fully or partially funded by the Navy. The program will help make the most efficient use of limited resources to address monitoring concerns for a variety of Navy activities. As noted in our previous letters regarding the Navy's requests for authorization to take marine mammals incidental to other military readiness activities, the Commission supports this effort. The Marine Mammal Commission recommends that the Navy continue to develop its Integrated Comprehensive Monitoring Program and provide the Commission with additional details regarding the program, including an estimated time frame for its implementation.

In previous letters on the Navy's military readiness operations, the Commission also has expressed its concern that the performance of the Navy's monitoring and mitigation efforts have yet to be thoroughly evaluated. The existing scientific data all indicate that efforts to monitor the presence or absence of marine mammals often are of limited effectiveness, which raises questions about their utility and reliability. The methods for conducting such performance testing are available and well within the scope of the Navy's capabilities. The Commission believes that the Navy should develop and implement a plan for obtaining performance data to justify its confidence in critical monitoring and mitigation measures, such as watchstander training, the probability of detecting various marine species of concern, and the use of night vision and passive acoustic technology in the Cherry Point Range and other range complexes where military readiness exercises are planned. The Marine Mammal Commission therefore reiterates its recommendation that the Navy develop and implement a plan to calibrate and verify the performance of monitoring and mitigation measures being proposed to enable the Navy, the National Marine Fisheries Service, and other interested parties to evaluate the reliability of proposed monitoring and mitigation measures.

Lethal Taking/Serious Injury

Based on its analyses in the DEIS, the Navy has chosen not to request authorization to take animals by Level A harassment. Absent such a request, the Marine Mammal Commission has recommended that the requested Marine Mammal Protection Act incidental take rule, if issued, require suspension of the associated Navy activity if marine mammals are seriously injured or killed and the injuries or deaths could be associated with the activity. The Marine Mammal Commission recommends that such a limitation and its effects on the proposed activities be recognized and assessed in the alternatives being considered in the DEIS. Any injury or death should be investigated to determine the cause, assess the full impact of the activity (e.g., the total number of animals involved), and determine how the activity should be modified to avoid future injuries or deaths. It should be clear to all interested parties that more information is required to understand the potential effects of sound on marine mammals, and full investigation of such incidents is essential to provide more complete information on potential effects.

Reporting

The Commission notes that post-event reports have great potential value to the Navy and the National Marine Fisheries Service. The Marine Mammal Commission therefore recommends that in its DEIS the Navy add a requirement for annual reports providing full documentation of methods, results, and interpretation pertaining to all monitoring tasks and the dates and locations of operations, marine mammal sightings, and estimates of the amount and nature of potential takes of marine mammals by harassment or in other ways.

Please contact me if you or your staff has questions about any of our comments or recommendations.

Sincerely,

Timothy J. Ragen, Ph.D.
Executive Director

Enclosure

MARINE MAMMAL COMMISSION
4340 East-West Highway, Room 700
Bethesda, MD 20814-4447

7 August 2008

Mr. P. Michael Payne
Chief, Permits Division
Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910-3226

Dear Mr. Payne:

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the application submitted by the U.S. Navy under section 101(a)(5)(A) of the Marine Mammal Protection Act. The applicant is seeking a Letter of Authorization to take marine mammals incidental to military readiness training operations in the Cherry Point Range Complex off the coast of North and South Carolina from 29 May 2009 through 28 May 2014. The Commission also has reviewed the National Marine Fisheries Service's 8 July 2008 *Federal Register* notice announcing receipt of the application and inviting comments on its proposal to promulgate regulations to authorize and govern the requested taking.

The planned training operations would expose various species of marine mammals within the Cherry Point Range Complex to pressures from underwater detonations and to taking incidental to the development, testing, and evaluation of weapons systems, vessels, and aircraft. The types of ordnance to be used include Hellfire and tube-launched, optically tracked, wire-guided missiles (net explosive weights of 8 lbs and 15.33 lbs, respectively), 20-lb net explosive weight charges, and 5-in guns.

RECOMMENDATION

The Marine Mammal Commission recommends that the National Marine Fisheries Service and the Navy ensure that the contemplated rule and any Letter of Authorization issued under that rule cover all marine mammal species that may be taken by Level A or Level B harassment as a result of the proposed activities. Further, the Marine Mammal Commission recommends that, if the National Marine Fisheries Service proceeds with publication of a proposed rule to authorize the taking of small numbers of marine mammals incidental to the proposed military training operations, the Navy be required to—

- perform an external peer review of its marine mammal density estimates for the southeast operating area to ensure their accuracy;
- revise its explosive ordnance exposure analysis to provide a more realistic assessment of potential occurrences and outcomes;
- provide additional details concerning its integrated comprehensive monitoring program, including an estimated timeframe for its implementation;

- develop and implement a plan to calibrate and verify the performance of monitoring and mitigation measures being proposed to enable the Navy, the Service, and other interested parties to evaluate their effectiveness;
- suspend an activity if a marine mammal is seriously injured or killed and the injury or death could be associated with the activity. The injury or death should be investigated to determine the cause, assess the full impact of the activity (e.g., the total number of animals involved), and determine how the activity should be modified to avoid future injuries or deaths; and
- submit annual reports providing full documentation of methods, results, and interpretation pertaining to all monitoring tasks and the dates and locations of operations, marine mammal sightings, and estimates of the amount and nature of potential takes of marine mammals by harassment or in other ways.

RATIONALE

The Navy is requesting authorization to take by Level B harassment bottlenose dolphins and Atlantic spotted dolphins incidental to the proposed operations. However, the application (p. 3-1) indicates that 30 other cetacean species (including six species listed as endangered under the Endangered Species Act) and one pinniped species occur regularly in the operating area. The Navy is not requesting authorization to take these species based on density estimates for them in the area where it proposes to use explosive ordnance. The Navy states that a consultation under the Endangered Species Act has been initiated in support of its request. The Marine Mammal Commission recommends that the Service and the Navy ensure that the contemplated rule and any Letter of Authorization issued under that rule cover all marine mammal species that may be taken by Level A or Level B harassment as a result of the proposed activities.

Density Estimation

The Navy's application states that the density estimates provided are derived from its report on marine mammal density estimates for the southeast operating area. Because the risk analysis and take estimates depend on the accuracy of the analyses in the report, the Marine Mammal Commission recommends that the Navy be required to perform an external peer review of its marine mammal density estimates for the southeast operating area to ensure their accuracy.

Explosive Ordnance Exposure Analysis

The application analyzes the effects of infrequent explosive events by assuming the events and their effects will be distributed evenly over four seasons, resulting in fractional annual totals. The Commission does not believe that assessing the effect of 0.25 or 0.5 event per season provides a realistic range of likely outcomes because neither the events nor the densities of marine mammals may be evenly distributed over those seasons. For example, if only two events are conducted per year, each event could be conducted in a different season or both could be conducted in the same season. But in no case would a fractional number of events occur in a given season. Similarly, animal densities may vary as a function of movement and migration patterns. The Navy should be able to

provide a more realistic range of likely outcomes when the number of events is so low. The Marine Mammal Commission therefore recommends that the Navy revise its explosive ordnance exposure analysis to provide a more realistic assessment of potential occurrences and outcomes.

Monitoring and Mitigation

The Commission notes that the Navy is developing an integrated comprehensive monitoring program to facilitate the collection and synthesis of data from range-specific monitoring efforts and research and development studies that are fully or partially funded by the Navy. The program will help to coordinate the most efficient use of limited resources to address monitoring concerns for a range of Navy activities. As noted in our previous letters regarding the Navy's requests for authorization to take marine mammals incidental to other military readiness activities, the Commission supports this effort. The Marine Mammal Commission recommends that the Navy provide additional details concerning its integrated comprehensive monitoring program, including an estimated timeframe for its implementation.

In previous letters on the Navy's military readiness operations, the Commission also has expressed its concern that the performance of the Navy's monitoring and mitigation efforts have yet to be thoroughly evaluated. The existing scientific data all indicate that efforts to monitor the presence or absence of marine mammals often are of limited effectiveness, which raises questions about their utility and reliability. The methods for conducting such performance testing are available and well within the scope of the Navy's capabilities. The Commission believes that the Navy should develop and implement a plan for obtaining performance data to justify its confidence in critical monitoring and mitigation measures such as watchstander training, the probability of detecting various marine species of concern, and the use of night vision and passive acoustic technology in the Cherry Point Range and other range complexes where military readiness exercises are planned. The Marine Mammal Commission therefore reiterates its recommendation that the Navy develop and implement a plan to calibrate and verify the performance of monitoring and mitigation measures being proposed to enable the Navy, the Service, and other interested parties to evaluate their effectiveness.

Lethal Taking/Serious Injury

Authorization to take marine mammals by serious injury or mortality is not being requested. The Marine Mammal Commission recommends that the rule, if issued, require suspension of the associated Navy activity if a marine mammal is seriously injured or killed and the injury or death could be associated with the activity. The injury or death should be investigated to determine the cause, assess the full impact of the activity (e.g., the total number of animals involved), and determine how the activity should be modified to avoid future injuries or deaths. It should be clear to all interested parties that more information is required to understand the potential effects of sound on marine mammals, and full investigation of such incidents is essential to provide more complete information on potential effects.

Reporting

The Commission notes that post-event reports have great potential value to the Navy and the Service. The Marine Mammal Commission therefore recommends that the National Marine Fisheries Service require that the applicant submit annual reports providing full documentation of methods, results, and interpretation pertaining to all monitoring tasks and the dates and locations of operations, marine mammal sightings, and estimates of the amount and nature of potential takes of marine mammals by harassment or in other ways.

Please contact me if you or your staff has questions about any of our comments or recommendations.

Sincerely,

Timothy J. Ragen

Timothy J. Ragen, Ph.D.
Executive Director

Comment #S1

North Carolina Department of Environment and Natural Resources
Division of Coastal Management
Michael F. Easley, Governor **James H. Gregson, Director** William G. Ross Jr., Secretary

October 8, 2008

Melba McGee
Environmental Coordinator
Office of Legislative & Intergovernmental Affairs
Department of Environment and Natural Resources
1601 Mail Service Center
Raleigh, NC 27699-1601

SUBJECT: Navy Cherry Point Range Complex Draft Environmental Impact Statement, Offshore, North Carolina (SCH#09-0069, and DCM#20080126 and DCM#20080129)

Dear Ms. McGee:

Thank you for the opportunity to review the US Navy's "*Navy Cherry Point Range Complex Draft Environmental Impact Statement/Overseas Environment Impact Statement*" (DEIS) offshore North Carolina. The DEIS assesses the potential environmental effects over a 10 year planning horizon associated with the Navy's Atlantic Fleet Training within the Navy's Cherry Point Operating Area (OPAREA). The purpose of this review, by the North Carolina Division of Coastal Management (DCM), is to evaluate the adequacy of the environmental analysis contained in the DEIS.

Our review of this DEIS has been constrained by the large size of this document, the complexity of the document, and the recent receipt of several other draft environmental impact statements including a consistency submission for Atlantic Fleet Active Sonar Training (AFAST). Consequently, because our review has been limited there is a potential that the DEIS may have already provided answers concerning comments that we are providing. Furthermore, we acknowledge that Environmental Impact Statements can be "*tiered*"[1], which may mean that certain comments could be considered premature at this time. Below are the comments of the North Carolina Division of Coastal Management.

- Section 2.2.1 identifies the DEIS's "*Proposed Action*". The proposed project is presented in an abbreviated conceptual manner. This makes identifying the full extent of the proposed action challenging. For example the proposed designation of Mine Warfare Training Areas (MIV) is not included in this section, but is incorporated elsewhere in the document, in this case in the "*Executive Summary*".

  Additionally, The DEIS states that: "*The Navy and Marine Corps extensively use each other's training areas and conduct many highly integrated training activities in the three adjoining range*

[1] 40 CFR 1502.20.

400 Commerce Avenue, Morehead City, North Carolina 28557-3421
Phone: 252-808-2808 \ FAX: 252-247-3330 \ Internet: www.nccoastalmanagement.net

complexes of Navy Cherry Point, Marine Corps Air Station (MCAS) Cherry Point and Marine Corps Base (MCB) Camp Lejeune"[2] The preceding statement seemingly implies that the proposed action could include a wide range of training activities that are both onshore and offshore that involve extensive inter-service coordination. For example, Figure 2.2-2 shows an Amphibious Landing Zone, which would be an on-shore impact. Additionally, the DEIS references shore bombardment operating procedures, which would imply an onshore impact[3]. The DEIS does clarify (limit) this potential by stating that the geographic scope would be limited to the offshore area. The DEIS also states that "*Despite the high degree of Navy and Marine Corps interaction in this region, the functions, structure, management and use of the three range complexes are sufficiently distinct that the Navy and Marine Corps will analyze the potential environmental effects of their combined training activities in three separate documents, Each service will provide environmental documentation for the Range Complex(es) over which it has cognizance: ...*" Nevertheless, it appears that the full scope of the various training exercises is being segmented in a manner that does not fully disclose the overall scope of the "*Proposed Action*". We recommend that Section 2.2.1 contain a more definitive all-inclusive "*Proposed Action*" that includes the interaction with other training efforts.

S1-1

- Cumulative impacts of the "*Proposed Action*" are evaluated in Chapter 6 of the DEIS. Similar to the DEIS's discussion of the "*Proposed Action*", the DEIS's cumulative impact discussion is vague. The DEIS basically notes that implementing the "*Proposed Action*" would represent an incremental increase over the no action alternative and consequently asserts that cumulative impact would be minimal.

  Nevertheless, the DEIS notes that there are at least 20 projects[4] that would result in incremental effects. Section 6.2.2.1 of the DEIS focuses on Camp Lejeune. This section does not disclose specific developmental projects at Camp Lejeune that are either currently in-process or are imminent. Examples of known projects at Camp Lejeune include the transfer of several thousand personnel to Camp Lejeune, the clearing of several hundred acres of land that is currently undeveloped (habitat) for urban (military) uses, the expansion of the proposed wastewater treatment facility to accommodate the proposed growth (transfer of personal), the construction of housing to accommodate the personnel being transferred to Camp Lejeune, and the increased training activities that will be occurring at Camp Lejeune. Instead of discussing the cumulative effect of all these activities, Section 6.2.2.1 simply states: "*An environmental assessment is currently being developed to evaluate the potential environmental consequences from current and emerging training operations of the MCB Camp Lejeune Range Complex. Once the EA is complete, the past and present impacts will be included here.*"[5] We recommend, similar to our recommendation on the "*Proposed Action*", that a more definitive analysis be provided in the cumulative impact assessment chapter.

S1-2

- Mitigation measures are discussed in Chapter 5 of the DEIS. The Navy is to be commended for providing an extensive array of mitigation commitments. Nevertheless, this DEIS, as other Navy DEISs have also done, refers to a <u>future</u> "*Integrated Comprehensive Monitoring Program*"[6] (ICMP). Referring to a <u>future</u> plan as a mitigative commitment in a DEIS is inappropriate since it represents a speculative action that may or may not be implemented. We encourage the Navy to complete the ICMP so that it can be reviewed by the public for adequacy and be included as a component of the "*Proposed Action*".

S1-3

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2 Page ES-1 of the DEIS.
3 Page 5-15 of the DEIS.
4 Page ES-20 of the DEIS.
5 Page 6-8 of the DEIS.
6 Page ES-19 of the DEIS.

- Water Quality is discussed in Section 3.3 of the DEIS. The water quality section uses an inappropriate standard for assessing whether an adverse impact to water quality has occurred. The DEIS states: "*A significant impact would result if the use or generation of expended materials resulted in a violation of any of the laws cited in Appendix K.*"[7] While a violation of a legal requirement can be considered a significant impact, it misses the concept that water quality can be degraded by a proposed activity without violating a law. As a hypothetical example, if water quality in a portion of the study area is currently rated as "*Outstanding Resource Water*" and the proposed project causes an impact that would result in a loss of that designation, then the impact would be considered significant. Below is a sample of defining vegetative impacts taken from the National Park Service's "*Ocracoke Island Multi-Use Trail Environmental Assessment*".

S1-4

> *The intensity of potential effects on vegetation was evaluated using the following system of impact thresholds:*
> ***Negligible**: Individual native plants may occasionally be affected, but measurable or perceptible changes in plant community size, integrity, or continuity would not occur.*
> ***Minor**: Effects on native plants would be measurable or perceptible. The natural function and character of the plant community would not be affected and, if left alone, would recover.*
> ***Moderate**: A change would occur in the natural function and character of the plant community in terms of basic properties (e.g., growth, abundance, reproduction, distribution, structure, or diversity) but not to the extent that the basic properties of the plant community change.*
> ***Major**: Effects on native plant communities would be readily apparent and would substantially and permanently change the natural function and character of the plant types.*

The above methodology can be adapted to apply to a wide variety of resources. We recommend that the entire DEIS be reviewed to verify that the definition of a significant impact to a resource be based on the degree of "*impairment*" caused by the project to that resource. This methodology can also be used for the cumulative impact assessment where the analysis is based on all reasonable known projects that potentially affect the resource.

Additionally, Section 3.3.2.2, which assesses "*Water Quality Baseline Conditions*", lacks water quality maps that have been prepared by the North Carolina Division of Water Quality. Attached to this letter is the water quality map for Onslow County. These maps would be useful for demonstrating the existing water quality baseline in the near shore area.

- Moratorium periods. The State of North Carolina recommends adherence by the Navy to a variety of State moratorium periods for the protection of various animals and plants such as sea turtles and shorebirds. Both nesting seabirds and nesting sea turtles occur on the interface between the land and water. Though the DEIS identifies the land area to be outside of the scope of the DEIS, activities proposed by the DEIS could have effects on species that travel between the land and water and vice-versa. The DEIS does not address, as a mitigation commitment, adherence to the State's moratorium periods. We recommend that that the DEIS incorporate adherence of the "*Proposed Action*" to the State's moratorium periods.

S1-5

[7] Page 3-36 of the DEIS.

- Federal/State Agency Coordination. We recognize that the "*Proposed Action*" is a Federal activity that principally occurs in Federal waters. Fore example, relative to Federal species, the DEIS states in several locations that: "*The Study Area does not contain designated critical habitat for any listed species. Consequently, the proposed action would have no effect on critical habitat.*"[8] That may be true for Federally listed species but not necessarily true for State species. The State has vested interests in many onshore and offshore resources such as sea turtles, shorebirds, Primary Nursery Areas (PNA), fishing (Commercial and Recreational), Natural Heritage Areas, and water quality. Additionally, 15 CFR 930.37 states that a Federal agency may use its NEPA documents as a vehicle for its consistency determination. Though not required in the DEIS, we recommend that the DEIS include a discussion of how the "*Proposed Action*" will affect State resources and how adverse effects will be mitigated. Such a discussion will be required in the Navy's consistency submission to DCM.

S1-6

Because of the size of the DEIS, its complexity, and other work priorities we have not been able to comment on all possible issues. Further reviews by DCM of this proposed action may result, in the future, in the submission of additional comments to the Navy. Thank you for your consideration of the North Carolina Coastal Management Program.

Sincerely,

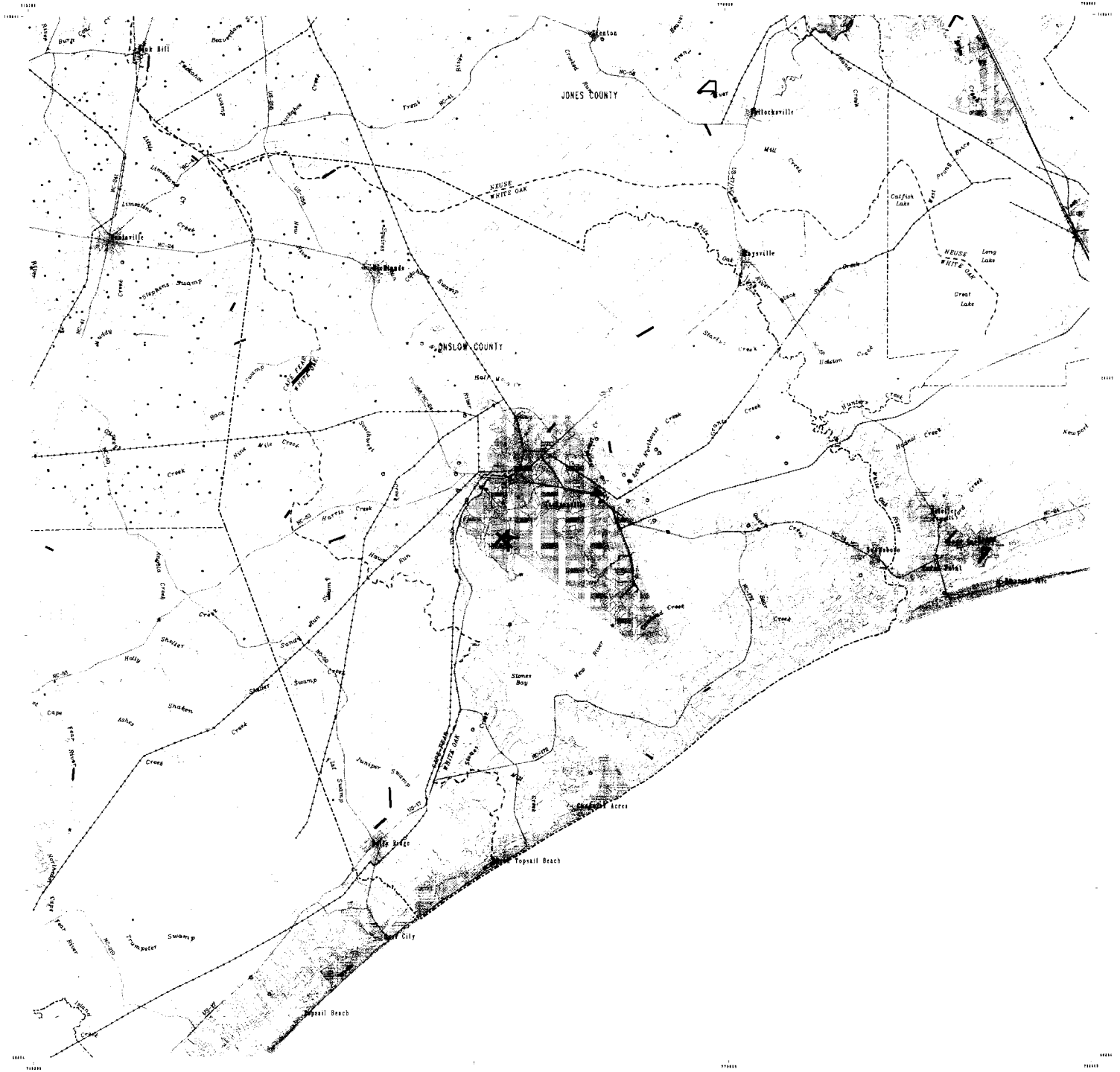
Stephen Rynas, AICP
Federal Consistency Coordinator

cc: Jim Gregson, Division of Coastal Management
Doug Huggett, Division of Coastal Management
J.M. Hinson, US Navy

[8] Page 6-54 of the DEIS.

WiRO

DIVISION OF WATER QUALITY
ENVIRONMENTAL SENSITIVITY MAP 2007
ONSLOW COUNTY, NORTH CAROLINA



Legend

- County Boundary
- Titled County Boundary
- State Boundary
- Hydrography
- River Basin Boundary
- Class B or SB Waters
- Trout Waters (DWQ)
- Class B Trout Waters
- Power/Transmission Line
- Railroad
- Airport/Landing Strip
- Primary Highway
- Road or Street
- Ambient Monitoring Site
- Animal Operation Permit
- NPDES Wastewater Site (Minor)
- NPDES Wastewater Site (Major)
- Surface Water Intake
- Lake/Stream/Sound
- Water Supply Watershed
- Water Supply Watershed Critical Area (Shading of entire watershed denotes WS-I Classification)
- Municipality
- High Quality Water Zone -- HQW, WS-I, WS-II, and SA Waters
- Outstanding Resource Water Zone
- Special Management Strategy Area

Scale 1:100,000

Prepared May 2007

Vicinity Map

North Carolina Center for Geographic Information & Analysis
301 N. Wilmington Street * Raleigh, NC 27601 * (919)733-2090

DATA SOURCE AGENCY AND CURRENCY DATES (Alphabetically):

Airports/Landing Strips	US Geological Survey	1994
Ambient Monitoring Sites	NC Division of Water Quality	2007
Animal Operation Permits	NC Division of Water Quality	2007
Class B Waters	NC Division of Water Quality	2006
County Boundaries	US Geological Survey	2006
High Quality Water Zones	NC Division of Water Quality	2007
Highways and Roads	NC Department of Transportation	2007
Hydrography	US Geological Survey	2006
Municipalities	NC Department of Transportation	2006
NPDES Wastewater Sites	NC Division of Water Quality	2006
Outstanding Resource Waters	NC Division of Water Quality	2007
Power/Transmission Lines	US Geological Survey	1988
Railroads	US Geological Survey	1987
River Basins	USDA - Natural Resources Conservation Svc.	1988
Surface Water Intakes	NC Division of Water Quality	2004
Trout Waters (DWQ)	NC Division of Water Quality	2006
Special Management Strategy Areas	NC Division of Water Quality	2007
Water Supply Watershed Critical Areas	NC Division of Water Quality	2007
Water Supply Watershed	NC Division of Water Quality	2007

DATA EXTENT AND VERIFICATION STATUS:

In order to provide users with needed information on this map series, CGIA has released some data prior to completion and/or verification of entire layers. Verification by the data custodians (source agencies) of the final data files prepared by CGIA is viewed as a critical step to ensure the accuracy of geographic features and associated attributes.

These maps are only as good as the data available when they were printed, and are not intended to replace any rule, regulation or classification schedule.

For stormwater permitting jurisdictions, see "Interactive Map for Stormwater Permitting Areas" http://h2o.enr.state.nc.us/stormw/map_maps.htm

NORTH CAROLINA STATE CLEARINGHOUSE
DEPARTMENT OF ADMINISTRATION
INTERGOVERNMENTAL REVIEW

RECEIVED
SEP 16 2008
HISTORIC PRESERVATION OFFICE

STATE NUMBER: 09-E-0000-0069 H12
DATE RECEIVED: 09/15/2008
AGENCY RESPONSE: 10/10/2008
REVIEW CLOSED: 10/15/2008

MS RENEE GLEDHILL-EARLEY
CLEARINGHOUSE COORD
DEPT OF CUL RESOURCES
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H - ok per
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DEPT OF CUL RESOURCES
DEPT OF TRANSPORTATION

PROJECT INFORMATION
APPLICANT: Department of the Navy
TYPE: National Environmental Policy Act
ERD: Draft Environmental Impact Statement
DESC: Testing and training activities in the Navy Cherry Point Range Complex off shores of North Carolina (Statewide counties). View document http://www.navycherrypointrangecomplexeis.com

The attached project has been submitted to the N. C. State Clearinghouse for intergovernmental review. Please review and submit your response by the above indicated date to 1301 Mail Service Center, Raleigh NC 27699-1301.
If additional review time is needed, please contact this office at (919)807-2425.

AS A RESULT OF THIS REVIEW THE FOLLOWING IS SUBMITTED:

☒ NO COMMENT

☐ COMMENTS ATTACHED

SIGNED BY: Renee Gledhill-Earley

DATE: 10-13-08

Comment #S2

North Carolina Wildlife Resources Commission

Gordon Myers, Executive Director

MEMORANDUM

TO: Melba McGee, Environmental Coordinator
Office of Legislative and Intergovernmental Affairs
North Carolina Department of Environment and Natural Resources

FROM: Maria T. Dunn, Northeast Coastal Region Coordinator
Habitat Conservation Program

DATE: October 20, 2008

SUBJECT: Comments on the Navy Cherry Point Range Complex Draft Environmental Impact Statement (DEIS) / Overseas Environmental Impact Statement (OEIS), Coastal North Carolina.
OLIA No. 09-0069

Biologists with the North Carolina Wildlife Resources Commission (NCWRC) reviewed the DEIS / OEIS with regard to impacts of the project on fish and wildlife resources. We attended a public information session and public hearing on October 14, 2008 in Beaufort, NC. Our comments are provided in accordance with the North Carolina Environmental Policy Act (G.S. 113A-1 et seq., as amended; 1 NCAC-25), provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and Sections 401 and 404 of the Clean Water Act (as amended).

The US Navy has submitted a DEIS / OEIS to assess the potential environmental impacts over a 10-year planning horizon associated with Navy Atlantic Fleet training, research, development, testing, and evaluation activities, and associated range capabilities enhancements (including infrastructure improvements) in the Navy Cherry Point Range Complex. The EIS/OEIS Study Area includes the Cherry Point Operating Area and Warning Areas located off the coast of North Carolina. Alternatives presented within the document were No Action Alternative, Alternative 1, and Alternative 2. The Navy has selected Alternative 2 as its preferred alternative. Alternative 2 includes all existing operations under the No Action Alternative as well as a 10% increase in most training and testing operations, changes in type and quantity of operations, tactical employment of forces to accommodate expanded mission areas, force structure changes, and new range capabilities that include tailored surface strike groups, surface-to-air missile training, MH-60R/S helicopters, Organic Mine Countermeasure systems, an upgrade of electronic

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Telephone: (919) 707-0220 • **Fax:** (919) 707-0028

warfare anti-ship and anti aircraft threat emitters, and elimination of all High Explosive Bombing Exercises (BOMBEX).

The NCWRC has the reviewed the document and has the following comments and concerns:

S2-1 – Table 3.10-2 lists seabirds known to utilize coastal and offshore waters in the study area. This list should include open water species such as northern gannet, red-throated loon, and horned grebe as well as sea ducks such as scoters, scaups, and red-breasted mergansers. It is important to include these open water species in the impact analysis.

S2-2 – Coastal North Carolina hosts high concentrations of wintering red-throated loons, a species that can occur in deep water and dive as deep as 250 feet. Information concerning impacts of the project to these birds was not addressed.

S2-3 – Increased MIW training and amphibious assault training in Onslow Bay may have a higher instance of impact to sea turtles and colonial shorebirds than other areas of the complex. To minimize impacts, we request the Navy adhere to the recommendations provided to the US Marine Corps in earlier correspondence (Ellwood, 20 August 2008) regarding activities in this area. This correspondence is attached.

S2-4 – We are concerned with the cumulative amounts of litter associated with the dispersal of materials in Alternative 2. This concern includes the copper wire associated with increased TOW missiles that will not be recoverable and may lead to entanglement of wildlife. Details should be provided that include maximizing attempts to recover debris, use of biodegradable materials, degradation time of materials, and other mitigative measures.

S2-5 – In addition to our concern with litter, it is difficult to predict the cumulative impacts of multiple releases of various hazardous materials on the marine environment. While there is detailed discussion of releases of hazardous material from individual sources, there is little discussion of cumulative impacts from multiple sources over many years.

S2-6 – The document states the Marine Corps Air Station Cherry Point will be evaluating operations at BT-9 and BT-11. However, recent public meetings have indicated these proposals will be addressed under separate documents and BT-9 operation changes are not being proposed at this time. The referencing of these target areas along with other concurrent military projects has caused confusion among the public. If operational changes at these areas are not being proposed within the Navy Cherry Point EIS, removal of the BT-9 and BT-11 references from this DEIS/OEIS would alleviate some public confusion.

– Several military projects are being reviewed concurrently. The cumulative impact of these projects should be considered. These activities have the potential to interrupt and impact migrating species, by land, by sea, and by air. Increased military training activities along the entire coast impact migratory shorebird populations for such species as the piping plover, Wilson's plover, American oyster catcher, and red knot. Along with migratory birds, sea turtle species, such as the loggerhead sea turtle, migrate through the waters from wintering grounds further south to nesting beaches along the North Carolina coast. Concerns arise when evaluating impacts from one project with the impacts from another proposed project in the same area. The NCWRC is concerned with

S2-7

cumulative impacts to important wildlife and fishery species up and down the coast and how this will particularly impact the important and valuable species of North Carolina over time. Therefore, all project impacts should be evaluated concurrently to realize the potential impact of multiple projects.

- We have coordinated with the NC DMF with regard to fisheries resources in the area and share their concerns with the impacts of the project on hardbottom (aka live-bottom) habitat and fisheries, particularly those that provide foraging resources for birds, sea turtles, and marine mammals. We support their recommendations in this regard.

- We defer comments on marine mammals to the National Marine Fisheries Service (NMFS).

We appreciate the opportunity to review and comment on this management plan. If you need further assistance or additional information, please contact me at (252) 948-3916.

North Carolina Wildlife Resources Commission

MEMORANDUM

TO: Stephen Rynas
Federal Consistency Coordinator
NC DENR/DCM

FROM: Molly Ellwood
Southeastern Permit Coordinator

DATE: August 20, 2008

RE: Proposed Testing of the Expeditionary Fighting Vehicle (EFV); DCM#20080089

Biologists with the North Carolina Wildlife Resources Commission (NCWRC) have reviewed the subject application for impacts to wildlife and fishery resources. Our comments are provided in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et. seq.), and Sections 401 and 404 of the Clean Water Act (as amended).

The United States Marine Corps proposes to perform developmental testing and engineering and engineering assessments/evaluations using the EFV prototype vehicles at Camp Lejeune in Onslow County. Impacts to the environment will be minimal and will utilize already impacted areas, through the increased use of existing tank trails and beach areas that are already designated as training areas for amphibious assault vehicles. Testing of EFV will include between 1-4 vehicles between 2008- 2014, with 5-15 training days per year.

Firepower operations are stated as occurring within the summer and early fall months, due to calmer water. While we understand that the time frame proposed provides for a more thorough evaluation of the testing components for the EFV, this is also the most productive time of year when various wildlife species actively utilize Onslow Beach.

- To mitigate for potential impacts we recommend that monitoring of the species be consistent with the increased use of the area. Increased beach patrols should be conducted to reduce the potential take of a nest from EFV traffic.

Mailing Address: Division of Inland Fisheries • 1721 Mail Service Center • Raleigh, NC 27699-1721
Telephone: (919) 707-0220 • **Fax:** (919) 707-0028

- NCWRC recommends that sea turtle nests not be relocated that are laid within the training areas outlined within the EA. We recommend that known nests be marked and avoided by vehicles utilizing the beach area to the greatest extent possible.
- Sections of the proposed training area, as depicted in Fig. 2-2, fall within the state designated sea turtle sanctuary, as defined in 15A NCAC 03R .0101. We recommend that activities during the sea turtle nesting season (01 May thru 15 Nov) be limited to decrease the potential for incidental take.
- Sargassum habitat provides important habitat for sea turtle hatchlings and is located in the upper most portion of the ocean. Maps provided, indicate that these areas will be frequently utilized by the training operations of EFV in the ocean, increasing the potential for incidental take of sea turtle hatchlings since these areas will be frequent more often.
- Furthermore, NCWRC requests that any night time testing of EFV be conducted outside of the state established sea turtle moratorium (01 May-15 Nov, or until the last known nest emerges, whichever is the latest date) and that lighting be limited to red lights only to prevent the potential for disorientating sea turtles.
- Areas along Onslow beach provide nesting and important foraging habitat for colonial shorebirds. To mitigate for impacts to these crucial areas, we recommend that areas that provide the greatest foraging and nesting habitats be roped off to discourage EFV operators from mistakenly utilizing these areas. Overwash fans provide critical nesting habitat for a variety of species and we expect that these areas be avoided, especially when accessing splash points. We recommend the USMC coordinate with Sue Cameron, NCWRC Water Bird Biologist to make sure that the routes proposed do not have a significant impact upon nesting shorebirds utilizing areas that fall within the planned routes during the nesting shorebird moratorium (01 Apr thru 15 Jul).

Due to the infrequency of the proposed training, NCWRC does not foresee a significant impact and concurs with the negative determination. We strongly encourage the USMC to avoid and minimize impacts to the greatest extent possible and reduce the amount of training days further during critical times of the year when training areas are inhabited by important wildlife species, particularly within the beach and ocean habitats. Thank you for the opportunity to review and comment on this application. If you have any questions or require additional information, please contact me at (910) 796-7217.

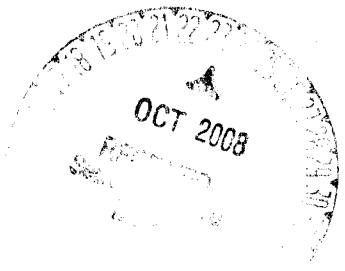
CC: Matthew Godfrey, NCWRC
Sue Cameron, NCWRC

Comment #S3

North Carolina Department of Environment and Natural Resources

Michael F. Easley, Governor

William G. Ross Jr., Secretary



MEMORANDUM

TO: Valerie McMillan
State Clearinghouse

FROM: Melba McGee
Environmental Review

RE: 09-0069 Navy Cherry Point Range Complex DEIS/OEIS, Coastal North Carolina

DATE: October 23, 2008

The Department of Environment and Natural Resources has reviewed the subject proposal. By the comments raised additional information is needed to fully evaluate the potential impacts of this project. The attached comments from our divisions identify several items that need to be expanded upon or clarified. Additional efforts should also be made in assessing cumulative impacts in relation to the multiple projects currently being reviewed.

At this point, the department would like to continue to work with the Navy to ensure that the preparation of the environmental impacts are considered. The applicant is encouraged to work directly with our resources agencies in addressing their concerns prior to finalizing project plans.

Thanks you for the opportunity to respond.

Attachments

1601 Mail Service Center, Raleigh, North Carolina 27699-1601
Phone: 919-733-4984 \ FAX: 919-715-3060 \ Internet: www.enr.state.nc.us/ENR/

North Carolina Department of Environment and Natural Resources
Division of Marine Fisheries

Michael F. Easley, Governor
William G. Ross Jr., Secretary

Dr. Louis B. Daniel III, Director

MEMORANDUM

TO: Melba McGee
Environmental Coordinator

FROM: Patricia L. Murphey
Marine Biologist Supervisor

DATE: October 22, 2008

RE: DEIS/OEIS For Navy Cherry Point Range Complex

The North Carolina Division of Marine Fisheries (NCDMF) has reviewed the Draft Environmental Impact Statement/Overseas Environmental Impact Statement (DEIS/OEIS) prepared by the Department of the Navy for the training activities in the sea space and undersea space of Cherry Point Operating Area (OPAREA); overlying Special Use Airspace of Warning Area 122; and the 3 nm-wide coastal strip from the mean high tide line up to and extending seaward to the western OPAREA boundary. After reviewing the DEIS/OEIS, NCDMF offers these comments, concerns and recommendations.

Chapter 1
1.7.2.1 Documents that will be Final when the Navy Cherry Point Range Complex FEIS is Published
This section discusses the draft EA Marine Corps Air Station Cherry Point Environmental Assessment which states the Marine Corp is currently preparing to address current and future training operations at BT-9 and BT-11. Based on public informational meetings hosted by MCAS Cherry Point, there are no proposed changes to restricted area at BT-0 at this time. Therefore, references to BT-9 in this section and other sections within the DEIS/OEIS should be removed in order to not confuse the public. S3-1

Chapter 3
3.3.2.2 Water Quality Baseline Conditions
This section discusses several River Basins in the area but leaves out the Neuse River Basin. S3-2

3.3.3.3 Alternative 2 (Preferred Alternative)
This section discusses potential effects to water quality of various training items used in the Navy Cherry Point Range Complex under the Navy's preferred alternative. The document states that the potential sediment disturbance would not exceed state or federal water quality standards; thus no significant impact on water quality is anticipated under alternative 2. The NCDMF requests the state and federal water quality standards be listed and provide data demonstrating that sediment disturbance will not exceed those standards. S3-3

3441 Arendell Street, P.O. Box 769, Morehead City, North Carolina 28557
Phone: 252 726-7021 \ FAX: 252 727-5127 \ Internet: www.ncdmf.net

3.6.3.3 Alternative 2 (Preferred Alternative)
This section discusses potential effects to marine communities of various training items used in the Navy Cherry Point Range Complex under the Navy's preferred alternative. The NCDMF is concerned about the live/hard bottom habitats that exist in the proposed training area for mine shape deployment and impacts from concrete anchors and mooring lines on thee fragile habitats. These areas appear to be located in the southwest portion of the Mine Warfare Training Area. The NCDMF request that the Navy reconsider including this portion of live/hard bottom in the area or at least require no mine shape deployment in the areas where live/hard bottom exists. The NCDMF is also concerned about potential impacts from non-explosive practice munitions (NEPM) on artificial reefs and shipwrecks due to the increase in use of these in the preferred alternative. It is stated that if NEPM were to strike these resources, little or no damage to the overall community would be expected because NEPM velocity would decrease upon contact with the water surface and as it travels through the water column. Velocities would have to decrease significantly in order to not have impacts from strikes. Velocity data demonstrating this decrease should be included.

S3-4

S3-5

3.7 Marine Mammals
The NCDMF defers to NMFS and USFWS expertise on marine mammals but will support any concerns and recommendations from those agencies.

3.8 Sea Turtles
The NCDMF defers to NMFS, USFWS and NCWRC expertise on sea turtles but will support any concerns and recommendations from those agencies.

3.9.3.1 No Action Alternative
This section discusses potential effects to fish and essential fish habitat of various training items used in the Navy Cherry Point Range complex under the Navy's no action alternative. The NCDMF is concerned about the use of TOW missiles because of the two 3,750 m long thin copper guide wires are not recoverable and may lead to entanglement. Currently, only four TOW missiles are fired per year but in the preferred alternative, this number will double to eight being fired, leading to approximately 37.3 miles of copper wire area expended in areas 16 and 17. More information regarding tensile strength and degradation time of copper wire in seawater should be included within this DEIS/OEIS.

S3-6

3.9.3.2 Alternative 2 (Preferred alternative)
This section discusses potential effects to fish and essential fish habitat of various training items used in the Navy Cherry Point Range Complex under the Navy's preferred alternative. It is stated that mine shape deployment will not occur in locations with known artificial reefs or shipwrecks. However the NCDMF is concerned about the live/hard bottom habitats that exist in the proposed training area for mine shape deployment and impacts from concrete anchors and mooring lines on these fragile habitats. These areas appear to be located in the southwest portion of the mine Warfare Training Area. The NCDMF request that the NAVY reconsider including this portion of live/hard bottom or at least require no mine shape deployment in the areas where live/hard bottom exists. The NCDMF is also concerned about potential impacts from non-explosive practice munitions (NEPM) on artificial reefs and shipwrecks due to the increase in use of these in Alternative 2. Since artificial reefs are considered essential fish habitat, discussion should be added to this section on the impacts to these artificial reefs. The NCDMF is concerned about NEPM strikes on artificial reefs as stated in the marine communities section of this document.

S3-7

3.15.2.3 State Landings
This section discusses potential effects to the regional economy of various training items used in the Navy Cherry Point Range Complex under the Navy's no action alternative. The NCDMF suggests that the Navy contact NCDMF License and Statistics section for information on landings, gear, waterbody, and species information that may also be incorporated into the DEIS/OEIS. S3-8

3.19 Summary of AFAST and Aggregate Impacts in the Navy Cherry Point Range Complex
This section summarizes the AFAST EIS/OEIS and the four alternatives analyzed by the Navy. The No Action alternative was selected as the preferred alternative. Under this alternative, the Navy would continue conducting active sonar activities within and adjacent to existing OPAREAS including the Cherry Point OPAREA. All ASW training will occur beyond 12 nm from shore. The NCDMF continues to recommend that an alternative representing a combination of Alternatives 1, 2, and 3 in the AFAST EIS/OEIS be considered. The NCDMF remains concerned about impacts on fish habitat from expended sonobuoys, ADCs, and EMATTs. The NCDMF also remains concerned about the lack of data that exists on long-term negative effects on marine fish from underwater sound associated with sonar activities and defers to NMFS, USFWS, and NCWRC on impacts of sonar activities on marine mammals and sea turtles. S3-9

Chapter 5
5.7.1 Navy Surface-to-Surface Gunnery
This section lists measures that are employed by the Navy for at sea training. Target area establishment criteria do not include artificial reefs or shipwrecks. S3-10

5.7.4 Air to Surface at Sea Bombing Exercises (explosive)
This section lists measures that are employed by the Navy for at sea training. Target area bombardment establishment criteria do not include artificial reefs or shipwrecks. Under the preferred alternative, HE Bombs are eliminated. However, artificial reefs and shipwrecks should also be considered.

5.7.5 Air to Surface at Sea Bombing (non-explosive)
This section lists measures that are employed by the Navy for at sea training. Target area establishment for aerial bombardment criteria do not include artificial reefs or shipwrecks.

5.7.6 Air to Surface Missile Exercises
This section lists measures that are employed by the Navy for at sea training. Target area establishment criteria do not include artificial reefs or shipwrecks.

5.7.7 Air to Surface Gunnery Exercises
This section lists measures that are employed by the Navy for at sea training. Target area establishment criteria do not include artificial reefs or shipwrecks.

5.8.1 Near-shore Operations
The NCDMF questions why BT-9 is discussed in this section and the conclusion that because BT-9 is located in shallow waters, the area is not critical or exceptional habitat for sea turtles. S3-11

Chapter 6
6.1.1.1 Navy Cherry Point EIS/OEIS Conclusions
It is stated that the primary effect of the Navy and Marine Corp's training activities in the Navy Cherry Point Study Area would be the deposition of expended training materials and their accumulation over time. The NCDMF is concerned about the increase in the amount of expended materials including the 37.3 miles of copper wire that will be expended from TOW missiles. More information regarding tensile strength and degradation time of copper wire in seawater should be included within this DEIS/OEIS. S3-12

Other comments
An additional concern of the NCDMF is the notification of mariners (both commercial and recreational fishermen). The NCDMF would like to suggest that in addition to NOTMARs, issued by the USCG, a website, email, email list server, or phone number be available in order for those fishermen to be informed on hazardous operations in the Navy Cherry Point Range Complex. S3-13

Comment #S4

NCDENR

North Carolina Department of Environment and Natural Resources

Michael F. Easley, Governor

William G. Ross Jr., Secretary

October 23, 2008

Navy Facilities Engineering Command Atlantic
Attention: Code EV22LL (USWTR OEIS/EIS PM)
6506 Hampton Boulevard
Norfolk, VA 23508-1278

Draft Environmental Impact Statement for Proposed Undersea Warfare Training Range

Ladies and Gentlemen:

This is to provide preliminary comments on the subject Draft Environmental Impact Statement. The Steering Committee for North Carolina's Coastal Habitat Protection Plan (CHPP) is comprised of two members each from NC's Coastal Resources Commission, Environmental management Commission and the Marine Fisheries Commission. The primary goal of the Coastal Habitat Protection Plan is the "long tern enhancement of coastal fisheries associated with coastal habitats." The possible USWTR site in Onslow Bight lies east of Topsail Island in Pender County and could have a significant effect on North Carolina's coastal habitats.

We respectfully request that the Navy:

S4-1 1. Consider all comments received on this DEIS as comments also on the DEIS dated September 12, 2008 related to the testing and training activities in the Navy Cherry Point Range Complex , and vice versa. Both DEIS statements relate to similar activities in the same Atlantic environment. To officially consider any comment on one DEIS as a comment on the other is certainly the fair thing to do. Furthermore, the CHPP Steering Committee feels that such treatment is consistent with the cumulative impact requirements of the National Environmental Protection Act.

S4-2 2. Immediately post all comment letters and all hearing transcripts for both DEIS matters on publically available web sites. Please do not wait for citizens to file Freedom of Information Act filings and go through all the tedious details that can involve.

S4-3 3. Extend the comment periods on both DEIS statements to January 15, 2009. These two documents are 1,000 and 700 pages long and very complex. The Navy and its consultants and contractors have worked on these documents for over 3 years. It is only fair and reasonable to give all parties reasonable time to study the documents and develop meaningful comments. That is within the spirit of the National Environmental Protection Act.

Thank you very much for considering these preliminary comments.

Sincerely,

Pete Peterson by Jimmy Johnson

Dr. Charles H. (Pete) Peterson
Chairman
NC CHPP Steering Committee

CHP/jj

Comment #S5

North Carolina
Department of Administration

Michael F. Easley, Governor

Britt Cobb, Secretary

November 4, 2008

Capt. J.M. Hinson
Department of the Navy
Naval Facilities Engineering Command
Code EV22LL
6506 Hampton Blvd.
Norfolk, VA 23508-1278

Post-it® Fax Note 7671	Date	# of pages ▶ 3
To Susan Adkins	From V. McMillan	
Co./Dept.	Co.	
Phone #	Phone # 919-807-2324	
Fax # 757-322-4894	Fax #	

Re: SCH File # 09-E-0000-0070; DEIS; Undersea Warfare Training Range - Navy proposes to instrument a 500-square-nautical-mile area of the sea floor to allow ships, submarines, & aircraft to perform anti-submarine warfare (statewide counties). View document at http://projects.earthtec

Dear Capt. Hinson:

The above referenced environmental impact information has been submitted to the State Clearinghouse under the provisions of the National Environmental Policy Act. Attached to this letter for your consideration are **additional** comments made by agencies after the review period closed.

If any further environmental review documents are prepared for this project, they should be forwarded to this office for intergovernmental review.

Should you have any questions, please do not hesitate to call.

Sincerely,

Valerie W. McMillan

Valerie W. McMillan, Director
State Environmental Policy Act

Attachments

Mailing Address:
1301 Mail Service Center
Raleigh, NC 27699-1301

Telephone: (919)807-2425
Fax (919)733-9571
State Courier #51-01-00
e-mail valerie.w.mcmillan@doa.nc.gov

Location Address:
116 West Jones Street
Raleigh, North Carolina

North Carolina Department of Environment and Natural Resources

Michael F. Easley, Governor William G. Ross Jr., Secretary

Post-it® Fax Note 7671	Date 11/3/08	# of pages ▶ 2
To SHEILA GRABEN	From KAREN CANAVAGIO	
Co./Dept.	Co.	
Phone #	Phone #	
Fax #	Fax #	

MEMORANDUM

TO: Valerie McMillan
State Clearinghouse

FROM: Melba McGee
Environmental Projects Officer

SUBJECT: #09-0070 Navy anti-submarine warfare training

DATE: November 3, 2008

The attached comments were received by this office after the response due date. These comments should be forwarded to the applicant and made a part of our previous comment package.

Thank you for the opportunity to respond.

Attachment

1601 Mail Service Center, Raleigh, North Carolina 27699-1601
Phone: 919-733-4984 \ FAX: 919-715-3060 \ Internet: www.enr.state.nc.us/ENR/

One North Carolina Naturally

North Carolina
Division of Environmental Health

Division of Environmental Health
Terry L. Pierce, Director

Public Water Supply Section
Jessica G. Miles, Section Chief

State of North Carolina
Michael F. Easley, Governor

Department of Environment and Natural Resources
William G. Ross, Secretary

October 1, 2008

To: Melba McGee, DEH Environmental Coordinator

From: Kelly Johnson, NC Public Water Supply, Wilmington Regional Office

Subject: Project Number 09-0070: Navy anti-submarine warfare training

Applicant: Department of Navy

Project Location: Offshore, Coastal Counties

Proposed Project: Construct a 500-square-nautical-mile area of sea floor for anti-submarine training

This agency has no objection to the project as proposed. The information provided does not indicate that the proposed project will require public water supply services or will interfere with current piping or other public water system infrastructure. If public water is involved, you will be required to obtain the appropriate approvals from the Public Water Supply Section. Please ensure that these activities do not result in the contamination of any public water groundwater supplies. If you have questions, please contact me at 910.796.7376.

Wilmington Regional Office
127 Cardinal Drive Extension, Wilmington, North Carolina 28405-3845
Telephone (910) 796-7215 ▲ Fax (910) 350-2004
http://ncdrinkingwater.state.nc.us/

O1

Comment #O1

CETACEAN SOCIETY INTERNATIONAL – EARTHJUSTICE – THE HUMANE SOCIETY OF THE UNITED STATES – INTERNATIONAL FUND FOR ANIMAL WELFARE -- NATURAL RESOURCES DEFENSE COUNCIL – OCEAN FUTURES SOCIETY – OCEAN MAMMAL INSTITUTE – CITIZENS OPPOSING ACTIVE SONAR THREATS – PENDERWATCH & CONSERVANCY — DUKE ENVIRONMENTAL LAW AND POLICY CLINIC – THE KAREN BEASLEY SEA TURTLE RESCUE & REHABILITATION CENTER – TOPSAIL TURTLE PROJECT – N.C. COASTAL FEDERATION – SOUTHERN ENVIRONMENTAL LAW CENTER

By Overnight Mail and Fax

REQUEST FOR EXTENSION OF PUBLIC COMMENT PERIOD

October 6, 2008

Naval Facilities Engineering Command Atlantic
Attention: Code EV22LL (USWTR OEIS/EIS Program Manager PM)
6506 Hampton Boulevard
Norfolk, VA 23508
Fax: 804-200-5568

Re: *Petition for Extension of Public Comment Period on Draft Overseas Environmental Impact Statement/ Environmental Impact Statement for the Undersea Warfare Training Range*

Dear Sir or Madam:

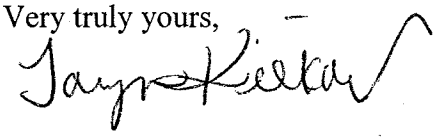
On behalf of the Natural Resources Defense Council ("NRDC"), The Humane Society of the United States, International Fund for Animal Welfare, EarthJustice, Cetacean Society International, Ocean Mammal Institute, Ocean Futures Society, Citizens Opposing Active Sonar Threats, PenderWatch & Conservancy, Animal Welfare Institute, Duke Environmental Law and Policy Clinic, The Karen Beasley Sea Turtle Rescue & Rehabilitation Center, Topsail Turtle Project, N.C. Coastal Federation, and Southern Environmental Law Center, and our millions of members and activists, I am writing to petition the Navy for an extension of the public comment period on its Undersea Warfare Training Range Draft Overseas Environmental Impact Statement/ Environmental Impact Statement ("DEIS").

Notice of the comment period was published in the Federal Register on September 12, 2008. See 73 Fed. Reg. 52973. The public has been given *only 45 days* to submit comments by October 27, 2008. To fully protect the public interest and allow meaningful consideration of new information, we respectfully request an extension until January 15, 2009, or a minimum of at least 45 additional days, to submit written comments.

The proposed Undersea Warfare Training Range ("USWTR") is an extremely controversial project involving more than 470 exercises per year (DEIS at 2-15) over 500 square nautical miles of ocean (DEIS at 2-2). The Navy's first USWTR DEIS, issued in October 2005, proved so controversial that it was withdrawn the following year and completely revised. See 70 Fed. Reg. 62102 (Oct. 28, 2005). In preparing the current document, the Navy switched its preferred site from waters off North Carolina (south of Cape Hatteras) to waters off Florida (east of Jacksonville), raising many new concerns. Notably, the area lies very close to critical habitat and breeding grounds for the endangered North Atlantic right whales. The public, as well as the scientific community, needs sufficient time to identify, analyze, and comment on this new site and on the Navy's revised analysis.

Because of the sheer size of the USWTR DEIS and the many issues it raised, in 2005 the Navy appropriately extended its initial two-month comment period an extra month, thus providing a full 90 days for comments. We believe at the very least that a similar extension is warranted here. Therefore, we strongly urge you to grant this petition and extend the comment period. As always, we would welcome discussion with the Navy at any time.

Very truly yours,



Taryn G. Kiekow
Staff Attorney, Marine Mammal Program
Natural Resources Defense Council

Comment #O2

Written comments become part of the public record associated with this proposed action. Accordingly, the Navy makes these comments, including names and home addresses of respondents, available for public review. Individual respondents may request that their name and/or home addresses be withheld from public disclosure, which will be honored to the extent allowable by law. If you wish to have your name and/or home address withheld, you must check the box(es) below. All submissions from organizations or businesses, and from individuals or officials representing organizations or businesses, will be made available for public inspection in their entirety.

Please withhold my name from the public record to the extent allowable by law.

Please withhold my address from the public record to the extent allowable by law.

United States Navy

Public Hearing Comment Form

Navy Cherry Point Range Complex Environmental Impact Statement / Overseas Environmental Impact Statement

The U.S. Navy has prepared a Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) for the Navy Cherry Point Range Complex. Please record your comments on the Draft EIS/OEIS on this form. You may submit your comments by:

1) Depositing this form at the Public Comment Collection station before you leave tonight
2) Submitting your comments via the project Web site at **www.navycherrypointrangecomplexeis.com**
3) Faxing this form to (757) 322-4894; Attention: Code EV22SA (Navy CP EIS/OEIS PM)
4) Mailing this form to:

Naval Facilities Engineering Command Atlantic
Attention: Code EV22SA (Navy CP EIS/OEIS PM)
6506 Hampton Blvd
Norfolk, VA 23508-1278

[X] *Please check the box if you would like to receive a CD Rom copy of the Final EIS/OEIS. Provide your mailing address below.*

All comments must be received no later than October 27, 2008.

Name: John R. Spruill Date: 10/15/08

Organization/Affiliation: North Carolinians for Responsible use of Sonar

Address:* 1836 Corcus Ferry Rd

City, State, Zip Code: Hampstead, NC 28443

Comments: Section 3.9

After a fast and preliminary reading of Section 3.9 it is very clear that the treatment of the impact on finfish is superficial and deficient. Specifically, there is no scientific evidence of the effect of sonar, propeller cavitation, blade vibration (Use reverse side for additional comment) (over)

Visit **www.navycherrypointrangecomplexeis.com** for project information.

*Provide your mailing address to receive future notices about the Navy Cherry Point Range Complex EIS/OEIS.

the diverse species of
of explosives on "fish" in the Op area in all
stages of their life and their
habitat and food chain.

I intend to develop detailed
comments on this issue. However,
I need an extension of the
comment period until 15 January 2009
to do this fully and completely.

I will also be issuing
comments on the USAWTR DEIS
which was also issued just after
12 September 2008 and is 1,000
pages long.

John R. Spruill

Comment #O3

Written comments become part of the public record associated with this proposed action. Accordingly, the Navy makes these comments, including names and home addresses of respondents, available for public review. Individual respondents may request that their name and/or home addresses be withheld from public disclosure, which will be honored to the extent allowable by law. If you wish to have your name and/or home address withheld, you must check the box(es) below. All submissions from organizations or businesses, and from individuals or officials representing organizations or businesses, will be made available for public inspection in their entirety.

Please withhold my name from the public record to the extent allowable by law.

Please withhold my address from the public record to the extent allowable by law.

United States Navy

Public Hearing Comment Form

Navy Cherry Point Range Complex Environmental Impact Statement / Overseas Environmental Impact Statement

The U.S. Navy has prepared a Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) for the Navy Cherry Point Range Complex. Please record your comments on the Draft EIS/OEIS on this form. You may submit your comments by:

1) Depositing this form at the Public Comment Collection station before you leave tonight
2) Submitting your comments via the project Web site at **www.navycherrypointrangecomplexeis.com**
3) Faxing this form to (757) 322-4894; Attention: Code EV22SA (Navy CP EIS/OEIS PM)
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Naval Facilities Engineering Command Atlantic
Attention: Code EV22SA (Navy CP EIS/OEIS PM)
6506 Hampton Blvd
Norfolk, VA 23508-1278

[X] *Please check the box if you would like to receive a CD Rom copy of the Final EIS/OEIS. Provide your mailing address below.*

All comments must be received no later than October 27, 2008.

Name: John R. Sprull Date: 10/15/08

Organization/Affiliation: North Carolinians for Responsible Use of Sonar

Address:* 1836 Corcus Ferry Rd.

City, State, Zip Code: Hampstead. NC 28443

Comments: Please extend the comment period on this DEIS until 15 JAN 2009. I intend to examine this 700-page document very carefully and present the most meaningful comments that I can. I and other concerned citizens need a reasonable time to analyze this complex document. *(Use reverse side for additional comment)*

Visit **www.navycherrypointrangecomplexeis.com** for project information. (OVER)

*Provide your mailing address to receive future notices about the Navy Cherry Point Range Complex EIS/OEIS.

The NAVY together with its contractors / and consultants has been working on this for several years. It is only fair, proper and within the spirit of the NATIONAL ENVIRONMENT Policy Act that citizens be given A Reasonable time to Review this 700-page document and present meaningful comments

Thank you very much.

John R. Sprunt

PenderWatch & Conservancy
Post Office Box 662 Hampstead, North Carolina 28443

Comment #O4

October 15, 2008

Navy Facilities Engineering Command Atlantic

Attention: Code EV22SA

6506 Hampton Boulevard

Norfolk, VA 23508-1278

Draft Environmental Impact Statement for Cherry Point Range Complex

Ladies and Gentlemen:

This is to provide preliminary comments on the subject DEIS. PenderWatch & Conservancy is an all-volunteer organization in Pender County, NC, with more than 400 members. We describe ourselves as *Responsible Advocates for the Environment.* The subject range lies offshore Pender County.

We respectfully request that the Navy:

1. Consider all comments received on this DEIS as comments also on the DEIS dated September 12, 2008 related to the proposed Undersea Warfare Training Range , and vice versa. Both DEIS statements relate to similar activities in the same Atlantic environment. To officially consider any comment on one DEIS as a comment on the other is certainly the fair thing to do for citizens and citizens-based groups like PenderWatch. Further, we think that such treatment is consistent with the cumulative impact requirements of the National Environmental Policy Act.

2. Immediately post all comment letters and all hearing transcripts for both DEIS matters on publicly available web sites. Please do not wait for citizens to file Freedom of Information Act filings and go through all the tedious details that can involve.

3. Extend the comment periods on both DEIS statements to January 15, 2009. These two documents are 1,000 and 700 pages long and very complex. The Navy and its consultants and contractors have worked on these documents for over 3 years. It is only fair and reasonable to give citizens and citizens-based groups reasonable time to study the

documents and develop meaningful comments. That is within the spirit of the National Environmental Policy Act.

If provided adequate time to do so, we plan to issue detailed, substantive comments, especially related to the inadequate treatment in the DEIS of

1. The impact on sea turtles, especially since the Pender County coast and all of southeastern North Carolina are hugely important nesting areas.

2. The impact of (a) Sonar, explosives and ship propeller cavitation and (b) hard bottom / habitat destruction on marine mammals and finfish in all stages of their life cycles, their feeding and reproduction, and

3. The economic impact on the hugely important recreational and commercial fishing businesses in North Carolina.

Thank you very much for considering these preliminary comments.

Very truly yours,

James Milne, President

John R. Spruill, Vice President

Allie Sheffield, Board of Directors

PenderWatch & Conservancy

entire process is the public's opportunity to comment. Two public hearings, including this one, are being held throughout this week. There are two opportunities for public comments, the letter of authorization, which is issued by National Fishery Service for their proposed rule, there's a public comment process for that, as well as comments on this document.

Your comments on the draft document will be addressed in the final EIS/OEIS. The final step is the decision phase. A decision will not be made until at least 30 days after distribution of the final EIS/OEIS. This decision will be summarized and published as a record of decision in the Federal Register in June, 2009. With that, sir, I'll turn it back over to you.

THE HEARING OFFICER: Thank you, Mr. Noble. At this time I'd like to invite our first speaker, Mrs. Sheffield, please come forward.

Comment #O5 MRS. SHEFFIELD: Thank you. My name is Allie Sheffield, and Allie is A-L-L-I-E. Sheffield is S-H-E-F-F-I-E-L-D. I represent Pender Watch, which is a citizen organization in Pender County, North Carolina, which has about 400 members, and we are concerned with the environmental issues, and call ourselves responsible advocates, not nut cases so the -- about the environment.

Pender County includes Topsail Island, which adjoins

the area that is currently part of the range. The New River Inlet separates Topsail Island from the Camp Lejeune Base, and most of the island is in Pender County, which is why I am here. Many of our members who live on Topsail Island have a large concern about these issues.

The primary thing I'm requesting here tonight is the extension of time to file responses. We have had the documents that have been -- the documents, I guess, you'd call them, they were issued or released on the 12th of September, and 45 days is just an inadequate amount of time to expect serious people to respond.

The Navy, I think, had spent about three years doing the work, and it looks -- it looks very thorough and very detailed, but more time is needed for us to give it the kind of attention it needs. Once we finish talking with experts and reviewing the various things in there, we may not object, but we need time to do what needs to be done so that we can decide. And again, six weeks, 45 days is a grossly inadequate amount of time. We're requesting an extension of time till January 15th, and we will be prepared to submit appropriate -- an appropriate response by that time.

In addition, just -- I can tell you what our -- what we would be particularly looking at, what are the issues we would be particularly looking at in there, and they're all things that you discussed in your presentation. And the first, of

course, is sea turtles.

The sea turtle hospital at Topsail Island is something that we're incredibly proud of. All of southeastern North Carolina is. It's a national treasure. They take -- they're the only sea turtle hospital between New York and Florida, and sea turtles from all up and down the East Coast are taken there for rehabilitation and release, but most of their turtles come from near our island. And your range is part of the territory that they get a lot of their turtles from, or that a lot of injured turtles come from.

And all of us -- all of us want to study more than we can in another two weeks the effect this is going to have. And I know that Ms. Beasley, and the other turtle hospital people were talking to the representatives here, and I'm very interested in talking to them after this about their impressions, and, you know, we're hopeful that the Navy has taken the issues we have in consideration, and that we won't have any serious complaints, but we just have not had time to be able to make that decision now. We're also, as you are, very concerned about marine mammals.

I was very pleased to see the attention you've given that, and again that appears to be something you seriously considered, and have taken pains to provide for. That's excellent.

The other thing is fin fish, of course. I don't know

if you know it, but you probably do, since you did the environmental impact statement. One of the very few hard bottom sea floors is right off that New River Inlet. It's a state treasure. It's the closest one to the shore in the state, and it's some of the best fishing in the state right off that inlet. We don't want to lose that.

The other thing, of course, we're concerned about is our commercial fisherman and our tourism business. Those are our primary issues, and again, we appreciate this opportunity to speak, and look forward to an extension of time so that we can file a longer response. Thank you.

THE HEARING OFFICER: Thank you, Mrs. Sheffield. I'd also note for the record that we do have your letter dated October 15th of 2008, signed by yourself, the president of Pender Watch, as well as the vice president, and that will be attached to the record.

MS. SHEFFIELD: Thank you.

THE HEARING OFFICER: We thank you for your comments. Ladies and gentlemen, do we have anyone else who wishes to speak tonight? I only received one speaker card. Is there anyone else that wishes to speak? Being that we don't have anybody else at this point in time, we're going to put the hearing into recess. We will remain until 9:00, which is the scheduled closing time, so if there are any other speakers that show up, we'll come back in, and put them on the record

Comment #O6

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25 October 2008

Facilities Engineering Command, Atlantic Division
Attention: Code EV22SA (Navy Cherry Point Complex DEIS/OEIS)
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Thank you for the opportunity for Cetacean Society International (CSI) to offer the following comment on the Draft Overseas Environmental Impact Statement / Environmental Impact Statement (DEIS) for the Navy Cherry Point Complex. CSI offers these comments in addition to being a signatory to comments submitted by the Natural Resources Defense Council.

CSI's primary concerns are for potentially significant impacts on cetaceans and marine turtles from ship strikes on-range during operations and vessel transit to and from the range, and cetacean aversion/avoidance behavior in response to the noise from multiple sonars and maneuvering vessels, with a specific concern for population-level impacts on North American right whales.

O6-1

The DEIS should discuss the potential for naval operations to trigger the release of dumped and potentially toxic or explosive munitions resting on the sea floor within the OPAREA. In early October a plan to explore the sea bottom offshore of New Jersey prompted the revelation that the U.S. Army had dumped 64 million pounds of chemical weapons into U.S. waters from World War I until the early 1970s. The weapons included mustard gas, sarin gas, arsenic, cyanide and VX nerve gas. A 2007 report prepared by the Congressional Research Service on the U.S. chemical weapon disposal in the ocean states that locating the weapons will be "difficult at best if not impracticable in some cases," but the DEIS must describe efforts to quantify whether or not such munitions are within the training area, and what mitigations will be made to prevent any triggering or leakage of the devices.

Because regulatory agencies, accumulating scientific evidence, and continual legal actions have impeded sonar training by the Navy, knowledgeable experts within the Navy appear to accept, if confidentially, that current operational mitigations are inadequate. The Navy appears to be actively researching realistic methods to detect vulnerable marine species of concern, and to operate under realistic mitigation protocols that would actually work throughout the range of weather and darkness under which the training and transit would be conducted. Nevertheless training must go on in the interim, whether or not the current DEIS is truly adequate, so the default "solution" the Navy may chose, as they did for the Southern California training range, may be to demand "emergency" waivers and exemptions to regulations and federal laws. CSI is a co-plaintiff in the case the Supreme Court is currently deliberating on the constitutionality of these actions.

CSI respects the need for readiness training, understands the significance of active sonars to mission success, and hopes that the Navy can find a way to operate without always seeking "emergency" waivers to regulations they cannot comply with. Most of all we wish we had the ability to provide realistic solutions to the conflict between conducting sonar operations and conserving marine animals. We believe the DEIS should be a platform for Navy to describe sponsored research

to improve at-sea detection of vulnerable marine mammals and turtles. We also believe that knee-jerk denials and unnecessary secrecy are counterproductive and a slur on the Service's reputation.

O6-2

Unfortunately this DEIS amounts to just another denial of the accumulating scientific evidence and military reports that have accumulated, clarifying and documenting the potential for deleterious effects from active sonar operations on marine animals, as well additional evidence about ship strike potential and avoidance. There is no excuse for the outdated and in some cases disproven resources still included in the current DEIS. Why wasn't a conscientious and professional effort made to ensure that the most current evidence was included? Has the Navy gotten what it paid for?

The trend in the evidence has been absolute: while data remains sparse and in some cases classified, and controlled experiments are at early stages, the accumulated evidence more strongly than ever suggests that active sonar operations may adversely affect cetacean behaviors, and under certain conditions the affects may have population-level significance. Initial research and discussion focused on the types of harm and injury noted most often from stranded animals, from the perspective that the harm and injury was caused directly by the animals being too close to an acoustical source of sufficient power. Many of the mitigations in the DEIS reflect this limited view. While direct harm remains a significant potential to individuals, the numbers of harmed animals would always be limited, generally below a regulatory threshold.

However, the current focus of research and discussion is about the potential for active sonars to provoke aversion or avoidance behaviors from animals that may perceive the sonars at near threshold levels, perhaps many miles from the source. Active sonars perceived at power levels far too low to cause direct injury have precipitated behaviors that have resulted in mortalities. While it is inappropriate to assume that each new mass stranding might be linked to active sonar use, it is more inappropriate not to investigate the potential by every means available. Unfortunately, such investigations often are hindered by remote locations, delayed responses, technical difficulties, and automatic military denials under a cover of secrecy.

A recent example is June's mass stranding of common dolphins near Cornwall, England. Despite immediate denials by the Royal Navy the event now has been linked to an active sonar exercise incorporating assets of several nations, including the Royal and U.S. Navies. A Freedom of Information (FOI) request to the British Ministry of Defence (MoD) was required to verify that the exercise was concurrent with the stranding, and a FOI request is underway to determine the extent of the U.S. Navy's participation. Experts now agree that these dolphins, a species known for strong social bonds, were behaving adversely to the exercise operations, and some of those that happened to approach the shore became involved in the mass stranding. There is no evidence to deal with the obvious questions about groups of animals that fled in other directions, or the population-level effect of scattering the group, or denial of habitat, or curtailed behaviors that may have been significant to survival. There might have been some evidence if qualified observers had been allowed to monitor cetaceans concurrent with the exercise. The unnecessary secrecy prevented both navies, and everyone else, from understanding more about the events so as to mitigate more successfully in the future.

CSI is grateful, therefore, that the U.S. Navy has supported initial efforts to enable experts to quantify behaviors of cetaceans before, during and after being exposed to active sonar operations. The first public research of this type was during RIMPAC 2008, and we hope it can

be extended to other active sonar operational training. An adequate DEIS would include a summary of this data for review.

Beaked whales continue to be a focus of considerable research, but the evidence from the bell-ringing events that triggered this focus faced considerable military interference. Recent events also have provided significant evidence, but only after being forced into public review. An unpublished MoD report for the Defence Science and Technology Laboratory documented cetacean behavior during Operation Anglo-Saxon 06, an exercise similar to future training represented by this DEIS. The report stated that during sonar operations beaked whales ceased vocalizing and foraging, noting that "Since these animals feed at depth, this could have the effect of preventing a beaked whale from feeding over the course of the trial and could lead to second or third order effects on the animal and population as a whole." The report was only obtained after a FOI request was made by *Nature*, and references a 2005 MoD document that discusses second- and third-order effects such as starvation and death. Repeated research on AUTEC with tagged beaked whales exposed to orca and generic mid-frequency transmissions affirms the basic aversion behavior discussed in the MoD reports.

The DEIS will remain inadequate until more reasonably current scientific evidence has been incorporated, the discussion reflects those data, and some allowances are made for future findings amplifying the need for substantially improved mitigations. The evidence is mounting that deleterious, significant impacts can be provoked by aversive or avoidance behaviors to active sonar, and perhaps other exercise noises, at ranges out to near the limit of a cetacean's perception. Navy-funded research has focused on perception thresholds, and it is logical to investigate the threshold of behavioral reactions to actual mid-frequency sonar sounds, as affected by environmental conditions and normal operations such as beam aiming and vessel maneuvers. It will be invalid to do this in controlled circumstances, for example using captive animals, as they will have had no experience with sonar noise, and no perception of the noise as a threat.

No visual or passive acoustical mitigations can reach out to where the vulnerable animals might first react to sonar operations. The solution to the extended range impacts may require technological changes to what the sonars sound like to marine animals, and the development of those technologies should not wait for absolute proof of the need.

While the DEIS relies upon unrealistic visual and acoustic mitigations for both ship strikes and sonar operations, we assume the Navy is searching for reasonable, practical solutions to this fundamental flaw. But at the moment it is simply illogical to state, and impossible to prove, that visual observers are able to detect cetaceans and sea turtles even at current mitigation ranges, during all operations encompassed by the DEIS, including darkness, high sea states and extreme surface weather. Surprisingly, sea state does not appear to be mentioned at all, while it has been established that above Beaufort 4 visual sightings become almost moot. Range operations must occur well above that level, or the training will not meet real-world conditions.

O6-3

The ship strike mitigations do not specify speeds but allow for captain's discretion to operate at "slow, safe speed; that is the slowest speed consistent with essential mission, training and operations at which the speed can take proper and effective action to avoid a collision;" and "to the extent practicable and consistent with the mission, training and operations...vessel operations...will be limited to daylight and periods of good visibility." But proper training stresses and tests both ship and crew, and a captain under pressure to fulfill the mission or meet a start time might stretch this "mitigation" to speeds known to produce mortalities, in conditions where even experienced observers would not have a reasonable chance to sight vulnerable animals.

O6-4 While respecting a captain's authority and responsibility CSI believes the DEIS must incorporate specific speed limits that at least match regulatory limits, such as ten knots or less. Training schedules or time constraints also must allow for slow speed mitigations. A vessel or crew under training should not be expected to make a specific on-range start time if they encounter a cetacean or sea turtle, and should be given leeway to mitigate that encounter.

Visual and acoustical mitigations are particularly unrealistic for sea turtles, as demonstrated by recent research on the hibernating behaviors of loggerhead sea turtles. Sea turtles in winter spend long periods resting below the surface, essentially hibernating, and although undetectable to all known mitigations, could be impacted by operations described in the DEIS. Vessel speed limits are the only available way to limit those impacts. "Only some like it hot — quantifying the environmental niche of the loggerhead sea turtle", Hawkes, et al, *Diversity and Distributions, (Diversity Distrib.)*(2007) 13, 447–457) , states, in addition to previously demonstrated at-sea hibernation by sea turtles, "that large numbers of adult North American loggerheads are making long resting dives at the edge of the Gulf Stream in winter, enabling them to sit-out cold periods in the winter while exploiting highly productive waters in higher latitudes on a seasonal basis." "Offshore federal waters of the USA constitute a more important habitat for both foraging and wintering turtles than previously appreciated. These areas are potential hotspots for interaction with proposed military training activities and should receive special monitoring efforts to fully assess the extent of overlap."

O6-5

O6-6 Why doesn't the DEIS incorporate adequate scientific data regarding the herd behavior of cetaceans that live in strongly-bonded groups? Considerable data on herding mammals is available, and applicable to several species of cetaceans with habitats overlapping the training areas and transit zones. One animal reacting fearfully to a perceived threat provokes other animals at least to become alert. That individual may have learned to fear mid-frequency active sonar sounds after a previous experience, and can be expected to react when the sound is received again, perhaps even near a threshold level. That may be the point where the individual reacts by fleeing away from the sound. Transmitting vessels' maneuvers, sweep changes and additional environmental factors may give the perception that the threat-sound is approaching, also provoking the fearful animal to flee. Even if surrounding animals do not perceive the threat itself they are likely to react by fleeing with the panicked individual. The numbers of animals fleeing may quickly include all members of the herd, by definition becoming a stampede. As a group and individual survival behavior, a full stampede requires no external obvious threats after the first animal is triggered to flee, and it may continue until the herd reaches exhaustion or some obstacle. For some cetaceans, such as pilot whales or common dolphins, that obstacle may be a beach. A mass stranding that appears to have no obvious cause, such as disease or adverse weather, must be evaluated for the potential that the animals were driven near shore by something, with the actual stranding perhaps being triggered by one or more individuals accidentally coming ashore. This potential is amplified when the mass stranding includes more than one species.

O6-7 Testing active sonars before being engaged in a training exercise must be regulated as clearly as speed restrictions, and require that full mitigations be in effect. The testing may provoke the same deleterious responses that can occur during the exercise, as demonstrated by several known events near Japan and Hawaii.

O6-8 **The North Atlantic right whale** should be the species of greatest concern to everyone involved with the planned Navy Cherry Point Complex range, and discussed accordingly in the DEIS. However, the DEIS discussion of the direct, significant and potentially population-level impact on the species is inadequate. Because the estimated species' population is less than 400

individuals, anthropogenic threats and impacts are increasing in spite of major efforts to reduce them, and regulatory actions have been constrained by political actions, it is nonsensical for the Navy to increase the risk by operating where right whales may be found. Right whales have been sighted eastward to the limit of effort, observers have found whales well outside of critical habitat, a tagged whale travelled over 100km offshore, and whales have stranded in seasons when they should be absent. Right whales, certainly including mothers with calves, may indeed be found in the Cherry Point Complex.

O6-9 In fact the DEIS should include a cost/risk analysis for the Navy of interrupted or cancelled training because of right whales, especially mother/calf pairs, are likely to be found on the eventual range, or in the transit zone. Because of the mother's protective caution the mother/calf pair are more vulnerable to disturbance, and therefore will suffer more harassment and harm from training operations and transits to the range. If visual and acoustical mitigations live up to DEIS expectations it is very likely whales will be found to be in the way, and they cannot be ignored.

If the Navy assigns a vessel to monitor whales in the transit area or while training occurs the vessel would soon find out what commercial whale watch vessels already know; right whales can spend long periods below the surface, and can seem to disappear even when watched by experts. Statistically, only 1/3 of the right whale mother/calf pairs may be detected when within 1.5nm of vessels, and only 55% of those at the surface may be seen. However, in all waters affected by range activity mothers with calves can be expected to spend more time at the surface because of the calf's shorter breath hold. This makes them significantly more vulnerable to ship strikes. The Navy certainly understands the physics of sound in the near-surface environment, and must concur with the experts that cetaceans are not likely to hear the sounds of an approaching vessel. To date no acoustical warning has proven to cause whales to avoid approaching ships, but it is cost effective research that the Navy should support.

Even if whales are sighted, attempting to move all training and transits far enough away to prevent acoustical harassment would be a logistical nightmare, especially as the whales are not likely to remain stationary. The mother may be so alarmed and confused by the activity that she might be unable to know which way to escape, creating an unpredictable track. The stress of the situation may compromise the mother's health, as she is not likely to have eaten since migrating south, and must be unhindered in her need to migrate to feeding grounds. Of course the calf would be compromised along with the mother. The event is not likely to escape public notice, as considerable scientific effort is made to locate and track all right whale mothers and calves from birth. In fact, these scientific aerial surveys may provide the expert detection and monitoring the Navy needs to operate legally and efficiently. On the other hand, prohibiting scientific surveys from maintaining their aerial monitoring while the whales are on-range will interfere with research critical to the species' survival. Experts would verify that this scenario is quite possible, and responsible authorities should consider it, even if only to lower eventual costs to the Navy.

Current research proves that the species' existence depends upon reducing anthropologic impacts, including masking noises. Right whales require specific prey in sufficiently dense aggregations to permit efficient feeding, and evidence suggests their ability to hear other whales feeding may be critical to an individual's survival. Acoustical cues allow an extremely small population to find each other and to find food in a very large ocean. However, evidence suggests that right whales raise the pitch of some calls in the presence of multiple masking sources such as the noises from several vessels. Multiple vessels operating on-range may trigger this response, which signals the animals' efforts to overcome some obstacle to their

survival needs. Models that incorporate responses to acoustic cues from other whales as a factor in the efficiency of foraging right whales suggest that the listening whale's foraging efficiency may be reduced by lowering detection ranges. One factor lowering detection ranges may be the masking effects of vessel activity. Even one right whale handicapped by anthropogenic acoustical masking has population-level significance. US Navy vessel and exercise activities associated with the Cherry Point Complex will produce a wide range of sounds that are likely to affect right whales. The DEIS should reflect this, because understanding how the whales respond to the maneuvering vessels and multiple sonars is critical to effective mitigations.

O6-10

O6-11 Many DEIS sources for right whale migration and feeding aggregations are from the 80's and 90's when more recent and more accurate resources are available. Including them would show that a migratory pathway along the shelf break that cuts directly through the Cherry Point Complex. The DEIS right whale seasonal distribution data should include the NMFS 2007 rulemaking for a Restricted Management Area to protect right whales extending at least 35 nm from South Carolina's shore. In that rulemaking NMFS acknowledged that South Carolina may be the preferred calving ground for some right whales. There doesn't seem to be any inclusion of the Southeast Implementation Team and Right Whale Consortium presentations or datasets. This data alone is likely to require rethinking of several DEIs conclusions.

The DEIS is more than inadequate in its right whale discussions; it is irresponsible for the authors to have presented it while ignoring or being unaware of so much necessary data. The DEIS authors should be as alarmed as the rest of us are that the loss of just two female right whales per year may precipitate the species' extinction, that one female has to have four calves to replace herself, and that, where size and sex of the dead animal could be determined, females accounted for 80% of known right whale deaths. The DEIS's failure to adequately

O6-12 discuss the differential risk to mothers and their calves is indefensible, and while it might satisfy the Navy that there are few problems ahead, it is a false assumption that must be corrected before the Final EIS is published .

Sincerely,

William W. Rossiter
President

Comment #O7

New York Whale and Dolphin Action League

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October 25, 2008

Naval Facilties Engineering Command, Atlantic Division
Attention: Code EV22SA (Navy CHPT EIS/OEIS PM)
6506 Hampton Blvd.
Norfolk, VA 23508-1278
Fax: 757-322-4894
Re: USWTR Cherry Point Operation Area

Dear Commander:

Please add this to the record regarding the Undersea Warfare Training Range.

This comment period for this issue was not long enough to avoid placing an undue burden on the public. I protest that the Navy did not extend this comment period as requested by numerous gorups and citizens. Inadequate time to peruse these lengthy documents has stifled citizens' and my ability to comment. I protest the inadequate amount of time for the public to submit written comments.

In addition, the DEIS does not address the threats to marine life from exercises involving sonar and should be withdrawn immediately. The Navy has failed to acknowledge risks to a variety of species in the marine environment, including fish, sea turtles, and even birds. The culumative effect of the continuous assault will devastate the area ecologically.

The overwhelming opposition to the use of active sonar is apparent on every level, from public hearings to the comments elicited by the public. The most glaring offense of the US Navy is its disregard for the people and marine life that will suffer irreparable harm by the sonar assault.

Commercial fishing operations, as well as sport fishing, will suffer as fish disappear. Whale watch tours will cease as whales vanish under the awful, brain-shattering sonar envelopes, penetrates and kills them.

Endangered species, such as sea turtles, who have journeyed their ocean routes for hundreds of millions of years will be decimated, ceasing their travels as they succumb to the assault. The area in question is located in a prime migration route for highly endangered right whales. A training range in this area is unthinkable, and a death knell for the right whale.

The deplorable history of the US Navy's use of military sonar with respect to injury and death of marine life has given rise to ongoing litigation. I applaud the efforts of groups like the NRDC, CSI, HSUS and others to counter the attacks on the ocean environment with timely and substantial litigation. The Navy has no right to destroy our environment, and leave the marine ecosystems in ruins.

The Navy's own analysis sconfirms that marine mammals would be significantly impacted by sonar as much as 400,000 times each year off the North Carolina's coast. Unbelievably, the Navy has no plans to employ any mitigation measures to help alleviate this tragic and unnecessary assault.

The training range creates no positive economic benefit to the people of the North Carolina area, or the adjoining coastal regions, nor does it present any positive environmental benefits. In fact, the negative impacts, both economically, in losses in the fishing and tourism industries, and enviornmentally, as marine species populations catastrophically decline. Therefore, the training range should not be made a part of this region.

The effects of sonar on cetaceans are well known, as they have become the unfortunate "canaries in the coal mine" of discovery of lethality of the military device. When hit by pressure waves created by sonar, deep diving cetaceans, such as beaked whales, panic and surface rapidly, resulting in nitrogen gas saturation in the blood, also known as "the bends". As sonar's pressure waves pass through air space cavities, such as the lungs, they cause the air space to vibrate or "resonate" so violently that ribs are borken and the lungs implode as evidenced on numerous occasions. Brain and breathing apparatus hemmoraging is common in cetaceans hit with sonar. It is not an exaggeration to say "their brains exploded" as they died. How many mass stranding do we list here to make the case?

Greece, May, 1996. 12 Cuvier's beaked whales.
Vieques, Puerto Rico. October, 1999. Four beaked whales.
The Bahamas, March 15, 2000. 18 whales of 4 different species.
The Canary Islands, September 2002. Eighteen beaked whales from 3 species.
Haro Strait, Washington State, May, 2003. Eleven Harbor porpoises.
Alaska, June, 2004. Six beaked whales.
Hanalei Bay, Hawaii, July, 2004. 200 melon-headed whales strand in the shallows.
Canary Islands, July, 2004. Four beaked whales.
Outer Banks, January, 2005. 34 whales of 3 species strand during Navy sonar training program.

There has never been a credible study by the US Navy that military sonar of any frequency, which can exceed 240 dB underwater, does not damage cetaceans, fish, turtles, and more. The reckless application of sonar during peacetime is an outrage that exposes the Navy, who wants to use it in 80% of the world's oceans, as the biggest threat to the welfare of marine ecosytems and marine life, and as such, the greatest and most imminent threat to the biomass of the entire planet.

What kind of mindless brutality could ignore, tolerate or make excuses for such an assault on our natural resources? As far as being "stewards of the marine environment" nothing could be farther than the truth. It is the Navy's use of military sonar that can and will wreak havoc on already compromised cetacean populations.

The Navy should under no circumstances place the fishing industry, tourism and cetaceans at risk by creating a sonar training range in the Cherry Point Operation Area. In fact, the Navy should end all use of active sonar while extending its use of vastly powerful passive sonars. The risks are just too great, too unnecessary and unjustified.

Sincerely,

Taffy Williams

Comment #O8

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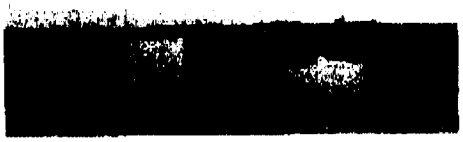

Provincetown Center for Coastal Studies

October 27, 2008

Facilities Engineering Command, Atlantic Division
Attention: Code EV22LL
Attention: Code EV22SA
6506 Hampton Blvd
Norfolk, Va. 23508-1278

Dear Madam/Sir:

The Provincetown Center for Coastal Studies (the Center) appreciates the opportunity to comment on the DEISs for the Undersea Warfare Training Range (USWTR) and the Navy Atlantic Fleet training activities proposed in the Navy Cherry Pont operating area (OPAREA). For over20 years, the Center has conducted research on Atlantic right whale and humpback whales. In addition the Center is the only organization on the east coast of the United States federally authorized, by National Marine Fisheries Service, to disentangle large, free swimming whales, and disentangles other marine animals as well including dolphins and porpoises, seals and sea turtles[1].

The Center's long term studies of humpbacks in the North Atlantic represent one of the longest running and largest data collections of a wild baleen whale population. Center scientists conduct work in three oceanic breeding grounds for humpback whales and have contributed significantly to our understanding of the population structure of this endangered species. In one project, Center scientists collaborated with other scientists to understand more about the nature and population identify of humpback whales observed in the US mid-Atlantic waters (New Jersey to North Carolina), notably in winter.

Based on photographic images of live and dead humpback whales observed in the region, researchers identified these whales as coming primarily from the Gulf of Maine population (45.5%), and other individuals from the Newfoundland and Gulf of St. Lawrence populations. Length data from 48 stranded whales suggest that 39 (81.2%) were first-year animals, 7 (14.6%) were immature and 2 (4.2%) were adults. This work led the researchers to suggest that the mid-Atlantic area primarily represents a supplemental winter feeding ground used by humpbacks and likely for more than one purpose. In addition the

[1] Scientific Research and Enhancement Permit Number 932-1489

researchers noted "that while further data is needed, the mortality rate may be significant for the GOM population and this warrants further investigation." [2] Although the DEIS for the USWTR cites this work, it did not include the discussion of potential impact on the larger population.

The Center's research on the right whale has focused on Cape Cod Bay and Great South Channel. This research was the foundation for the federal designation of Cape Cod Bay as critical habitat for this most endangered whale. The Center's work has identified primary food sources, feeding behavior, population structure and seasonal movements of right whales in this region. This research, together with that of the New England Aquarium and the Whale Center of New England, are the foundation of our understanding of right whale distribution, behavior and habitat from the Bay of Fundy to Florida.

The Center's right whale program includes a surveillance program, funded by the Massachusetts Division of Marine Fisheries. The Program includes bi-weekly aerial surveys and weekly habitat sampling in Cape Cod Bay (CCB) and adjacent waters from 1 January through 15 May, when right whales inhabit the bay. When each survey is done, all sightings are reported to the NOAA Fisheries Sighting Advisory System (SAS) and the US Army Corps of Engineers Cape Cod Canal Field Station. The Cape Cod Canal operators relay this information to ships transiting in the area, in an effort to minimize interaction between ships and whales.

There is also a Sighting Advisory System operating in southeastern Atlantic waters that includes cooperating groups such as the New England Aquarium, Florida Fish and Wildlife and the Georgia Department of Natural Resources. The Navy should consider cooperating with the Southeast SAS to alert vessel captains to the presence of right whales and other whale species, during exercises in the USWTR and the OPAREA. O8-1

Vessel strikes are the primary human cause of death for North Atlantic right whales, and are a major cause of death for humpback whales as well. A 2004 summary report from the federal large whale strike database, maintained by NOAA's Office of Protected Resources, noted that "Finback whales are the most often reported species hit (75 records of strike), followed by humpback (44 records), North Atlantic right (38 records). Collisions between ships and whales are associated with a wide variety of vessel types. From our database, 134 of 292 cases of ship strike include information on vessel type, while in 158 cases the type of ship was unknown. Of the 134 cases of known vessel type, there are 23 reported incidents (17.1%) of Navy vessels hitting whales, 20 reports (14.9%) of ship strike for container/cargo ships/freighters, 19 (14.2%) reports of ship strike for whale-watching vessels, and 17 reports (12.7%) for cruise ships/liners (Figure 5). Sixteen reports of ship strike (11.9%) are attributed

[2] Barco, S. G., W. A. McLellan, J. M. Allen, R. A. Asmutis-Silvia, R. Mallon-Day, E. M. Meagher, D. A. Pabst, J. Robbins, R. E. Seton, W. M. Swingle, M. T. Weinrich and P. J. Clapham. Population identity humpback whales (Megaptera novaeangliae) in the waters of the US Mid-Atlantic states. *Journal of Cetacean Research and Management* 4(2): 135-141.

to ferries. Nine cases of ship strike (6.7%) are reported for Coast Guard vessels and eight cases (6.0%) for tankers."

The Navy outlined its proposed actions to reduce the likelihood of harm to whales from its vessel activities to and from and within the USWTR and the OPAREA in each DEIS. These include a combination of on-board observers, restriction on north-south movements during calving season, maintaining a distance of at least 1500 feet from any observed whale, "use extreme caution and operate at a slow, safe speed; that is the slowest speed consistent with essential mission, training and operations at which the ship can take proper and effective action to avoid a collision and can be stopped within a distance appropriate to the prevailing circumstances and conditions."

O8-2

The Center urges the Navy to do more to reduce the likelihood of encounters with right and humpback whales, including a commitment to the 10 knot speed limit specified by the recent NOAA rule on ship strike reductions. The Center recommends that the Navy consider a more comprehensive approach to monitoring the presence of endangered whales in close proximity to and within the USWTR and OPAREA, similar to the programs in place in Cape Cod Bay, southeastern Atlantic SAS and those required by the Incidental Harassment Authorization, issued in June 2008 by NOAA for the Neptune LNG facility. This authorization requires a reduction in ship speeds to 10 knots when approaching an area in which right whales have been reported, and the implementation of a PAM system to aid in the monitoring and detection of vocalizing marine mammals in the project area.

The PAM system is designed to be capable of detecting, localizing, and classifying marine mammals in near real-time. Combined with the on-board observer and communication plan, this system should provide the capability to make timely decisions and allow vessel captains to implement steps to minimize the potential for collisions between marine mammals and naval vessels. The PAM system for the Neptune LNG project involves the installation of an array of auto-detection monitoring buoys, arranged to maximize auto detection and provide localization capability. The buoys are designed to monitor the sound output from construction activities to ensure predicted levels are not exceeded and to detect the presence of vocally active marine mammals.[4]

The USWTR DEIS notes the survey work the Navy has contracted for with a consortium of institutions in the southeast. The DEIS says the baseline program began last year and that the intensive data collection effort is planned to continue in support of UWTR. The Center encourages the Navy to continue this program and utilize it as part of its efforts to minimize impacts to marine mammals during operations in the USWTR and OPAREA.

The Center believes there is not enough data to support this statement in the USWTR: "In accordance with NEPA, there would be no significant impact to North Atlantic right whales in territorial waters from acoustic effects related to the proposed Site A USWTR. In accordance with

[3] Jensen, Aleria S. and Gregory K. Silber **Large Whale Ship Strike Database** Technical Memorandum NMFS-OPR-25, January 2004

[4] 73FR114, June 12, 2008

EO 12114, there would be no significant harm to North Atlantic right whales in non-territorial waters from acoustic effects related to the proposed Site A USWTR"

The National Research Council concluded that "there are very limited observations concerning the effects of ocean noise on marine mammals. Short- and long-term effects on marine mammals of ambient and identifiable components of ocean noise are poorly understood. There is no documented evidence of ocean noise being the direct physiological agent of marine mammal death under any circumstances. On the other hand, marine mammals have been shown to change their vocalization patterns in the presence of background and anthropogenic noise. Furthermore, the long-term effects of ambient noise on marine organisms are even less well understood. Potential effects include changes in hearing sensitivity and behavioral patterns, as well as acoustically induced stress and impacts on the marine ecosystem."[5]

One of the Center's modeling studies on right whale foraging suggests that "variations in the whales' sensory range (probably hearing) profoundly impacted searching behavior, distribution, and, importantly, caloric intake. At reduced sensory distances the modeled whales' failure to consistently locate suitable feeding habitat resulted in a net energy deficit and the likelihood of decreased fitness. The study suggests a mechanism by which the nutritional support for whales, even in foraging areas of rich zooplankton resources, may be compromised and, further, that the observed differences in body condition and function among populations of whales in different ocean basins may be explained, at least in part, by differences in anthropogenic acoustic contamination."[6]

The Center respectively suggests that given the uncertainties surrounding the impact of anthropogenic sound on marine mammals and the widely accepted view that many aspects of their behavior, including forging activities, nursery interactions, and migration, are likely dependent upon acoustic behavior and communications, we suggest that intensive activity produced by Navy ships and their activities may be assumed to have significant impact upon the success of impacted individuals.

For the very reason that many aspects of the acoustic sensitivity of marine mammals are not well understood, the Center believes that conservative approaches to the activities proposed should be taken. Because sound travels considerable distances the Center believes that the proper approach towards the proposed project is to take an extremely conservative approach in order to assure that no marine mammals are present within a region of biological effects, much larger than that contemplated in the proposed mitigation measures. Furthermore, in-depth studies directed at illuminating the impact of the kind of anthropogenic noise contemplated in the EIS should be an integral part of the plan for the proposed activities. Specifically, an understanding

O8-3

[5] National Research Council. Ocean Noise and Marine Mammals, 2003

[6] Mayo Charles; Michael Page, David Osterberg and Andrew Pershing. On the path to starvation: the effects of anthropogenic noise on right whale foraging success. Abstract of paper submitted to the North Atlantic Right Whale Consortium meeting, November 5-6, 2008

of the impact of noise generated by the activities proposed should include range and effects of such noise on critical nursery, migration, and forging behaviors.

Sincerely,

Richard F. Delaney, Director

Comment #O9

ANIMAL WELFARE INSTITUTE

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telephone: (703) 836-4300 facsimile: (703) 836-0400

October 27, 2008

Naval Facilities Engineering Command Atlantic Division
Attention: Code EV22SA (Navy CHPT EIS/OEIS PM)
6506 Hampton Blvd
Norfolk, VA 23508–1278

Dear Sirs:

RE: Navy Cherry Point Range Complex Draft EIS/OEIS

We are writing to provide comments on the above-referenced Draft EIS/OEIS and incorporate by reference, our comment letter on the Atlantic Fleet Active Sonar Training Draft Environmental Impact Statement/Overseas Environmental Impact Statement (AFAST Comment Letter) which is attached. Notwithstanding other areas of the document that might fall short of satisfying NEPA requirements, the Cherry Point Draft EIS/OEIS is inadequate as it grossly underestimates the impacts of the Navy's active sonar use on marine animals, does not effectively address cumulative impacts of the Navy's actions and provides for mitigations that are more ineffectual than mitigations employed elsewhere by the U.S. Navy and by other navies.

O9-1

We note that the Navy is incorporating by reference, its analysis of anthropogenic ocean noise impacts that is contained in the AFAST Draft Environmental Impact Statement/Overseas Environmental Impact Statement (Federal Register Notice Vol. 73, Number 32, Page 8856-8858). This document was filed with the Environmental Protection Agency on February 8, 2008.

Since February 2008 there have been several marine mammal stranding incidents coincident with the use of anthropogenic ocean noise, including: an unusual mass stranding incident off north-west Scotland, UK involving at least 11 Cuvier's beaked whales, 2 Sowerby's beaked whales and 11 pilot whales; an admission by the United Kingdom's Ministry of Defence that its active sonar use preceded the stranding of dozens of common dolphins off Cornwall, UK in June; a beaked whale stranding on Molakai, HI in July coincident with RIMPAC 2008; and scientific articles that add to the current knowledge base on anthropogenic noise-related marine mammal strandings.

O9-2

In light of this information the Navy should not rely on its analysis of noise impacts contained in the AFAST Draft Environmental Impact Statement/Overseas Environmental Impact Statement, which in any event and as discussed in our comment letter on that document, is inadequate. A revision to that analysis is warranted.

Sincerely,

Susan Millward
Executive Director

Marsha Green, Ph.D.
Ocean Mammal Institute

Encl.

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March 27, 2008

Naval Facilities Engineering Command
LANTDIV, Attn: Code EV22 (Atlantic Fleet Sonar Project Manager
6506 Hampton Boulevard
Norfolk, VA 23508-1278

Re: Draft Environmental Impact Statement/Overseas Environmental Impact Statement
Federal Register Notice Vol. 73, Number 32, Page 8856-8858

Dear Sirs:

The Animal Welfare Institute (AWI) appreciates the opportunity to submit the following comments on the US Navy's Atlantic Fleet Active Sonar Training Draft Environmental Impact Statement/Overseas Environmental Impact Statement (DEIS/OEIS). This comment letter is limited to the impacts of the active sonar use described in the DEIS/OEIS but this does not imply that AWI believes that impacts from other activities described in the DEIS/OEIS will be benign.

In view of the evidence related to the impacts of human-generated undersea noise, including active sonar use, on marine animals[1] and the international action and calls for pre-caution[2] over

[1] The Navy is aware of the literature on behavioral, physical and auditory impacts of undersea noise on marine mammals and other species. It includes W.J. Richardson et al., Marine Mammals and Noise (1995); National Research Council, Ocean Noise and Marine Mammals (2003); P. Tyack, "Behavioral Impacts of Sound on Marine Mammals," Presentation to the U.S. Marine Mammal Commission Advisory Committee on Acoustic Impacts on Marine Mammals (February 4, 2004); Whale and Dolphin Conservation Society, Oceans of Noise (2004); M. Jasny, Sounding the Depths II: The Rising Toll of Sonar, Shipping, and Industrial Ocean Noise on Marine Life (2005); A. Fernández et al., "'Gas and Fat Embolic Syndrome' Involving a Mass Stranding of Beaked Whales (Family Ziphiidae) Exposed to Anthropogenic Sonar Signals," 42 Veterinary Pathology 446 (2005); Vidal Martin et al., "Mass Strandings of Beaked Whales in the Canary Islands," in Proceedings of the Workshop on Active Sonar and Cetaceans 33 (P.G.H. Evans & L.A. Miller eds., 2004); Jepson, P. D. et al., "Gas bubble lesions in stranded cetaceans," Nature 425: 575-576 (2003); International Whaling Commission, 2004 Report of the Scientific Committee, Annex K at Tab. 1; M. Jasny, Sounding the Depths II at Tab. 1-3; McCauley, R., J. Fewtrell, and A.N. Popper, "High intensity anthropogenic sound damages fish ears," Journal of the Acoustical Society of America 113: 638-42 (2003); Bart, A. N., Clark, J., Young, J. and Zohar, Y., "Underwater ambient noise measurements in aquaculture systems: a survey," Aquacultural Engineering 25: 99-110 (2001); Engås, A., S. Løkkeborg, E. Ona, and A. V. Soldal, "Effects of seismic shooting on local abundance and catch rates of cod (*Gadus morhua*) and haddock (*Melanogrammus aeglefinus*)," Canadian Journal of Fisheries and Aquatic Sciences 53:2238-2249 (1996); Frantzis, A. 1998. Does acoustic testing strand whales? Nature (London), 392: 29; and Balcomb, K.C., and Claridge, D.E. 2001. A mass stranding of cetaceans caused by naval sonar in the Bahamas. Bahamas J. Sci. 8(2): 1-8.

[2] In recent years the international community has come to recognize the significance of anthropogenic ocean noise in relation to its impacts on marine life. In July 2005, the UN Secretary General prominently included the problem of ocean noise in a report to the General Assembly listing anthropogenic underwater noise as one of five "current major threats to some populations of whales and other cetaceans," and including noise as one of the ten "main

the introduction of anthropogenic noise into our oceans, we strongly urge the Navy to reconsider its planned action.

The US Navy (the Navy) should demonstrate a serious commitment to the protection of marine life by: a) ceasing actions involving the introduction of high intensity anthropogenic noise into the ocean in areas where there are known populations of marine animals, including designated protected areas, migration routes, and breeding, mating and feeding areas; b) reducing the output levels of its active sonar to the minimum practicable level; and c) committing to meaningful mitigation measures that assure the strongest protections for marine animals.

Active Sonar Use Harms Marine Life

There is a growing list of stranding events coincident with active sonar use - Spain (2006), North Carolina (2005), Taiwan (2005), Hawaii (2004), Canary Islands (2004, 2002, 1991, 1989, 1988, 1985), Washington State (2003), Virgin Islands (1999), Bahamas (2000), Madeira (2000), Greece (1996), and Japan (1990, 1989, 1987, 1979, 1978, 1968). In the DEIS/OEIS the Navy admits to active sonar use being the potential causative factor in five of these cases – Spain (2006), Canary Islands (2002), Bahamas (2000), Madeira (2000), and Greece (1996).

Despite the overwhelming evidence that active mid-frequency sonar use has caused deaths in marine mammals, the Navy has chosen the DEIS/OEIS alternative with the potential to do the most harm. Instead of committing to avoiding areas and times when marine mammals and other biologically sensitive factors are present, the Navy chooses the alternative that allows it to operate whenever and wherever it pleases. This is not the approach to take in an area such as the

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current and foreseeable impacts on marine biodiversity" on the high seas. Specific references from this and other fora recognizing and/or addressing the problems of anthropogenic ocean noise include: General Assembly Resolution, Oceans and the Law of the Sea, §120 (A/62/L.27) (December 4, 2006); Report of the Secretary General, Oceans and the Law of the Sea Addendum, §9 and §51-54 (A/62/66/Add.2) (September 10, 2007); Report of the Secretary General, Oceans and the Law of the Sea Addendum, §150, and §190-195, (A/62/66/Add.1) (August 31, 2007); Report on the work of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea at its eighth meeting, §92 (July 30, 2007); Report of the Secretary General, Oceans and the Law of the Sea, § 183 and 286 (A/62/66) (March 12, 2007); General Assembly Resolution, Oceans and the Law of the Sea, §107 (A/61/222) (March 16, 2007); Report on the work of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea (A/61/156) (July 17, 2006); Report of the Ad Hoc Open-Ended Informal Working Group to study issues relating to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction, § 38 (March 2006); General Assembly Resolution, Oceans and the Law of the Sea, § 84 (A/60/30) (November 2005); Report of the Secretary General, Oceans and the Law of the Sea, §159 and 147 (A/60/63/Add.1) (July 15 2005); Commission Proposal for a Directive of the European Parliament and of the Council establishing a framework for Community Action in the field of Marine Environmental Policy, COM(2005)505 (October 24, 2005); Revised Draft of the Proposal reflecting the Political Agreement of the Council (Environment) on 18 December 2006, New Article 2(a), § 7; IUCN/World Conservation Union 2004: Resolution 053, "Underwater Noise Pollution" (November 2004); European Parliament 2004: Resolution B6-0018/2004 (October 21, 2004); International Whaling Commission 2004: Report of the Scientific Committee, at § 12.2.5 and Annex K – Report of the Standing Working Group on Environmental Concerns; ACCOBAMS 2004: Second Meeting of Parties, Res. 2.16, "Assessment and Impact Assessment of Man Made Noise"; Arctic Treaty Consultative Meeting 2004: Informational Paper 056, "An Update on Some Issues Surrounding Noise Pollution," at 7; ASCOBANS 2003: Fourth Meeting of Parties, Res. 5, "Effects of Noise and of Vessels."

eastern seaboard which is rich in marine life and home to the last few remaining North Atlantic right whales.

The Navy's analysis of acoustic impacts to marine mammals is through modeling based on abundance estimates which were largely determined from aerial surveys, a difficult way to count marine mammals, especially relatively small animals and those that dive for prolonged periods such as beaked whales – the very animals thought to be most susceptible to anthropogenic ocean noise. Modeling based on estimates is an inexact science that cannot accurately predict every eventuality in the real world.

However, using its modeling, the Navy predicts that for its preferred alternative, each year its active sonar use in the preferred action will cause: over 2 ½ million marine mammals to be behaviorally impacted; over 20,608 to experience temporary deafness; and 120 to be exposed to active sonar at levels sufficient to cause permanent deafness (a deaf cetacean is a dead cetacean). The Navy claims that its modeling predictions are before mitigation measures are put in place, but the proposed mitigation measures are severely flawed as outlined below and cannot be relied upon to prevent harm.

The Navy is asking the National Marine Fisheries Service (NMFS) for permission to kill or injure up to 10 beaked whales stating this is a precautionary "overestimate" and admitting that it wants to avoid investigation should a beaked whale be found "dead coincident with Navy activities" because it would "unnecessarily interfere with Navy training exercises." This cavalier attitude to the deaths of marine life is shocking.

Though the numbers of animals that the Navy predicts its proposal will impact are worryingly high, we believe them to be gross underestimates of the real numbers of animals potentially at risk because of the thresholds the Navy is using to predict behavioral disturbance and levels of deafness. The Navy is using 215 dB (re 1 μPa2-s) as the threshold above which below which it says permanent deafness (PTS) will occur and 195 dB (re 1 μPa2-s) as the threshold above which it says temporary deafness (TTS) will occur. Behavioral impacts are predicted based on a dose-response function. The threshold numbers are based on Navy-funded studies involving a few captive animals of a couple of species, including terrestrial animals, who were also presumably habituated to noise.

In the wild, animals display wide variety, just as humans do, with not only different species exhibiting different hearing capabilities, but also different ages, different sexes, and even merely different individuals of the same species displaying different sensitivities to noise. The empirical evidence proves that these threshold levels are too high since animals have stranded and died at received levels of active sonar over ten thousand times lower than 195 dB.[3]

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[3] The animals in the Bahamas 2000 stranding incident in which 17 animals of various species stranded and died after the Navy's mid-frequency active sonar use were exposed to received noise levels of 150-160 dB according to modeling reported in Hildebrand, J.A. (2005) Impacts of anthropogenic sound. In Marine Mammal Research: conservation beyond crisis. Edited by J.E. Reynolds, III, Perrin, W. F., Reeves, R. R., Montgomery, S. and Ragen, T. J. Johns Hopkins University Press, Baltimore, Maryland. Pp. 101-124.

The use of the dose-response function to predict behavioral impacts to marine mammals is preferable to the previous methodology used by the Navy and the National Marine Fisheries Service (NMFS) as it likely more readily depicts the real world. However it is not without its flaws. Principal among the flaws is the data set used in the development of the dose-response predictions. The Navy acknowledges that the data used is limiting given that it is based on one set of controlled exposure experiments on a small number of captive toothed whales and two surveys on wild baleen whales. The Navy should not be using such limited data sets to predict behavioral impacts, especially given the enormity of the AFAST proposal. The Navy states that to assist in addressing this lack of data, it is funding a series of controlled exposure experiments on wild whales, the first of which took place in the Bahamas in 2007. Yet preliminary results from this experiment support a much lower threshold for behavioral impacts than the Navy is using. In the experiment, only one successful playback experiment on a beaked whale was acheived and in it a tagged Blainsville beaked whale displayed a probable behavioral response at a received level of MFA sonar of 145 dB re 1μPa [rms]. The precautionary principle should be applied and the Navy should, at a minimum curb its activities around known areas of high marine mammal density and at times when marine animals are expected to be present.

The dose-response approach does not take into account factors such as an animal's perception of the sound, including non-auditory effects or potential masking impacts, the cumulative and synergistic effects of several noise sources and possible long-term impacts. Furthermore, predicting the probabilities of population responses to a sound while ignoring individual animals is problematic if that individual is a key individual to that population. For the north Atlantic right whale for example, the impacts of a stressor on an individual can have population level impacts. There are countless examples of individuals of the same species receiving the same exposure levels of noise, yet reacting differently.[4] In some circumstances, cetaceans also seem to react to the change in received level, rather than the received level per se, or whether a noise source is approaching the animal or not. Clearly, dosage is not the only, or possibly even the most important, factor to consider in determining the dose-response function approach.

The Navy's proposed mitigation methods are woefully inadequate. They include using non-dedicated trained observers to look out for marine mammals and passive acoustic monitoring to listen for vocalizing marine mammals. Even if an animal is spotted and reported within 1,000 yards of the sonar dome the sonar will not be stopped but will be turned down by a mere 6 decibels to 229 decibels – still over 10 million times more intense than the Navy's human diver standard of 145 decibels and over a million times more than the noise level received by the animals in the Bahamas incident of 2000.

According to the Navy's proposed mitigation measures, the sonar will only be shut down when an animal is spotted within 200 yards of the sonar dome. By the time the sonar has traveled that far, it will already have been ensonified for many minutes with noise equivalent to that which

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[4] Nowacek, et. al. (2004) North Atlantic right whales (Eubalaena glacialis) ignore ships but respond to alerting stimuli, Proceedings of the Royal Society, Volume 271, Number 1536, February 07, 2004.

caused the Bahamas whales to strand and die. To shut off the sonar when an animal is observed and reported at 200 yards will already be too late.

The likelihood of even a trained and dedicated marine mammal observer seeing every animal in the vicinity of the ships at all times le very low. Whales and dolphins are diving animals, some staying at depth for over an hour. Beaked whales are only at surface 8% of the time and the chance of seeing beaked whales has been calculated by NMFS scientists at a mere 2% during good conditions. Human observers cannot possibly see every animal in the vicinity of the ships at all times.

The Navy intends to use the active sonar day and night. During hours of inclement weather, poor sea states and darkness, human observers are virtually useless and so the only mitigation method will be passive acoustic monitoring. Passive acoustic monitoring is only adequate for vocalizing animals within range and then only at certain frequencies. The Navy should not be using active sonar during periods of darkness and poor visibility.

The Navy's operational requirements should not supersede its marine stewardship obligations. Other navies use more effective mitigation procedures which, in some cases, the Navy has adhered to, demonstrating that operational effectiveness need not be compromised for the sake of protecting the marine environment.

Specifically the NATO Undersea Research Center requires much stricter measures for the protection of marine mammals during high intensity active sonar use. Sites are selected only after an environmental assessment has considered known marine mammal habitat and noise propagation and sites are selected to avoid enclosed areas and coastal areas with complex steep sea bed topography. Ship tracks are planned to provide marine mammal escape routes and avoidance of embayments. Operations are suspended if marine mammals enter the safety zone which is defined as the area ensonified to 160 dB for large whales. The safety zone for endangered species, or for Cuvier's beaked whales is double the above-mentioned safety zone.

Similarly, the Australian Navy takes more cautious and significant steps to minimize harm to marine life from sonar exercises. It imposes seasonal and geographic restrictions on the use of mid-frequency active sonar systems at highest power levels and avoids transmissions with source levels greater than 210 dB within 30 nautical miles off certain coastlines during times when whales are likely to be present. It also uses lower power levels in conditions that may produce surface ducting or embayments. It also avoids seamounts and monitors a 4,000 yard safety zone for 30 minutes prior to sonar transmission which is maintained throughout the active sonar transmissions with an immediate shut-down procedure if a marine mammal is detected within the safety zone.

The Navy can and has complied with the Australian Navy's mitigation methods, for example during Operation Talisman Saber in 2007. Therefore for the Navy to be aware of the existence and implications of more stringent mitigation methods, to have implemented them and then to not use them around its own shores is unacceptable.

The Navy has also employed more stringent mitigation measures than it is proposing in this DEIS. During the Rim of the Pacific biennial exercise in 2006 the Navy adopted larger marine mammal safety zones, had at least one dedicated marine mammal observer, implemented restrictions on exercises involving the use of active sonar taking place in channels between islands with steep underwater topography and instituted a reduction of power levels in conditions of low visibility. It must be noted that these improved mitigation procedures for the RIMPAC 2006 exercises were only implemented after the courts deemed the Navy's proposed mitigation to be inadequate and a settlement was reached.

In conclusion, the Navy should be adhering to much stricter mitigation methods in use by other navies for similar exercises and to include those that the Navy when required to, has used before. The Navy should commit to the following at a minimum:

- exercises should not be conducted at night or during other periods when visibility is poor;
- exercises should not be conducted during conditions conducive to ducting are present;
- areas where marine animals are known to congregate, such as known feeding and breeding areas, should be completely avoided;
- areas close to the migration paths of the North Atlantic right whale should be off-limits to Navy traffic during the migration season;
- at least three trained and dedicated marine mammal observers should be employed on all ships equipped with MFA sonar;
- dedicated marine mammal aerial surveillance should be employed to look for marine animals an hour before and an hour after an exercise;
- when an animal is observed within 2,000 yards of the sonar dome, the sonar should be shut down until the animal has left the area.
- an after action report for each exercise documenting ship positions and sonar use should be prepared and made publically available at no charge.

We appreciate the opportunity to provide our comments.

Sincerely,

Susan Millward
Research Associate

Comment #O10

NRDC
THE EARTH'S BEST DEFENSE

NATURAL RESOURCES DEFENSE COUNCIL

By Regular Mail

October 27, 2008

Naval Facilities Engineering Command Atlantic
Attention: Code EV22SA
6506 Hampton Boulevard
Norfolk, VA 23508
Fax: (757) 322-4894

Re: Navy Cherry Point Range Complex Draft Environmental Impact Statement/ Overseas Environmental Impact Statement

Dear Sir or Madam:

On behalf of the Natural Resources Defense Council ("NRDC"), The Humane Society of the United States, International Fund for Animal Welfare, Defenders of Wildlife, North Carolina Wildlife Federation, Whale and Dolphin Conservation Society, Cetacean Society International, League for Coastal Protection, PenderWatch & Conservancy, North Carolinians for Responsible Use of Sonar, Pamlico Tar River Foundation, Ocean Futures Society, and Jean-Michel Cousteau, and on behalf of our millions of members and activists, thousands of whom reside in North Carolina, I am writing to submit comments on the Navy's Draft Environmental Impact Statement/ Overseas Environmental Impact Statement for the Cherry Point Range Complex ("DEIS"). See 73 Fed. Reg. 52969 (Sept. 12, 2008). Please include these comments and the enclosure into the administrative record.[1]

We believe that the DEIS fails to meet the environmental review standards prescribed by the National Environmental Policy Act ("NEPA"), 42 U.S.C. 4321 et seq. NEPA requires the Navy to employ rigorous standards of environmental review, including a full explanation of potential impacts, a comprehensive analysis of all reasonable alternatives, a fair and objective accounting of cumulative impacts, and a thorough description of measures to mitigate harm. Unfortunately, the DEIS incorporates by reference the Atlantic Fleet Active Sonar Training Draft Environmental Impact

[1] NRDC is aware that comments may be submitted separately by government agencies, individual scientists, environmental organizations, and the public. All of these comments are hereby incorporated by reference. The comments that follow do not constitute a waiver of any factual or legal issue raised by any of these organizations or individuals and not specifically discussed herein.

Statement/ Overseas Environmental Impact Statement ("AFAST DEIS"). DEIS at 3-375. As discussed in detail in our comments responding to the AFAST DEIS (see enclosed NRDC comment letter dated March 31, 2008), the Navy's environmental review falls well short of the rigorous standards prescribed by NEPA.

O10-1

First, the Navy does not properly analyze environmental impacts. The Navy's analysis substantially understates the potential effects of sonar on marine wildlife and concludes that no animals would suffer serious injury or die during the many thousands of hours of sonar training. The Navy reaches this astounding conclusion by excluding relevant information adverse to its interests, using approaches and methods that are unacceptable to the scientific community and ignoring entire categories of impacts. As discussed in detail in our enclosed comment letter, the Navy's assessment of acoustic impacts – and the thresholds established for physical injury, hearing loss, and significant behavioral harassment – are highly problematic. For example, the Navy uses a faulty risk function to determine "Level B" harassment under the Marine Mammal Protection Act ("MMPA"), 16 U.S.C. § 1361 et seq., that places great weight on flawed SPAWAR data, misuses data from the Haro Strait event, and excludes other relevant data. Even more glaringly, the Navy's analysis entirely fails to account for cumulative impacts from the years of anticipated activity. The Navy's usual platitude that all of its impacts are short-term in nature and thus would not combine to produce cumulative effects not only has no scientific validity but also grossly misapprehends the definition of cumulative impacts under NEPA. 40 C.F.R. § 1508.7.

O10-2

Nor is the Navy's analysis of alternatives or mitigation any more credible. The Navy fails to consider a variety of other options, alternatives, and common sense mitigation measures – some employed by other navies – that would reduce the impacts. What the Navy presents instead is an alternatives analysis and mitigation strategy so narrowly defined that it disregards the environment all together.

O10-3

For the following reasons, and as described more fully in our enclosed comment letter, we urge the Navy to revise its analysis consistent with federal law and to produce a mitigation plan that truly maximizes environmental protection. We also urge the Navy to make available to the public the data and modeling upon which its analysis is based.

Sincerely,

Taryn Kiekow
Staff Attorney

Encl.: NRDC comments on the AFAST DEIS

Comment #P1

Candis M. Harbison
120 East 2nd Place
Panama City, Florida 32401
phone 850/872-8260 fax 850/872-9072
candis1@comcast.net

October 3, 2008

Naval Facilities Engineering Command, Atlantic
Attention: Code EV22LL (USWTR/Code EV22SA (Cherry Point)
6506 Hampton Boulevard
Norfolk, VA 23508-1278

Re: **Extra time needed for public comment on Navy's use of sonar**

Dear Sir/Madam:

I am writing to ask for your help in extending the comment periods on two important documents recently published by the U.S. Navy.

On September 12, 2008, the Navy released its latest draft environmental impact statement (EIS) for its planned development of an Undersea Warfare Training Range off the southeast coast of the United States. The Navy proposes to locate its training range just off of Jacksonville, Florida, near designated critical habitat for endangered Atlantic Right Whales. Repeating mistakes it made three years ago when it first analyzed the proposal for such a training range, the Navy failed to properly analyze the impacts of repeated use of mid-frequency sonar on marine creatures in the area. Nor did it propose to adequately mitigate the harmful effects of sonar. **Despite the fact that the draft EIS is over 1,000 pages long, the Navy has limited the time in which the public/citizens may submit comments to a 45-day period.** This is the very minimum time frame required by federal law/NEPA.

In light of the Navy's failure to adequately analyze the impacts of repeated use of sonar on marine creatures, the dense information provided by the Navy in justifying its plans, and the simultaneous issuance of related documents, I urge you for an extension of the comment period until January 15, 2009. Such an extension will give citizens the time to thoroughly analyze the Navy's proposals and submit comments on these critical issues.

Sincerely,

Candis Harbison

Comment #P2

LYNCH & EATMAN, L.L.P.
LAWYERS
SUITE 201, CAROLINA CORPORATE CENTER
5400 GLENWOOD AVENUE
RALEIGH, NORTH CAROLINA 27612
919/571-3332
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MARIA M. LYNCH *
JEROME R. EATMAN, JR.
KATHERINE B. WILKERSON
JACOB E. SUTHERLAND
ISAAC J. BRADLEY**

*Board Certified Specialist in Estate Planning and Probate Law

**Certified Public Accountant

MAILING ADDRESS:
POST OFFICE BOX 30515
RALEIGH, NC 27622-0515

WRITER'S DIRECT DIAL:
919/571-9714
jre@lyncheatman.com

October 3, 2008

Naval Facilities Engineering Command, Atlantic
Attention: Code EV22LL for USWTR and Code EV22SA for Cherry Point
6506 Hampton Boulevard
Norfolk, VA 23508-1278

Dear Sir or Madam,

Having reviewed two recent documents published by the U.S. Navy regarding the Undersea Warfare Training Range (USWTR), I am concerned about the amount of time allotted for the public to submit comments. I ask that these comment periods be extended to allow the public adequate time to consider the importance of these documents.

The most recent draft environmental impact statement (EIS) regarding the plans for developing an USWTR off the southeast coast of Jacksonville, Florida was released on September 12, 2008. The proposed area lies dangerously close to the habitat for endangered Atlantic Right Whales. Development of USWTR in such an area will undoubtedly cause enormous and unnecessary harm to these already endangered species. Given the severity of the issue at hand and the depth of the draft, the 45-day comment period, the minimum time frame required by federal law/NEPA, is not nearly long enough.

In addition, more consideration needs to be given to sonar and other naval training exercises off the coast of North Carolina, in the Cherry Point Operating Area. The use of sonar in this area will have a negative impact on the North Carolina marine mammals which use this area for substantial periods each year. The detrimental impact of sonar on these marine mammals could easily be avoided by mitigation measures. Despite having used successfully mitigation measures to protect marine mammals in other parts of the world's oceans, the Navy nonetheless refuses to adopt mitigation measures for the Cherry Point Operating Area. The draft EIS for this issue is, like that of the USWTR, much too voluminous to be addressed in comment period limited to 45 days.

In light of the Navy's failure to analyze adequately the impacts of repeated use of sonar on marine creatures, the dense information provided by the Navy in justifying its plans, and the simultaneous issuance of related documents, I urge the Navy to extend the comment period until January 15, 2009. Such an extension will give citizens the time to thoroughly analyze the Navy's proposals and submit comments on these critical issues.

Sincerely,

Jerome R. Eatman, Jr.

Comment P3

RE EV22 LL
EV 22 5A

10/8/2008

Please postpone hearings

on Sonar and Whales to

JAN 15th. Let us have more

time to study the proposal.

No way should This Be Allowed (in it's present form)

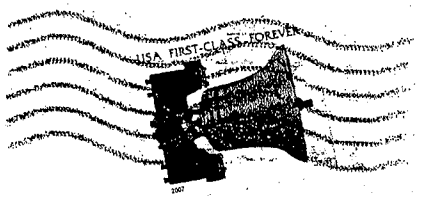
with the history of whales Being

Harmed.

Wayne Johnson Ph.D.

180 Montague
#4(D)
Brooklyn 11201 NY

BROOKLYN NY 112
07 OCT 2008 PM 5 T



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Naval Facilities Engineer Command (Atlantic)
6506 Hampton Blvd
Norfolk 23508-1278
VA.

23508+1212

Comment #P4

14 Oct 2008

Naval Facilities Engineering Command, Atlantic
Attention: Code EV22LL (USWTR/Code EV22SA (Cherry Point)
6506 Hampton Boulevard , Norfolk, VA 23508-1278
fax (804) 200-5568.

I am writing to ask you to investigate the Florida, Gulf of Mexico Coast as a location you might want to locate to better analyze the impacts of your sonar, to protect GA fish, shrimp, blue crabs industry, the sea turtles and especially our Northern Right Whales living off our Georgia coast.

Your plan says that the 625-square-mile site off Jacksonville, Fla., is outside an area of the Atlantic frequented by endangered right whales. But I disagree and contend that the sonar will at that range still harm the new born whale caves, which use sounds to communicate and are sensitive to sonar.

A National Commission study said in a seven-page letter to you in 2006. "The winter inhabitants off the coast of Jacksonville include the most vulnerable component of the right whale population. The additional noise levels and increased vessel traffic could jeopardize the females and calves of a species that is already at high risk of extinction.... We believe the importance of the southeastern calving grounds to the persistence of the species renders the Jacksonville operating area inappropriate."

In January 2006, that same commission told you that Florida's northern waters should not be considered for the training range - and in no case should the range be used between mid-October and mid-April, when right whale calves typically are born.

The Navy's Plan
I understand that many scenarios would involve surface ships and submarines from Norfolk and Groton, Conn., but the most frequent user of the range would be SH-60 Seahawk helicopters. As a result of 2005 base realignments, all of the Navy's East Coast Seahawk squadrons are now based in Florida. P-3C Orion planes, which conduct long-range anti-submarine warfare patrols, also will be based in Jacksonville.

At close range, blasts of mid-frequency, active sonar - the type Navy ships and helicopters use to detect enemy submarines - can injure dolphins and whales, which use sound to navigate and communicate. Scientists understand less about how marine mammals are affected by repeated or continual exposure to underwater noise.

Jene Nissen, environmental acoustics manager for the Navy's Fleet Forces Command, said the critical habitat for right whales extends to about 20 miles off the coast of northern Florida. The range's westernmost boundary would be 50 miles offshore.

For some reason you believes they are far enough off that we're not going to have an adverse effect on right whales. Navy analysts concluded that humpback and right whales might behave differently when exposed to sonar from the range. So the Navy admits there will be impact, you just believe the effects would be low-level, and not permanent on a new born whale.

With the border of the proposed 625-square-mile range would come within a few dozen miles of calving grounds of the endangered North Atlantic right whale, I argue your impact will be significant.

Experts believe fewer than 400 right whales remain in the North Atlantic. The population spends its summers off the coast of Maine and Nova Scotia, and in winter, pregnant females migrate to warmer southern waters off Georgia and Florida to give birth. Michelle Nowlin, a professor of

environmental law at Duke University, said the Navy appears to be on a direct collision course with state and federal efforts to protect the right whale.

What the Navy is looking for can be found in the Gulf of Mexico.
Navy brass have long called for an instrumented range to teach sailors how to detect quiet diesel submarines in noisy coastal waters. Hundreds of underwater microphones placed on the ocean floor would record exercises, so crews could reconstruct events. The Navy estimates that the range, which would cost an estimated $100 million, would be used 480 times a year, from one to six hours at a time. The Navy wants to build an underwater system allowing it to better train its sailors on state-of-the art equipment in settings similar to what they would expect to find in combat or a conflict. One of the sites being considered stretches into waters off of Brunswick, GA.

The Navy already has three sonar range training areas -- one off the coast of California, one off Hawaii and a third in the Bahamas. But they are used for deep-water training. The one they are proposing what will impact Georgia Waters here would be tailored for training in shallow areas such as the Arabian Sea, South China Sea and Korean Sea. Shallow, by Navy standards, is water from 120 to 900 feet deep.

The military wants to enhance its ability to pick up on what it views as a growing threat -- quiet, diesel or air-independent propulsion submarines. In a draft environmental impact statement released last year for the local sonar project, Navy officials said such subs "continue to proliferate in non democratic nations."

A 500-square-mile grid - The part of the operation based on land would be small -- little more than a small building to house electronics and the terminal end of an underwater cable. The offshore area would span 500 square miles. The Navy plans to install 300 transducers -- equipment that detects sound -- on the ocean floor across that 500-square-mile grid, spaced from one to three miles apart. The transducers themselves are large -- roughly the size of a small car -- and weigh about 2,500 pounds. A single cable would bring the sound data back to shore, where it would be transmitted to an operations center for review and analysis.

Capt. Kelly Baragar, deputy director of fleet forces training with the U.S. Fleet Command in Norfolk, said a sonar training operation would begin with a submarine hiding within the 500-square-mile grid. A single ship, a combination of ships or ships and aircraft then would go out and look for the sub using sonar. Sonar is used to detect the movements of ships and submarines.

Impact on marine life debated
I am worried that the intense sonar activity would have an impact on fish and marine mammals. I am worried most about the potential impact on fish and whether Navy officials has a good understanding of how sonar and other electronic devices they use alter fish behavior.

The Navy's draft environmental impact statement concludes that fish detect mid frequency sonar but "significant effects on fish are not anticipated." The study concluded there is no evidence the midrange sonar kills fish. The study also concluded that the impact on marine mammals would be negligible. Just by saying the navy does not "anticipate" a significant impact does not make non-existent. Your not anticipating a problem is not good enough.

Sonar link to beached whales - Last year, the Natural Resources Defense Council sued the Navy because of concerns that mid frequency sonar exposed marine mammals to dangerous levels of underwater noise. The environmental group asked that the Navy be required to take precautions to protect marine mammals. The group describes mid frequency sonar as "ear-splitting" and compares the sound levels to the intensity of a Saturn V rocket at blastoff.

In January 2005, 37 whales beached on the North Carolina coast after a Navy sonar training exercise. Navy officials said the training exercise was more than 200 miles away from where the strandings occurred. The National Marine Fisheries Services is investigating and Navy officials say they are cooperating.

I realize the Navy says the sound of sonar falls off very rapidly and, within 400 to 500 yards, is similar to sound levels that marine mammals use to communicate. On average, the Navy would hold 161 training exercises each year. Each exercise would last about six hours and sonar would not be used continuously.

I read where the Navy believes they can cooperate environmentally and in a safe manner with the marine mammals. The Navy says they plans to do two years of study, but some state regulators questioned whether that was enough time to gather useful data. I recognize the need of training, but I worry that Navy training activities were already affecting the migration of fish. There are a lot of unanswered questions.

I am skeptical when Navy officials say it is unlikely that a proposal for sonar training off the Atlantic shoreline will not have significant impact on the behavior of fish and marine mammals like dolphins and whales. I suggest the Navy officials interview fishermen about what they see during and after training exercises. I offer the Navy will find major changes in the fish populations when you do a sonar exercise. The Navy has not conducted sufficient studies of the health effects of sonar on fish and mammals, or the potential to change behavior such as migration patterns.

I read where officials from the U.S. Fleet Forces Command in Norfolk outlined a proposed offshore sonar training operation at a meeting of the Mid-Atlantic Fishery Management Council. The agency, which includes officials from the mid-Atlantic region, manages fisheries in federal waters from New York to North Carolina. It is interesting that managers of South Carolina, Georgia and Florida Federal Waters were not invited or present.

Georgia Department of Natural Resources/NOAA
In January 2005, more than three dozen whales beached and died on the Outer Banks of North Carolina within hours of a U.S. Navy sonar training exercise. And now, on September 12, 2008, the Navy announced a new plan for its USWTR that the coast of Georgia/ Florida is the leading site for a planned sonar testing range. Much more is at risk in GA/FL than in North Carolina. Why must you the move here?

While the exact cause of deaths of the beached whales on the Outer Banks has not been conclusively established, sonar testing and the increased boat traffic of the proposed range could have serious effects on marine life, including critically endangered species such as the right whale and the loggerhead turtle. In addition, Georgia fisheries, crab and shrimp have a significant impact on the state's economy - among the highest in the nation - with the state's coastal waters playing a vital role in recreation and commercial fishery. Alarmingly, the Navy's Draft Environmental Impact Statement grossly underestimates the impact sonar testing site could have on marine life. Through comprehensive research and analysis of existing field data, Georgia has developed a more accurate and comprehensive picture of the marine life in and near the proposed testing range. This research has shown the area to be much more biologically productive, more diverse, more active, and more abundant than the Navy understands.

In January, 2006, the Navy was urged it to take measures to reduce the harm sonar poses to whales, dolphins, fish and other marine resources and to conduct additional analysis of the effects the training range would have on the region's environment and economy. I have seen no evidence that any changes were made to your plan.

The North Atlantic Right Whale is the most endangered whale off America's coasts. Sonar testing so near its caving site will seriously impact the survival of this species.

Of particular concern to me:
Whales: Active sonar interferes with whales' ability to communicate and navigate and can cause physical harm, even death. Several whale species found off the Atlantic are endangered, including the North Atlantic Right Whale, and the Navy's plans could push them over the edge. Current compiled data shows that the seasonal behavior of the right whale is unpredictable and that they are present in higher numbers than the Navy estimates. Furthermore, when they do live in Georgia waters, they swim in close proximity to the proposed testing range, not the fifty miles away that the Navy contends.

Blue Crab/ Shrimp and Commercial Fisheries: Little is known about the impacts of sonar on various fish species, but scientific studies provide evidence that sonar can cause profound physical damage and cause fish to avoid noisy areas altogether. Such impacts, if realized, could be devastating to coastal communities and fishermen. I have read nothing to indicate sonar impact on Blue Card and shrimp. Studies are needed before this plan should be even considered.

Sea turtles: Compiled data to show that sea turtles, including the endangered loggerhead turtle, have much higher populations that the Navy estimates in its Draft EIS and that the area near the proposed sonar testing range is especially important to their survival. Not only do high numbers of turtles swim in and near the proposed testing range, but the nearby sea turtle sanctuary off Cumberland Island, GA provides an important nesting area. The Navy's proposed submarine training range threatens this sanctuary and would undermine Georgia's commitment to helping the endangered sea turtles survive.

I am writing to ask you to consider the Florida, Gulf of Mexico Coast as a location you might want to investigate as a location for your new sonar training site,

LTC Sam Booher
4387 Roswell Dr,
Augusta, GA 30907
706-863-2324 , sbooher@aol.com

LTC Sam Booher

research are listed on this slide.

This slide concludes our presentation on the information and analysis contained in the document.

Now I would like to discuss the future steps in the process related to the project.

This slide outlines the schedule beyond release of the Draft document. A key characteristic of the entire process is the public's opportunity to comment. Two public hearings, including this one, are being held throughout this week. Your comment on the Draft document will be addressed in the Final EIS/OEIS. The final step is the decision phase. A decision will not be made until at least 30 days after distribution of the Final EIS/OEIS. This decision will be summarized and published as a record decision in the Federal Register in June of 2009.

Back to you, sir.

LT. COL. WARD: Thank you. At this time, would Ms. Susan Davis please come to the podium?

Good evening.

Comment #P5

MS. DAVIS: My name is Susan Davis. S-u-s-a-n, D-a-v-i-s. And I'm a resident of North Carolina.

I respectfully request that the Navy extend the comment period on the Cherry Point Range Draft Environmental Impact Statement to January 15, 2009. This DEIS is 700 pages long and very complex. Because of the sheer number of

pages to review, it is only fair to give citizens and citizen-based groups and the scientific community reasonable time to study the document and develop meaningful comments. This is within the spirit of the National Environmental Policy Act.

Thank you.

LT. COL. WARD: Thank you, ma'am.

At this time, is there anyone else here that wishes to speak? We have about two more hours.

(No response)

LT. COL. WARD: Okay. At this time, I think what we'll do is go ahead and take a recess. If anyone here, during that recess, changes their mind and decides they would like to speak, please either let me know or let one of the Navy representatives know, and we'll give the opportunity to do that.

We'll go ahead and take a recess now. Thank you.

(The hearing was recessed at 7:29 p.m.)

(The hearing was reconvened at 8:55 p.m.)

LT. COL. WARD: We're now back on the record. I have time as 8:55, and there's still time remaining. Are there any additional speakers?

Comment P6

Sunday, October 19, 2008

Naval Facilities Engineering Command, Atlantic Division
Attention: Code EV22SA (Navy CHPT EIS/OEIS PM)
6506 Hampton Blvd
Norfolk, VA 23508-1278

Subject: Navy Cherry Point Range Complex Draft Environmental Impact Statement (DEIS)/Overseas Environmental Impact Statement (OEIS)

I am writing to express my concern with the Navy Cherry Point Range Complex Draft Environmental Impact Statement (DEIS)/Overseas Environmental Impact Statement (OEIS) for sonar and other naval training exercises off the coast of North Carolina, in the Cherry Point Operating Area. This Navy Cherry Point Range Complex DEIS/OEIS is inadequate. A new Navy Cherry Point Range Complex DEIS/OEIS needs to be undertaken with in-depth, comprehensive analysis of sonar's cumulative impacts on the marine environment. The Navy continues to inadequately analyze the impacts of repeated use of sonar on marine creatures. This in-depth, comprehensive analysis must include all marine life in the waters of North Carolina and a cumulative study of all current and future actions and activities by the military in the waters of North Carolina.

The Navy needs to look at the cumulative impacts of all the current and future military actions and activities for the lands and waters of the State of North Carolina and the East Coast.

Why is the Navy doing piecemeal environmental studies on Sonar on the East Coast instead of a comprehensive environmental study on all Navy Sonar Training on the East Coast?

Sincerely,

Frances T Armstrong

Frances T. Armstrong
264 Teach's Cove
Bath, NC 27808

Comment #P7

Janisse Ray

604 Hilton Baxley Road
Baxley, Georgia 31513
912.367.4999

Watershed: little ten mile creek @ ten mile creek @ altamaha river @ atlantic ocean

October 27, 2008

Naval Facilities Engineering Command, Atlantic
Attention: Code EV22LL (USWTR/Code EV22SA – Cherry Point)
6506 Hampton Blvd.
Norfolk, VA 23508-1278

Dear Navy:

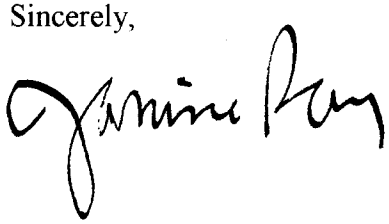
P7-1 A sonar range off the coast of Jacksonville, Florida, near where I live, is a terrible idea. I am completely opposed to this project.

Attached you will find a column that I wrote on this matter and sent to every newspaper in the state of Georgia.

Please protect our endangered right whales, who birth in these waters every winter.

Thank you.

Sincerely,



Janisse Ray
On Nature

Doing Right by Right Whales

Any day now, pregnant right whales will arrive to the shallow waters off the coast of southern Georgia and north Florida, their calving grounds. Between 20 and 35 females and juveniles make the journey south each fall.

Even though most of us don't get to see them, the endangered whales spend the winter in their nursery, right off our coast, communicating with each other with sound.

About 12 births occur each year. Last year 18 babies were born. By mid-April the whales return north, toward the Bay of Fundy, with their calves.

Only about 400 right whales are left. (Between 1804 and 1876, U.S. whalers killed 193,000 right whales.)

When only 400 of a species are left in the world, you have to do everything possible to avoid further injury.

One thing that harms whales is sonar.

In 2000 a mass stranding of whales on the beaches of the Bahamas was linked to U.S. Navy exercises using mid-frequency sonar. Many of the beached whales died. Some were bleeding from the ears and brain.

Sonar produces intense sound-waves that probe the ocean to reveal underwater objects. The waves spread tens and even hundreds of miles.

They create ear-splitting noises as loud as rocket blasts. Navy sonar, in fact, reaches 235 decibels. By comparison, a power saw is 110. The Saturn V rocket launch registered 220.

Low-frequency sonar affects whale behavior, and mid-frequency sonar is lethal. Still, the U.S. Navy proposes to construct a sonar range 625 miles square off Jacksonville, Florida, an undersea warfare training area, to be used for submarine war games. The Navy says the range will be used 480 times a year, up to six hours at a time.

The western edge of the range will be about 50 miles offshore, and the whales tend to cling closer to the coastline. However, sonar can be heard for enormous distances.

Imagine giving birth during a rocket launch.

If you, like me, are proud of the fact that right whales calve in our Georgia waters, and if you, like me, are worried about the fate of these whales, please let the Navy know. Ask them to protect whales from sonar. From now until Oct. 27 you may submit your comments to Naval Facilities Engineering Command, Atlantic; 6506 Hampton Boulevard; Norfolk, VA 23508-1278. Send it Attention: Code EV22LL (USWTR Code EV22SA (Cherry Point).

Author and naturalist Janisse Ray is a founding board member of Altamaha Riverkeeper and is on the faculty of Chatham University.

Comment #P8

Naval Facilities Engineering Command, Atlantic
Attention: Code EV22LL for USWTR and Code EV22SA for Cherry Point
6506 Hampton Boulevard
Norfolk, VA 23508-1278

The fax number for the USWTR document is (804) 200-5568. The fax number for the Cherry Point document is (757) 322-4894.

Asking For an Extension of the Comment Periods until January 15

Re: Extra time needed for public comment on Navy's use of sonar

Dear: Naval Command:

I am writing to ask for your help in extending the comment periods on two important documents recently published by the U.S. Navy.

On September 12, 2008, the Navy released its latest draft environmental impact statement (EIS) for its planned development of an Undersea Warfare Training Range off the southeast coast of the United States. The Navy proposes to locate its training range just off of Jacksonville, Florida, near designated critical habitat for endangered Atlantic Right Whales. Repeating mistakes it made three years ago when it first analyzed the proposal for such a training range, the Navy failed to properly analyze the impacts of repeated use of mid-frequency sonar on marine creatures in the area. Nor did it propose to adequately mitigate the harmful effects of sonar. Despite the fact that the draft EIS is over 1,000 pages long, the Navy has limited the time in which the public/citizens may submit comments to a 45-day period. This is the very minimum time frame required by federal law/NEPA.

On the same day, the Navy released a draft EIS for sonar and other naval training exercises off the coast of North Carolina, in the Cherry Point Operating Area. The Navy's own analysis indicates that North Carolina marine mammals in this area will be significantly impacted hundreds of thousands of times by its use of sonar each year. Yet the Navy has refused to adopt mitigation measures that would help protect these animals, even though it has used mitigation measures in other parts of the world's oceans. Once again, although the draft EIS for the Cherry Point sonar training is nearly 700 pages long, the Navy limited its comment period to 45 days.

In light of the Navy's failure to adequately analyze the impacts of repeated use of sonar on marine creatures, the dense information provided by the Navy in justifying its plans, and the simultaneous issuance of related documents, I urge you to ask the Navy for an extension of the comment period until January 15, 2009. Such an extension will give citizens the time to thoroughly analyze the Navy's proposals and submit comments on these critical issues.

P8-1

Sincerely,

Stephanie Sellers

Dr. Stephanie A. Sellers
1275 Ridge Road
Fayetteville, Pennsylvania 17222

Please Consider!

Thank you!

Comment #P10

10/19/2008

Naval Facilities Engineering Command, Atlantic

Attention: CodeEV22LL for USWTR and Code EV22SA for Cherry Point

6506 Hampton Blvd.

Norfolk, VA 23508-1278

Regarding:

Please delay public comments until January, 2009:

Dear Navy Department:

Please give the taxpayers more time to review and study the EIS drafts on the use of Sonar.

I am against further use of Sonar in or near the North Carolina and Florida coast.

I hope you will be able to keep the Sonar from harming all whales and other sea creatures. These animals were here on earth first and deserve to live in peace and tranquility in their environment. I hope the Navy Department can do the Sonar tests elsewhere without anymore harm to earth's sea animals.

Thank you for your consideration.

Sincerely,

Mary L. Brown

Mary L. Brown

268 Bigelow Street

Clayton, CA 94517

Comment #P11

October 26, 2008

Naval Facilities Engineering Command Atlantic
6506 Hampton Boulevard
Norfolk, VA 23508-1278

ATTN: Code EV22SA (USWTR OEIS/EIS)

RE: UNDERSEA WARFARE TRAINING RANGE, CHERRY POINT

To Whom It May Concern:

I urge the U.S. Navy to reconsider its proposal for sonar use and training in North Carolina's coastal waters.

The Navy has not fixed the errors it made three years ago. Repeating the same mistakes, the Navy fails to properly analyze the impacts of repeated use of mid-frequency sonar on marine creatures in the area. Nor does it propose to adequately mitigate the harmful effects of sonar or fully analyze reasonable alternatives.

Active sonar at this level is clearly a dangerous technology, with effects that are both cruel and far-reaching. It would be greatly preferable to employ an alternative to the active form of sonar. At the least, it is critical that the Navy reassess its plans and implement a broader set of mitigation measures to protect marine life, given the extensive, long-term effects of its proposal.

Again, I cannot urge the Navy strongly enough to consider reasonable alternatives to the use of this technology.

Sincerely,

Debra Fried

Debra Fried
24 Ivy Lane
Spring Valley, NY 10977-2006

Third Grade Class
White County Intermediate School
2696 Testnatee Gap Valley Rd.
Cleveland, Ga. 30528

Naval Facilities Engineering Command, Atlant
6506 Hampton Boulevard
Norfolk, Virginia 23508-1278

Attention: Code EV 22LL
(USWTR Code EV 22SA (Cherry Point)

Comment #P12

10/24/08

Dear Sirs,

I'm going to tell you why right whales need to be protected. They need to make submarines with soft horns. They need to put them in a safe place so they do not get hurt. You need too help them not to bleed. Please help the right whales.

Sincerely,
Skylah Carrin

10-24-08

Dear Sirs,

Can you please stop using sonar because it is killing the right whales by them bleeding to death. There are only 400 right whales left because people use to hunt right whales for their teeth. People mate them be protected because they will die of sonar. So please stop using sonar.

Sincerely,
Ashlyn Abernathy

Dalton V. 10/24/08

Dear Sirs,

Why are you guys killing the right whales. I like the right whales. The right whales want to live I bet they want to have a family They probably wont to also have a great life. They have to live a full life they are very nice whales. Please help protect the right whales.

Sincerely
Dalton Vanderstelt

Dear Sirs, 10-24-[illegible]

Would you stop your submarine sonar? Start sending metal [illegible] with [illegible]. [illegible] hurt the [illegible] and your hunting [illegible] com[illegible] [illegible] stop [illegible] [illegible] in. My [illegible] respect the right whale. That why you [illegible] start [illegible] in the pool[illegible]

[illegible]

A[illegible]

Dear Sirs,

I think that you should protect the right Whales. They are beautiful animals but there is less than 400. I Love the right Whales. They are on the endangered list. I just don't want to see them all extinct. They might all die over 19000 have even been Killed. Now They are pretected. Please help Keep them from being extinct.

Sincerely,
Danielle Janoski

10/24/08

Dear Sirs,

I think you shouldn't Sail in the ocean with a submarine close by a right whale because it will hurt the right wals brain. The Sonar will hurt the right whale really bad and it will make the whale bleed through the brain.

Sincerely
Courtnie
Raven

Jacob 10-24-08

Dear Sirs,

Please protect those right whales.
I hope y'all people protect
them. Those bad guys here
killing alot of those good
right whales. If I was a
right whale protecter,
I would not let anybody
shoot any right whales.

Sincerely,
Jacob Hutchesson

10-24-08

Dear sirs,

The right whales are very special to Georgia because they are the only whales that live at Georgia. So you have to stop your sonar thing before all the right whales are extinct. So do your undersea warfare training in the Pacific ocean. Right whales are on the endangered list.

Sincerely,
Matthew

10/24/08

Dear Sirs,

Will you not put submarines under water and blow sonar please oh please. It will kill the right Whales and those whales don't harm people like those other whales do. Please don't kill the right-whales please. I'll do any thing. These whales are the most beautiful whales in the world. Please don't kill the whales.

Sincerely,
Caleb

10/24/08

Dear sirs,

Pleas keep are right whales
sake and protected. I want
them to have a great like
like we do. I don't want
them to get sonar. I
want them keep them
very, very, very sake from
sonar and other things.
I want right whales to
have their life.
I don't want it to be
destroyed. Right whales
desorve to live cause
there is only like 400
right whales left. I
dont want them to be
destroyed too. Please
keep are right whales
safe.

Sincerely,
Alyssa
Wilson

10/24/08

Dear Sirs,

Can you stop using sonars in the Atlantic Ocean? It will be your fault and you will take the blame for killing the right whales. Would you like for a right whale to do sonar in your ear and kill you?

Sincerely,
Benjamin

10/24/08

Dear Sirs,
We want no sonar in the ocean harting the right whales. we want all animal life un hamed. We want no submarines down unless it doesnot make any sound. All animals should be protected no matter what cause they don't do any thing to us. Sonar probably does not hartus but it does the animals. So protect the animals and it could make the world a better place.

Sincerely,
Ashley Edge

10/24/08

Dear sirs,

With your undersea warfare training you are killing beautiful right whales. Plus while they are having babies. They are legally protected If you didn't know they are our States Marine Mammal. So why are you killing them? Everybody loves right whales. These grateful animals should not be killed.

Sincerely,
Kamryn Cantrell

October 24, 2008

Dear Sirs,

Please, Oh please don't kill the Right Whales we need them. Alot of men killed over 1,000 Right Whales and now there are about 400 left. These beautiful whales need to survive. What if somebody killed you and your family would you like it? Alot of people care about the Right Whales I don't know about you but we need to help them. Agian please Oh please help them stay alive.

Sincerely,
Jasmyn Casper

Dear Sirs 10/24/08

I thint the right whales should be protected because I think the right whales do not like being hurt. Rights whales should be free not killed.

Sincerely,
Seth

10\24\08

Dear Sirs,

Please do not do your undersea warfare training. My friends and I want to protect the right whales. The right whale is one of my favorite kinds of whales. Do your undersea warfare training on the other side of the United States.

Sincerely,
Annie Dean

Dear Sirs, 10-24-08

Please stop killing right whales. How would you like it if you was a right whale and you was trying to give birth. Then you died. Stop killing the right whales. Killing the right whales is not, not not, and not nice. Hearing right whales die is so sad. So, stop, stop, stop, and stop killing right whales.

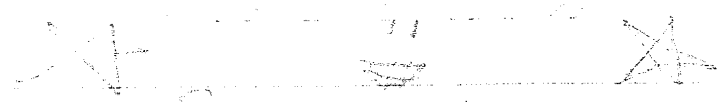
Sincerely,
Dillon Knepp

Heather N

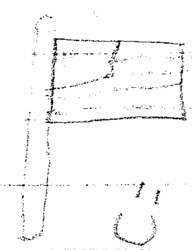
October 22, 200

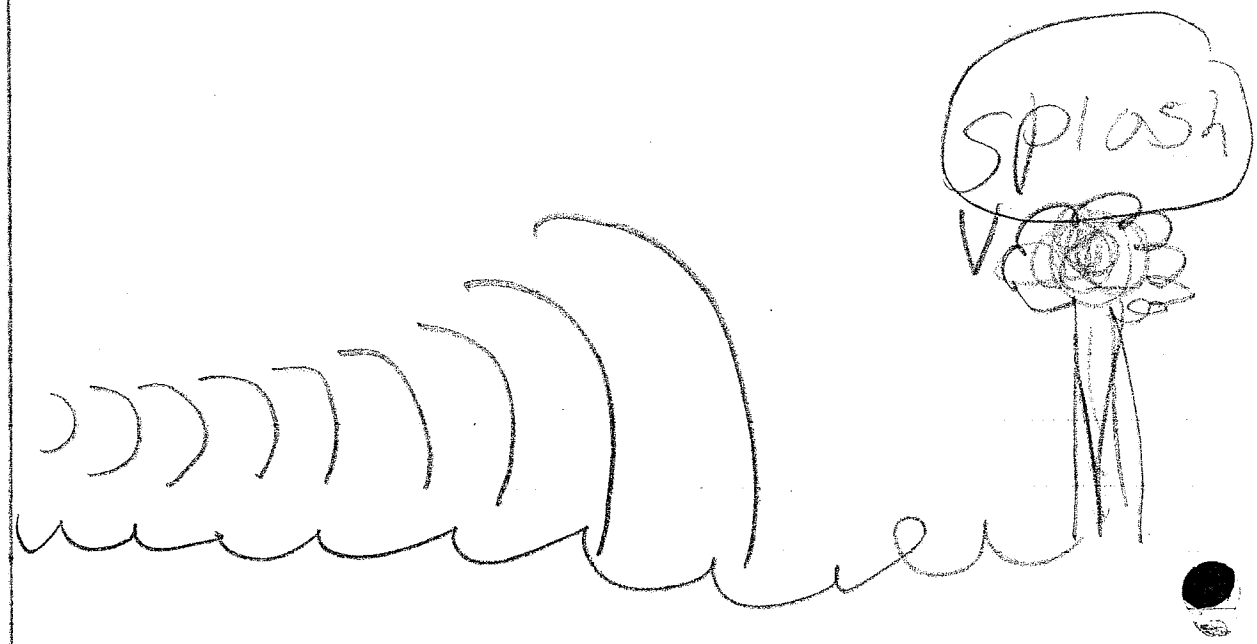
Dear Navy Commander,

This letter is to convince you to take the wales and put them some where else. I think you would ... the right ... put ... [illegible]



3rd grade




SPLASH

October 4th

Dear Navy Commander,

This letter is to persuade you to
protect the right whales, Having the is
whales is another thing we can be proud of
SO please put your base Somewhere else
SO please and thank you.

sincirle
Eric Wilson.

October 22, 2008

Dear Navy commanders

This letter is to persuade you to portect the right whales. Stop makeing The sounds please. Can you please move away please. their The State mammal

Sincerely
Juli inford

Gabrielle A. October 22, 20..

Dear Navy Commander

This letter is to get you to protect the right whales. Pleas do not kill the whales. Pleas consider moving your sonar range away from Georgia's right whale area.

Sincerely
Gabriella the 3rd grader

October 22, 2

Dear Navy Commander,

This letter is about the endangered right whales. I read the news paper about them. There are only 400 in the world. So can you please [illegible]

sincerly

Heather Chill

October 22, 200

Dear Navy Commander,

This letter is to persuade you to protect the right whales. there is 400 whales in the world. Can you beleve that I could. Thank you if you do it but try to do it Thanks for listing to me

Sincerely
Kristina

October 22, 20[illegible]

by [illegible] #

Dear Navy Commander,

This letter is to Persuade you to Protect The Right Whales becaues we Don't Won't to hert Tham becaues going EKcstingt becaues your harting Them

Please Do Do not [illegible] The

Please Consider Moving your Sonar range away from Georgias Right whale area

Dear Navy commander

This letter is to persuade you
protect the right whales.
can you [illegible] Please
do not kill them. Please
consider moving your Sonar
range off of the Georgia
Port Canaveral area.

Sincerely, Jessica

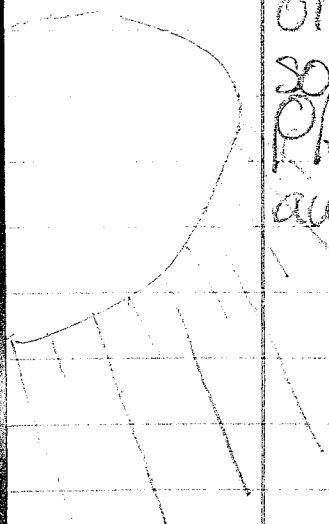
White County

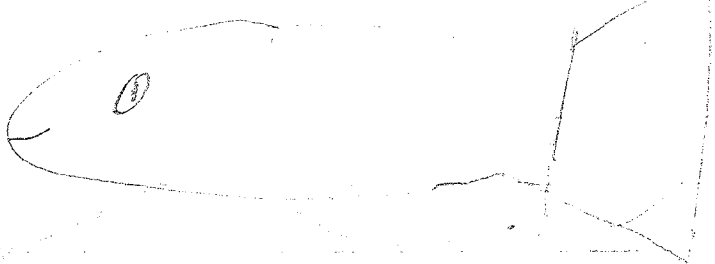
October 22, 200

Dear Navy Commander,

This letter is to persuade you to protect the right whales. The risen why I want you stop the sonar range is because we want the whales to live because we love th right whales and our teacher told us ~~that~~ there is only 400 hundred right whales left so If you could move to another place Please consider moving you sonar range away from Georgia's right whales area

Sincerely,
Eli Taylor
3rd Grade





October 22, 2008

Dear Navy Commander,

This is a letter to persuade you to protect the right whales. There are only 400 left. Please consider moving your sonar range away from Georgia's right whale area.

From, Kendal

October 22, 200

1 Dear Navy Cammander,

This letter is to persuade you to the right whales. People ha been talking about [illegible] the right whales. We only have 400 right whales in the world.

Please consider moving your sonar range [illegible] from Georgia's right whale [illegible]. People are trying to [illegible] the right whales. Will you [illegible] one of them?

Sincerely,
Emily [illegible]erman

October 22, 200[illegible]

1 Dear Navy Cammander,

This letter is to persuade you to the right whales. People ha[illegible] been talking about [illegible] the right whales. We only have 400 right whales in the world.

Please consider moving your sonar [illegible] away from Georgia's right whale area. People are trying to save the right whales. Will you be one of them?

Sincerely,
Emily [illegible]erman

October 22 2009.

Justin

Dear Navy Commander

This letter is to persuae you to protect the right whales.

Mr. ~~Navy~~ commander you are nice of not keling whales.

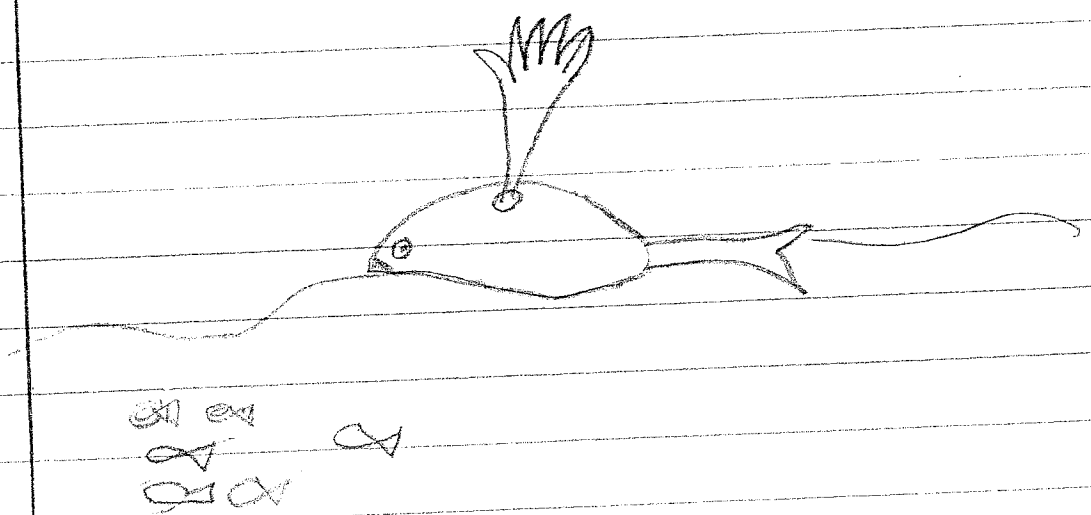
I am glad you are not keling whales.

October 22, 2008

Dear Navy Commander,

This letter is to persuade you to portect the right whales. The right whales are dieing please stop the Sooting. There are only 400 in the world please stop the Sooting.

Sincerely Heather chastain



Cross Reference Index by Comment Tracking Number
Navy Cherry Point Range Complex Draft EIS/OEIS

Comment No.	Summary Comment	Comment Response
F1- US Department of the Interior, Office of Environmental Policy and Compliance		
F1-1	Bathymetry and Sediments reference corrected	Hollister, 1973 reference corrected in Chapter 7 (page 7-3)
F2- Congress of the United States		
F2-1	Requested extension of the public comment period until 15 January 2009.	After careful consideration, the Navy made the decision not to extend the public comment period for the Navy Cherry Point DEIS document. This decision was made after evaluating the extension requests against the obligation to fulfill NEPA requirements while still meeting training needs. Adherence to the timeline permits the Navy to meet the planned dates for the publication of the Final EIS and the Record of Decision (ROD) in the Spring timeframe, as well as ensures continuity of Navy operations without interruption or cessation. Copies of US Fleet Forces signed letters responding to the Congressional Inquiries have been included at the end of this public response matrix.
F3- US Environmental Protection Agency, Region 4		
F3-1	What additional impacts from the use of commercial air services to supplement Navy training would be reasonably foreseeable?	Aircraft will be based out of Newport News Airport. Additional impacts to Air Quality and Noise issues will be discussed in Sections # 3.4 & 3.5 and Chapter 6.
F3-2	Include a thorough description of the historical results of mitigation and monitoring as a result of the 1997 Biological Opinion	The 1997 Southeast BO applies to the consultation area primarily within the JAX OPAREA. The BO provides guidelines for the conduct of specific events (mitigation and protective measures) but does not have formal monitoring or reporting requirements.

Comment No.	Summary Comment	Comment Response
F3-3	Recommends that the FEIS documents the consultation record with the US Fish and Wildlife Service and the National Marine Fisheries Service as part of the navy's compliance with the Endangered Species Act, the Marine Mammal Protection Action, and the Magnuson- Stevens Fishery Conservation Management Act.	The dates that the Biological Evaluation (BE), as well as the Navy Cherry Point request for a Letter of Authorization for Incidental Take submitted have been added to the text (see section 3.7.5). The date that the final Proposed Rule was published was added to the text (see section 3.7.5). See Appendix C for agency correspondence. The Navy is still waiting for the Biological Opinion (BO). Both the BE and the BO will provide specific details of the consultation history.
F3-4	The FEIS should describe what actions the Navy is taking to reduce the introduction of pollutants during range activities. Requests additional information and a discussion of efforts to minimize and reduce hazardous materials deposited into the aquatic environment from training activities.	The Navy has included this information in Section 3.2 (Hazardous Materials and Hazardous Waste), as well as in Chapter 5 (Mitigation Measures).
F3-5	Recommends that the ICMP be expanded to include monitoring military expended materials in the aquatic environment. EPA also requests more specificity of the content of the ICMP in the EIS. At a minimum, EPA recommends a pilot monitoring program at one training range.	The Navy has recently implemented the Water Range Sustainability Environmental Program Assessment (WRSEPA) Policy (29 Aug 08) to ensure the long-term viability of our operational ranges while protecting human health and the environment; and to develop a written operational range assessment plan that details the process and procedures to assess operational ranges. These water range assessments will be updated every 5 years to account for new technologies, changes in range usage, and changes in regulations/action levels. The Navy believes this separate effort will provide better information and analysis on military expended materials than expanding the ICMP, which is focused on marine life.
F4- Marine Mammal Commission		
F4-1	In concert with the National Marine Fisheries Service, take steps to ensure that the Incidental Take Statement and the Letter of Authorization cover all marine mammal species that may be taken by level A and level B harassment as a result of the proposed actions.	The Navy, and NMFS as a cooperating agency, has taken steps to ensure all marine mammal species that may be potentially taken are covered in the Incidental Take Statement (ITS) and the Letter of Authorization (LOA).

Comment No.	Summary Comment	Comment Response
F4-2	Re-label the No Action Alternative because it exceeds the level of activity that has historically been performed on the range and include a true no action alternative, even if selecting it would result in serious adverse consequences for national security.	IAW CEQ guidance a No Action alternative can be defined as current operations. Historically, training activities have included a surge capability. Levels of current activity were determined by a number of means including the use of Range Complex Management Plans, interviews of range operators, and logistics data in order to best establish historic training levels. The text describing the No Action alternative has been amended. Additionally, the Navy has added language in Section 2.2.7 describing a "true No Action" alternative in the alternatives considered but eliminated from further consideration section. This alternative was eliminated from further consideration because it fails to meet the Purpose and Need of the Proposed Action.
F4-3	Perform an external peer review of the marine mammal density estimates of the Cherry Point OPAREA.	Please see Section 3.7.1.2 of the V5 DEIS for discussion of density estimates used in the analysis. The marine mammal density estimates were developed by contractors and researchers external to the Navy and reviewed by NMFS staff at the Northeast and Southeast Fishery Science Centers.
F4-4	Revise the analysis of explosive ordnance to provide a more realistic assessment of potential occurrences and outcomes.	Scheduling of training activity is determined by a number of factors, not the least of which includes weather conditions, current surge levels and international events, and requirements of the Fleet Response Training Plan. By assuming an even distribution over the year, the Navy believes that it does reflect a realistic outlook when considering the ten year planning horizon covered by this EIS/OEIS.
F4-5	Continue to develop the Integrated Comprehensive Monitoring Program, provide the Commission with its details, including a schedule for implementation.	Some components of the ICMP have already begun implementation and the Navy is continuing to develop the ICMP in cooperation with NMFS. The ICMP will be used both as: 1) a planning tool to focus Navy monitoring priorities (pursuant to ESA/MMPA requirements) across Navy Range Complexes and Exercises; and 2) an adaptive management tool, through the consolidation and analysis of the Navy's monitoring and watchstander (lookout) data, as well as new information from other Navy programs (e.g., research and development), and newly published non-Navy information. The ICMP is described in the EIS. Range specific monitoring plans will be included in the Final Rule and posted via the NOAA web site.

Comment No.	Summary Comment	Comment Response
F4-6	Develop and implement a plan to calibrate and verify the mitigation and monitoring measures	One objective of the ICMP is to assess the efficacy and practicality of the monitoring and mitigation techniques used by the Navy. This is being addressed through a series of "studies" that will be implemented through individual monitoring plans for specific range complexes. The results of these studies will feed into the overall analysis and reporting process under the ICMP and ultimately inform the adaptive management process.
F4-7	Assess alternatives that would require the Navy to suspend an activity if a marine mammal is seriously injured or killed and injuries or deaths could be associated with the activity. An injury or death should be investigated to determine the cause and how the activity should be modified to avoid future injuries or death.	These types of measures will be addressed in the MMPA LOA. A response plan may be incorporated into the final rule that provides information on actions that would be taken by both Navy and NMFS in the event of a marine mammal injury or death.
F4-8	Add a requirement for annual reports to include methods of monitoring, all training activities locations and dates, marine mammal sightings, and estimates of possible takes.	The Navy will be preparing reports in accordance with the LOA to include information on mitigation activities and will include methods of monitoring, training activities locations and dates, marine mammal sightings, and estimates of possible takes.
S1- North Carolina Department of Environment and Natural Resources, Division of Coastal Resources		
S1-1	Recommends Section 2.2.1 contain a more definitive, all-inclusive Proposed Action that includes the interaction of other training efforts.	We have revised the language of the Proposed Action.
S1-2	Recommends that a more definitive analysis be provided in the cumulative impacts assessment chapter	We have revised the cumulative impacts analysis in Chapter 6.
S1-3	Complete the ICMP so that it can be reviewed by the public for adequacy and included in the Proposed Action.	The ICMP will be completed in late 2009. See response to F4-5. The ICMP is described in the EIS. Range specific monitoring plans will be included in the Final Rule, in the EIS, and posted via the NOAA web site.

Comment No.	Summary Comment	Comment Response
S1-4	Section 3.3 uses an inappropriate standard for assessing whether an adverse impact to water quality has occurred. Recommend that the entire DEIS be reviewed to verify that the definition of a significant impact to a resource is based on the degree of impairment caused by the project to that resource. Section 3.3.2.2 lacks water quality maps prepared by the North Carolina Division of Water Quality.	Descriptions of conditions resulting in significant impacts were revised to include impairment of water resources. North Carolina's water quality maps concentrate on inland waters; Navy's actions are conducted off-shore, therefore the benefit of including the maps in this EIS/OEIS was considered marginal.
S1-5	Recommend that the Proposed Action adhere to the State's moratorium periods for shorebirds and sea turtles.	See Appendix G for information on the Navy's compliance with NC enforceable policies. Mitigation measures for sea turtles were developed in consultation with NMFS, and impacts to shorebirds are addressed in this document and in the Marine Corps Base Camp Lejeune Environmental Assessment, which is incorporated into the FEIS by reference in Section 1.7.1.
S1-6	Recommend that the DEIS include a discussion of how the Proposed Action will affect State resources and how adverse effects will be mitigated. Such discussion will be required for the Consistency Determination.	The Navy has submitted a CCD to the State of NC. See Appendix G.
S2- North Carolina Wildlife Resources Commission		
S2-1	Include open water bird species, such as northern gannet, red-throated loon, horned grebe, and sea ducks in Section 3.10	The Navy included these species in its consideration of potential impacts. Refer to the Section 3.10.
S2-2	Include an assessment of training impacts on wintering red throated loons	The Navy included these species in its consideration of potential impacts. Refer to the Section 3.10.
S2-3	Recommend adhering to recommendations made to USMC regarding to activities in the Onslow Bay area. The recommendations were attached to comment letter.	The Navy coordinated with MCI East Env Mgmt Division (USMC) on the proposed testing and evaluation of the Expeditionary Fighting Vehicle (EFV). USMC has the EFV Testing and Evaluation Plan Environmental Assessment, but has not yet developed a training plan in order to incorporate the EFV in the Navy Cherry Point FEIS/OEIS. Separate NEPA documentation will be developed once USMC has a mature training plan.

Comment No.	Summary Comment	Comment Response
S2-4	Provide details of maximizing attempts to recover expended materials, use of biodegradable materials, degradation time of expended materials, and mitigation measures.	The Navy has taken numerous steps to reduce the quantity of Military Expended Materials that are not recovered. Most expended materials that float including targets are recovered. Additional information has been added to Section 3.2 (Hazardous Materials/Hazardous Waste) and Chapter 5 (Mitigation Measures). The Navy is supporting research leading to biodegradable products safe for the environment. We will cite the website where more information on the Navy's pollution prevention program can be found. Please also see the response to comment F3-5 regarding the newly implemented Water Range Sustainability Environmental Program Assessment (WRSEPA) Policy (29 Aug 08).
S2-5	Provide a detailed discussion of the cumulative impacts of hazardous materials from multiple sources over many years.	Hazardous materials for this EIS/OEIS are addressed in Section 3.2. Chapter 6 has been modified to address the issue of cumulative impacts from hazardous materials.
S2-6	Recommend removal of references to BT9/BT11 if they are not included in the Proposed Action, as these references are confusing to the Public.	These are related actions and are referred to in relevant sections, including Sections 1.5, 1.7.1, and Chapter 6, Cumulative Impacts. Any extraneous references to BT9/BT11 were removed.
S2-7	Concerned that there are many Federal actions being proposed simultaneously and the need to assess the cumulative impacts of all actions concurrently.	The Navy has updated Chapter 6, Cumulative Impacts.
S3- North Carolina Department of Environment and Natural Resources, Division of Marine Fisheries		
S3-1	Re: Section 1.7.2.1: Remove references to BT-9 so as not to confuse the public	Noted; it is part of a related action. See comment S2-6.
S3-2	Re: Section 3.3.2.2 leaves out the Neuse River Basin in Baseline Conditions	Text was revised to include a discussion of the Neuse River Basin. See Section 3.3.2.2
S3-3	Re: Section 3.3.3.3: Requests the state and federal water quality standards be listed and provide data demonstrating that sediment disturbance will not exceed those standards.	Regulatory framework for water resources is presented in Appendix K. Text was revised to discuss the potential temporary disturbance to sediments would be distributed across an expansive off-shore area (18, 617 nm^2). See Section 3.3.1.1

Comment No.	Summary Comment	Comment Response
S3-4	Re: Section 3.6.3.3: Concerned about the deployment of mine shapes and their concrete anchors to live/hard bottom habitat in the Mine Warfare Training Area.	The small boat crews who will deploy mine shapes in the Mine Warfare Training Area may be able to avoid dropping the mines on live/hard bottom habitat only if the following three conditions support such an action: 1. The location of hardbottom habitat in Onslow Bay is known with sufficient precision to create a detailed map. The best available hardbottom data with which we are familiar is on the Habitat and Ecosystem Interactive Map Server from the South Atlantic Fishery Management Council (SAFMC). We will need to plot this data on a larger scale map than is currently available in the DEIS to judge its sufficiency. 2. The total percentage and specific locations encumbered with hardbottom habitat within the Mine Warfare Training Area will not seriously compromise the quality of training. After we have been able to create an accurate map, we will discuss probable training impacts with the mine warfare community. 3. The small boat crews who will deploy the mine shapes have the technology to precisely locate and avoid them. See Sections 2.2.4 and 2.2.5 regarding mine shapes and Mine Warfare, Section 3.6 regarding proposed action and possible impacts to marine communities, and 3.12 regarding the proposed actions and impacts to cultural resources.

Comment No.	Summary Comment	Comment Response
S3-5	Re: section 3.6.3.3: Concerned about the potential impacts of NEPM on artificial reefs and shipwrecks due to the increases proposed in the preferred alternative. More data is required.	NEPM in the OPAREA, including non-explosive training bombs, naval gun shells and missiles, quickly sink to the ocean floor where they cause very local disturbances without long term impacts. Over a long period of time, benthic organisms and marine communities use these items as hard substrate and develop localized communities. Refer to Section 3.6.3 Marine Communities and 3.9 Fish and Essential Fish Habitat for more information. While the Navy does not believe expended ordnance settling on shipwrecks in deep water will cause significant impact, it recognizes the greater fragility of coral reefs. All ships and aircrew must consult Protective Measures Assessment Protocol (PMAP) before expending any ordnance at-sea, and comply with the resulting protective measures. PMAP includes information on coral reefs identified by NOAA and World Resource Institute. Specific to exercises involving NEPM at-sea, PMAP prohibits establishing target areas in the vicinity of known or observed coral reefs.
S3-6	Re: 3.9.3.1: concerned about the TOW missile copper wire that is not recovered. Wants more information regarding tensile strength, degradation time for the 37.3 miles of wire expended in Areas 16 and 17 each year.	Additional analysis of TOW missile copper wire has been provided in Section 3.9.3 of the FEIS/OEIS and in Appendix L
S3-7	Same concerns as stated in S3-4 and S3-5	See Navy responses to Comments S3-4 and S3-5.
S3-8	Re: 3.15.2.3: Suggests the Navy contact NCDMF License and Statistics section for information on landings, gear, waterbody, and species information	Navy has incorporated the latest statistics from NCDMF. See Sections 3.15 & 3.16.
S3-9	Re: 3.19: NCDMF still believes a combination of AFAST Alternatives 1, 2 and 3 should be considered. Concerned by the lack of long term negative effects data on marine fish.	A.) The No Action Alternative has been selected as the Preferred Alternative in AFAST. B.) There will be no increases in sonar activity or change in type of sonar activity. C.) Sonar is addressed comprehensively in the AFAST EIS. D.) In this Navy Cherry Point EIS/OEIS, the No Action Alt, Alt 1, and Alt 2, represent a reasonable selection of alternatives. Text was added regarding research by Dr. Popper who addressed long term effects on fish. See Section 3.9.

Comment No.	Summary Comment	Comment Response
S3-10	Re: 5.7.1, 5.7.4, 5.7.5, 5.7.6, and 5.7.7: Add artificial reefs and shipwrecks to the list of target area establishment criteria to avoid during the stated activities	Ordnance in the OPAREA, including explosive and non-explosive bombs, naval gun shells and missiles, quickly sink to the ocean floor where they cause very local disturbances without long term impacts. Over a long period of time, benthic organisms and marine communities use these items as hard substrate and develop localized communities. Refer to Section 3.6.3 Marine Communities and 3.9 Fish and Essential Fish Habitat for more information. While the Navy does not believe expended ordnance settling on shipwrecks in deep water will cause significant impact, it recognizes the greater fragility of coral reefs. All ships and aircrew must consult Protective Measures Assessment Protocol (PMAP) before expending any ordnance at-sea, and comply with the resulting protective measures. PMAP includes information on coral reefs identified by NOAA and World Resource Institute. Specific to exercises involving NEPM at-sea, PMAP prohibits establishing target areas in the vicinity of known or observed coral reefs.
S3-11	Re: 5.8.1: NCDMF questions the discussion of BT-9 in this section	The Navy concurs and the reference to BT-9 was removed from the Mitigation Measures chapter.
S3-12	Re: Chapter 6: same concern as stated in S3-6	Additional analysis of TOW missile copper wire has been provided in Section 3.9.3 of the FEIS/OEIS and in Appendix L
S3-13	NCDMF recommends that in addition to the issuance of NOTMARs, a web site, email, email list server, or phone number be available in order to inform commercial and recreational fishermen of hazardous operations in the Navy Cherry Point Range Complex.	NOTMARs are already posted on the website for the Fleet Area Control And Surveillance Facility Virginia Capes & Fleet Forces Atlantic Exercise Coordination Center (FACSFAC VACAPES). Please see the NOTMAR tab on www.vacapes.navy.mil.
S4 - North Carolina Department of Environment and Natural Resources		
S4-1	Consider comments on the USWTR DEIS/OEIS as applicable to the Navy Cherry Point DEIS/OEIS	The proposed actions for the Navy Cherry Point EIS/OEIS are vastly different from the proposed actions of USWTR EIS/OEIS. This is the reason for the Navy making them separate and distinct actions. However, any comments relevant to this EIS/OEIS will be addressed.

Comment No.	Summary Comment	Comment Response
S4-2	Post all public comments and public hearing transcripts on a public accessible web site or make available in some similar way.	All DEIS/OEIS comment letters and public hearing transcripts were posted to the public website for Navy Cherry Point.
S4-3	Requested extension of the public comment period until 15 January 2009.	After careful consideration, the Navy made the decision not to extend the public comment period for the Navy Cherry Point DEIS document. This decision was made after evaluating the extension requests against the obligation to fulfill NEPA requirements while still meeting training needs. Adherence to the timeline permits the Navy to meet the planned dates for the publication of the Final EIS and the Record of Decision (ROD) in the Spring timeframe, as well as ensures continuity of Navy operations without interruption or cessation. Copies of US Fleet Forces signed letters responding to the Congressional Inquiries have been included at the end of this public response matrix.
S5 - North Carolina Department of Administration, Division of Environmental Health		
S5-1	Letter references the USWTR DEIS/OEIS and states it has no objection to the proposed action	No Navy response needed.
O1 - Natural Resources Defense Council		
O1-1	Requested extension of the public comment period for the Under Sea Warfare Training Range DEIS/OEIS Public Comment period until 15 January 2009.	The USWTR DEIS/OEIS is a separate EIS/OEIS from the Navy Cherry Point Range Complex DEIS/OEIS discussed here. The request will be addressed in the USWTR DEIS/OEIS.
O2 - North Carolina For Responsible Use of Sonar		
O2-1	Requested extension of the public comment period until 15 January 2009.	After careful consideration, the Navy made the decision not to extend the public comment period for the Navy Cherry Point DEIS document. This decision was made after evaluating the extension requests against the obligation to fulfill NEPA requirements while still meeting training needs. Adherence to the timeline permits the Navy to meet the planned dates for the publication of the Final EIS and the Record of Decision (ROD) in the Spring timeframe, as well as ensures continuity of Navy operations without interruption or cessation. Copies of US Fleet Forces signed letters responding to the Congressional Inquiries have been included at the end of this public response matrix.

Comment No.	Summary Comment	Comment Response
O3 - North Carolina For Responsible Use of Sonar		
O3-1	Inadequate treatment in Section 3.9 regarding the treatment of sonar, projectile cavitations, helo blade wash, or explosives on finfish in all stages of their life, their habitat, and their food chain.	Sonar is addressed in detail in the AFAST EIS and is summarized in Section 3.19. Section 3.9 of the Navy Cherry Point FEIS includes additional analysis of projectile cavitations, helicopter blade wash, and explosive ordnance.
O3-2	Requested extension of the public comment period until 15 January 2009.	After careful consideration, the Navy made the decision not to extend the public comment period for the Navy Cherry Point DEIS document. This decision was made after evaluating the extension requests against the obligation to fulfill NEPA requirements while still meeting training needs. Adherence to the timeline permits the Navy to meet the planned dates for the publication of the Final EIS and the Record of Decision (ROD) in the Spring timeframe, as well as ensures continuity of Navy operations without interruption or cessation. Copies of US Fleet Forces signed letters responding to the Congressional Inquiries have been included at the end of this public response matrix.
O4 - PenderWatch & Conservancy (letter)		
O4-1	Consider all comments received on this DEIS relevant to the DEIS for the Under Sea Warfare Training Range (USWTR) as the activities are similar.	The proposed actions for the Navy Cherry Point EIS/OEIS are vastly different from the proposed actions of USWTR EIS/OEIS. This is the reason for the Navy making them separate and distinct actions. However, any comments relevant to this EIS/OEIS will be addressed.
O4-2	Request that all DEIS/OEIS comment letters and public hearing transcripts be immediately posted on public web sites.	All DEIS/OEIS comment letters and public hearing transcripts were posted to the public website for Navy Cherry Point.

Comment No.	Summary Comment	Comment Response
O4-3	Requested extension of the public comment period until 15 January 2009.	After careful consideration, the Navy made the decision not to extend the public comment period for the Navy Cherry Point DEIS document. This decision was made after evaluating the extension requests against the obligation to fulfill NEPA requirements while still meeting training needs. Adherence to the timeline permits the Navy to meet the planned dates for the publication of the Final EIS and the Record of Decision (ROD) in the Spring timeframe, as well as ensures continuity of Navy operations without interruption or cessation. Copies of US Fleet Forces signed letters responding to the Congressional Inquiries have been included at the end of this public response matrix.
O5 - PenderWatch (verbal comment at Public Hearing)		
O5-1	Requested extension of the public comment period until 15 January 2009.	After careful consideration, the Navy made the decision not to extend the public comment period for the Navy Cherry Point DEIS document. This decision was made after evaluating the extension requests against the obligation to fulfill NEPA requirements while still meeting training needs. Adherence to the timeline permits the Navy to meet the planned dates for the publication of the Final EIS and the Record of Decision (ROD) in the Spring timeframe, as well as ensures continuity of Navy operations without interruption or cessation. Copies of US Fleet Forces signed letters responding to the Congressional Inquiries have been included at the end of this public response matrix.
O6 – Cetacean Society International		
O6-1	The DEIS should discuss the potential for naval operations to trigger the release of previously dumped (i.e decades ago) and potentially toxic or explosive munitions resting on the sea floor within the OPAREA.	As analyzed in section (insert reference to NCP EIS sediment /bathymetry section (if appropriate)) the naval operations proposed will result in minor, widely scattered disturbances of the seafloor. Expended materials that would eventually settle to the seafloor would have a very low potential to impact any munitions that may currently be resting on the sea floor. In addition, should any expended materials settle near existing munitions, there is a very low likelihood that they would trigger a release from munitions resting on the sea floor.

Comment No.	Summary Comment	Comment Response
O6-2	Letter is primarily concerned about the potential effects of active sonar on marine life.	The Navy is analyzing the potential effects of active sonar on marine life in the Atlantic Fleet Active Sonar Training (AFAST) EIS/OEIS. The Navy Cherry Point Range Complex DEIS/OEIS will summarize the AFAST analysis in Section 3.19.
O6-3	DEIS does not mention effectiveness of visual observers above a sea state of Beaufort 4.	Navy training operations are sea state dependent. The ICMP will be investigating the relationship of sea state and the effectiveness of lookouts' ability to observe marine mammals and sea turtles.
O6-4	DEIS must incorporate specific speed limits that at least match regulatory limits, such as 10 knots or less.	The NMFS Final Rule, published October 2008, regarding the North Atlantic Right Whale pertains to commercial vessels of a certain size, not to military vessels.
O6-5	The Navy should provide special monitoring efforts to assess the overlap of military training activities and edge of the Gulf Stream where diving turtles are known to feed in winter.	Monitoring activities will be focused on specific areas and exercises that have the best opportunities to provide important data. Mitigation measures in place to avoid impacts to sea turtles apply to all activities regardless of location. Section 5.7 provides mitigation measures for specific at-sea training events.
O6-6	The DEIS does not adequately discuss herding behavior in marine mammals and how startle may initiate herding, resulting in stranding.	This comment is specific to mid-frequency sonar which the Navy is analyzing in the Atlantic Fleet Active Sonar Training (AFAST) EIS/OEIS, not this document. Regardless, the "stampede" response mentioned in the original comment has not been observed in marine mammals at sea that the Navy is aware of.
O6-7	Testing active sonar must be regulated as clearly as speed restrictions.	The Navy analyzed active sonar in the Atlantic Fleet Active Sonar Training (AFAST) Final EIS/OEIS, The Navy Cherry Point Range Complex FEIS/OEIS summarizes the AFAST analysis in Section 3.19.
O6-8	Discussion of direct, significant and potentially population-level impact on the North Atlantic right whale is inadequate.	Results of the analysis do not suggest an impact to North Atlantic right whales from training activities within the CHPT OPAREA under the proposed action, however, Navy is in the process of consulting with NMFS under Section 7 of the Endangered Species Act.
O6-9	The DEIS should include a cost/risk analysis for the Navy of interrupted or cancelled training because of right whales (in particular mother/calve pairs in transit zone).	The Navy does not do cost/risk analyses based on financial costs alone. The Navy considers additional factors such as time, PERSTEMPO, training fidelity to support when mitigations are, or are not, practicable.
O6-10	The DEIS should reflect the wide range of vessel sounds and sounds from other Navy activity that are likely to affect right whales.	Section 3.7.3.1 of the EIS discusses the analytic framework for assessing marine mammal response to anthropogenic sound. Section 3.7.3 later discusses potential stressors considered including vessel movement, aircraft overflights, gunnery sound transmitted through the hull of a ship, and underwater detonations of explosive ordnance.

Comment No.	Summary Comment	Comment Response
O6-11	DEIS needs to include most recent right whale migration data, including data that shows a migratory pathway along the shelf break. The DEIS should include the NMFS 2007 rulemaking for a restricted management area to protect right whales extending at least 35 nm from South Carolina's shore. The DEIS needs to include the Southeast Implementation Team and Right Whale Consortium presentations or datasets.	Available data and publications at the time of our analysis were incorporated into the DEIS. The 2007 rule applies specifically to restricting gillnet fishing within the management area. Entanglement in fishing gear is on of the greatest threats to the species. Pages 3-123 and 3-124 discuss the distribution and occurrence of North Atlantic right whales in the CHPT OPAREA. http://www.publicaffairs.noaa.gov/releases2007/jun07/noaa07-r119.html
O6-12	The DEIS fails to adequately discuss the differential risk to right whale mothers and their calves.	The Navy is consulting with NMFS through the ESA and MMPA compliance process. Mitigation measures employed by the Navy that are specific to NARW are in place to protect all individuals, including mothers and their calves.
O7 – New York Whale and Dolphin Action League		
O7-1	Letter is concerned about the potential effects of the Under Sea Warfare Training Range (USWTR) described in a separate EIS/OEIS	The Navy Cherry Point Range Complex DEIS/OEIS does not include the proposed actions described in the USWTR EIS/OEIS and comments will be addressed by the Navy in that document.
O8- Provincetown Center for Coastal Studies		
O8-1	The Navy should consider cooperating with the Southeast Sighting Alert System (SAS) to the presence of whales	The Navy participates with and provides funding support to the Sighting Advisory System (SAS).
O8-2	Urges the Navy to do more to reduce the likelihood of encounters with right and humpback whales including commitment to 10 knot speed limit and a more comprehensive approach to monitoring the presence of endangered whales.	The NMFS Final Rule, published October 2008, regarding the North Atlantic Right Whale pertains to commercial vessels of a certain size, not to military vessels. The ICMP will provide a Navy-wide comprehensive monitoring program.
O8-3	Suggest taking an extremely conservative approach to taking mitigation measures in order to reduce acoustic exposures to marine mammals since anthropogenic noise effects are not well understood.	The Navy is consulting with NMFS through the ESA and MMPA compliance process. Mitigation measures employed by the Navy are designed to reduce or minimize potential exposures to all marine mammals.

Comment No.	Summary Comment	Comment Response
O9- Animal Welfare Institute		
O9-1	The DEIS is inadequate in that it underestimates the impacts of the Navy's active sonar on marine mammals, does not effectively estimate cumulative impacts of the navy's proposed actions, and provides for mitigations that are more ineffectual than those employed elsewhere in the Navy or by other navies.	The Navy analyzed the potential effects of active sonar on marine life in the Atlantic Fleet Active Sonar Training (AFAST) Final EIS/OEIS. The Navy Cherry Point Range Complex FEIS/OEIS summarizes the AFAST analysis in Section 3.19. We have updated and added discussion regarding Cumulative Impacts to Chapter 6. One objective of the ICMP is to assess the efficacy and practicality of the monitoring and mitigation techniques used by the Navy. This is being addressed through a series of "studies" that will be implemented through individual monitoring plans for specific range complexes. The results of these studies will feed into the overall analysis and reporting process under the ICMP and ultimately inform the adaptive management process.
O9-2	Recommends not using the analysis of effects in the AFAST DEIS/OEIS as they believe it is inadequate. Animal Welfare Institute comments are attached to this letter.	The AFAST DEIS/OEIS has been modified to address NMFS comments as well as public comments. The AFAST FEIS/OEIS is summarized in the Navy Cherry Point EIS/OEIS Section 3.19.
O10 – Natural Resources Defense Council		
O10-1	The Navy does not properly analyze environmental impacts	The EIS/OEIS is prepared by the Department of the Navy in compliance with the National Environmental Policy Act (NEPA), the Council no Environmental Quality, the Department of the Navy procedures for implementing NEPA, and Executive Order 12114. The Navy used the best available and most applicable science to analyze potential environmental impacts to every resource. Analysts used all available literature, but placed a high degree of confidence in peer-reviewed literature in making its analysis of the environmental impacts. The Navy has consulted with NMFS and USFWS, as well as coordinating with appropriate State-level agencies, to ensure that analysis of potential impacts is appropriate. All environmental analyses are located in Chapter 3, where the proposed actions are assessed for each resource.
O10-2	The Navy fails to consider a variety of other options, alternatives, and common sense mitigation measures	The Navy has considered various alternatives and for various reasons had to eliminate them for further consideration. Please see Section 2.2.7 for the reasoning behind these considerations.

Comment No.	Summary Comment	Comment Response
O10-3	Urges the Navy to make available to the general public the data and modeling upon which its analysis was based.	All data and modeling techniques are contained in the EIS/OEIS or in it's attached appendices.
P1 - Candis M. Harbison		
P1-1	Requested extension of the public comment period until 15 January 2009.	After careful consideration, the Navy made the decision not to extend the public comment period for the Navy Cherry Point DEIS document. This decision was made after evaluating the extension requests against the obligation to fulfill NEPA requirements while still meeting training needs. Adherence to the timeline permits the Navy to meet the planned dates for the publication of the Final EIS and the Record of Decision (ROD) in the Spring timeframe, as well as ensures continuity of Navy operations without interruption or cessation. Copies of US Fleet Forces signed letters responding to the Congressional Inquiries have been included at the end of this public response matrix.
P2 - Lynch and Eatman, L.L.P		
P2-1	Requested extension of the public comment period until 15 January 2009.	After careful consideration, the Navy made the decision not to extend the public comment period for the Navy Cherry Point DEIS document. This decision was made after evaluating the extension requests against the obligation to fulfill NEPA requirements while still meeting training needs. Adherence to the timeline permits the Navy to meet the planned dates for the publication of the Final EIS and the Record of Decision (ROD) in the Spring timeframe, as well as ensures continuity of Navy operations without interruption or cessation. Copies of US Fleet Forces signed letters responding to the Congressional Inquiries have been included at the end of this public response matrix.

Comment No.	Summary Comment	Comment Response
P3 - Wayne Johnson, PhD		
P3-1	Requested extension of the public comment period until 15 January 2009.	After careful consideration, the Navy made the decision not to extend the public comment period for the Navy Cherry Point DEIS document. This decision was made after evaluating the extension requests against the obligation to fulfill NEPA requirements while still meeting training needs. Adherence to the timeline permits the Navy to meet the planned dates for the publication of the Final EIS and the Record of Decision (ROD) in the Spring timeframe, as well as ensures continuity of Navy operations without interruption or cessation. Copies of US Fleet Forces signed letters responding to the Congressional Inquiries have been included at the end of this public response matrix.
P4 - LTC Sam Booher		
P4-1	Letter is concerned about the potential effects of the Under Sea Warfare Training Range (USWTR) described in a separate EIS/OEIS	The Navy Cherry Point Range Complex DEIS/OEIS does not include the proposed actions described in the USWTR EIS/OEIS and comments will be addressed by the Navy in that document.
P5 - Susan Davis		
P5-1	Requested extension of the public comment period until 15 January 2009.	After careful consideration, the Navy made the decision not to extend the public comment period for the Navy Cherry Point DEIS document. This decision was made after evaluating the extension requests against the obligation to fulfill NEPA requirements while still meeting training needs. Adherence to the timeline permits the Navy to meet the planned dates for the publication of the Final EIS and the Record of Decision (ROD) in the Spring timeframe, as well as ensures continuity of Navy operations without interruption or cessation. Copies of US Fleet Forces signed letters responding to the Congressional Inquiries have been included at the end of this public response matrix.

Comment No.	Summary Comment	Comment Response
P6 - Frances T. Armstrong		
P6-1	Request for a more in-depth, comprehensive analysis of sonar cumulative impacts.	I n an effort to develop a comprehensive analysis of the use of Navy sonar training on the Atlantic coast and Gulf of Mexico, the Navy developed the Atlantic Fleet Active Sonar Training (AFAST) EIS/OEIS. The Navy Cherry Point Range Complex EIS/OEIS includes a summary of the AFAST EIS/OEIS analysis as well as including a comprehensive cumulative impacts analysis in Chapter 6 of this document.
P7- Janisse Ray		
P7-1	Says that a sonar range (implying USWTR) sited off the coast of Jacksonville is a bad idea.	The Navy Cherry Point Range Complex DEIS/OEIS does not include the proposed actions described in the USWTR EIS/OEIS and comments will be addressed by the Navy in that document.
P8- Dr. Stephanie A. Sellers		
P8-1	Requested extension of the public comment period until 15 January 2009.	After careful consideration, the Navy made the decision not to extend the public comment period for the Navy Cherry Point DEIS document. This decision was made after evaluating the extension requests against the obligation to fulfill NEPA requirements while still meeting training needs. Adherence to the timeline permits the Navy to meet the planned dates for the publication of the Final EIS and the Record of Decision (ROD) in the Spring timeframe, as well as ensures continuity of Navy operations without interruption or cessation. Copies of US Fleet Forces signed letters responding to the Congressional Inquiries have been included at the end of this public response matrix.

Comment No.	Summary Comment	Comment Response
P9 - Jacqueline Eckert		
P9-1	Requested extension of the public comment period until 15 January 2009.	After careful consideration, the Navy made the decision not to extend the public comment period for the Navy Cherry Point DEIS document. This decision was made after evaluating the extension requests against the obligation to fulfill NEPA requirements while still meeting training needs. Adherence to the timeline permits the Navy to meet the planned dates for the publication of the Final EIS and the Record of Decision (ROD) in the Spring timeframe, as well as ensures continuity of Navy operations without interruption or cessation. Copies of US Fleet Forces signed letters responding to the Congressional Inquiries have been included at the end of this public response matrix.
P10 - Mary Brown		
P10-1	Requested extension of the public comment period until January 2009.	After careful consideration, the Navy made the decision not to extend the public comment period for the Navy Cherry Point DEIS document. This decision was made after evaluating the extension requests against the obligation to fulfill NEPA requirements while still meeting training needs. Adherence to the timeline permits the Navy to meet the planned dates for the publication of the Final EIS and the Record of Decision (ROD) in the Spring timeframe, as well as ensures continuity of Navy operations without interruption or cessation. Copies of US Fleet Forces signed letters responding to the Congressional Inquiries have been included at the end of this public response matrix.
P11- Debra Fried		
P11-01	Letter is concerned about the potential effects of the Under Sea Warfare Training Range (USWTR) described in a separate EIS/OEIS	The Navy Cherry Point Range Complex DEIS/OEIS does not include the proposed actions described in the USWTR EIS/OEIS and comments will be addressed by the Navy in that document.
P12- White County Intermediate School		
P12-01	Thirty-one letters from third graders concerned with the health and welfare of marine mammals, primarily the North Atlantic right whale	The Navy has added more detail to Section 3.7, Marine Mammals, as well as detailing the mitigation measures in Chapter 5 and Cumulative Impacts in Chapter 6.

DEPARTMENT OF THE NAVY
COMMANDER
U.S. FLEET FORCES COMMAND
1562 MITSCHER AVENUE SUITE 250
NORFOLK, VA 23551-2487

5090
Ser N45/1026
November 7, 2008

The Honorable Mike McIntyre
House of Representatives
2437 Rayburn House Office Building
Washington, DC 20515-3307

Dear Mr. McIntyre:

Thank you for your letter of October 15, 2008, on behalf of The Karen Beasley Sea Turtle Rescue & Rehabilitation Center, and Mr. Jack Spruill of PenderWatch & Conservancy, regarding their requests for an extension of the public comment period concerning two documents - the Draft Environmental Impact Statements (DEIS)/Overseas EIS (OEIS) for the Navy Cherry Point Range Complex, hereinafter Cherry Point, and DEIS/OEIS for the Undersea Warfare Training Range (USWTR). We received your letter on October 28, 2008, from Commander, Naval Facilities Engineering Command, Atlantic, for direct response to you since U.S. Fleet Forces is the action proponent for both documents.

After careful consideration, the Navy made the decision not to extend the public comment period for both the Cherry Point and USWTR DEIS documents. This decision was made after evaluating the extension requests against the requirements to fulfill our obligations under NEPA. Adherence to the timeline ensures that the Navy can meet the planned dates for the publication of the Final EIS (FEIS) and the Record of Decision (ROD) next year in the Spring time frame. Navy representatives on October 23, 2008, informed Ms. Taryn G. Kiekow of the Natural Resources Defense Council, since she wrote a letter on behalf of both organizations, and Mr. Jack Spruill, of the above decision.

The Navy will review the public comments submitted on the DEIS of both projects and will address them, if appropriate, in the FEIS for the Cherry Point Range Complex and USWTR which will be released in Spring 2009. The FEIS of both projects will be filed by the Navy with the Environmental Protection Agency (EPA) when completed. The EPA will publish a Notice of Availability in the Federal Register stating that the documents are available for public review for a period of 30 days in accordance with NEPA.

The 30-day waiting or cooling off period is sometimes mistaken for a comment review period. Although the FEISs are publicly circulated, there is no requirement for a federal agency to request comments. Following the review period, the Department of the Navy will issue a ROD regarding the Cherry Point Range Complex and USWTR FEIS. If new substantive issues not covered in the FEIS are raised by comments submitted by The Karen Beasley Sea Turtle Rescue & Rehabilitation Center, PenderWatch & Conservancy or others during the 30-day waiting/cooling off period, the Navy will address these new substantive issues in the ROD.

Sincerely,

J. W. MURPHY
By Direction

DEPARTMENT OF THE NAVY
COMMANDER
U.S. FLEET FORCES COMMAND
1562 MITSCHER AVENUE SUITE 250
NORFOLK, VA 23551-2487

5090
Ser N4/7/1027
November 7, 2008

The Honorable Virgil H. Goode, Jr.
House of Representatives
70 East Court Street, Suite 215
Rocky Mount, VA 24151

Dear Mr. Goode:

Thank you for your letter of October 15, 2008, on behalf of Ms. Nazen Merjian, VFA, regarding her request for an extension of the public comment period concerning two documents - the Draft Environmental Impact Statements (DEIS)/Overseas EIS (OEIS) for the Navy Cherry Point Range Complex, hereinafter Cherry Point, and DEIS/OEIS for the Undersea Warfare Training Range (USWTR).

After careful consideration, the Navy made the decision not to extend the public comment period for both the Cherry Point and USWTR DEIS documents. This decision was made after evaluating the extension requests against the requirements to fulfill our obligations under NEPA. Adherence to the timeline ensures that the Navy can meet the planned dates for the publication of the Final EIS (FEIS) and the Record of Decision (ROD) next year in the Spring time frame.

The Navy will review the public comments submitted on the DEIS of both projects and will address them, if appropriate, in the FEIS for the Cherry Point Range Complex and USWTR which will be released in Spring 2009. The FEIS of both projects will be filed by the Navy with the Environmental Protection Agency (EPA) when completed. The EPA will publish a Notice of Availability in the Federal Register stating that the documents are available for public review for a period of 30 days in accordance with NEPA.

The 30-day waiting or cooling off period is sometimes mistaken for a comment review period. Although the FEISs are publicly circulated, there is no requirement for a federal agency to request comments. Following the review period, the Department of the Navy will issue a ROD regarding the Cherry Point Range Complex and USWTR FEIS. If new substantive issues not covered in the FEIS are raised by comments submitted by Ms. Merjian or others during the 30-day waiting/cooling off period, the Navy will address these new substantive issues in the ROD.

Sincerely,

J. W. MURPHY
By Direction

INTRODUCTION

Two public hearings were held 14-15 October 2008 to receive public comments on the Navy Cherry Point Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS). The hearings were held in Beaufort and Wilmington, North Carolina. The following is information resulting from each of these hearings.

PUBLIC HEARING #1

The first public hearing was held in Beaufort, NC at the Maritime Museum, October 14, 2008. The public was invited to attend an open-house from 5-7 pm during which time the Navy displayed six poster stations on various information regarding the EIS/OEIS. Subject Matter Experts (SME) were present to answer questions. From 7-9 pm a formal hearing was held and public comments were solicited. One speaker from the general public made a presentation. Fifteen people attended the open house, the hearing, or both. No written comments were received during the meeting. The following pages are scanned copies of the sign-in sheets, speaker cards, and transcript of the formal hearing.

PUBLIC HEARING #2

The second public hearing was held in Wilmington, NC, at the Best Western Inn and Convention Center, October 15, 2008. The public was invited to attend an open-house from 5-7 pm during which time the Navy displayed six poster stations on various information regarding the EIS/OEIS. Subject Matter Experts (SME) were present to answer questions. From 7-9 pm a formal hearing was held and public comments were solicited. One speaker from the general public made a presentation. Fourteen people attended the open house, the hearing, or both. Two written comment were received during the meeting. The following pages are scanned copies of the sign-in sheets, speaker cards, comment forms, and transcript of the formal hearing.

APPENDIX G FEDERAL CONSISTENCY DETERMINATION

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The Coastal Zone Management Act (CZMA) of 1972 (16 U.S.C. 1451 "*et seq*".) was enacted to protect coastal resources from growing demands associated with commercial, residential, recreational and industrial uses. The CZMA allows coastal states to develop a Coastal Zone Management Plan (CZMP) whereby they designate permissible land and water use within the state's coastal zone. States then have the opportunity to review and comment on federal agency activities that could affect the state's coastal zone or its resources.

Federal agency activities potentially affecting a state's coastal zone must be consistent, to the maximum extent practicable, with the enforceable policies of the state's coastal management program. The enforceable policies of a state's coastal management program for purposes of federal consistency consist of management programs adopted by a coastal State in accordance with the provisions of sections 305 and 306, (16 U.S.C. 1454, 1455(d)) of the CZMA and approved by the Assistant Administrator for the Ocean Services and Coastal Zone Management, National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce. In addition, the enforceable policies of a State must be legally binding through constitutional provisions, laws, regulations, land use plans, ordinances or judicial or administrative decisions, by which a State exerts control over private and public land and water uses and natural resources in the coastal zone and which are incorporated in a management program as approved by the Office of Ocean and Coastal Resource Management, NOAA, either as part of the program approval described above or as a program change in accordance with the procedures detailed in 16 U.S.C. 1455(e). Typically, a state's CZMP will focus on the protection of physical, biological, and socioeconomic resources.

Review of federal agency activities is conducted through the submittal of either a Consistency Determination or a Negative Determination. A federal agency shall submit a Consistency Determination when it determines that its activity may have either a direct or an indirect effect on a state's coastal zone or resources. In accordance with 15 CFR 930.39, the consistency determination shall include a brief statement indicating whether the proposed activity will be undertaken in a manner consistent to the maximum extent practicable with the enforceable policies of the management program and should be based upon an evaluation of the relevant enforceable policies of the management program.

Pursuant to 15 CFR 930.41, the state has 60 days from the receipt of the Consistency Determination in which to concur with or object to the Consistency Determination, or to request an extension under 15 CFR 930.41(b). Federal agencies shall approve one request for an extension period of 15 days or less.

A federal agency may submit a Negative Determination to a coastal state when the federal agency has determined that its activities would not have an effect on the state's coastal zone or its resources or when conducting the same or similar activities for which Consistency Determinations have been prepared in the past. Pursuant to 15 CFR 930.35 the state has 60 days to review a federal agency's Negative Determination. States are not required to concur with a Negative Determination, and if the federal agency has not received a response from the state by the 60th day of submittal, it may proceed with its action. However, within the 60-day review period, a state agency may request, and the federal agency shall approve, one request for an extension period of 15 days or less.

In accordance with the CZMA, the U.S. Navy has reviewed the enforceable policies for North Carolina's CZMP located within the Study Area. Based on the limitations discussed in Section 2.4, the enforceable policies for North Carolina's CZMP, and pursuant to 15 CFR 930.39, the U.S. Navy prepared and submitted a Consistency Determination to North Carolina. A copy of the CZMA determination letter is enclosed in this appendix. The Navy received North Carolina Department of Environment and Natural Resources concurrence March 30, 2009.

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DEPARTMENT OF THE NAVY
COMMANDER
U.S. FLEET FORCES COMMAND
1562 MITSCHER AVENUE SUITE 250
NORFOLK, VA 23551-2487

5090
Ser N4/7/77
February 25, 2009

Mr. Steve Rynas
Division of Coastal Management
Department of Environment and Natural Resources
400 Commerce Avenue
Moorehead City, NC 28557-3421

Dear Mr. Rynas:

The U.S. Navy is proposing activities associated with U.S. Navy Atlantic Fleet training; research, development, testing, and evaluation (RDT&E); and associated range capabilities enhancements, including infrastructure improvements in the U.S. Navy Cherry Point Range Complex. The purpose of the proposed action is to: 1) achieve and maintain Fleet readiness to support and conduct current, emerging, and future training operations and RDT&E operations; 2) expand warfare missions supported by the range complex; and 3) upgrade and modernize existing range capabilities to enhance and sustain U.S. Navy training and RDT&E.

Pursuant to Section 307(c)(1), 16 United States Code (USC) 1456 of the Coastal Zone Management Act (CZMA) of 1972, as amended, we have determined that the proposed action in the U.S. Navy Cherry Point Range Complex will be conducted in a manner consistent with the enforceable policies of North Carolina's coastal management program. The basis for this "Consistency Determination" is detailed in Enclosure (1) based on the enforceable policies in the State's federally approved coastal management plan[1].

In addition, Enclosure (2) is a CD-ROM of the U.S. Navy Cherry Point Draft Environmental Impact Statement (DEIS)/Overseas EIS (OEIS) and appendices, which were published and released to the public for comment on September 12, 2008[2], in compliance with the National Environmental Policy Act and Executive Order 12114. Further

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[1] See CZMA Section 304, 16 USC 1453 (6a). An enforceable policy is a state policy that is legally binding under state law, and by which a state exerts control over private and public coastal uses and resources, and which are incorporated in the states federally approved coastal management plan. An enforceable policy is limited to a state's jurisdiction and must be given legal effect by state law and cannot apply to federal lands, federal waters, federal agencies or other areas or entities outside the state's jurisdiction, unless authorized by federal law.

[2] Federal Register, FR Vol. 73 No. 178, Friday September 12, 2008, pages 52969 to 52972.

information regarding these DEIS/OEIS documents may be obtained by visiting the project website: www.navycherrypointrangecomplexeis.com.

In accordance with 15 Code of Federal Regulations (CFR) Section 930.32, the Department of the Navy has reviewed North Carolina's coastal management program and associated enforceable policies, and has determined that the proposed activities occurring within North Carolina's coastal zone are consistent to the maximum extent practicable.

In accordance with 15 CFR Section 930.41(a), the State of North Carolina has 60 days from the receipt of this document in which to concur with, or object to, this Consistency Determination, or to request an extension under 15 CFR Section 930.41(b). Our point of contact is Ms. Susan Admire, Naval Facilities Engineering Command, Atlantic, (757) 322-4398.

North Carolina's concurrence will be presumed if its response is not received by the U.S. Navy (U.S. Fleet Forces Command) within 60 days from receipt of this Consistency Determination. North Carolina's response or other inquiries should be sent to: Naval Facilities Engineering Command, Atlantic, Attn: Code EV22 (U.S. Navy Cherry Point Range Complex EIS/OEIS Project Manager), 6506 Hampton Blvd., Norfolk, Virginia 23508-1278; or Facsimile (757) 322-4805. If additional information should be required, such information should be requested within ten days of receipt of this Consistency Determination.

Sincerely,

D. F. BAUCOM
Assistant Deputy Chief of Staff
for Operational Readiness
and Training

Enclosures: 1. Federal Agency CZMA Consistency Determination for North Carolina
2. U.S. Navy Cherry Point DEIS/OEIS CD-Rom

FEDERAL AGENCY COASTAL ZONE MANAGEMENT ACT (CZMA) CONSISTENCY DETERMINATION FOR NORTH CAROLINA

INTRODUCTION

This document provides the State of North Carolina with the Department of the Navy's (U.S. Navy) Consistency Determination under the CZMA 16 United States Code (U.S.C). § 1456 Section 307 (c) (1) and (2) and 15 Code of Federal Regulations (CFR) § 930.36, for training and testing activities in the U.S. Navy Cherry Point Range Complex. The information in this CZMA Consistency Determination is provided pursuant to 15 CFR § 930.39.

The proposed action of the U.S. Navy Cherry Point Complex Environmental Impact Statement (EIS)/Overseas EIS (OEIS) has potential to affect North Carolina's coastal zone resources as described in this CZMA Consistency Determination.

The following information is based upon a review of North Carolina's Coastal Management Program (CMP) and its associated enforceable policies, and information provided by the North Carolina Division of Coastal Management (DCM). The near-shore portions of the range complex is within the Public Trust Areas of the Estuarine and Ocean System Area of Environmental Concern (15A NCAC 07H .0207). State permits are not required to implement the proposed action.

In accordance with CZMA and North Carolina's Coastal Area Management Act, the State of North Carolina requires that federal agencies conduct a CZMA Consistency Determination for certain direct federal actions, federal permits and licenses, and federal assistance programs that occur within the State's designated coastal zone, and have the potential to affect the State's coastal zone resources.

North Carolina's coastal zone includes the 20 counties that are adjacent to, adjoining, intersected by, or bounded by the Atlantic Ocean or any coastal sound(s). There are two tiers within the coastal boundary. The first tier is comprised of Areas of Environmental Concern (AEC), and the second tier includes land uses which have potential to affect coastal waters even though they are not located in AECs. The seaward extent of North Carolina's coastal zone is 5.6 kilometers (3 nautical miles (nm)) into the Atlantic Ocean.

The proposed action includes direct federal activities that would take place inside the State of North Carolina's coastal zone. Based on analysis in the EIS/OEIS, the scope of activities requires a CZMA Consistency Determination because the activities have the potential to impact coastal resources within the State of North Carolina's coastal zone.

The National Marine Fisheries Service (NMFS) is a cooperating agency for the U.S. Navy Cherry Point EIS/OEIS. In accordance with the Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA), the U.S. Navy has analyzed the potential effects of the proposed action on threatened and endangered species, and non-listed marine mammals in consultation with NMFS.

Activities that have the Potential to Impact North Carolina's Coastal Zone

The U.S. Navy used a screening process to identify aspects of the proposed action that could act as stressors to resources and issues evaluated in the EIS/OEIS. U.S. Navy subject matter experts studied the warfare areas and operations to identify specific activities that could act as stressors. Public and agency scoping comments, previous environmental analyses, previous agency consultations, laws, regulations, Executive Orders (E.O.), and resource-specific information were

also evaluated. Of the potential environmental stressors considered for the analysis of environmental consequences, the following stressors were carried forward for detailed analyses:

- Vessel movements (disturbance and collisions)
- Aircraft overflights (disturbance and strikes)
- Towed mine warfare devices
- Temporary mineshape deployment/recovery
- Non-explosive practice munitions
- Underwater detonations and high explosive (HE) ordnance
- Military expended materials

Most of the activities in the proposed action would be conducted in the offshore operating area (OPAREA), beginning at 3 nm from the coastline and extending seaward. Activities that would be conducted in the OPAREA include:

- Mine Warfare (MIW): Mine Countermeasures and Mine Neutralization;
- Surface Warfare: Missile Exercise (MISSILEX) (air-to-surface), Gunnery Exercise (GUNEX) (air-to-surface), GUNEX (surface-to-surface), Bombing Exercise (BOMBEX), Maritime Security Operations, and Laser Targeting;
- Air Warfare: Air Combat Maneuvers (ACM), Air Intercept Control, MISSILEX (air-to-air and surface–to-air), Detect to Engage, and GUNEX (air-to-air and surface-to-air);
- Strike Warfare: High-speed Anti-radiation Missile (HARM) Exercises;
- Electronic Combat: Electronic Combat Operations, Chaff Exercise, and Flare Exercise (aircraft self-defense); and
- Amphibious Warfare: Firing Exercises (FIREX) with Integrated Maritime Portable Acoustic Scoring and Simulator System (IMPASS), FIREX (land), Amphibious Assault, and Amphibious Raid

Fewer activities would be conducted within 3 nm of North Carolina's coast. These activities would include:

- Mine Warfare: Mine Countermeasures (No HE used, and includes aircraft overflights, towed mine warfare devices, and temporary mineshape deployment/recovery as environmental stressors); and
- Amphibious Warfare: Amphibious Assault, Amphibious Raid (Includes vessel movements and aircraft overflights as environmental stressors).

No activity in the proposed action would be conducted on land in North Carolina. Specific details of the current and proposed operations are presented in Chapter 2 of the enclosed Draft EIS/OEIS.

CONSISTENCY DETERMINATION

In accordance with 15 CFR § 930.39, the U.S. Navy has reviewed North Carolina's CMP and associated enforceable policies and determined that the proposed action in the U.S. Navy Cherry Point Range Complex EIS/OEIS is consistent to the maximum extent practicable with North Carolina's CMP. The findings presented below are based on the analyses presented in Chapter 3, Affected Environment and Environmental Consequences of the Draft EIS/OEIS.

PROPOSED FEDERAL AGENCY ACTION

The U.S. Navy has prepared an EIS/OEIS to assess potential environmental impacts for the proposed action in the U.S. Navy Cherry Point Range Complex over a ten-year planning horizon. The EIS/OEIS is expected to be completed in the spring of 2009. The proposed activities evaluated in the EIS/OEIS are associated with U.S. Navy and Marine Corps training; research, development, testing, and evaluation (RDT&E) activities; and associated range capabilities enhancements.

The components of the U.S. Navy Cherry Point Range Complex encompass 18,966 square nautical miles (nm^2) of special use airspace warning area; 18,617 nm^2 of offshore surface and subsurface OPAREA; and 12,529 nm^2 of deep ocean area greater than 100 fathoms (600 feet). The geographic scope of the EIS/OEIS includes the airspace; seaspace; and undersea space of the U.S. Navy Cherry Point Range Complex, including the area from the mean high tide line, up to and extending seaward from the 3 nm western boundary of the OPAREA, and referred to as the U.S. Navy Cherry Point Study Area (refer to the study area figure in the enclosed CD). The U.S. Navy Cherry Point Study Area does not include any dry land.

The EIS/OEIS was prepared by the U.S. Navy in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. Section 4321); The Council on Environmental Quality regulations for implementing the procedural provisions of the NEPA (Title 40 CFR Parts 1500-1508); Department of the Navy procedures for implementing the NEPA (32 CFR 775); E.O. 12114, Environmental Effects Abroad of Major Federal Actions; and Department of Defense regulations implementing E.O. 12114 (32 CFR Part 187). The proposed action requires analysis of potential impacts within and outside U.S. territory. Therefore, the document was written to satisfy the requirements of both NEPA (for areas within the United States) and E.O. 12114.

In accordance with 50 CFR Part 401.12, the U.S. Navy has prepared a separate biological evaluation (BE) for the three east coast range complexes (Virginia Capes, U.S. Navy Cherry Point, and Jacksonville) to assess the potential effects from the proposed action on marine resources and anadromous fish (which live in saltwater but spawn in freshwater) protected by NMFS under ESA. In accordance with the MMPA (16 U.S.C. Section 1371[a][5]), the U.S. Navy has submitted a request for a letter of authorization (LOA) and an addendum to the LOA request for the three east coast range complexes to NMFS for the incidental taking of marine mammals by the proposed actions. The LOA and addendum for the U.S. Navy Cherry Point Range Complex are available for review at the following web site address for NOAA Fisheries, Office of Protected Resources: http://www.nmfs.noaa.gov/pr/permits/incidental.htm#applications. In addition, the U.S. Navy has prepared a separate consultation package for the three range complexes in accordance with legal requirements set forth under regulations implementing Section 7 of the ESA (50 CFR 402; 16 U.S.C 1536 (c)) for listed species under jurisdiction of the U.S. Fish and Wildlife Service (USFWS). Consultation is ongoing.

The proposed action is to support and conduct current and emerging training and RDT&E operations in the range complex. To achieve this, the U.S. Navy proposes to:

- Maintain training and RDT&E operations at current levels if the No Action alternative is selected.

If either Alternative 1 or Alternative 2 is selected, then:

- Increase or modify training and RDT&E operations from current levels as necessary in support of the Fleet Response Training Plan (FRTP).

- Accommodate mission requirements associated with force structure changes, including those resulting from the introduction of new platforms (aircraft, and weapons systems).
- Implement enhanced range complex capabilities.

The U.S. Navy's preferred alternative is Alternative 2, which includes implementation of Alternative 1, plus eliminating all HE bombing exercises at-sea (BOMBEX Air-to-Surface) and designating a MIW training area for major exercise MIW events. Under the Preferred alternative, all components of the proposed action (for example, increases in training and RDT&E operations, force structure changes, and implementation of enhancement recommendations) would be achieved, based on the goal of meeting the purpose and need of the proposed action to the maximum extent possible by optimizing training to support future contingencies. The U.S. Navy is seeking concurrence on this consistency determination based on the preferred alternative.

Purpose and Need for Action

Operational requirements for deployment of naval forces world-wide drive and shape training doctrine and procedures. The nature of modern warfare and security operations has become increasingly complex. U.S. Navy training activities must focus on achieving proficiency in eight functional areas, known as Primary Mission Areas: Air Warfare, Amphibious Warfare, Surface Warfare, Anti-submarine Warfare, Mine Warfare, Strike Warfare, Electronic Combat, and Naval Special Warfare. The EIS/OEIS addresses the training strategies described in the FRTP to implement the Fleet Response Plan, which is to ensure continuous availability of agile, flexible, trained, and ready surge-capable (rapid response) forces.

The purpose for the proposed action is therefore to:

- Achieve and maintain Fleet readiness using the range complex to support and conduct current, emerging, and future training operations and RDT&E operations;
- Expand warfare missions supported by the range complex; and
- Upgrade and modernize existing range capabilities to enhance and sustain U.S. Navy training and RDT&E.

The need for the proposed action is to provide range capabilities for training and equipping combat-capable naval forces ready to deploy worldwide. In this regard, the range complex furthers the U.S. Navy's execution of its congressionally mandated roles and responsibilities under Title 10 U.S.C § 5062. To implement this Congressional mandate, the U.S. Navy needs to:

- Maintain current levels of military readiness by training in the range complex;
- Accommodate future increases in operational training tempo in the range complex and support the rapid deployment of naval units or strike groups;
- Achieve and sustain readiness of ships and squadrons so the U.S. Navy can quickly surge significant combat power in the even of a national crisis or contingency operation, and consistent with the FRTP;
- Support the acquisition and implementation into the Fleet of advanced military technology. The range complex must adequately support the testing and training needed for new platforms (aircraft and weapons systems); and
- Maintain the long-term viability of the range complex while protecting human health and the environment, and enhancing the quality and communication capability and safety of the range complex.

Support to current, emerging, and future training and RDT&E operations, including implementation of range enhancements, entails the action evaluated in the EIS/OEIS. These potentially include:

- Increase use of contractor-operated aircraft that simulate enemy aircraft during training (Commercial Air Services Support for Fleet Opposition Forces and Electronic Warfare Threat Training);
- Increase anti-piracy and maritime interception training (Maritime Security Surface Strike Group Training);
- Support MH-60 R/S helicopter warfare mission areas;
- Designate a littoral mine warfare training area for the temporary deployment of mineshapes in support of Strike Group mine warfare training during major exercises; and
- Upgrade the Mid-Atlantic Electronic Warfare Range.

FEDERAL CONSISTENCY REVIEW

Agency comments on the Draft EIS/OEIS were reviewed for preparation of this Consistency Determination. Specific comments and responses that were considered are provided in the following paragraphs.

Regarding a recommendation that the Integrated Comprehensive Monitoring Program (ICMP) be expanded to include monitoring military expended materials in the aquatic environment, the U.S. Navy has implemented the Water Range Sustainability Environmental Program Assessment Policy (dated August 29, 2008) to ensure the long-term viability of operational ranges, while protecting human health and the environment, and to develop a written operational range assessment plan that details the process and procedures to assess operational ranges. These assessments will consist of detailed study of the water body, inventories of the munitions/targets used, and specific range usage data, development of a site-specific conceptual site model, fate and transport analyses, and an assessment of regulatory compliance. These assessments will be updated every five years to account for new technologies, changes in range usage, and changes in regulations/action levels.

Regarding a request to continue developing the ICMP, the U.S. Navy is continuing development in cooperation with NMFS. The ICMP will be used as: 1) a planning tool to focus U.S. Navy monitoring priorities (pursuant to ESA/MMPA requirements) across U.S. Navy range complexes and exercises; and 2) an adaptive management tool, through the consolidation and analysis of the U.S. Navy's monitoring and lookout data, as well as new information from other U.S. Navy programs (e.g., research and development), and newly published non-U.S. Navy information.

Regarding a recommendation that the Draft EIS/OEIS assess water quality impacts based on the degree of impairment, the U.S. Navy revised descriptions of conditions resulting in significant impacts to include impairment of water resources. Regarding a recommendation that the Draft EIS/OEIS include a discussion of how the proposed action will affect state resources and how adverse effects will be mitigated as required for this consistency determination, the U.S. Navy will comply with all of the state's enforceable policies (approved by Federal CZMA).

Regarding a recommendation that the Draft EIS/OEIS include recommendations made to U.S. Marine Corps regarding activities in the Onslow Bay area, the U.S. Navy will coordinate with the Camp Lejeune Environmental Management Division on the expeditionary fighting vehicles recommendations to avoid or minimize potential impacts to sea turtles and other wildlife species. Regarding a request to list state and federal water quality standards and provide data demonstrating that sediment disturbance will not exceed those standards, the regulatory framework for water resources is presented in Appendix K of the Draft EIS/OEIS. The assessment indicates that potential temporary disturbance to sediments would be distributed across an expansive off-shore area (18, 617 nm^2).

Regarding a concern for potential impacts from deployment of mine shapes and their concrete anchors to live/hard bottom habitat in the Mine Warfare Training Area, the U.S. Navy will not place mine shapes in sensitive areas, like hard bottoms, artificial reefs, shipwrecks, and coral reefs.

Regarding a concern for the potential impacts of non-explosive practice munitions (NEPM) on artificial reefs and shipwrecks due to increases proposed in the preferred alternative, no detonations will take place on artificial reefs and shipwrecks. In addition, NEPM in the range will be primary chaff and flares; they will be widely dispersed by wind and wave action. Other NEPM includes training bombs and missiles that quickly drop to the ocean bottom. Due to the fact that they are non-explosive, settling on the ocean floor causes very local disturbance that would not cause long term impacts.

In accordance with CZMA, North Carolina's CMP is comprised of the following state statutes found under North Carolina Administrative Code Title 15A, Chapter 7 Coastal Management.

Activities in Public Trust Areas (15A NCAC 07H)

- 0205 Coastal Wetlands
- 0206 Estuarine Waters
- 0207 Public Trust Areas
- 0209 Estuarine Shorelines
- 0303 Ocean Hazard Areas
- 0403 Public Water Supplies
- 0505 Coastal Areas that Sustain Remnant Species
- 0506 Coastal Complex Natural Area
- 0507 Unique Coastal Geologic Formations
- 0509 Significant Coastal Archaeological Resources
- 0510 Significant Coastal Historic Architectural Resources
- 0602 Pollution of Water
- 0603 Minimum Altitudes
- 0604 Noise Pollution

Activities Outside Areas of Environmental Concern (15A NCAC 07M)

- 0200 Shoreline Erosion
- 0300 Shorefront Access
- 0400 Coastal Energy
- 0500 Post-disaster
- 0600 Floating Structures
- 0700 Mitigation
- 0800 Coastal Water Quality
- 1000 Water and Wetland Based Target Areas for Military Training Areas
- 1100 Beneficial Use and Availability of Materials Resulting from the Excavation or Maintenance of Navigation Channels
- 1200 Ocean Mining

North Carolina's CMP, as approved by National Oceanic and Atmospheric Administration, constitutes the enforceable policies of the CMP. Statutes addressed as part of the consistency review and considered in the analysis of the proposed action are discussed in Table 1 below. The proposed action would not result in any excavation or filling within any estuarine waters, tidelands, or State-owned lakes; therefore, no action is required regarding compliance with North Carolina's Dredge and Fill Law (NCGS 113-229). The U.S. Navy has determined that the proposed action is consistent to the maximum extent practicable with the enforceable policies of North Carolina's CMP based on the following information, data, and analysis (given as a

summary in the table and presented as a comprehensive analysis in Chapter 3 of the Draft EIS/OEIS).

Pursuant to 15 CFR § 930.41, the North Carolina State Clearinghouse has 60 days from receipt of this document in which to concur with, or object to, this Consistency Determination, or to request an extension, in writing, under 15 CFR § 930.41(b). North Carolina's concurrence will be presumed if the U.S. Navy (U.S. Fleet Forces Command) does not receive its response within 60 days from receipt of this Determination. North Carolina's response should be sent to Naval Facilities Engineering Command, Atlantic, Attn: Code EV22 (U.S. Navy Cherry Point Range Complex EIS/OEIS Project Manager), 6506 Hampton Blvd., Norfolk, Virginia 23508-1278. The DEIS/OEIS may be downloaded by visiting the project's website: www.navycherrypointrangecomplexeis.com.

Table 1. North Carolina Coastal Management Program Consistency Review

Section (North Carolina Statute)	Scope	Consistency
Activities in Public Trust Areas (DCM 15A North Carolina Administrative Code 07H) State Guidelines for Areas of Environmental Concern (AEC)		
0205 Coastal Wetlands	To conserve and manage coastal wetlands so as to safeguard and perpetuate their biological, social, economic and aesthetic values; to coordinate and establish a management system capable of conserving and utilizing coastal wetlands as a natural resource essential to the functioning of the entire estuarine system.	The Proposed Action does not include testing and training activities in or affecting coastal wetlands; therefore, the policy is not applicable.
0206 Estuarine Waters	To conserve and manage the important features of estuarine waters so as to safeguard and perpetuate their biological, social, aesthetic, and economic values; to coordinate and establish a management system capable of conserving and utilizing estuarine waters so as to maximize their benefits to man and the estuarine and ocean system.	The Proposed Action does not include testing and training activities in or affecting estuarine waters; therefore, the policy is not applicable.
0207 Public Trust Areas	To protect public rights for navigation and recreation and to conserve and manage the public trust areas so as to safeguard and perpetuate their biological, economic and aesthetic value.	The Proposed Action includes testing and training activities in public trust areas that, due to safety concerns, would temporarily restrict public access in accordance with established procedures. However, the action would be consistent with the policy.
0209 Estuarine Shorelines	Ensures that shoreline development is compatible with the dynamic nature of coastal shorelines as well as the values and the management objectives of the estuarine and ocean system.	The Proposed Action does not include development activities in or affecting estuarine shorelines; therefore, the policy is not applicable.

Section (North Carolina Statute)	Scope	Consistency
0303 Ocean Hazard Areas	Ensures protection of natural hazard areas along the Atlantic Ocean shoreline where, because of their special vulnerability to erosion or other adverse effects of sand, wind, and water, uncontrolled or incompatible development could unreasonably endanger life or property. Ocean hazard areas include beaches, frontal dunes, inlet lands, and other areas in which geologic, vegetative and soil conditions indicate a substantial possibility of excessive erosion or flood damage.	The Proposed Action does not include construction and development activities in ocean hazard areas; therefore, the policy is not applicable.
0403 Public Water Supplies	Regulates development within critical water supply areas is the protection and preservation of public water supply well fields and A-II streams and to coordinate and establish a management system capable of maintaining public water supplies so as to perpetuate their values to the public health, safety, and welfare.	The Proposed Action does not include testing and training activities in or affecting small surface water supply watersheds and public water supply well fields; therefore, the policy is not applicable.
0505 Coastal Areas that Sustain Remnant Species	Protects unique habitat conditions that are necessary to the continued survival of threatened and endangered native plants and animals and minimizes land use impacts that might jeopardize these conditions.	The Proposed Action would not jeopardize fragile coastal natural resource areas that sustain remnant species as indicated in the BE and USFWS consultation package. Therefore, the action would be consistent with the policy.
0506 Coastal Complex Natural Area	Protects features of a designated coastal complex natural area to safeguard its biological relationships, educational and scientific values, and aesthetic qualities. These areas are defined as lands that support native plant and animal communities and provide habitat qualities which	The Study Area does not include significant components of coastal systems or especially notable habitat areas of scientific, educational, or aesthetic value; therefore, the policy is not applicable.

Section (North Carolina Statute)	Scope	Consistency
	have remained essentially unchanged by human activity.	
0507 Unique Coastal Geologic Formations	Preserves unique resources of more than local significance that function as key physical components of natural systems, as important scientific and educational sites, or as valuable scenic resources.	The Proposed Action does not include testing and training activities in or affecting unique coastal geologic formations; therefore, the policy is not applicable.
0509 Significant Coastal Archaeological Resources	Conserves coastal archaeological resources of more than local significance to history or prehistory that constitute important scientific sites, or are valuable educational, associative, or aesthetic resources.	The Proposed Action would not impact historical resources of the state. The Navy would avoid all known cultural resources; however, if effects to cultural resources are anticipated, consultation with the applicable agencies, including the State Historic Preservation Officer would be initiated in accordance with Section 106 of the National Historic Preservation Act. Therefore, the action would be consistent with the policy.
0510 Significant Coastal Historic Architectural Resources	Conserve coastal historic architectural resources of more than local significance which are valuable educational, scientific, associative or aesthetic resources.	The Proposed Action does not include testing and training activities in districts, structures, buildings, sites or objects that have more than local significance to history or architecture; therefore, the policy is not applicable.
0602 Pollution of Water	Specifies that no development shall be allowed in any AEC which would have a substantial likelihood of causing pollution of the waters of the state in which shell fishing is an existing use to the extent that such waters would be officially closed to the taking of shellfish.	The Proposed Action does not include development activities in or adjacent to shell fish waters; therefore, the policy is not applicable.

Section (North Carolina Statute)	Scope	Consistency
0603 Minimum Altitudes	Specifies that no development involving airspace activity shall be allowed in any AEC which would result in violation of minimum altitude standards adopted by the Federal Aviation Administration (FAA) and codified at 14 CFR Part 91.79.	The Proposed Action would not impact FAA minimum altitude standards. Air traffic control is provided by FAA, which owns and operates the air traffic control system, and the Fleet Area Control and Surveillance Facility in Virginia, which is a designated air traffic control facility and is required to provide air traffic separation consistent with FAA guidelines to ensure the safe, efficient and expeditious flow of air traffic. Therefore, the policy is not applicable.
0604 Noise Pollution	Specifies that except as required for safe aircraft takeoff and landing operations, airspace activity associated with coastal development shall not impose an increase in average noise exceeding 10 dBA above background levels.	The Proposed Action does not include airspace activity associated with coastal development; therefore, the policy is not applicable.
Activities outside Areas of Environmental Concern (DCM 15A North Carolina Administrative Code 07M)		
General Policy Guidelines for the Coastal Area		
0200 Shoreline Erosion	Addresses development along the ocean and estuarine shoreline and erosion response measures that should be developed to minimize the loss of private and public resources.	The Proposed Action does not include development along of affecting the ocean or estuarine shoreline; therefore, the policy is not applicable.
0300 Shorefront Access	Addresses provision of pedestrian access to the public trust waters, including the ocean beaches and estuarine waters for recreational purposes in the 20 coastal counties.	The Proposed Action includes temporary testing and training activities in public trust waters that, due to safety concerns, would temporarily restrict pedestrian access. However, the action would be consistent with the policy.
0400 Coastal Energy	Addresses development of energy facilities and energy resources in the state and in offshore	The Proposed Action does not include the development of energy facilities or exploration of offshore or OCS

Section (North Carolina Statute)	Scope	Consistency
	waters, and exploration for the development of offshore and outer continental shelf (OCS) energy resources such as oil and gas.	energy resources; therefore, the policy is not applicable.
0500 Post-disaster	Intended to provide guidance on and mitigate for the effects of a coastal natural disaster by providing adequate plans for post-disaster reconstruction.	The Proposed Action does not include any efforts to assist with post-disaster activities; therefore, the policy is not applicable.
0600 Floating Structures	Addresses prohibition of floating structures intended for human habitation or commerce in public trust waters of the coastal area except in permitted marinas.	The Proposed Action would not include floating structures as defined in the statute; therefore, the policy is not applicable.
0700 Mitigation	Addresses mitigation for adverse impacts to coastal lands and waters from development.	The Proposed Action does not include construction or other activities that could result in adverse impacts. Therefore, the policy is not applicable.
0800 Coastal Water Quality	Declares that no land or water use shall cause the degradation of water quality so as to impair traditional uses of the coastal waters, including activities outside the coastal area.	The Proposed Action would not result in releases of constituents in violation of state or federal water quality standards; therefore, the action would be consistent with the policy.
1100 Beneficial Use and Availability of Materials Resulting from the Excavation or Maintenance of Navigation Channels	Regulates disposal of materials resulting from excavation or maintenance of navigation channels and promotes its beneficial use whenever practicable.	The Proposed Action does not include any excavation or maintenance activities or disposal of material from these activities; therefore, the policy is not applicable.
1200 Ocean Mining	Regulates mining activities in state waters, or in federal waters insofar as the activities affect any land, water use or natural or historic resource of the state waters.	The Proposed Action does not include any mining activities or construction of mining-related structures; therefore, the policy is not applicable.

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Coastal Management

Beverly Eaves Perdue
Governor

James H. Gregson
Director

Dee Freeman
Secretary

March 30, 2009

Susan Admire
(ATTN Code EV22 (US Navy Cherry Point Range Complex EIS/OEIS Project Manager))
Deputy Chief of Staff for Operational Readiness and Training
Naval Facilities Engineering Command
6506 Hampton Blvd.
Norfolk, VA 23508-1278

SUBJECT: **CD09-016** – Consistency Concurrence for the Proposed Continuance of Navy Training within the Cherry Point Range Complex (CHPT), Offshore, North Carolina (DCM#20090021)

Dear Ms. Admire:

We received your consistency determination on February 26, 2009 for proposed continuance of Navy training within the Cherry Point Range Complex (CHPT), Offshore, North Carolina According to the submission, the Navy is proposing a variety of activities associated with US Navy Atlantic Fleet training such as: research, development, testing, and evaluation. Additionally, in support of the training, the Navy is proposing associated range capabilities enhancements, including infrastructure improvements. The proposed project is described in greater detail in the: "*Navy Cherry Point Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement*" (August 2008).

North Carolina's coastal zone management program consists of, but is not limited to, the Coastal Area Management Act, the State's Dredge and Fill Law, Chapter 7 of Title 15A of North Carolina's Administrative Code, and the land use plan of the County and/or local municipality in which the proposed project is located. It is the objective of the Division of Coastal Management (DCM) to manage the State's coastal resources to ensure that proposed Federal activities would be compatible with safeguarding and perpetuating the biological, social, economic, and aesthetic values of the State's coastal waters.

To solicit public comments, DCM circulated a description of the proposed project to State agencies that would have a regulatory interest. No comments asserting that the proposed activity would be inconsistent with the State's coastal management program were received. Nevertheless, comments were received concerning the use of sonar, the effect of training activities on public trust rights, the impact of training activities on marine life, and the impact of increased training activities on Hammocks Beach State Park. A copy of the responses received has been attached for reference.

DCM has reviewed the submitted information pursuant to the management objectives and enforceable policies of Subchapters 15A NCAC 07H and 15A NCAC 07M of Chapter 7 of Title 15A of North

Carolina's Administrative Code which are a part of the State's certified coastal management program and concurs that the proposed Federal activity is consistent, to the maximum extent practicable, with the enforceable policies of North Carolina's coastal management program. This concurrence applies only to the Navy's implementation of Alternative 2 and adherence to the mitigation measures as described in the "*Navy Cherry Point Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement*" (August 2008).

Though we have concurred with the proposed project, this proposed project along with other recent military training proposals in North Carolina constitutes a cumulative incremental increase in the intensity of training activities along North Carolina's shoreline. The continued increased intensification of military training activities has raised concerns, as expressed in the attached comments, that the Navy's proposed training activities will have increasingly cumulative adverse effects on marine life, public usage of coastal waters, and public enjoyment and use of Hammocks Beach State Park. We encourage the Navy to carefully review the concerns expressed by the commenting State agencies. We request that the Navy respond, to the maximum extent practical, in a positive manner to those concerns.

Should the proposed action be modified, a revised consistency determination could be necessary. This might take the form of either a supplemental consistency determination pursuant to 15 CFR 930.46, or a new consistency determination pursuant to 15 CFR 930.36. Likewise, if further project assessments reveal environmental effects not previously considered by the proposed development, a supplemental consistency certification may be required. If you have any questions, please contact Stephen Rynas at 252-808-2808. Thank you for your consideration of the North Carolina Coastal Management Program.

Sincerely,

Doug Huggett

Doug Huggett
Manager, Major Permits and Consistency Unit

Cc: Jim Gregson, Division of Coastal Management
Frank Jennings, Division of Coastal Management
Terry Moore, Division of Coastal Management
Teri Barrett, Division of Coastal Management
Steve Everhart, Division of Coastal Management

North Carolina Department of Environment and Natural Resources
Division of Coastal Management

Beverly Eaves Perdue
Governor

James H. Gregson
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Dee Freeman
Secretary

MEMORANDUM

February 27, 2009

TO: Tancred Miller
Division of Coastal Management - Morehead
400 Commerce Avenue
Morehead City, NC 28557-3421

FROM: Stephen Rynas, AICP; Federal Consistency Coordinator

SUBJECT: Proposed Continuance of Navy Training Within the Cherry Point Range Complex (DCM#20090021)

LOCATION: Offshore, North Carolina

This document is being circulated for **consistency** review and comment by **March 20, 2009**. The US Navy is proposing to continue training operations off the coast of North Carolina within the Navy's designated Cherry Point Range Complex (CHPT). Please see page ES-3 for the graphic of the CHPT area. (Steve, Terre, Terry, and Frank; delegate as needed.) Your responses will assist us in determining whether the proposed project would be consistent with the State's Coastal Management Program. If the proposed project does not conform to your requirements, please identify the measures that would be necessary to bring the proposed project into conformance. If you have any additional questions regarding the proposed project you may contact me at 252-808-2808.

REPLY:

_____ No Comment.

_____ This office supports the project as proposed.

_✓_ Comments to this project are attached.

_____ This office objects to the project as proposed.

Signed: [signature] Date: 3/19/2009

CORRECTIONS: Please identify any corrections, additions, or deletions that should be made in terms of contact information.

RETURN COMPLETED FORM TO:

Stephen Rynas, Federal Consistency Coordinator
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557-3421

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Coastal Management

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March 19, 2009

TO: Stephen Rynas
Federal Consistency Coordinator
NC Division of Coastal Management
400 Commerce Ave
Morehead City, NC 28557

RE: Consistency request for continuance of Navy training within the Cherry Point Range Complex (DCM#20090021)

Thank you for the opportunity to review the above-referenced consistency request. The request notes the proposed use of active sonar for mine warfare exercises. The Division of Coastal Management (DCM) has previously submitted comments in response to the use of active sonar. Those comments would be applicable to this consistency request, therefore I recommend incorporating the following prior comments by reference into your response to the US Navy:

1. March 26, 2008 comments from DCM re Proposed Use of Sonar in Atlantic Fleet Training Exercises in the Atlantic Ocean and the Gulf of Mexico (SCH#08-0258, DCM#20080017 and DCM#200820).
2. November 14, 2006 comments from DCM regarding the Proposed Environmental Assessment for Atlantic Fleet Active Sonar Training along the East Coast of the United States (SCH#07-0114, DCM#20060086).
3. January 24, 2006 comments from DCM re Draft Overseas Environmental Impact Statement/Environmental Impact Statement for the Undersea Warfare Training Range (SCH#06-146, DCM#2005099).

In addition, there have been other state agency responses regarding the use of active sonar in North Carolina's state and contiguous waters, including comments from the NC Division of Marine Fisheries and the NC Wildlife Resources Commission. I recommend that those agencies' prior comments be incorporated by reference into your response if the agencies so desire.

Sincerely,

Tancred Miller
Coastal Policy Analyst
NC Division of Coastal Management
400 Commerce Ave
Morehead City, NC 28557

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Parks and Recreation

Beverly Eaves Perdue, Governor | Dee Freeman, Secretary | Lewis Ledford, Director

March 25, 2009

Stephen Rynas, Federal Consistency Coordinator
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557-3421

Re: DCM#20090021

Dear Mr. Rynas,

The North Carolina State Division of Parks and Recreation (DPR) reviewed Environmental Impact Statement for expansion of training at Navy Cherry Point Range Complex (DCM#20090021). The project proposes to increase the frequency of training episodes throughout the Cherry Point Range Complex, and to add mine response training activities in Onslow Bay.

After reviewing the EIS, we believe that the proposed actions are likely to impact recreation and natural resources at Hammocks Beach State Park, a DPR holding adjacent to Camp Lejeune on Onslow Bay. We object to increased noise and vibrations from low-flying aircraft, artillery, or explosives that would be heard at Hammocks Beach State Park, either on the mainland or on Bear Island.

The policy of the Division of Parks and Recreation is to manage state parks property based on conservation and protection of natural resources and ecological features, as well as protecting recreational resources of statewide significance. Both Bear Island and mainland portion of Hammocks Beach State Park are already subject to a significant amount of noise from weapons operations at Camp Lejeune. Additional noise impacts or additional occurrences of low-flying aircraft at these locations have the potential to degrade both the natural resources (for example, by startling nesting or foraging birds), and to further degrade the recreational resource (for example, by diminishing the experience of visitors seeking a peaceful experience of nature on a barrier island).

In section 3.5.2.2 (pp. 3-80 to 3-81), the Navy EIS names "parks" as noise-sensitive areas, or "sensitive receptors." The EIS then omits any mention of Hammocks Beach State Park from the discussion of impacts to noise-sensitive areas: "The nearest shore-based sensitive receptors would be located in the communities of Sneads Ferry, Chadwick Acres, Beaufort, Morehead City, Atlantic Beach, Pine Knoll Shores, Indian Beach, Emerald Isle, Bogue, and Cape Carteret." Hammocks Beach should have been included in this assessment.

Thank you for the opportunity to respond to this proposal.

Sincerely,

Jean M. Lynch
Coastal Region Biologist
North Carolina State Parks
P.O. Box 475
Carolina Beach, NC 28428-0475
Office: (910) 458-8206
Fax: (910) 409-5755

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Coastal Management
James H. Gregson
Director

Beverly Eaves Perdue
Governor

Dee Freeman
Secretary

MEMORANDUM

February 27, 2009

TO: Tere Barrett
Division of Coastal Management - Morehead
400 Commerce Avenue
Morehead City, NC 28557-3421

FROM: Stephen Rynas, AICP; Federal Consistency Coordinator

SUBJECT: Proposed Continuance of Navy Training Within the Cherry Point Range Complex (DCM#20090021)

LOCATION: Offshore, North Carolina

This document is being circulated for **consistency** review and comment by **March 20, 2009**. The US Navy is proposing to continue training operations off the coast of North Carolina within the Navy's designated Cherry Point Range Complex (CHPT). Please see page ES-3 for the graphic of the CHPT area. (Steve, Terre, Terry, and Frank; delegate as needed.) Your responses will assist us in determining whether the proposed project would be consistent with the State's Coastal Management Program. If the proposed project does not conform to your requirements, please identify the measures that would be necessary to bring the proposed project into conformance. If you have any additional questions regarding the proposed project you may contact me at 252-808-2808.

REPLY:

___ No Comment.

tbt This office supports the project as proposed.

___ Comments to this project are attached.

___ This office objects to the project as proposed.

Signed: _____ Date: 3/20/09

CORRECTIONS: Please identify any corrections, additions, or deletions that should be made in terms of contact information.

RETURN COMPLETED FORM TO:

Stephen Rynas, Federal Consistency Coordinator
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557-3421

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Coastal Management

Beverly Eaves Perdue
Governor

James H. Gregson
Director

Dee Freeman
Secretary

MEMORANDUM

DATE: March 20, 2009

TO: Stephen Rynas

FROM: Barry Guthrie

SUBJECT: Consistency Determination-Proposed Continuance of Navy Training within the Cherry Point Range Complex DCM#20090021

The Department of the Navy is proposing to continue training operations off the coast of North Carolina within the area designated the Cherry Point Range Complex (CHPT). This project is located in the Atlantic Ocean off of the coast of NC and with cover an expansive area of 18,617nm^2. A majority of the CHPT lies outside the 3nm territorial boundary, although some training is to take place inside the 3 nm line. The Navy proposes to expand various training activities, which already occur in the CHPT. Concerns with expansion in training exercises in the area would be:

- Suspension of Public Trust Rights to waters within the CHPT during training exercises.
- Impacts to marine life during periods of training exercises.

If actions are taken to minimize effects caused by an expansion, then the Division supports the project as proposed.

400 Commerce Ave., Morehead City, NC 28557
Phone: 252-808-2808 \ FAX: 252-247-3330 Internet: www.nccoastalmanagement.net

RECEIVED MAR 2

NCDENR

North Carolina Department of Environment and Natural Resources

Division of Coastal Management

Beverly Eaves Perdue Governor	James H. Gregson Director	Dee Freeman Secretary

MEMORANDUM

February 27, 2009

CH 07-0941

A- (NC) previously cleared RWL/eff 3-5-09

TO: Renee Gledhill-Early
State Historic Preservation Office
4617 Mail Service Center
Raleigh, NC 27699-4617

5 (NC)

FROM: Stephen Rynas, AICP; Federal Consistency Coordinator

SUBJECT: Proposed Continuance of Navy Training Within the Cherry Point Range Complex (DCM#20090021)

LOCATION: Offshore, North Carolina

Due 3/17/09

This document is being circulated for **consistency** review and comment by **March 20, 2009**. The US Navy is proposing to continue training operations off the coast of North Carolina within the Navy's designated Cherry Point Range Complex (CHPT). Please see page ES-3 for the graphic of the CHPT area. (Steve, Terre, Terry, and Frank; delegate as needed.) Your responses will assist us in determining whether the proposed project would be consistent with the State's Coastal Management Program. If the proposed project does not conform to your requirements, please identify the measures that would be necessary to bring the proposed project into conformance. If you have any additional questions regarding the proposed project you may contact me at 252-808-2808.

REPLY:

X No Comment.

____ This office supports the project as proposed.

____ Comments to this project are attached.

____ This office objects to the project as proposed.

Signed: Renee Gledhill-Earley Date: 3-12-09

CORRECTIONS: Please identify any corrections, additions, or deletions that should be made in terms of contact information.

RETURN COMPLETED FORM TO:

Stephen Rynas, Federal Consistency Coordinator
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557-3421

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Coastal Management

Beverly Eaves Perdue
Governor

James H. Gregson
Director

Dee Freeman
Secretary

MEMORANDUM

February 27, 2009

TO: Patty Fowler
Shellfish Sanitation and Recreational Water Quality Section
NCDENR - Division of Environmental Health
PO Box 769
Morehead City, NC 28557-0769

FROM: Stephen Rynas, AICP; Federal Consistency Coordinator

SUBJECT: Proposed Continuance of Navy Training Within the Cherry Point Range Complex (DCM#20090021)

LOCATION: Offshore, North Carolina

This document is being circulated for **consistency** review and comment by **March 20, 2009**. The US Navy is proposing to continue training operations off the coast of North Carolina within the Navy's designated Cherry Point Range Complex (CHPT). Please see page ES-3 for the graphic of the CHPT area. (Steve, Terre, Terry, and Frank; delegate as needed.) Your responses will assist us in determining whether the proposed project would be consistent with the State's Coastal Management Program. If the proposed project does not conform to your requirements, please identify the measures that would be necessary to bring the proposed project into conformance. If you have any additional questions regarding the proposed project you may contact me at 252-808-2808.

REPLY:

X No Comment.

____ This office supports the project as proposed.

____ Comments to this project are attached.

____ This office objects to the project as proposed.

Signed: Patrick Rynas for Patty Fowler Date: 3/2/09

CORRECTIONS: Please identify any corrections, additions, or deletions that should be made in terms of contact information.

RETURN COMPLETED FORM TO:

Stephen Rynas, Federal Consistency Coordinator
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557-3421

North Carolina Department of Environment and Natural Resources
Division of Coastal Management

Beverly Eaves Perdue
Governor

James H. Gregson
Director

Dee Freeman
Secretary

MEMORANDUM

February 27, 2009

TO: Frank Jennings
Division of Coastal Management - Elizabeth City
1367 US 17 South
Elizabeth City, NC 27909-7634

FROM: Stephen Rynas, AICP; Federal Consistency Coordinator

SUBJECT: Proposed Continuance of Navy Training Within the Cherry Point Range Complex (DCM#20090021)

LOCATION: Offshore, North Carolina

This document is being circulated for **consistency** review and comment by **March 20, 2009**. The US Navy is proposing to continue training operations off the coast of North Carolina within the Navy's designated Cherry Point Range Complex (CHPT). Please see page ES-3 for the graphic of the CHPT area. (Steve, Terre, Terry, and Frank; delegate as needed.) Your responses will assist us in determining whether the proposed project would be consistent with the State's Coastal Management Program. If the proposed project does not conform to your requirements, please identify the measures that would be necessary to bring the proposed project into conformance. If you have any additional questions regarding the proposed project you may contact me at 252-808-2808.

REPLY:

__✓__ No Comment.

_____ This office supports the project as proposed.

_____ Comments to this project are attached.

_____ This office objects to the project as proposed.

Signed: Frank Jennings Date: 3-5-9

CORRECTIONS: Please identify any corrections, additions, or deletions that should be made in terms of contact information.

RETURN COMPLETED FORM TO:

Stephen Rynas, Federal Consistency Coordinator
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557-3421

North Carolina Department of Environment and Natural Resources
Division of Coastal Management

Beverly Eaves Perdue
Governor

James H. Gregson
Director

Dee Freeman
Secretary

MEMORANDUM

February 27, 2009

TO: Hannah Stallings
DWQ - Planning Section
NCDENR - Division of Water Resources
1617 Mail Service Center
Raleigh, NC 27699-1617

FROM: Stephen Rynas, AICP; Federal Consistency Coordinator

SUBJECT: Proposed Continuance of Navy Training Within the Cherry Point Range Complex (DCM#20090021)

LOCATION: Offshore, North Carolina

This document is being circulated for **consistency** review and comment by **March 20, 2009.** The US Navy is proposing to continue training operations off the coast of North Carolina within the Navy's designated Cherry Point Range Complex (CHPT). Please see page ES-3 for the graphic of the CHPT area. (Steve, Terre, Terry, and Frank; delegate as needed.) Your responses will assist us in determining whether the proposed project would be consistent with the State's Coastal Management Program. If the proposed project does not conform to your requirements, please identify the measures that would be necessary to bring the proposed project into conformance. If you have any additional questions regarding the proposed project you may contact me at 252-808-2808.

REPLY:

X No Comment.

____ This office supports the project as proposed.

____ Comments to this project are attached.

____ This office objects to the project as proposed.

Signed: Hannah Stallings Date: 03/06/2009

CORRECTIONS: Please identify any corrections, additions, or deletions that should be made in terms of contact information.

RETURN COMPLETED FORM TO:

Stephen Rynas, Federal Consistency Coordinator
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557-3421

North Carolina Department of Environment and Natural Resources
Division of Coastal Management

Beverly Eaves Perdue
Governor

James H. Gregson
Director

Dee Freeman
Secretary

MEMORANDUM

February 27, 2009

TO: John Fear
Coastal Reserve Program - Beaufort
101 Pivers Island Road
Beaufort, NC 28516-9701

FROM: Stephen Rynas, AICP; Federal Consistency Coordinator

SUBJECT: Proposed Continuance of Navy Training Within the Cherry Point Range Complex (DCM#20090021)

LOCATION: Offshore, North Carolina

This document is being circulated for **consistency** review and comment by **March 20, 2009**. The US Navy is proposing to continue training operations off the coast of North Carolina within the Navy's designated Cherry Point Range Complex (CHPT). Please see page ES-3 for the graphic of the CHPT area. (Steve, Terre, Terry, and Frank; delegate as needed.) Your responses will assist us in determining whether the proposed project would be consistent with the State's Coastal Management Program. If the proposed project does not conform to your requirements, please identify the measures that would be necessary to bring the proposed project into conformance. If you have any additional questions regarding the proposed project you may contact me at 252-808-2808.

REPLY:

____ No Comment.

_X_ This office supports the project as proposed.

____ Comments to this project are attached.

____ This office objects to the project as proposed.

Signed: John Fear Date: 3-3-09

CORRECTIONS: Please identify any corrections, additions, or deletions that should be made in terms of contact information.

RETURN COMPLETED FORM TO:

Stephen Rynas, Federal Consistency Coordinator
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557-3421

North Carolina Department of Environment and Natural Resources
Division of Coastal Management

Beverly Eaves Perdue
Governor

James H. Gregson
Director

Dee Freeman
Secretary

MEMORANDUM

February 27, 2009

TO: Steve Everhart
Division of Coastal Management - Wlmington
127 Cardinal Drive Extension
Wilmington, NC 28405-5406

FROM: Stephen Rynas, AICP; Federal Consistency Coordinator

SUBJECT: Proposed Continuance of Navy Training Within the Cherry Point Range Complex (DCM#20090021)

LOCATION: Offshore, North Carolina

This document is being circulated for **consistency** review and comment by **March 20, 2009**. The US Navy is proposing to continue training operations off the coast of North Carolina within the Navy's designated Cherry Point Range Complex (CHPT). Please see page ES-3 for the graphic of the CHPT area. (Steve, Terre, Terry, and Frank; delegate as needed.) Your responses will assist us in determining whether the proposed project would be consistent with the State's Coastal Management Program. If the proposed project does not conform to your requirements, please identify the measures that would be necessary to bring the proposed project into conformance. If you have any additional questions regarding the proposed project you may contact me at 252-808-2808.

REPLY:

X No Comment.

_____ This office supports the project as proposed.

_____ Comments to this project are attached.

_____ This office objects to the project as proposed.

Signed: [signature] Date: 3/3/09

CORRECTIONS: Please identify any corrections, additions, or deletions that should be made in terms of contact information.

RETURN COMPLETED FORM TO:

Stephen Rynas, Federal Consistency Coordinator
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557-3421

North Carolina Department of Environment and Natural Resources
Division of Coastal Management

Beverly Eaves Perdue
Governor

James H. Gregson
Director

Dee Freeman
Secretary

MEMORANDUM

February 27, 2009

TO: Terry Moore
Division of Coastal Management - Washington
943 Washington Square Mall
Washington, NC 27889-1638

FROM: Stephen Rynas, AICP; Federal Consistency Coordinator

SUBJECT: Proposed Continuance of Navy Training Within the Cherry Point Range Complex (DCM#20090021)

LOCATION: Offshore, North Carolina

This document is being circulated for **consistency** review and comment by **March 20, 2009**. The US Navy is proposing to continue training operations off the coast of North Carolina within the Navy's designated Cherry Point Range Complex (CHPT). Please see page ES-3 for the graphic of the CHPT area. (Steve, Terre, Terry, and Frank; delegate as needed.) Your responses will assist us in determining whether the proposed project would be consistent with the State's Coastal Management Program. If the proposed project does not conform to your requirements, please identify the measures that would be necessary to bring the proposed project into conformance. If you have any additional questions regarding the proposed project you may contact me at 252-808-2808.

REPLY:

✓ No Comment.

* No direct impact to any AEC

____ This office supports the project as proposed.

____ Comments to this project are attached.

____ This office objects to the project as proposed.

Signed: Dale Maye TEM Date: 3/3/2009

CORRECTIONS: Please identify any corrections, additions, or deletions that should be made in terms of contact information.

RETURN COMPLETED FORM TO:

Stephen Rynas, Federal Consistency Coordinator
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557-3421

Trish

North Carolina Department of Environment and Natural Resources
Division of Coastal Management

Beverly Eaves Perdue
Governor

James H. Gregson
Director

Dee Freeman
Secretary

(E)

MEMORANDUM

February 27, 2009

TO: Anne Deaton
NCDENR - Division of Marine Fisheries
PO Box 769
Morehead City, NC 28557-0769

FROM: Stephen Rynas, AICP; Federal Consistency Coordinator

SUBJECT: Proposed Continuance of Navy Training Within the Cherry Point Range Complex (DCM#20090021)

LOCATION: Offshore, North Carolina

This document is being circulated for **consistency** review and comment by **March 20, 2009**. The US Navy is proposing to continue training operations off the coast of North Carolina within the Navy's designated Cherry Point Range Complex (CHPT). Please see page ES-3 for the graphic of the CHPT area. (Steve, Terre, Terry, and Frank; delegate as needed.) Your responses will assist us in determining whether the proposed project would be consistent with the State's Coastal Management Program. If the proposed project does not conform to your requirements, please identify the measures that would be necessary to bring the proposed project into conformance. If you have any additional questions regarding the proposed project you may contact me at 252-808-2808.

REPLY:

____√____ No Comment.

_____ This office supports the project as proposed.

_____ Comments to this project are attached.

_____ This office objects to the project as proposed.

Signed: Peter L Weeks Anne Deaton Date: 3/20/09 3/23/09

CORRECTIONS: Please identify any corrections, additions, or deletions that should be made in terms of contact information.

RETURN COMPLETED FORM TO:

Stephen Rynas, Federal Consistency Coordinator
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557-3421

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APPENDIX H OVERVIEW OF AIRBORNE AND UNDERWATER ACOUSTICS

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APPENDIX H
OVERVIEW OF AIRBORNE AND UNDERWATER ACOUSTICS

TABLE OF CONTENTS

H.1 INTRODUCTION 2
H.2 AIRBORNE NOISE CHARACTERISTICS 2
H.2.1 SUBSONIC NOISE 2
H.2.2 SUPERSONIC NOISE 6
H.2.3 AIRBORNE NOISE EFFECTS ON WILDLIFE 7
H.2.4 AMBIENT NOISE 8
H.3 SOUND TRANSMISSION THROUGH THE AIR-WATER INTERFACE 8
H.3.1 SUBSONIC SOURCES 9
H.3.2 SUPERSONIC SOURCES 14
H.4 UNDERWATER NOISE CHARACTERISTICS 14
H.4.1 UNITS OF MEASUREMENT 15
H.4.2 SOURCE CHARACTERISTICS 15
H.4.3 UNDERWATER SOUND TRANSMISSION 15
H.4.4 UNDERWATER AMBIENT NOISE 16
H.4.5 MARINE MAMMAL NOISE METRICS 17
H.4.6 SONIC BOOM PROPAGATION INTO THE WATER 20

H.1 INTRODUCTION

This appendix provides additional information on the characteristics of in-air and underwater noise. Sound transmission characteristics are different for sounds in air versus sounds in water. Similarly, sound reception sensitivities vary for in-air sound and in-water sound. Therefore, this appendix is divided into two major subsections: Airborne Noise Characteristics and Underwater Noise Characteristics. A third subsection describes sound transmission through the air-water interface. Underwater ambient noise is partially a result of sound sources that occur outside the Navy Cherry Point Range Complex. However, for the purposes of this Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS), the region of influence for underwater noise is limited to airborne and underwater sound sources that occur primarily within the Navy Cherry Point Range Complex boundaries. Full citations for the literature cited in this appendix are provided in Chapter 6 of the EIS/OEIS.

H.2 AIRBORNE NOISE CHARACTERISTICS

Primary sources of airborne noise in the Navy Cherry Point Range Complex include aircraft and their weapons, naval gunfire, aerial targets, and airborne ordnance (e.g., missiles). Throughout this section, the F/A-18 aircraft is used to represent typical jet aircraft that operate in the Navy Cherry Point Range Complex. For the purpose of noise characterization, aerial targets and airborne ordnance are essentially small-scale aircraft.

Two distinct types of noise may result from aircraft operations. When an aircraft flies slower than the speed of sound or subsonically, noise is produced by the aircraft's engine and by effects of aircraft movement through air. When an aircraft flies faster than the speed of sound, a sharply defined shock front is created, producing a distinct phenomenon called "overpressure." Noise produced by this physical phenomenon is termed "impulse noise." Thunder claps, noise from explosions, and sonic booms are examples of impulse noise. Airborne noise that originates in higher altitudes is seldom heard on the ground. This is due to the upward bending of sound that takes place in temperature inversions, where the surface temperature is warmer than the temperature at the higher altitude of the sound source. The characteristics of subsonic and supersonic noise are discussed below.

H.2.1 SUBSONIC NOISE

The physical characteristics of noise (or sound) include its intensity, frequency, and duration. Sound is created by acoustic energy, which produces pressure waves that travel through a medium, like air or water, and are sensed by the eardrum. This may be likened to ripples in water that would be produced when a stone is dropped into it. As acoustic energy increases, the intensity or height of these pressure waves increases, and the ear senses louder noise. The ear is capable of responding to an enormous range of sound levels, from that of a soft whisper to the roar of a rocket engine.

Units of Measurement

The range of sound levels humans are capable of hearing is very large. If the faintest sound level recognized (threshold of hearing) is assigned a value of one, then the highest level capable of being heard (threshold of pain), measured on the same scale, would have a value of 10 million. To make this large range of values more meaningful, a logarithmic mathematical scale is used: the decibel [dB] scale. On this scale, the lowest level audible to humans is 0 dB and the threshold of pain is approximately 140 dB. The reference level for the decibel scale used to describe airborne sound is, thus, the threshold of hearing (for young adults). In physical terms, this corresponds to a sound pressure of 20 micro Pascals (μPa). Atmospheric pressure is about 100,000 Pa.

Noise Measurement (weighting)

The normal human ear can detect sounds that range in frequency from about 20 cycles per second (or Hertz (Hz)) to 15,000 Hz. However, all sounds throughout this range are not heard equally well. Figure H.1 shows the in-air hearing threshold curve (audiogram) for humans. The human ear is most sensitive at 1 to 4 kilohertz (kHz).

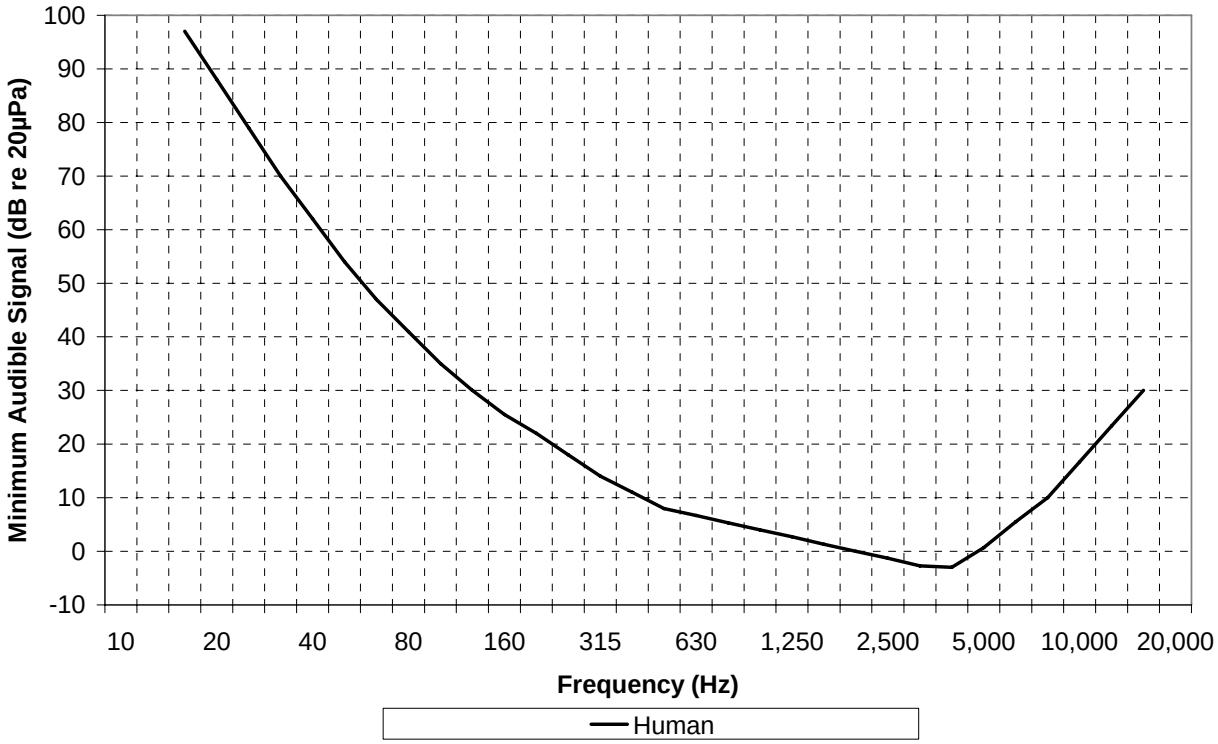


Figure H.1 Human In-Air Hearing Threshold

Sound level meters have been developed to measure sound fields and to show the sound level as a number proportional to the overall sound pressure as measured on the logarithmic scale described previously. This is called the sound pressure level. It is often useful to have this meter provide a number that is directly related to the human sensation of loudness. Therefore, some sound meters are calibrated to emphasize frequencies in the 1 to 4 kHz range and to de-emphasize higher and especially lower frequencies to which humans are less sensitive. Sound level measurements obtained with these instruments are termed "A-weighted" (expressed in dBA). The A-weighting function is shown in Figure H.2. It is closely related to the human hearing characteristic shown previously in Figure H.1. Because other animals are sensitive to a different range of frequencies, various other weighting protocols may be more appropriate when their specific hearing characteristics are known. Alternative measurement procedures such as C-weighting or flat-weighting (unweighted), which do not de-emphasize lower frequencies, may be more appropriate for various animal species such as the baleen whale.

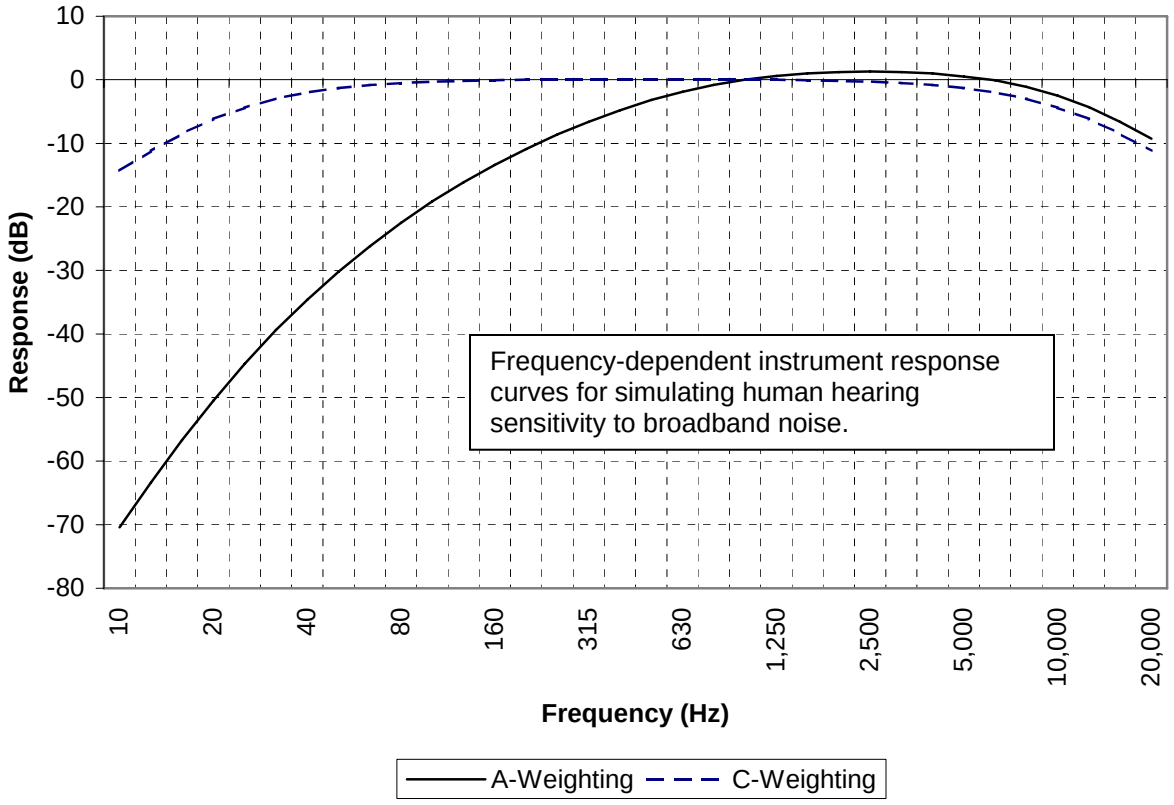


Figure H.2 Noise Weighting Characteristics

Although sound is often measured with instruments that record instantaneous sound levels in dB, the duration of a noise event and the number of times noise events occur are also important considerations in assessing noise impacts. With these measurements, sound levels for individual noise events and average sound levels, in decibels, over extended periods of hours, days, months, or years can be calculated (e.g., the daily day-night average sound level [L_{dn}] in dB).

Sound Exposure Level (Single Noise Event)

The sound exposure level (SEL) measurement provides a means of describing a single, time varying, noise event. It is useful for quantifying events such as an aircraft overflight, which includes the approach when noise levels are increasing, the instant when the aircraft is directly overhead with maximum noise level, and the period of time while the aircraft moves away with decreasing noise levels. SEL is a

measure of the physical energy of a noise event, taking into account both intensity (loudness) and duration. SEL is based on the sounds received during the period while the level is above a specified threshold that is at least 10 dB below the maximum value measured during a noise event. SEL is usually determined on an A-weighted basis, and is defined as the constant sound level that provides the same amount of acoustic exposure in one second as the actual time-varying level for the exposure duration. It can also be expressed as the one-second averaged equivalent sound level (L_{eq} 1 sec).

Table H.1 provides a brief comparison of A-weighted, C-weighted, and flat SEL (F-SEL) values for military aircraft operating at various altitudes and power settings. By definition, SEL values are normalized to a reference time of 1 second and should not be confused with either the average or maximum noise levels associated with a specific event. There is no general relationship between the SEL value and the maximum decibel level measured during a noise event. By definition, SEL values exceed the maximum decibel level where noise events have durations greater than one second. For subsonic aircraft overflights, maximum noise levels are typically 5 to 7 dB below SEL values.

Table H.1 SEL Comparison for Select Department of Defense Aircraft (in dB)

	P-3			F/A-18		
Power Setting	2000 ESHP			88% RPM		
Speed (knots)	180			400		
Altitude	**A-SEL**	**C-SEL**	**F-SEL**	**A-SEL**	**C-SEL**	**F-SEL**
2,500 feet	83.5	88.4	88.4	91.3	95.3	95.2
2,000 feet	85.6	90.0	90.0	93.7	97.4	97.3
1,600 feet	87.7	91.6	91.6	96.0	99.4	99.4
1,000 feet	91.7	94.7	94.7	100.2	103.2	103.2
500 feet	97.2	99.2	99.3	105.9	108.5	108.5
315 feet	100.6	102.2	102.2	109.3	111.7	111.8
200 feet	103.9	105.1	105.2	112.5	114.8	114.9

ESHP – effective shaft horsepower
RPM – revolutions per minute

Day-Night Average Sound Level

The day-night average sound level (L_{dn} or DNL[1]) is the energy-averaged sound level measured over a 24-hour period, with a 10 dB penalty assigned to noise events occurring between 10:00 p.m. and 7:00 a.m. DNL values are obtained by summation and averaging of SEL values for a given 24-hour period. DNL is the preferred noise metric of the U.S. Department of Housing and Urban Development, Federal Aviation Administration, U.S. Environmental Protection Agency, and Department of Defense insofar as potential effects of airborne sound on humans are concerned.

People are constantly exposed to noise. Most people are exposed to average sound levels of 50 to 55 L_{dn} or higher for extended periods on a daily basis. Normal conversational speaking produces received sound levels of approximately 60 dBA. Studies specifically conducted to determine noise impacts on various human activities show that about 90 percent of the population is not significantly bothered by outdoor average sound levels below 65 L_{dn} (Federal Aviation Administration, 1985).

[1] L_{dn} is the formula version of the Day-Night Average Sound Level metric and DNL is normally used in text.

DNL considers noise levels of individual events that occur during a given period, the number of events, and the times (day or night) at which events occur. Since noise is measured on a logarithmic scale, louder noise events dominate the average. To illustrate this, consider a case in which only one aircraft flyover occurs in daytime during a 24-hour period, and creates a sound level of 100 dB for 30 seconds. During the remaining 23 hours, 59 minutes, and 30 seconds of the day, the ambient sound level is 50 dB. The calculated sound level for this 24-hour period is 65.5 L_{dn}. To continue the example, assume that 10 such overflights occur during daytime hours during the next 24-hour period, with the same 50 dB ambient sound level during the remaining 23 hours and 55 minutes. The calculated sound level for this 24-hour period is 75.4 L_{dn}. Clearly, the averaging of noise over a given period does not suppress the louder single events.

In calculating DNL, noise associated with aircraft operations is considered, and a 10 dB penalty is added to operations that occur between 10:00 p.m. and 7:00 a.m.; this time period is considered nighttime for the purposes of noise modeling. The 10 dB penalty is intended to compensate for generally lower background noise levels and increased human annoyance associated with noise events occurring between the hours of 10:00 p.m. and 7:00 a.m.

While DNL does provide a single measure of overall noise, it does not provide specific information on the number of noise events or specific individual sound levels that occur. For example, as explained above, an DNL of 65 dB could result from very few, but very loud events, or a large number of quieter events. Although it does not represent the sound level heard at any one particular time, it does represent total sound exposure. Scientific studies and social surveys have found DNL to be the best measure to assess levels of human annoyance associated with all types of environmental noise. Therefore, its use is endorsed by the scientific community and governmental agencies (U.S. Environmental Protection Agency, 1974; Federal Interagency Committee on Urban Noise, 1980; Federal Interagency Committee on Noise, 1992).

Onset-Rate Adjusted Day-Night Average Sound Level

Aircraft operating at low altitude and in special use airspace generate noise levels different from other community noise environments. Overflights can be sporadic, which differ from most community environments where noise tends to be continuous or patterned.

Military overflight events also differ from typical community noise events because of the low altitude and high airspeed characteristics of military aircraft. These characteristics can result in a rate of increase in sound level (onset rate) of up to 30 dB per second. To account for the random and often sporadic nature of military flight activities, computer programs calculate noise levels created by these activities based on a monthly, rather than a daily, period. The DNL metric is adjusted to account for the surprise, or startle effect, of the onset rate of aircraft noise on humans. Onset rates above 30 dB per second require an 11 dB penalty because they may cause a startle associated with the rapid noise increase. Onset rates from 15 to 30 dB per second require an adjustment of 0 to 11 dB. Onset rates below 15 dB per second require no adjustment because no startle is likely. The adjusted L_{dn} is designated as onset-rate adjusted monthly day-night average sound level (L_{dnmr}).

H.2.2 SUPERSONIC NOISE

A sonic boom is the noise a person, animal, or structure on the earth's surface receives when an aircraft or other type of air vehicle flies overhead faster than the speed of sound (or supersonic). The speed of sound is referred to as Mach 1. This term, instead of a specific velocity, is used because the speed at which sound travels varies for different temperatures and pressures. For example, the speed of sound in air at standard atmospheric conditions at sea level is about 772 statute miles per hour, or 1,132 feet per second (fps). However, at an altitude of 25,000 feet, with its associated lower temperature and pressure, the speed of sound is reduced to 1,042 fps (approximately 710 miles per hour). Thus, regardless of the absolute speed of the aircraft, when it reaches the speed of sound in the environment in which it is flying, its speed is Mach 1.

Air reacts like a fluid to supersonic objects. When an aircraft exceeds Mach 1, air molecules are pushed aside with great force, forming a shock front much like a boat creates a bow wave. All aircraft generate two shock fronts. One is immediately in front of the aircraft; the other is immediately behind it. These shock fronts "push" a sharply defined surge in air pressure in front of them. When the shock fronts reach the ground, the result is a sonic boom. Actually, a sonic boom involves two very closely spaced impulses, one associated with each shock front. Most people on the ground cannot distinguish between the two and they are usually heard as a single sonic boom. However, the paired sonic booms created by vehicles that are the size and mass of the space shuttle are very distinguishable, and two distinct booms are easily heard.

Sonic booms differ from most other sounds because: (1) they are impulsive; (2) there is no warning of their impending occurrence; and (3) the peak levels of a sonic boom are higher than those for most other types of outdoor noise. Although air vehicles exceeding Mach 1 always create a sonic boom, not all sonic booms are heard on the ground. As altitude increases, air temperature normally decreases, and these layers of temperature change cause the shock front to be turned upward as it travels toward the ground. Depending on the altitude of the aircraft and the Mach number, the shock fronts of many sonic booms are bent upward sufficiently that they never reach the ground. This same phenomenon also acts to limit the width (area covered) of those sonic booms that actually do reach the ground.

Sonic booms are sensed by the human ear as an impulsive (sudden or sharp) sound because they are caused by a sudden change in air pressure. The change in air pressure associated with a sonic boom is generally a few pounds per square foot, which is about the same pressure change experienced riding an elevator down two or three floors. It is the rate of change - the sudden onset of the pressure change - that makes the sonic boom audible. The air pressure in excess of normal atmospheric pressure is referred to as "overpressure." It is quantified on the ground by measuring the peak overpressure in pounds per square foot (psf) and the duration of the boom in milliseconds. The overpressure sensed is a function of the distance of the aircraft from the observer; the shape, weight, speed, and altitude of the aircraft; local atmospheric conditions; and location of the flight path relative to the surface. The maximum overpressures normally occur directly under the flight track of the aircraft and decrease as the slant range, or distance, from the aircraft to the receptor increases. Supersonic flights for a given aircraft type at high altitudes typically create sonic booms that have low overpressures but cover wide areas.

The noise associated with sonic booms is measured on a C-weighted scale (as shown previously in Figure H.2). C-weighting provides less attenuation at low frequencies than A-weighting. This is appropriate based on the human auditory response to the low frequency sound pressures associated with high-energy impulses (such as those generated by sonic booms).

H.2.3 AIRBORNE NOISE EFFECTS ON WILDLIFE

The previous discussion primarily concerned the metrics that have been developed to predict human response to various noise spectral and temporal characteristics. Response prediction metrics for non-human species such as marine mammals are generally not available, except in a limited form for a few examples such as gray and humpback whales, whose responses to industrial noise playbacks and vessel traffic have been studied. Some studies of response to impulse noise in the form of air gun signals have also been made. Those sounds are underwater sounds. Although several studies of pinniped response to airborne noise and sonic booms from aircraft and missile flyovers have been made, few sound exposure data have been reported.

Because of the limited amount of response data available for marine mammals, it is not possible to develop total sound exposure metrics similar to those applied to human population centers. Instead, the potential impacts of noise sources in the Navy Cherry Point Range Complex need to be assessed by examining individual source-receiver encounter scenarios typical of range operations.

A wide variety of noise sources must be considered in assessing the potential impact of airborne noise sources in the Navy Cherry Point Range Complex on non-human species. It is necessary to provide an

overall sound level measure that is proportional to the sound level perceived by a given species. This facilitates the application of sound level criteria based on potential avoidance behavior, potential temporary threshold shift, or some other appropriate response (refer to Section 3.6 of the EIS/OEIS, Marine Mammals). A weighting function related to the hearing characteristics of a specific species is required, analogous to the A-weighting used for human response prediction.

H.2.4 AMBIENT NOISE

Ambient noise is the background noise at a given location. Airborne ambient noise can vary considerably depending on location and other factors, such as wind speed, temperature stratification, terrain features, vegetation, and the presence of distant natural or man-made noise sources.

In predicting human response to loud airborne noise sources, it is reasonable to assume that ambient background noise would have little or no effect on the calculated noise levels since the ambient levels would add insignificant fractions to calculated values. Therefore, ambient background noise is not considered in noise calculations.

Ambient noise may have a more significant effect on prediction of marine mammal response to loud airborne noise sources. Marine mammals are exposed to a wide range of ambient sounds ranging from the loud noise of nearby wave impacts to the quiet of remote areas during calm wind conditions. The ambient noise background on beaches is strongly influenced by surf noise. Some examples of airborne noise levels in human and marine mammal habitat are given in Table H.2.

It should be noted that the characteristics of subsonic noise, which is measured on an A-weighted scale, and supersonic noise, which is measured on a C-weighted scale, are different. Therefore, each is calculated separately, and it would be incorrect to add the two values together. Nevertheless, both subsonic and supersonic noises occur in the Navy Cherry Point Range Complex. Together, they form the cumulative acoustic environment in the region. Therefore, each is addressed where applicable in this EIS/OEIS.

Table H.2 Representative Airborne Noise Levels

Source of Noise	dBA re 20 µPa
F/A-18 at 1,000 feet (Cruise Power)	98
Helicopter at 200 feet (UH-1N)	91
Car at 25 feet (60 mph) [1]	70 - 80
Light Traffic at 100 feet [1]	50 - 60
Quiet Residential (daytime) [1]	40 - 50
Quiet Residential (night) [1]	30 - 40
Wilderness Area [1]	20 - 30
Offshore (low sea state) [2]	40 - 50
Surf [2]	60 - 70

[1] Kinsler, et al., 1982.
[2] U.S. Coast Guard, 1960.

H.3 SOUND TRANSMISSION THROUGH THE AIR-WATER INTERFACE

Many of the sound sources considered in this EIS/OEIS are airborne vehicles, but a significant portion of the concern about noise impacts involves marine animals at or below the surface of the water. Thus,

transmission of airborne sound into the ocean is a significant consideration. This section describes some basic characteristics of air-to-water transmission of sound for both subsonic and supersonic sources.

H.3.1 SUBSONIC SOURCES

Sound is transmitted from an airborne source to a receiver underwater by four principal means: (1) a direct path, refracted upon passing through the air-water interface; (2) direct-refracted paths reflected from the bottom in shallow water; (3) lateral (evanescent) transmission through the interface from the airborne sound field directly above; and (4) scattering from interface roughness due to wave motion.

Several papers are available in the literature concerning transmission of sound from air into water. Urick (1972) presents a discussion of the effect and reports data showing the difference in the underwater signature of an aircraft overflight for deep and shallow conditions. The study includes analytic solutions for both the direct and lateral transmission paths and presents a comparison of the contributions of these paths for near-surface receivers. Young (1973) presents an analysis which, while directed at deep-water applications, derived an equivalent dipole underwater source for an aircraft overflight that can be used for direct path underwater received level estimates. A detailed description of air-water sound transmission is given in Richardson, *et al.* (1995). The following is a short summary of the principal features.

Figure H.3 shows the general characteristics of sound transmission through the air-water interface. Sound from an elevated source in air is refracted upon transmission into water because of the difference in sound speeds in the two media (a ratio of about 0.23). Because of this difference, the direct sound path is totally reflected for grazing angles less than 77°, i.e., if the sound reaches the surface at an angle more than 13° from vertical. For smaller grazing angles, sound reaches an underwater observation point only by scattering from wave crests on the surface, by non-acoustic (lateral) pressure transmission from the surface, and from bottom reflections in shallow water. As a result, most of the acoustic energy transmitted into the water from a source in air arrives through a cone with a 26° apex angle extending vertically downward from the airborne source. For a moving source, the intersection of this cone with the surface traces a "footprint" directly beneath the path of the source, with the width of the footprint being a function of the altitude of the source. To a first approximation, it is only the sound transmitted within this footprint that can reach an underwater location by a direct-refracted path. Because of the large difference in the acoustic properties of water and air, the pressure field is actually doubled at the surface of the water, resulting in a 6 dB increase in pressure level at the surface. Within the direct-refracted cone, the in-air sound transmission paths are affected both by geometric spreading and by the effects of refraction.

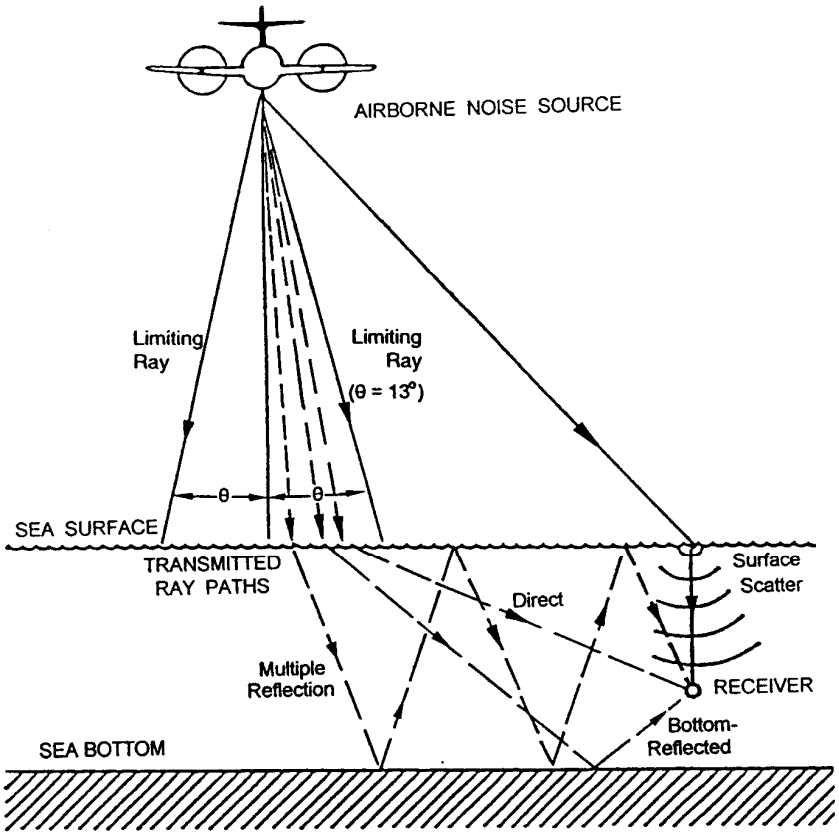


Figure H.3 Characteristics of Sound Transmission through Air-Water Interface

In shallow water within the direct transmission cone, the directly transmitted sound energy is generally greater than the energy contribution from bottom-reflected paths. At horizontal distances greater than the water depth, the energy transmitted by reflected paths becomes dominant, especially in shallow water. The ratio of direct to reverberant energy depends on the bottom properties. For hard bottom conditions the reverberant field persists for longer ranges than the direct field. However, with increasing horizontal distance from the airborne source, underwater sound diminishes more rapidly than does the airborne sound.

Near the surface, the laterally transmitted pressure from the airborne sound is transmitted hydrostatically underwater. Beyond the direct transmission cone this component can produce higher levels than the underwater-refracted wave. However, the lateral component is very dependent on frequency and thus on acoustic wavelength. The level received underwater is 20 dB lower than the airborne sound level at a depth equal to 0.4 wavelength.

For this application, it is necessary to have an analytical model to predict the total acoustic exposure level experienced by marine mammals near the surface and at depth near the path of an aircraft overflight. Malme and Smith (1988) describe a model to calculate the acoustic energy at an underwater receiver in shallow water, including the acoustic contributions of both the direct sound field (Urick, 1972) and a depth-averaged reverberant sound field (Smith, 1974).

In the present application, the Urick (1972) analysis for the lateral wave field was also included to predict this contribution. The paths of most concern for this application are the direct-refracted path and the lateral path. These paths will likely determine the highest sound level received by mammals located nearly directly below a passing airborne source and mammals located near the surface, but at some distance away from the source track. In shallow areas near shore, bottom-reflected acoustic energy will also contribute to the total noise field, but it is likely that the direct-refracted and lateral paths will make the dominant contributions.[2]

Figure H.4 shows an example of the model prediction for a representative source-receiver geometry. The transmission loss (TL) for the direct-refracted wave, the lateral wave, and their resultant energy-addition total is shown. Directly under the aircraft, the direct-refracted wave is seen to have the lowest TL. For the shallowest receiver at a 3-foot depth, the lateral wave is seen to become dominant at about a horizontal range of 40 feet. Beyond this point the underwater level is controlled by the sound level in the air directly above the receiver and follows the same decay slope with distance. For the deeper receiver at 10 feet, the lateral wave does not become dominant until the horizontal range is about 130 feet. When sound reaches the receiver via the direct-refracted path, it decays at about 12 dB/distance doubled (dd), consistent with a surface dipole source. In contrast, when the sound reaches the receiver via the lateral path, it decays at about 6 dB/dd, consistent with the airborne monopole source. Underneath the aircraft, the drop in sound level with depth change from 3 to 10 feet is only about 2 dB, but beyond about 200 feet, a 12 dB drop occurs for the same change in depth.

[2]The bottom-reflected reverberant sound field section of this model for nearshore applications requires detailed knowledge of bottom slope and bottom composition. In view of the requirements of this application, this level of detail is not appropriate and the reflected path subroutine was not used.

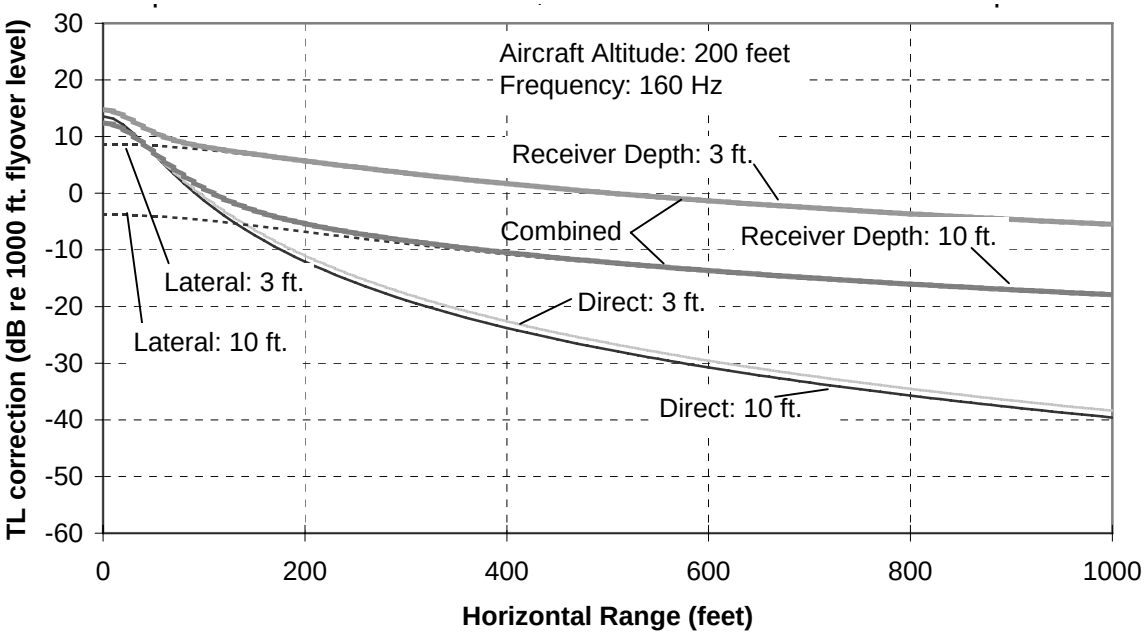


Figure H.4 Transmission of Loss of Noise through Air-Water Interface, Comparison of Direct-Refracted, Lateral and Combined TL Component

Figures H.5A-C illustrate the interaction between the various parameters for different sets of variables. For clarity, only the total transmission loss curves are shown in these figures. Figure H.5A shows the influence of frequency (wavelength) change on transmission loss. Here the loss at a depth of 3 feet can be seen to increase significantly with frequency in the region where the lateral wave is dominant. Thus, marine mammals near the surface will benefit from high frequency attenuation when they are not directly below the source track. Figure H.5B shows the change in TL with receiver depth for low frequency sound. Near the source track, a 6 dB drop in level occurs for a change in depth from 1 to 30 feet, but beyond a horizontal range of 200 feet, there is a 20 to 30 dB drop in level for the same change in receiver depth. Note, however, that for an increase in depth from 30 to 300 feet, the received level increases because of the effective source directionality. Figure H.5C shows the effect of increasing the aircraft altitude. In this case the region near the source track is affected the most with about a 38 dB drop in level for an altitude change of 50 feet to 5,000 feet. At a horizontal range of 200 feet, this drop is about 20 dB, with a decrease to 15 dB at 500 feet.

For a passing airborne source, received level at and below the surface diminishes with increasing source altitude, but the duration of exposure increases. The maximum received levels at and below the surface are inversely proportional to source altitude, but total noise energy exposure is inversely proportional to the product of source altitude and speed because of the link between altitude and duration of exposure.

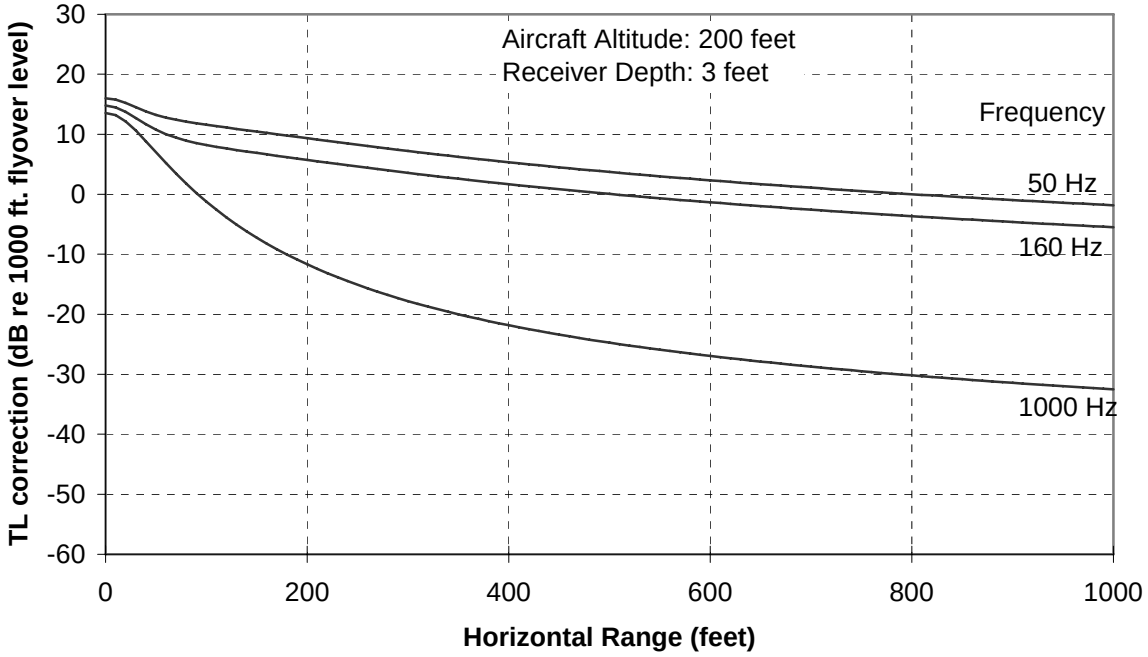


Figure H.5A Air-Water Transmission Loss vs. Frequency

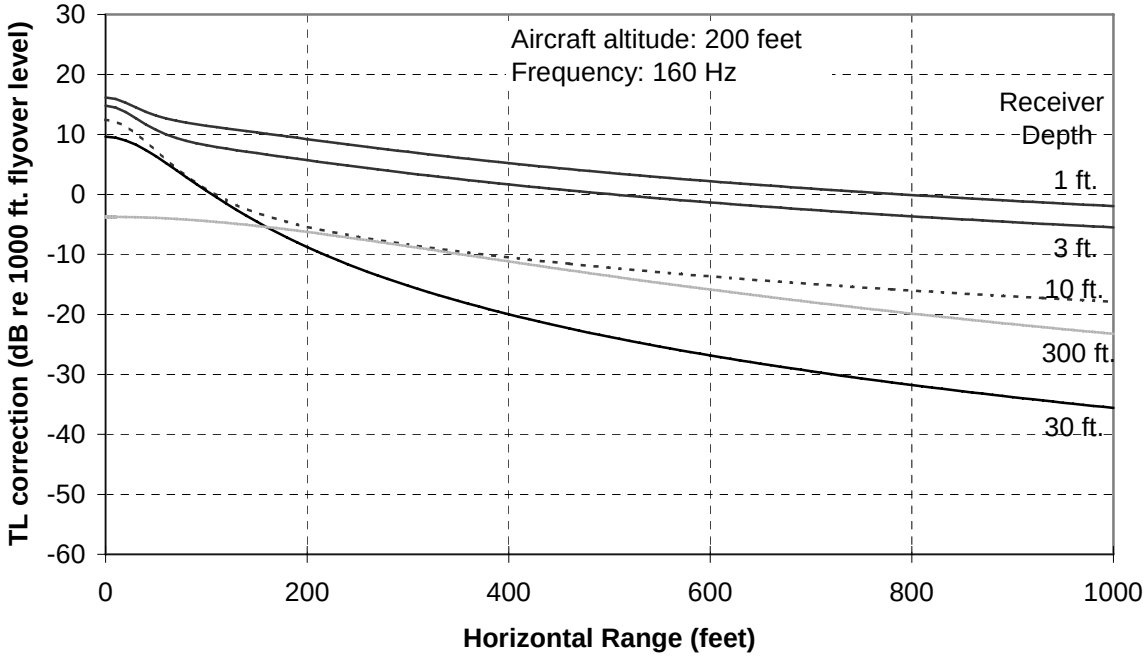


Figure H.5B Air-Water Transmission Loss vs. Receiver Depth

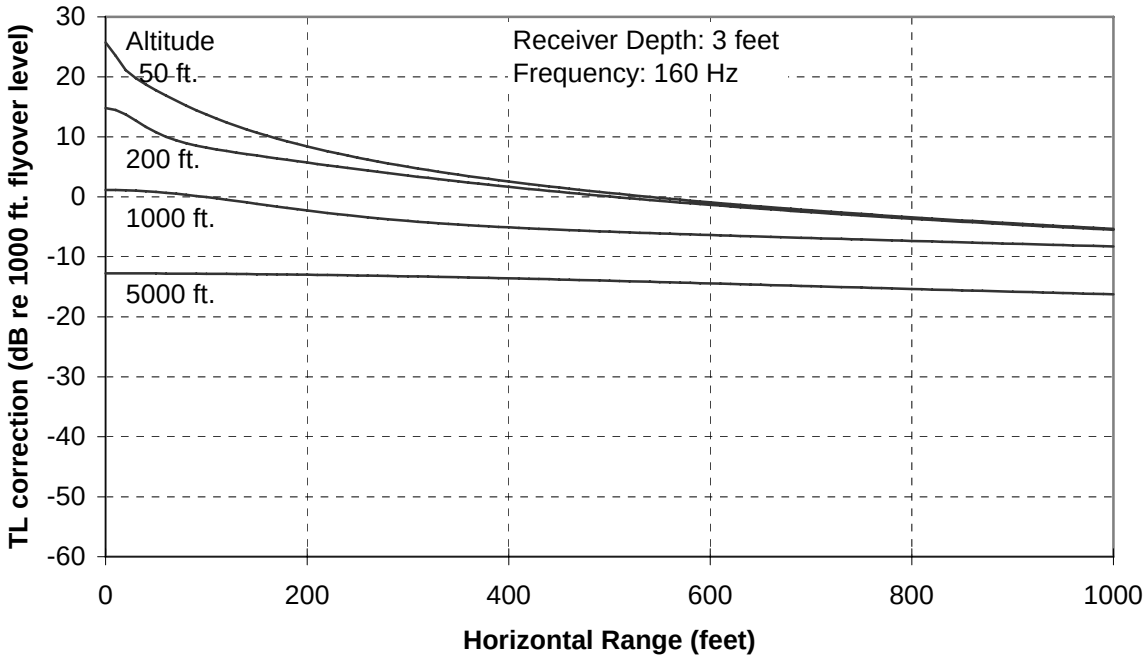


Figure H.5C Air-Water Transmission Loss vs. Aircraft Altitude

H.3.2 SUPERSONIC SOURCES

The sonic boom footprint produced by a supersonic aircraft in level flight at constant speed traces a hyperbola on the sea surface. The apex of the hyperbola moves at the same speed and direction as the aircraft with the outlying arms of the hyperbola traveling at increasing oblique angles and slower speeds until the boom shock wave dissipates into a sonically propagating pressure wave at large distances from the flight path. The highest boom overpressures at the water surface are produced directly below the aircraft track. In this region the pressure-time pattern is described as an "N-wave" because of its typical shape. Aircraft size, shape, speed, and altitude determine the peak shock pressure and time duration of the N-wave. The incidence angle of the N-wave on the water surface is determined by the aircraft speed, i.e., for Mach 2 the incidence angle is 45°. Thus, for air vehicles in level flight at speeds less than about Mach 4.3, the N-wave is totally reflected from the surface. Dives and other maneuvers at supersonic speeds of less than Mach 4.3 can generate N-waves at incidence angles that are refracted into the water, but the water source regions affected by these transient events are limited. Since the aircraft, missiles, and targets used in range activities generally operate at less than Mach 4.3, sonic boom penetration into the water from these sources occurs primarily by lateral (evanescent) propagation. Analyses by Sawyers (1968) and Cook (1969) show that the attenuation rate (penetration) of the boom pressure wave is related to the size, altitude, and speed of the source vehicle. The attenuation of the N-wave is not related to the length of the signature in the simple way that the lateral wave penetration from subsonic sources is related to the dominant wavelength of their signature. Specific examples will be given for the supersonic vehicles used in range tests as appropriate in this EIS/OEIS.

H.4 UNDERWATER NOISE CHARACTERISTICS

Many of the general characteristics of sound and its measurement were discussed in the introduction to airborne noise characteristics. This section expands on this introduction to summarize the properties of underwater noise that are relevant to understanding the effects of noise produced by range activities on

the underwater marine environment in the Navy Cherry Point Range Complex area. Since the effect of underwater noise on human habitat is not an issue (except perhaps for divers), the primary environmental concern that is addressed is the potential impact on marine mammals.

H.4.1 UNITS OF MEASUREMENT

The reference level for airborne sound is 20 μPa, consistent with the minimum level detectable by humans. For underwater sound, a reference level of 1 μPa is used because this provides a more convenient reference and because a reference based on the threshold of human hearing in air is irrelevant. For this reason, as well as the different propagation properties of air and water, it is not meaningful to compare the levels of sound received in air (measured in dB re 20 μPa) and in water (in dB re 1 μPa) without adding the 26 dB correction factor to the airborne sound levels.

H.4.2 SOURCE CHARACTERISTICS

The most significant range-related sources of underwater noise operating on the Navy Cherry Point Range Complex are the ships used in ASW exercises. Because of their slow speed compared to most of the airborne sources considered in the last section, they can be considered to be continuous sound sources. The primary underwater transient sound sources are naval gunfire, aircraft-delivered bombs and gunfire, missile launches, and water surface impacts from missiles and falling debris. All sources are subsonic or stationary in water. While supersonic underwater shock waves are produced at short ranges by underwater explosions, no sources operate at supersonic speeds in water.

H.4.3 UNDERWATER SOUND TRANSMISSION

Airborne sources transmit most of their acoustic energy to the surface by direct paths that attenuate sound energy by spherical divergence (spreading) and molecular absorption. For sound propagating along oblique paths relative to the ground plane, there may also be attenuation (or amplification) by refraction (bending) from sound speed gradients caused by wind and temperature changes with altitude. There may also be multipath transmission caused by convergence of several refracted and reflected sound rays, but this is generally not important for air-to-ground transmission. However, for underwater sound, refracted and multipath transmission is often more important than direct path transmission, particularly for high-power sound sources capable of transmitting sound energy to large distances.

A surface layer sound channel often enhances sound transmission from a surface ship to a shallow receiver in tropical and mid-latitude deep-water areas. This channel is produced when a mixed isothermal surface layer is developed by wave action. An upward refracting sound gradient, produced by the pressure difference within the layer, traps a significant amount of the sound energy within the layer. (Sound travels faster with increasing depth.) This results in cylindrical rather than spherical spreading. This effect is particularly observable at high frequencies where the sound wavelengths are short compared to the layer depth. When the mixed layer is thin or not well defined, the underlying thermocline may extend toward the surface, resulting in downward refraction at all frequencies and a significant increase in transmission loss at shorter ranges where bottom reflected sound energy is normally less than the directly transmitted sound component.

In shallow water areas sound is trapped by reflection between the surface and bottom interfaces. This often results in higher transmission loss than in deep water because of the loss that occurs with each reflection, especially from soft or rough bottom material. However, in areas with a highly reflective bottom, the transmission loss may be less than in deep water areas since cylindrical spreading may occur.

The many interacting variables involved in prediction of underwater transmission loss have led to the development of analytical and computer models. One or more of these models will be used in analyzing the potential impact of the underwater noise sources in the range areas.

H.4.4 UNDERWATER AMBIENT NOISE

Above 500 Hz, deep ocean ambient noise is produced primarily by wind and sea state conditions. Below 500 Hz, the ambient noise levels are strongly related to ship traffic, both near and far. In shallow water near continents and islands, surf noise is also a significant factor. Wenz (1962) and Urick (1983) are among many contributors to the literature on underwater ambient noise. Figure H.6, based on these two sources, was adapted by Malme, *et al*. (1989) to show ambient noise spectra in 1/3-octave bands for a range of sea state and ship traffic conditions.

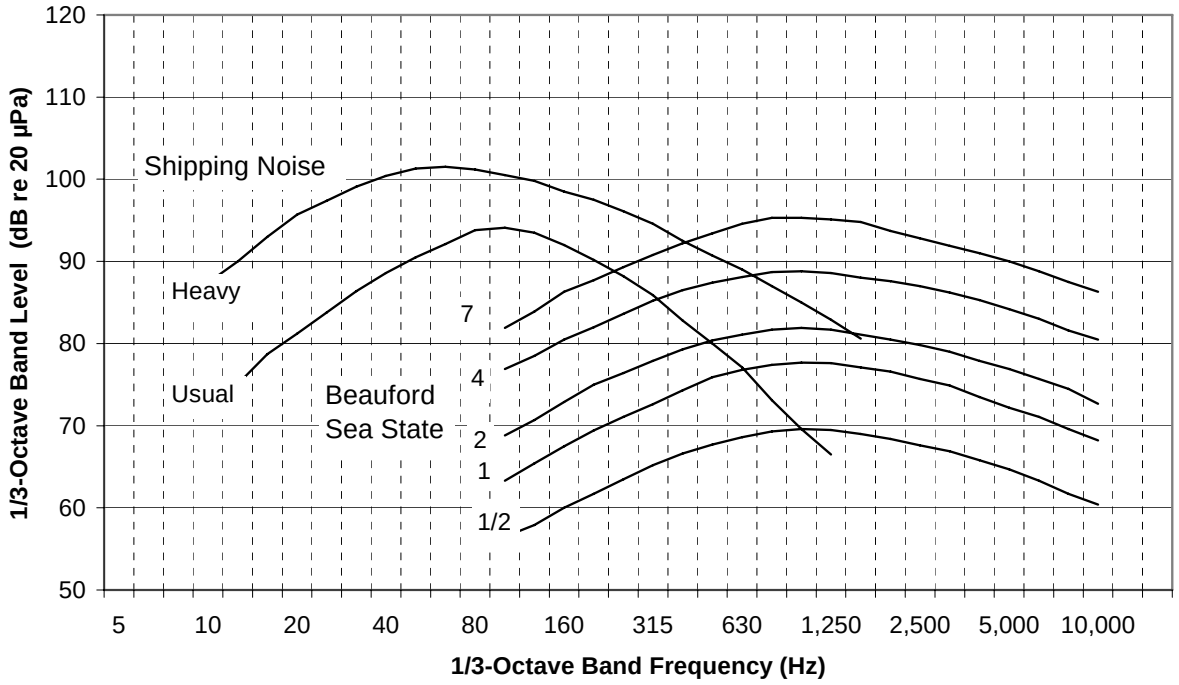


Figure H.6 Underwater Ambient Noise

Wind

On a 1/3-octave basis, wind-related ambient noise in shallow water tends to peak at about 1 kHz (see Figure H.6). Levels in 1/3-octave bands generally decrease at a rate of 3 to 4 dB per octave at progressively higher frequencies, and at about 6 dB per octave at progressively lower frequencies. Sound levels increase at a rate of 5 to 6 dB per doubling of wind speed. At a frequency of about 1 kHz, maximum 1/3-octave band levels are frequently observed at 95 dB referenced to 1 µPa for sustained winds of 34 to 40 knots and at about 82 dB for winds in the 7 to 10-knot range. Wave action and spray are the primary causes of wind-related ambient noise; consequently, the wind-related noise component is strongly dependent on wind duration and fetch as well as water depth, bottom topography, and proximity to topographic features such as islands and shore. A sea state scale, which is related to sea surface conditions as a function of wind conditions, is commonly used in categorizing wind-related ambient noise. The curves for wind-related ambient noise shown in Figure H.6 are reasonable averages, although relatively large departures from these curves can be experienced depending on site location and other factors such as bottom topography and proximity to island or land features.

Surf Noise

Very few data have been published relating specifically to local noise due to surf in nearshore areas along mainland and barrier island coasts. Estimated noise source level densities for heavy surf at Duck, North Carolina, varied from 120 to 125 dB re 1 µPa/Hz$^{1/2}$ /m at 200 Hz to 90-100 dB re 1 µPa/Hz$^{1/2}$ /m at

900 Hz, with a slope of -5 dB per octave (Fabre and Wilson, 1997). These results compare well with previous surf noise studies conducted in Monterey Bay, California by Wilson, *et al*. (1985). Wilson, *et al*. (1985) presents underwater noise levels for wind-driven surf along the exposed Monterey Bay coast, as measured at a variety of distances from the surf zone. Wind conditions varied from 25 to 35 knots. They vary from 110 to 120 dB in the 100 to 1,000 Hz band at a distance of 650 feet from the surf zone, down to levels of 96 to 103 dB in the same band 4.6 nm from the surf zone. Assuming these levels are also representative near shorelines in the Navy Cherry Point Range Complex area, surf noise in the 100 to 500 Hz band will be 15 to 30 dB above that due to wind-related noise in the open ocean under similar wind speed conditions.

Distant Shipping

The presence of a relatively constant low frequency component in ambient noise within the 10 to 200 Hz band has been observed for many years and has been related to distant ship traffic as summarized by Wenz (1962) and Urick (1983). Low frequency energy radiated primarily by cavitating propellers and by engine excitation of the ship hull is propagated efficiently in the deep ocean to distances of 100 nm or more. Higher frequencies do not propagate well to these distances due to acoustic absorption. Also, high frequency sounds radiated by relatively nearby vessels will frequently be masked by local wind-related noise. Thus, distant shipping contributes little or no noise at high frequency. Distant ship-generated low frequency noise incurs more attenuation when it propagates across continental shelf regions and into shallow nearshore areas than occurs in the deep ocean.

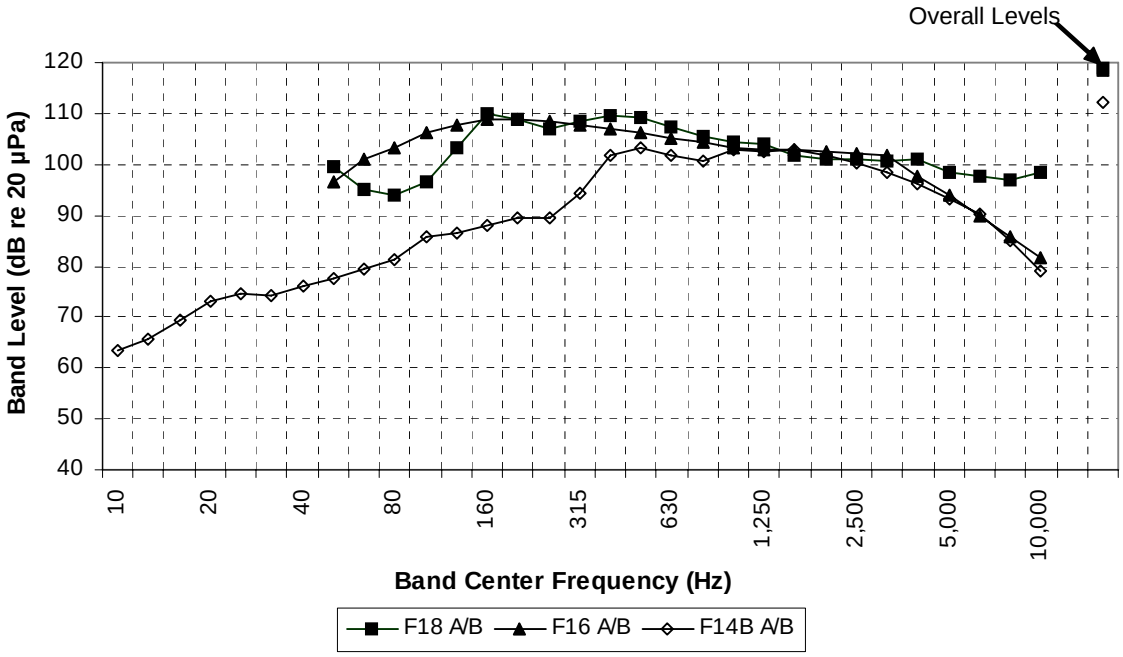
Figure H.6 also provides two curves that approximate the upper bounds of distant ship traffic noise. The upper curve represents noise at sites exposed to heavily used shipping lanes. The lower curve represents moderate or distant shipping noise as measured in shallow water. As shown, highest observed ambient noise levels for these two categories are 102 dB and 94 dB, respectively, in the 60 to 100 Hz frequency range. In shallow water the received noise from distant ship traffic can be as much as 10 dB below the lower curve given in Figure H.6, depending on site location on the continental shelf. In fact, some nearshore areas can be effectively shielded from this low frequency component of shipping noise due to sound propagation loss effects.

Note that the shipping noise curves shown in Figure H.6 show typical received levels attributable to *distant* shipping. Considerably higher levels can be received when a ship is present within a few miles.

H.4.5 MARINE MAMMAL NOISE METRICS

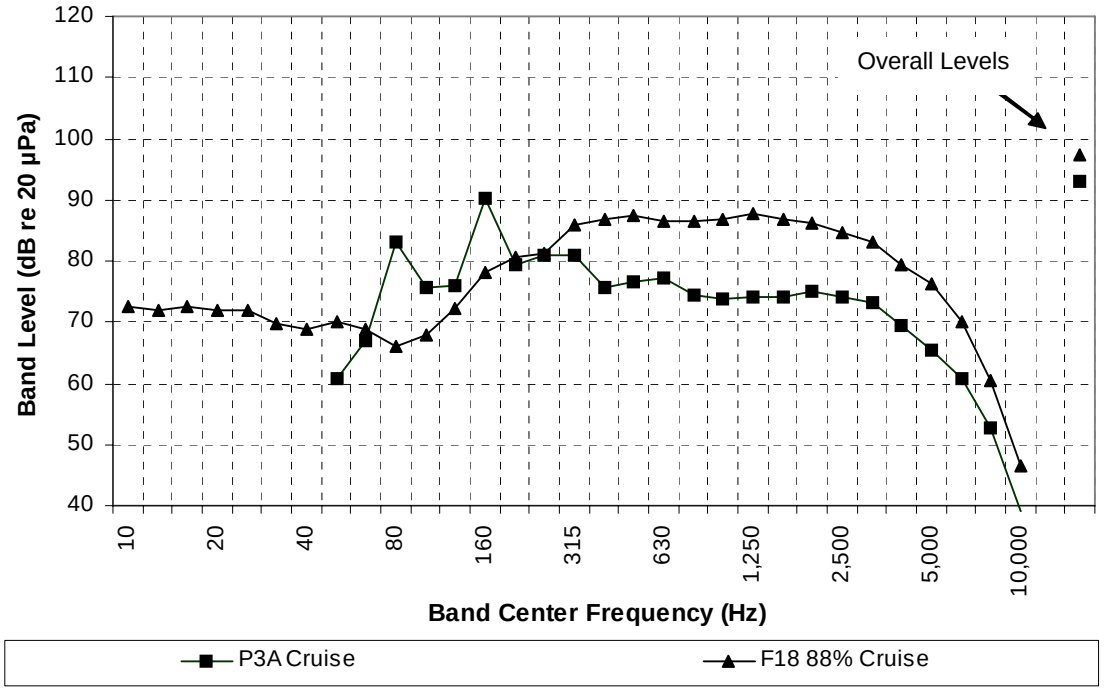
Noise received at and below the sea surface is relevant to marine mammals and some other marine animals at sea. The spectral composition and overall level of each airborne noise source must both be considered in assessing potential impacts on marine mammals present at sea in the Navy Cherry Point Range Complex. As described earlier, the most significant sources are low-flying aircraft and their related weapons, naval gunfire, targets, missiles, and debris impacts. Brief noise transients or impulses from surface missile launches, low level explosions, and gunfire may also be important during training operations.

Aircraft spectrum information was obtained from the U.S. Air Force Armstrong Laboratory for various aircraft types (Armstrong Aerospace Medical Research Laboratory, 1990). Data for some additional types of aircraft occasionally used on the Navy Cherry Point Range Complex were also included. The information obtained is summarized in the 1/3-octave band spectra shown in Figure H.7A (for fighter and attack aircraft), and Figure H.7B (selected Navy Cherry Point Range Complex aircraft). Most of these spectra represent received levels near the surface during overflights at 1,000 feet above sea level under standard atmospheric conditions (59° F, 70 percent relative humidity). The data shown in this standard format can be adjusted for different aircraft altitudes and other atmospheric attenuation conditions – an important consideration at high frequencies.



Source: Air Force Aerospace Medical Research Laboratory, 1990.

Figure H.7A Noise Spectra: Fighter and Attack Aircraft



T/O = takeoff
Source: Air Force Aerospace Medical Research Laboratory, 1990.

Figure H.7B Noise Spectra: Selected Navy Cherry Point Range Complex Aircraft

Helicopters of different sizes and types emit intense low frequency engine sounds during flights. Most frequencies are in the range of 20 to 200 Hz, well within the range of hearing of most terrestrial and marine animals. Sound levels associated with the SH-60R are similar to the current H-60 helicopters, since the engines are the same. The SH-60R also uses the same engine as the variant, MH-60S helicopter used in the Navy Cherry Point Range Complex, and thus sound levels are representative of Navy Cherry Point Range Complex helicopters.

In 1991, the Air ASW Systems Program Office conducted tests to determine the effects of in-water H-60 helicopter noise on ASW operations (DoN, 1999). During these tests, an H-60 flew over calibrated sonobuoys (receiver depth 400 feet) at altitudes ranging from 250 to 5000 feet. Results showed a relatively flat spectrum (increases of approximately 1 to 5 dB over ambient) below 200 Hz rising to a maximum increase of 18 dB between 2 and 3 kHz. Models to determine precise in-water, near-surface noise levels are not reliable for all sea surface conditions. Spherical spreading can be used to estimate near-surface point noise levels. These levels were estimated by adding 42.5 dB (calculated from spherical spreading) to the received levels at 400 feet and by summing the energy across the entire spectrum. Table H.3 provides a summary of the estimated equivalent in-water, near-surface spectrum noise level for an H-60 helicopter operating at 250 feet. When this energy is summed across the entire spectrum, the nominal case estimate is an in-water, near-surface total energy level of 142.2 dB for a helicopter hovering at 250 feet. This level could be higher if the helicopter hovers at a lower altitude.

Table H.3 Estimated H-60 In-Water, Near-Surface Noise Levels

Frequency	**Spectrum Noise Level at 122 m (400 ft) Depth** (dB re 1 μPa)	**Estimated Near-Surface Spectrum Noise Level** (dB re 1 μPa)
10 Hz	80	123
100 Hz	72	115
500 Hz	60	103
1 kHz	56	99
2.5 kHz	45	88
5 kHz	28	71
Source: DoN, 1999.		

The aircraft spectra can be compared to the shapes and quantitative features of marine mammal audiograms, when known, to determine the weighting functions and overall level adjustments needed to estimate the perceived overall levels produced during close encounters. These levels can then be compared to known or assumed impact thresholds to determine whether a detailed analysis is needed. If a detailed analysis is indicated, then contour plots can be calculated to estimate the total number of animals potentially affected by an encounter scenario.

H.4.6 SONIC BOOM PROPAGATION INTO THE WATER

Aircraft Overflights

Supersonic operations in the Navy Cherry Point Range Complex result in sonic boom penetration of the water in the operating area. Boom signatures were estimated using PCBOOM3 (Air Force Aerospace Medical Research Laboratory, 1996) to determine the potential for noise impacts near or at the surface. The F-4 fighter is used as an example, although it has since been replaced by the F-14s and later by the F/A-18s. Table H.4 shows the underwater boom parameters at locations near the water surface together with the estimated attenuation rate of peak pressure with depth using a method developed by Sawyers (1968).

Table H.4 Underwater Sonic Boom Parameters for F-4 Overflight

Sonic Boom Parameters			**Depth Peak Pressure Loss (feet)**					
Speed	**Alt. (feet)**	**T (msec)**	**Lp (1μPa)**	**CSEL**	**ASEL**	**6 dB**	**10 dB**	**20 dB**
M1.2	10,000	103	168.0	143.9	129.6	11.5	24.6	68.9
M1.2	5,000	88	179.9	148.8	134.3	9.8	21.3	59.7
M1.2	1,000	64	182.9	159.1	145.6	6.9	15.1	42.6
M2.2	1,000	44	186.7	163.1	149.7	9.7	21.0	58.4

Source: Ogden, 1997.

Missile and Target Overflights

Low-level supersonic target and missile flights also produce significant underwater sonic boom noise. Supersonic targets launched from Wallops Flight Facility into the Navy Cherry Point Operating Area (OPAREA) include the Vandal and AQM-37 target drones. Specific data are not available for the Vandal target under normal flight conditions at low altitudes of 100 feet down to 20 feet. The required sonic boom estimates were made using a method developed by Carlson (1978) and adapted for model-based analysis by Lee and Downing (1996). This analysis assumes that the essential boom signature is a simple "N-wave" as is typically measured for supersonic aircraft passing at high altitudes (hundreds of feet). At lower altitude overflights, which are of interest here, the pressure contributions from the shape variations on the aircraft body and wings become observable, and at very low altitudes the signature is no longer a simple N-wave.

The acoustic impact analysis requires estimates of both the peak pressure level produced by a Vandal boom and the total sound energy exposure. The peak pressure level produced at close range (near field) can be influenced by contributions from minor peaks in the waveform. A relevant study by McLean and Shrout (1966) made a comparison of near-field boom waveforms calculated with appropriate near-field theory with waveforms predicted by far-field theory for representative aircraft. The results showed that the peaks predicted by the near-field theory were generally about 10 percent lower than those predicted at the same range by far-field theory. Thus in this application, the use of the Carlson method would be expected to yield conservative results.

The energy density spectrum and total sound energy exposure were estimated using Fourier analysis of the predicted N-wave to obtain the unweighted (flat) energy density spectrum and the F-SEL. This spectrum was then A-weighted to estimate the A-SEL. The A-SEL is about 9 dB below the F-SEL. On the issue of near-field effects, the change in frequency distribution of the pressure signature with distance must be considered. The near field signature has more of its energy in smaller shock waves associated with the details of the airframe (e.g., fins, fuselage changes in area, etc.). The peaks associated with the far-field N signature have not yet fully developed so more of the acoustic energy appears at higher frequencies. A coalescing process is caused by non-linear propagation of high-pressure sound in the atmosphere (sound travels faster at higher pressures) that occurs with distance as the sound wave propagates outward from the flight path. Initially smooth high-pressure fluctuations compress into shock waves. Thus, because of the increased high frequency content, the resulting total energy of a near-field signature measured at 20 feet would likely be reduced less by the A-weighting process than would the total energy of an N-wave approximation. However, this difference is not be expected to be more than 2 to 3 dB because of the large shifts in spectrum energy that would be required during propagation.

An analytic model was developed to predict the boom signature produced by Vandal flights that used the Vandal dimensions and assumed a level flight at Mach 2.1 at various altitudes. For an altitude of 20 feet, the predicted overpressure underwater at the surface is 300 psf or 203 dB re 1 µPa with a boom duration of 4.8 milliseconds. The peak level is estimated to be 10 dB lower at a depth of 1.5 feet and 20 dB lower at a depth of 5 feet, based on an analysis developed by Sawyers (1968).

The sonic boom associated with the AQM-37 was analyzed in the Final Environmental Assessment (EA) for AQM-37 Operations at the National Aeronautics and Space Administration Goddard Space Flight Center Wallops Flight Facility (NASA, 2003). According to the EA, sonic booms would occur with each target launch after the vehicle exceeded the speed of sound. The sonic boom would be directed toward the front of the vehicle. Due to the small size of the AQM-37, the sonic boom would be much less than that of an aircraft flying at a similar velocity and flight path. Sonic booms would not be heard outside of the Navy Cherry Point OPAREA.

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APPENDIX I STATISTICAL PROBABILITY MODELING FOR MUNITIONS IMPACTS

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Statistical Probability Model for Estimating Impact Probability and Number of Exposures

Direct Impact Model (DIM)

A statistical probability model, the Direct Impact Model (DIM), was developed to estimate the impact probability (P) and number of exposures (T) associated with direct impact of falling munitions (ordnance) with marine animals on the sea surface within the given warning area (R) in which naval operations are occurring. The DIM model is based on probability theory and modified Venn diagrams with rectangular "footprint" areas for the individual animal (A) and total impact (I) inscribed inside the warning area (R):

1) A = length*width, where the individual animal's width (breadth) is assumed to be 20% of its length. For a given season, this product for A is multiplied by the number of animals N_a in the warning area (i.e., product of seasonal animal density (D) and warning area (R): $N_a = D*R$) to obtain the total animal footprint area ($A*N_a = A*D*R$) in the given warning area. When integrating over the number of animal species of each type (e.g., all marine mammals, all sea turtles), these calculations are repeated (accounting for differences in dimensions and densities for different species) to obtain the total animal footprint area for each species. These animal footprint areas are summed over all species of interest to obtain the total animal footprint area resulting from all animals present in the given warning area in the given season.

2) $I = N_{mun}$*length*diameter, where N_{mun} = number of munitions, and "length" and "diameter" refer to the individual munitions dimensions. For a given season and warning area, the total number of munitions for each munitions type is multiplied by the percent use by warning area and the percent use by season to obtain the "effective" number of munitions (N_{mun}). For each munitions type, the individual impact footprint area is multiplied by the "effective" number of munitions to obtain the type-specific impact footprint area ($I = N_{mun}$*length*diameter). Each naval operation uses one or more different types of munitions, each with a specific number of munitions (e.g., gunnery, missiles, bombs) and dimensions, and several operations can occur in a given season and warning area. When integrating over the number of munitions types for the given operation (and then over the number of operations in the given season and warning area), these calculations are repeated (accounting for differences in dimensions and numbers for different munitions types and different operations) for all munitions types used, to obtain the type-specific impact footprint area (I) for each munitions type. These impact footprint areas are summed over all munitions types for the given operation, and then summed (integrated) over all operations to obtain the total impact footprint area resulting from all operations occurring in the given warning area in the given season.

The probability (P) that a random point (i.e., a falling munitions) within R is within the animal footprint (A) or within the impact footprint (I), is calculated as the area ratio A/R or I/R, respectively. [Note that A (referring to an INDIVIDUAL animal footprint) and I (referring to the impact footprint resulting from the TOTAL number of munitions N_{mun}) are the relevant quantities used in the following calculations of single-animal impact probability (P), which is then multiplied by the number of animals to obtain the number of exposures T.] The probability that the random point on the warning area is within both types of footprints (i.e., A and I) depends on the degree of overlap of A and I. The probability that I overlaps A is calculated by adding a buffer distance around A based on one-half of the impact area (i.e., 0.5*I), such that an impact (center) occurring anywhere within the combined (overlapping) area would impact the animal. Thus, if L_i and W_i are the length and width of the impact footprint such that $L_i*W_i = 0.5*I$ and $W_i/L_i = L_a/W_a$ (i.e., similar geometry between the animal footprint and impact footprint), and if L_a and W_a are the length and width (breadth) of the individual animal such that $L_a*W_a = A$ (= individual animal footprint area), then, assuming a purely static, rectangular model (Model 1), the total area $A_{tot} = (L_a + 2*L_i)*(W_a + 2*W_i)$, and the buffer area $A_{buffer} = A_{tot} - L_a*W_a$.

Four models were examined with respect to defining and setting up the overlapping combined areas of A and I:
1) **Model 1**: Purely static, rectangular model. Impact is assumed to be static (i.e., direct impact effects only; non-dynamic; no explosions or scattering of shrapnel after the initial impact). Hence the impact footprint area (I) is assumed to be rectangular and given by the product of ordnance length and ordnance width (multiplied by the number of ordnances). $A_{tot} = (L_a + 2*L_i)*(W_a + 2*W_i)$ and $A_{buffer} = A_{tot} - L_a*W_a$.
2) **Model 2**: Dynamic model with end-on collision, in which the length of the impact footprint (L_i) is enhanced by R_n = 4-5 ordnance lengths to reflect forward momentum. $A_{tot} = (L_a + (1+R_n)*L_i)*(W_a + 2*W_i)$ and $A_{buffer} = A_{tot} - L_a*W_a$.
3) **Model 3**: Dynamic model with broadside collision, in which the width of the impact footprint (W_i) is enhanced by Rn =

4-5 ordnance lengths to reflect forward momentum. $A_{tot} = (L_a + 2*W_i)*(W_a + (1+R_n)*L_i)$ and $A_{buffer} = A_{tot} – L_a*W_a$.
4) **Model 4**: Purely static, radial model, in which the rectangular animal and impact footprints are replaced with circular footprints while conserving area. Define the radius (R_a) of the circular individual animal footprint such that $pi*R_a^2 = L_a*W_a$, and define the radius (R_i) of the circular impact footprint such that $pi*R_i^2 = 0.5*L_i*W_i = 0.5*I$. Then $A_{tot} = pi*(R_a + R_i)^2$ and $A_{buffer} = A_{tot} – pi*R_a^2$ (where pi = 3.1415927).

Static impacts (Models 1 and 4) assume no additional aerial coverage effects of scattered ordnance beyond the initial impact. For dynamic impacts (Models 2 and 3), the distance of any scattered ordnance (e.g., shrapnel) must be considered, by increasing the length (Model 2) or width (Model 3), depending on orientation (broadside versus end-on collision), of the impact footprint to account for the forward horizontal momentum of the falling ordnance. Forward momentum typically accounts for 4-5 ordnance lengths, resulting in a corresponding increase in impact area. Significantly different values may result from these 2 types of orientation. Both of these types of collision conditions can be calculated each with 50% likelihood (i.e., equal weighting between Models 2 and 3, in order to average these potentially different values.

Impact probability P is the probability of impacting one animal with the given number, type, and dimensions of all munitions/ordnance used in all naval operations occurring in the given warning area and season, and is given by the ratio of total area (A_{tot}) to warning area area (R): $P = A_{tot}/R$. Number of exposures is $T = N*P = N*A_{tot}/R$, where N = number of animals in the Range Complex area in the given season (given as the product of seasonal animal density D and Range Complex area R). Thus, $N = D*R$ and hence $T = N*P = N*A_{tot}/R = D*A_{tot}$. Using this procedure, P and T were calculated for each of the 4 models, for each animal species, for each season (and annually), for each munitions type used in all of the naval operations in the given warning area. The model-specific P and T values were averaged over the 4 models (using equal weighting) to obtain model-averages. Annual estimates of P and T were obtained by integrating the 4 seasonal estimates. Furthermore, the following integrated impact probabilities were calculated:

1) **Munitions-integrated**: Impact footprint areas were calculated for each individual munitions type and number. These footprint areas were summed to include all munitions used in all naval operations in the given season and annually in the given warning area. This enhanced impact footprint area was used together with the species-specific animal footprint area to calculate the munitions-integrated impact probability P and number of exposures T.

2) **Species-integrated**: Animal footprint areas were calculated for each individual animal species and associated density. These animal densities and footprint areas were summed to include all animal species of interest occurring in the given season and annually in the given warning area. These enhanced animal densities and animal footprint areas were used together with the munitions-specific impact footprint area to calculate the species-integrated impact probability P and number of exposures T. Species integrations were conducted over all species and also over only those species in the following categories: a) All marine mammals only; b) All sea turtles only.

3) **Species-and-munitions-integrated**: Both the enhanced impact footprint area and the enhanced animal footprint area were used to calculate this double-integrated impact probability P and number of exposures T.

Parameters for Model Application
Impact probabilities P and number of exposures T were estimated by the DIM model for the following parameters:
1) **Three proposed action plans**: No Action Alternative, Alternative 1, and Alternative 2. Number of events (munitions) for each naval operation in each warning area for the 2 alternatives is proportional to that of the Baseline action plan (based on a proportionality factor, the ratio of total number of events between the given alternative plan and the Baseline plan) across all types of munitions, all 4 seasons, all animal species, all naval operations, and all warning areas of the given OPAREA involved in the given naval operation. Animal densities and dimensions, munitions dimensions, and percent use distributions of munitions across the warning area and seasons are the same for the 3 action plans.
2) **Three OPAREAS**: Virginia Capes (VACAPES), Jacksonville (JAX), and Navy Cherry Point (CHPT): Areas are 27661, 50090, and 18617 square nautical miles (nm^2), respectively.
3) **All restricted and warning areas** within the given study area for which marine animal densities and naval operations data are available: a) **VACAPES**: R-6606, W-386, W-50, and W-72; 2) **JAX**: W-157, W-158, W-159, W-132,

W-133, W-134, and R2910A/B/C; 3) **CHPT**: W-122. Percent use distributions of munitions for each naval operation across the involved study areas were used in the model calculations.
4) **Three types of munitions**: a) **Gunnery**: 40-mm grenade; 0.50 cal projectile; 7.62-mm projectile; 20-mm and 25-mm projectile cannon shells; 5", 20-mm CIWS, 25-mm, and 76-mm naval gun projectiles; b) **Bombs**: BDU-45; BDU-48; MK-20; MK-76; MK-82I; MK-82L; MK-83I; MK-83L; MK-84L; LGTR; CATM; AGM-65; GBU-12I; GBU-12L; GBU-16I; c) **Missiles**: AGM-114 (Hellfire); RIM-7; SM-1; AGM-88 (HARM); AIM-7; AIM-9; AIM-54; AIM-120.
6) **All animal species** of interest and report type (EIS, LOA): Marine mammals and sea turtles, including threatened and endangered species.
7) **Four seasons** (Winter, Spring, Summer, Fall) and annually. Seasonal percent use distributions of munitions for each naval operation were used in the seasonal model calculations.

Model Input Data
In addition to the identity and areas of each study area, input data for the DIM model include animal species and munitions used in each naval operation in each warning area. Animal species data include: 1) Species ID and status (i.e., threatened, endangered, or neither); 2) Seasonal animal density estimates for each species and each warning area; 3) Adult animal dimensions (length and width/breadth) for each species. The animal dimensions are used to calculate individual animal footprint areas (A = length*width), and animal densities are used to calculate the number of exposures (T) from the impact probability (P): T = N*P. Munitions data include: 1) Munitions ID and category (e.g., gunnery, bomb, missile); 2) Munitions dimensions (length, width/diameter); 3) Total number of munitions used in each naval operation (e.g., number of bullets, missiles, or bombs); 4) Percent use of the total number of munitions in the given restricted/warning area occurring in the given study area; 5) Distribution of percent use of munitions by season.

Munitions input data, specifically the ordnance quantity (e.g., numbers of guns, bombs, and missiles), are different in magnitude among the 3 proposed action plans (Baseline, Alternative 1, and Alternative 2) but vary proportionally across all types of munitions, across all warning area involved in the given naval operation, and across all 4 seasons. From the munitions quantities (for the given munitions type, naval operation, warning area, and season) for the Baseline plan, the corresponding quantities for the Alternative 1 and Alternative 2 plans are calculated by multiplying by a proportionality factor, given by the ratio of the total number of events (munitions) for the given Alternative (1 or 2) to the total number of events (munitions) for the Baseline. All animal species input data, the munitions ID and category, munitions dimensions, and the percent use distributions across all involved warning area and across the 4 seasons are the same for the 3 action plans. Only the magnitude of munitions quantities (i.e., total number of munitions) are different and vary proportionally according to the constant proportionality factor.

Model Output Data
Generating seasonal estimates of impact probability (P) and number of exposures (T) for each season and species of interest, the DIM model was run for each study area (accounting for all naval operations and their specific munitions numbers and percent use distributions across restricted/warning areas and seasons) of each warning area, for each of the 3 action plans. The model calculates P and T from falling munitions associated with all naval operations occurring in the given restricted/warning area of the given study area, for the given action plan. These P and T estimates were calculated for all 4 seasons for all animal species of interest and were categorized according to species, season, study area, restricted/warning area, report, and action plan. Probabilities and exposure estimates were also integrated over all restricted/warning areas within the given study area, over all species of a given animal type (i.e., all animal species, all marine mammals, all sea turtles), and over all 4 seasons (to obtain annual estimates). Seasonal variabilities in P and T arise from seasonal variabilities in animal densities and in percent use distributions of munitions for the naval operations occurring in the given restricted/warning area. Differences in P and T among study areas arise from geographical differences in animal densities and differences in percent use distributions of munitions among all restricted/warning areas involved in the given naval operations. Differences in P and T among action plans for the given study area arise from different numbers of events (munitions) for the two alternative action plans relative to the Baseline action plan.

Species- and munitions-integrated P and T values are summarized in final output form for each action plan, report, restricted/warning area, study area, season and annually, and type of species integrated (i.e., all species, all marine

mammals, all sea turtles). Typical impact probabilities (P) range on the order of 10^{-5} to 10^{-7}.

There are no tables included for warning areas where no munitions information was available and/or no density data existed for any species, such as VACAPES R-6606, Jacksonville W-132A, W-132B, W-133, and W-134, and Cherry Point MAEWR.

Estimated number of direct munitions strike exposures for marine mammals and sea turtles under the No Action Alternative

Navy Cherry Point Study Area

Table I-1
Seasonal[1] number of exposures of marine animals in W-122 in the Navy Cherry Point Study Area. N/A = No estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.0000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.0000	<0.0001
Sei Whale	N/A	N/A	N/A	N/A
Fin Whale	0.0000	0.0000	0.0000	0.0000
Blue Whale	N/A	N/A	N/A	N/A
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
West Indian Manatee	N/A	N/A	N/A	N/A
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic spotted dolphin	0.00020	0.00020	0.00020	0.00020
Beaked whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose dolphin	0.00042	0.00042	0.00036	0.00042
Clymene dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Minke whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical spotted dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot whales	<0.0001	<0.0001	<0.0001	<0.0001
Risso's dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-toothed dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped dolphin	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell turtles include hawksbill, green, and unidentified hardshell turtles

Estimated number of direct munitions strike exposures for marine mammals and sea turtles under Alternative 1

Navy Cherry Point Study Area

Table I-2
Seasonal[1] number of exposures of marine animals in W-122 in the Navy Cherry Point Study Area. N/A = No estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.0000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.0000	<0.0001
Sei Whale	N/A	N/A	N/A	N/A
Fin Whale	0.0000	0.0000	0.0000	0.0000
Blue Whale	N/A	N/A	N/A	N/A
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
West Indian Manatee	N/A	N/A	N/A	N/A
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic spotted dolphin	0.00022	0.00022	0.00022	0.00022
Beaked whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose dolphin	0.00046	0.00046	0.00040	0.00046
Clymene dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Minke whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical spotted dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot whales	<0.0001	<0.0001	<0.0001	<0.0001
Risso's dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-toothed dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped dolphin	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell turtles include hawksbill, green, and unidentified hardshell turtles

Estimated number of direct munitions strike exposures for marine mammal and sea turtle species under Alternative 2

Navy Cherry Point Study Area

Table I-3
Seasonal[1] number of exposures of marine animals in W-122 in the Navy Cherry Point Study Area. N/A = No estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.0000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.0000	<0.0001
Sei Whale	N/A	N/A	N/A	N/A
Fin Whale	0.0000	0.0000	0.0000	0.0000
Blue Whale	N/A	N/A	N/A	N/A
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
West Indian Manatee	N/A	N/A	N/A	N/A
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic spotted dolphin	0.00022	0.00022	0.00022	0.00022
Beaked whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose dolphin	0.00045	0.00045	0.00039	0.00045
Clymene dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Minke whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical spotted dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot whales	<0.0001	<0.0001	<0.0001	<0.0001
Risso's dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-toothed dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped dolphin	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell turtles include hawksbill, green, and unidentified hardshell turtles

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APPENDIX J TECHNICAL RISK ASSESSMENT FOR THE USE OF UNDERWATER EXPLOSIONS

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CHAPTER 1 INTRODUCTION

This appendix provides the background information, assumptions, and the details of the impact assessment for use of underwater explosives in conjunction with the training outlined in Chapter 2 of this EIS. It specifically addresses the potential impact to marine mammals and sea turtles from underwater explosives used in the Firing Exercises (FIREX) with the Integrated Maritime Portable Acoustic Scoring & Simulator (IMPASS) system, Bombing Exercises (BOMBEX), Mine Neutralization Exercises (MINEX), and Missile Exercises (MISSILEX) in the Navy Cherry Point Study Area.

Assumptions that were made for the analysis include:

- Exposures were rounded to the nearest whole number using conventional rounding methods (<0.5 was rounded down and ≥0.5 was rounded up).
- Unless otherwise indicated, annual event totals were divided evenly across the four seasons as we assume these events can occur at anytime during the year.
- For events that could occur in any one of multiple sub-areas (ex. FIREX), the number of events was evenly distributed over each of the sub-area.
- In the absence of specifically developed criteria for sea turtles, the criteria developed for marine mammals is used in this analysis to determine potential exposures for sea turtles.
- MINEX and IMPASS events were modeled (using CASS/GRAB) to support previous Navy documentation. Due to the fact that these events did not change, those results were used for this analysis. MISSILEX and BOMBEX events were modified and therefore were remodeled for this analysis (using REFMS).

Figure J-1 shows the areas where explosive ordnance is used in the Navy Cherry Point Study Area under the No Action Alternative and Alternative 1. **Figure J-2** shows the areas where explosive ordnance is used in the Navy Cherry Point Study Area under Alternative 2.

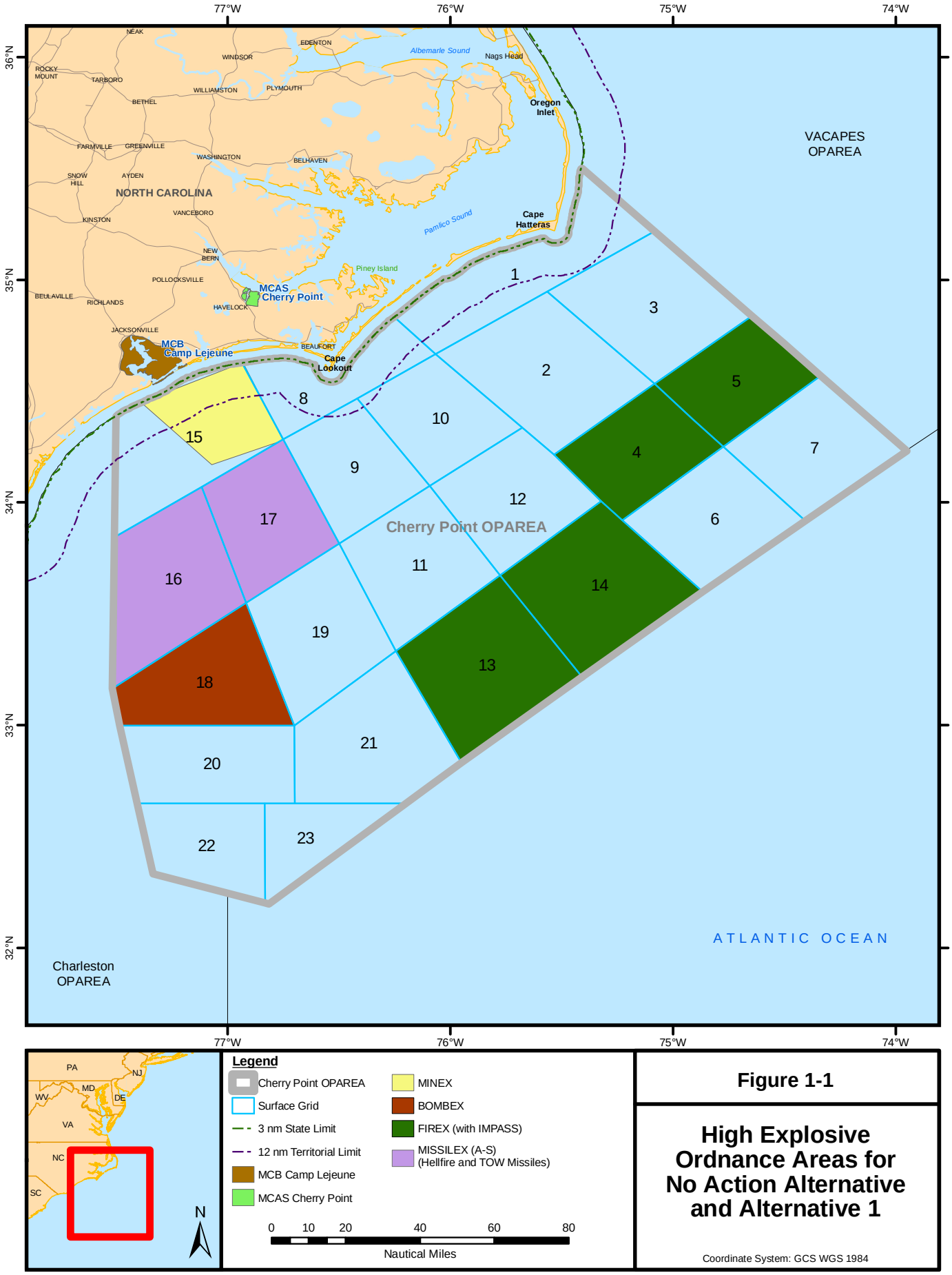


Figure 1-1

High Explosive Ordnance Areas for No Action Alternative and Alternative 1

Coordinate System: GCS WGS 1984

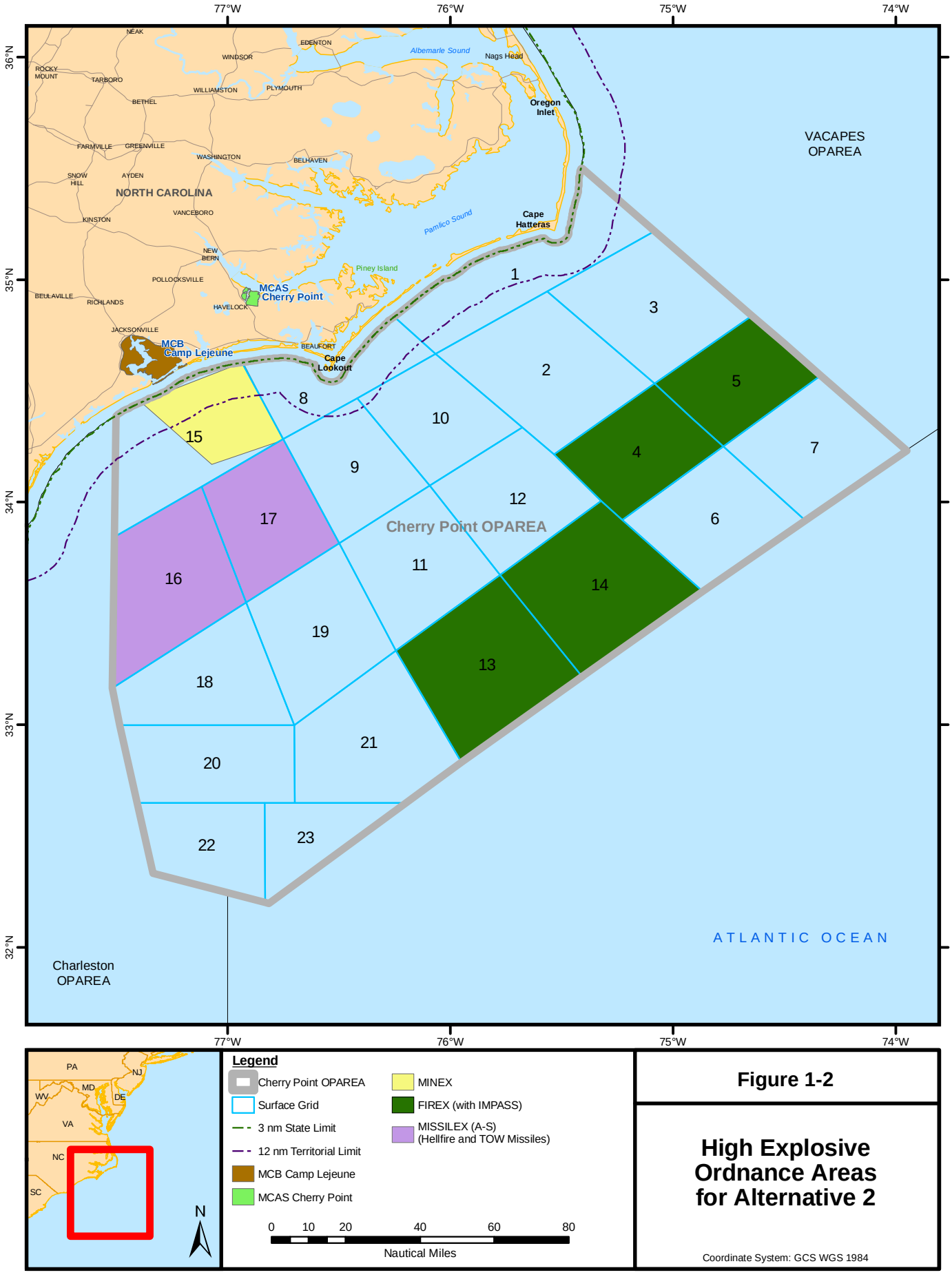


Figure 1-2

High Explosive Ordnance Areas for Alternative 2

Coordinate System: GCS WGS 1984

Table 1-1 summarizes the number of events (per year by season) for the No Action Alternative and specific areas where each occurs for each type of explosive ordnance used. **Table 1-2** summarizes the number of events (per year by season) for Alternative 1 and specific areas where each occurs for each type of explosive ordnance used. **Table 1-3** summarizes the number of events (per year by season) for Alternative 2 and specific areas where each occurs for each type of explosive ordnance used. For most of the operations, there is no difference in how many events take place between the different seasons. Fractional values are a result of evenly distributing the annual totals over the four seasons. For example, under Alternative 2 there are 6 Hellfire missile events per year that can take place in Area 16 and 17 during any season, so there are 1.5 events modeled for each season.

TABLE 1-1
NUMBER OF EXPLOSIVE EVENTS WITHIN THE NAVY CHERRY POINT STUDY AREA FOR NO ACTION ALTERNATIVE

Sub-Area	Ordnance	Winter	Spring	Summer	Fall	Annual Totals
	MISSILEX					**7**
16,17	Hellfire	0.75	0.75	0.75	0.75	
16,17	TOW	1	1	1	1	
	GUNEX					**2**
4,5	5" rounds	0.25	0.25	0.25	0.25	
13,14	5" rounds	0.25	0.25	0.25	0.25	
	MINEX					**20**
UNDET	20 LB	5	5	5	5	
	BOMBEX					**37**
Area 18	MK-82*	5.75	5.75	5.75	5.75	
Area 18	MK-83*	3.25	3.25	3.25	3.25	
Area 18	MK-84	0.25	0.25	0.25	0.25	

** One event using the MK-82 or MK-83 bombs consists of four bombs being dropped in succession. For example, in Area 18 there are 23 events for the MK-82, which means that a total of 92 bombs will be dropped per year.*

TABLE 1-2
NUMBER OF EXPLOSIVE EVENTS WITHIN THE NAVY CHERRY POINT STUDY AREA FOR ALTERNATIVE 1

Sub-Area	Ordnance	Winter	Spring	Summer	Fall	Annual Totals
	MISSILEX					**14**
16,17	Hellfire	1.5	1.5	1.5	1.5	
16,17	TOW	2	2	2	2	
	GUNEX					**2**
4,5	5" rounds	0.25	0.25	0.25	0.25	
13,14	5" rounds	0.25	0.25	0.25	0.25	
	MINEX					**20**
UNDET	20 LB	5	5	5	5	
	BOMBEX					**37**
Area 18	MK-82*	5.75	5.75	5.75	5.75	
Area 18	MK-83*	3.25	3.25	3.25	3.25	
Area 18	MK-84	0.25	0.25	0.25	0.25	

** One event using the MK-82 or MK-83 bombs consists of four bombs being dropped in succession. For example, in Area 18 there are 23 events for the MK-82, which means that a total of 92 bombs will be dropped per year.*

TABLE 1-3
NUMBER OF EXPLOSIVE EVENTS WITHIN THE NAVY CHERRY POINT STUDY AREA FOR ALTERNATIVE 2

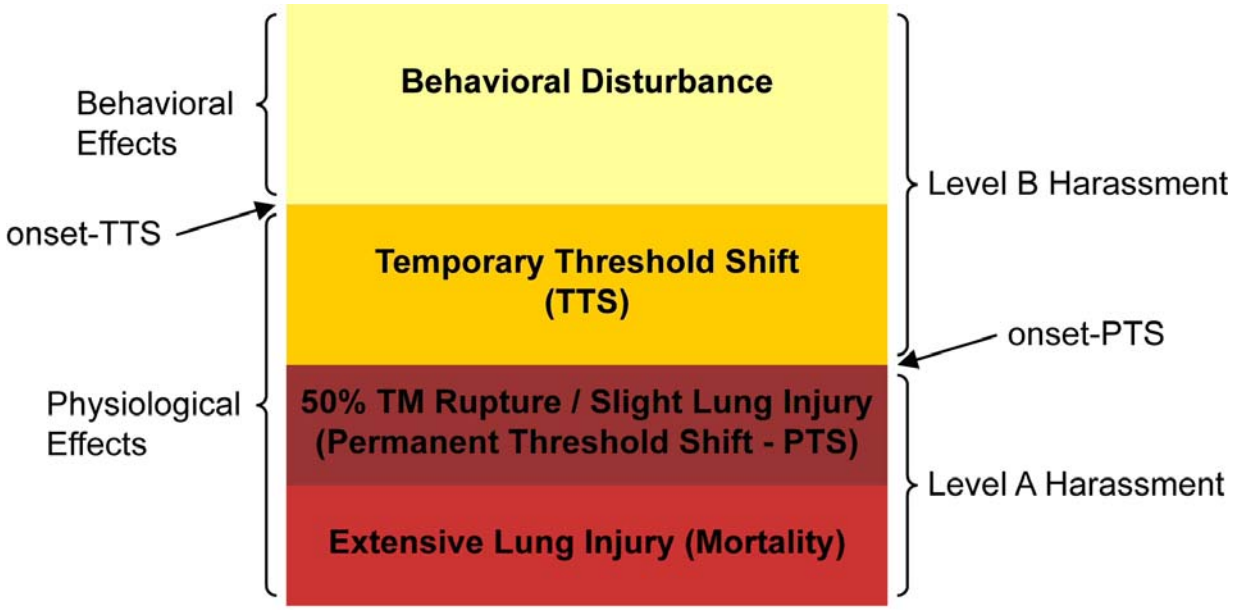
Sub-Area	Ordnance	Winter	Spring	Summer	Fall	Annual Totals
	MISSILEX					**14**
16,17	Hellfire	1.5	1.5	1.5	1.5	
16,17	TOW	2	2	2	2	
	GUNEX					**2**
4,5	5" rounds	0.25	0.25	0.25	0.25	
13,14	5" rounds	0.25	0.25	0.25	0.25	
	MINEX					**20**
UNDET	20 LB	5	5	5	5	

1.1 Thresholds and Criteria for Impulsive Sound

Criteria and thresholds for estimating the exposures from a single explosive activity on marine mammals were established for the Seawolf Submarine Shock Test Final Environmental Impact Statement (FEIS) ("Seawolf") and subsequently used in the USS Winston S. Churchill (DDG-81) Ship Shock FEIS ("Churchill") (DoN, 1998 and 2001). NMFS adopted these criteria and thresholds in its final rule on unintentional taking of marine animals occurring incidental to the shock testing (NMFS, 2001). Since the ship-shock events involve only one large explosive at a time, additional assumptions were made to extend the approach to cover multiple explosions for FIREX with IMPASS and BOMBEX. In addition, this section reflects a revised acoustic criterion for small underwater explosions (< 1500 NEW) (i.e., 23 pounds per square inch [psi] for peak pressure instead of previous acoustic criteria of 12 psi for peak pressure), which is based on an incidental harassment authorization (IHA) issued to the Air Force (NOAA, 2006). As was the case for Seawolf and Churchill, in the absence of

specifically developed criteria, criteria and thresholds for impact on protected marine mammals are used for protected sea turtles. **Figure J-3** depicts the acoustic impact framework used in this assessment.

Figure J-3 Physiological and Behavioral Acoustic Effects Framework for Explosives



(Figure is not to scale and is for illustrative purposes only)

1.1.1 Metrics

Several standard acoustic metrics are used for underwater pressure waves in this document; textbooks on underwater sound (e.g., Urick, 1983) should be consulted for details. Four metrics are especially important for this analysis:

- *Energy flux density (EFD).* For plane waves, as assumed here, energy flux density (EFD) is the time integral of the squared pressure divided by the impedance. It has SI units of J/m^2 (but in-lb/in^2 is also used in CHURCHILL). EFD levels have units of dB re 1 μPa^2-s (using the usual convention that the reference impedance is the same as the impedance at the field point).
- *1/3-Octave EFD.* This is the energy flux density in a 1/3-octave frequency band. A 1/3-octave band has upper and lower frequency limits with a ratio of $2^{1/3}$. Hence, the bandwidth is about 23% of center frequency.
- *Positive impulse.* This is the time integral of the pressure over the initial positive phase of an arrival. SI units are Pa-s, but psi-ms are also used. There is no decibel analog for impulse.
- *Peak pressure.* This is the maximum positive pressure for an arrival. Units used here are psi and decibel levels with the usual underwater reference of 1 μPa.

1.1.2 Thresholds and Criteria for Injurious Physiological Effects

Single Explosion

For injury, the Navy uses dual criteria: eardrum rupture (i.e., tympanic-membrane [TM] rupture) and onset of slight lung injury. These criteria are considered indicative of the onset of injury. The threshold for TM rupture corresponds to a 50 percent rate of rupture (i.e., 50% of animals exposed to the level are expected to suffer TM rupture); this is stated in terms of an Energy Flux Density Level (EL) value of 1.17 inch pounds per square inch (in-lb/in^2) (about 205 dB referenced to 1 micro Pascal squared second (dB re 1 μPa^2-s)). This recognizes that TM rupture is not necessarily a serious or life-threatening injury, but is a useful index of possible injury that is well correlated with measures of permanent hearing impairment (Ketten [1998] indicates a 30% incidence of permanent threshold shift [PTS] at the same threshold).

The threshold for onset of slight lung injury is calculated for a small animal (a dolphin calf weighing 26.9 lbs), and is given in terms of the "Goertner modified positive impulse," indexed to 13 psi-millisecond (ms) (DoN, 2001). This threshold is conservative since the positive impulse needed to cause injury is proportional to animal mass, and therefore, larger animals require a higher impulse to cause the onset of injury. This analysis assumed the populations were 100% small animals. The criterion with the largest potential impact range (most conservative), either TM rupture (energy threshold) or onset of slight lung injury (peak pressure threshold), will be used in the analysis to determine injurious physiological exposures.

For mortality, the Navy uses the criterion corresponding to the onset of extensive lung injury. This is conservative in that it corresponds to a 1 percent chance of mortal injury, and yet any animal experiencing onset severe lung injury is counted as a lethal exposure. For small animals, the threshold is given in terms of the Goertner modified positive impulse, indexed to 30.5 psi-ms. Since the Goertner approach depends on propagation, source/animal depths, and animal mass in a complex way, the actual impulse value corresponding to the 30.5 psi-ms index is a complicated calculation. To be conservative, the analysis used the mass of a calf dolphin (at 26.9 lbs) for 100% of the population.

Multiple Explosions

For this analysis, the use of multiple explosions only applies to FIREX with IMPASS and the MK-82 and MK-83 bombs used in BOMBEX. Since FIREX with IMPASS and portions of BOMBEX require multiple explosions, the Churchill approach had to be extended to cover multiple sound events at the same training site. For multiple exposures, accumulated energy over the entire training time is the natural extension for energy thresholds since energy accumulates with each subsequent shot (explosion); this is consistent with the treatment of multiple arrivals in Churchill. For positive impulse, it is consistent with Churchill to use the maximum value over all impulses received.

1.1.3 Thresholds and Criteria for Non-Injurious Physiological Effects

The Navy criterion for non-injurious physiological effects is TTS — a slight, recoverable loss of hearing sensitivity (DoN, 2001a). For this assessment, there are dual thresholds for TTS, an energy threshold and a peak pressure threshold. The criterion with the largest potential exposure range (most conservative), either the energy threshold or peak pressure threshold, will be used in the analysis to determine non-injurious physiological (TTS) exposures.

Single Explosion –TTS-Energy Threshold

The first threshold is a 182 dB re 1 μPa^2-s maximum energy flux density level in any 1/3-octave band at frequencies above 100 Hz for toothed whales/sea turtles and in any 1/3-octave band above 10 Hz for baleen whales. For large explosives, as in the case of the Churchill FEIS, frequency range cutoffs at 10 and 100 Hz make a difference in the range estimates. For small explosives (< 1500 lb NEW), as what

was modeled for this analysis, the spectrum of the shot arrival is broad, and there is essentially no difference in impact ranges for toothed whales/sea turtles or baleen whales.

The TTS energy threshold for explosives is derived from the Space and Naval Warfare Systems Center (SSC) pure-tone tests for TTS (Schlundt *et al*., 2000, Finneran and Schlundt 2004). The pure-tone threshold (192 dB as the lowest value) is modified for explosives by (a) interpreting it as an energy metric, (b) reducing it by 10 dB to account for the time constant of the mammal ear, and (c) measuring the energy in 1/3-octave bands, the natural filter band of the ear. The resulting threshold is 182 dB re 1 μPa^2-s in any 1/3-octave band. The energy threshold usually dominates and is used in the analysis to determine potential MMPA-Level B exposures for single explosion ordnance.

Single Explosion –TTS-Peak Pressure Threshold

The second threshold applies to all species and is stated in terms of peak pressure at 23 psi-ms (about 225 dB re 1 μPa). This criterion was adopted for Precision Strike Weapon (PSW) Testing and Training by Eglin Air Force Base in the Gulf of Mexico (NMFS, 2006). It is important to note that for small shots near the surface (such as in this analysis), the 23-psi-ms peak pressure threshold generally will produce longer impact ranges than the 182-dB energy metric. Furthermore, it is not unusual for the TTS impact range for the 23-psi-ms pressure metric to actually exceed the behavioral impact range for the 177-dB energy metric.

Multiple Explosions –TTS

For multiple explosions, accumulated energy over the entire training time is the natural extension for energy thresholds since energy accumulates with each subsequent shot/detonation. This is consistent with the energy argument in Churchill. For peak pressure, it is consistent with Churchill to use the maximum value over all impulses received.

1.1.4 Thresholds and Criteria for Behavioral Effects

Single Explosion

For a single explosion, to be consistent with Churchill, TTS is the criterion for MMPA-Level B. In other words, because behavioral disturbance for a single explosion is likely to be limited to a short-lived startle reaction, use of the TTS criterion is considered sufficient protection and therefore behavioral effects are not considered for single explosions.

Multiple Explosions

For this analysis, the use of multiple explosions only applies to FIREX with IMPASS and the MK-82 and MK-83 bombs used in BOMBEX. Because multiple explosions would occur within a discrete time period, a new acoustic criterion-behavioral disturbance is used to account for behavioral effects significant enough to be judged as harassment, but occurring at lower noise levels than those that may cause TTS.

The threshold is based on test results published in Schlundt *et al*. (2000), with derivation following the approach of the Churchill FEIS for the energy-based TTS threshold. The original Schlundt *et al*. (2000) data and the report of Finneran and Schlundt (2004) are the basis for thresholds for behavioral disturbance. As reported by Schlundt *et al*. (2000), instances of altered behavior generally began at lower exposures than those causing TTS; however, there were many instances when subjects exhibited no altered behavior at levels above the onset-TTS levels. Regardless of reactions at higher or lower levels, all instances of altered behavior were included in the statistical summary.

The behavioral disturbance threshold for tones is derived from the Spawar Systems Center (SSC) tests, and is found to be five dB below the threshold for TTS, or 177 dB re 1 μPa2-s maximum energy flux density level in any 1/3-octave band at frequencies above 100 Hz for toothed whales/sea turtles and in

any 1/3-octave band above 10 Hz for baleen whales. As stated previously for TTS, for small explosives (< 1500 lb NEW), as what was modeled for this analysis, the spectrum of the shot arrival is broad, and there is essentially no difference in impact ranges for toothed whales/sea turtles or baleen whales. In shallower water, the behavioral disturbance exposure range can be about twice the exposure range for TTS. However, in deeper water, the TTS pressure criteria (23 psi) exposure range can result in a longer exposure range than the behavioral disturbance criteria exposure range. This is due to the fact that in a deep water environment, it is more likely that there is a direct path for the shockwave to propagate, which results in a larger peak pressure range. In shallow water, there is reflection, absorption, and cancellation of the shockwave propagation due to interactions with the bottom, sediment type, etc., which can limit the peak pressure range.

1.2 Summary of Thresholds and Criteria for Impulsive Sounds

Table 1-4 summarizes the effects, criteria, and thresholds used in the assessment for impulsive sounds. The criteria for behavioral effects without physiological effects used in this analysis are based on use of multiple explosives that only take place during a FIREX with IMPASS event or a BOMBEX event involving MK-82 or MK-83 bombs.

Table 1-4 Effects, Criteria, and Thresholds for Impulsive Sounds

Effect	Criteria	Metric	Threshold
Mortality	Onset of Extensive Lung Injury	Goertner modified positive impulse	indexed to 30.5 psi-ms (assumes 100% small animal at 26.9 lbs)
Injurious Physiological	50% Tympanic Membrane Rupture-PTS[1]	Energy flux density	1.17 in-lb/in2 (about 205 dB re 1 μPa2-s)
Injurious Physiological	Onset Slight Lung Injury	Goertner modified positive impulse	indexed to 13 psi-ms (assumes 100% small animal at 26.9 lbs)
Non-injurious Physiological	TTS[2]	Greatest energy flux density level in any 1/3-octave band (above 100 Hz for toothed whales/sea turtles and above 10 Hz for baleen whales) - for total energy over all exposures	182 dB re 1 μPa2-s
Non-injurious Physiological	TTS	Peak pressure for any single exposure	23 psi

[1] Permanent Threshold Shift

[2] Temporary Threshold Shift

Table 1-4 Effects, Criteria, and Thresholds for Impulsive Sounds (Continued)

Effect	Criteria	Metric	Threshold
Non-injurious Behavioral	Behavioral Disturbance without TTS	Greatest energy flux density level in any 1/3-octave (above 100 Hz for toothed whales/sea turtles and above 10 Hz for baleen whales) - for total energy over all exposures (multiple explosions only)	177 dB re 1 μPa2-s

CHAPTER 2 ACOUSTIC ANALYSIS FOR UNDERWATER EXPLOSIONS ASSOCIATED WITH FIREX WITH IMPASS

2.1 Summary Description of the Action

A typical FIREX with IMPASS evolution is summarized below.

- Under all Alternatives, the plan is for up to 2 events per year in the CHPT OPAREA. The duration of an event is several hours.
- Each event is comprised of a "Pre-FIREX" test followed by a FIREX consisting of at least 6 "missions."
- "Pre-FIREX" consists of 4 live rounds to support Trend Analysis in order to remove mechanical error from the Fall of Shot (FOS). These rounds are fired at a one-minute cycle rate. This is followed by 2 live rounds fired for Trend Analysis Verification at a 10-second cycle time. Error distance between where the shell impacts and the target point is assumed to be less than 100 yards (yards) (~ 91 meters [m]).
- The first "mission" begins within 45 minutes of the last pre-FIREX round.
- For each event there are a minimum of 6 "missions," with approximately 5-10 minutes between each mission. These missions include:
  - ***AREA Target*** (6 live rounds, 10-second cycle time)
  - ***Danger Close*** (5 live rounds, 10-second cycle time)
  - ***Coordinated Illumination*** (4 live rounds, 20-second cycle time)
  - ***Counter Mech*** ((4 live rounds, 10-second cycle time)
  - ***SEAD*** (4 live rounds, 10-second cycle time)
  - ***Re-fire*** (4 live rounds, 10-second cycle time)

  If a mission fails, a ***Do Over*** mission of up to 6 live rounds is executed.
- All rounds for a given mission are expected to impact within 50 yards (45 m) of the target point.
- The modeled typical event involves firing a total of 39 rounds (6 rounds for pre-FIREX, and 4-6 rounds for each of 6 mission types and one 6-round ***Do Over***).

2.2 Characterization of Source Properties

For the acoustic analysis, the exploding shell is characterized here as a point source, with an 8 pound net weight of high-energy explosive.

2.2.1 Depths of Animals and Explosions

Although the 5-inch shells are set to detonate on contact with the ocean surface, actual detonation depth is not known. For this analysis, an assumption of a 1 ft (0.3 m) depth is made. Animal depths are selected to ensure the greatest direct path for the harassment ranges, and to give the greatest impact range for the injury thresholds; they are thus conservative. The latter is consistent with the approach of CHURCHILL.

2.2.2 Similitude Formulas for Source Properties

Standard similitude formulas are used to model the free-field source properties close to the source, starting at a nominal source-level range of 1 m (3.3 ft). Weak shock theory is used to estimate the waveform and levels to ranges beyond a few meters. Rather than revert to linear propagation theory when the amplitudes are small, the weak shock is used to all ranges. This is consistent with the SEAWOLF and CHURCHILL FEISs (although not explicitly stated in the documents). References for similitude and explosive sound propagation include Cole (1948), Arons *et al.* (1949), Weston (1960), Urick (1983), Goertner (1982), Gaspin (1983), Chapman (1988), Gaspin and Shuler (1971), and Bluy and Payne (1974). The formulas are provided below.

Waveform for Shock Wave, Positive Phase (Similitude, Arons et al., 1949):

The pressure as a function of time at a fixed location is given by:

$P(t) = P_o \exp(-t/t_o)$, for $t > 0$, and

$P(t) = 0$, $t < 0$,

where P_o is peak pressure, t is time (with $t = 0$ as arrival time of the shock front), and t_o is time constant. This is an idealized waveform, and does not include negative phase or bubble pulses. The latter is not at issue for shots at the surface. Negative pressure disturbances are treated here for the case of the surface reflected path.

Peak Pressure of Shock Wave (Similitude, Arons et al., 1949):

Peak pressure in psi is given by:

$$P_o = 2.16 \times 10^4 \, (W^{1/3}/R)^{1.13}$$

where W is net explosive weight (NEW) in pounds, and R is range in feet.

Time Constant for Shock Wave (Similitude, Arons et al., 1949):

The 1/e time in ms is given by:

$$t_0 = 0.052 W^{1/3} \, (W^{1/3}/R)^{-0.26}$$

where W is NEW in pounds and R is range in feet.

Positive Impulse for Shock Wave (Similitude, Arons et al., 1949):

Positive impulse is calculated directly from the time integral of the pressure over the positive phase.

Goertner (1982) Modified Positive Impulse

As in the CHURCHILL FEIS, this document utilizes the Goertner (1982) approach to determine the positive impulse. In this approach, either: (1) a surface reflected impulse, or (2) a lung/bubble resonance

period is used to modify the positive impulse at various ranges and depths. For a pressure-release surface, the reflected pulse is the negative of the incident, with perhaps a reduction in amplitude and distortion of the waveform. The result of combining the surface reflected and direct paths is a reduction in positive impulse. Similarly, the lung/bubble resonance period cuts off the decaying peak pressure. The Goertner modified positive impulse is the integral of the pressure from the start of the arrival of the direct-path impulse until the start of the arrival of the surface-reflected pulse (or the period of the resonance). The minimum of the two integrals is calculated as a function of animal depth, and compared to the Goertner depth-dependent threshold. Since the maximum range over the possible animal depths is used in the analysis, the estimated impact ranges are conservative.

Energy Flux Density (Similitude, Arons et al., 1949):

EFD is calculated directly from the time integral of the squared pressure, normalized by impedance.

Energy Flux Density Spectrum (Similitude, Weston, 1960):

The EFD spectrum is the squared modulus of the Fourier transform of the exponential waveform. It can be written as:

$$E = \{2P_o^2\} / \{\rho c\,(1/t_o^2 + 4\pi^2 f^2)\}$$

where E is in ergs/cm^{2}Hz, P_o is the peak pressure in μPa, $\rho c = 1.539 * 10^5$ g/cm^2-s, t_o is time constant in seconds, and f is frequency in Hz.

Dependence of Formulas on the Type of Explosive

All of the formulas above assume TNT as the high-explosive material. For other explosives, the formulas remain the same, but an adjustment is made for the density of the explosive relative to TNT. For example, RDX has a density about 15% greater than TNT.

2.3 Environmental Provinces and Sound Propagation

2.3.1 Overview

For an ideal, deep-water environment (flat pressure-release surface, constant sound speed, no absorption, no bottom interaction, source and receiver away from the surface) and a single explosion, impact ranges associated with the acoustic thresholds defined in Section 1.3 can be estimated using standard formulas for shock waves. For a single 8-lb NEW charge at a depth of 1 ft (0.3 m), the MMPA-Level B harassment range is determined from the 23-psi TTS threshold to be approximately 295 m (320 yards). Injury ranges are approximately 45 m (50 yards) for small animals.

Because training would occur year-round, the assumption of an ideal, deep-water environment would not always be appropriate. In fact, FIREX with IMPASS may be deployed in waters as shallow as 50 m (55 yards). To estimate impact areas for the variety of FIREX with IMPASS deployment sites, Navy standard acoustic models and databases were applied to environmental 'provinces' within which the ocean acoustic environments are expected to be similar. The environmental provincing follows naturally from the Navy databases, and yields from 45 to 80 provinces in each OPAREA for each season.

Based on the Navy standard CASS/GRAB model (OAML, 2002), modified to account for impulse response, shock-wave waveform, and nonlinear shock-wave effects, and on the Navy (OAML, 2002) standard environmental databases (sound speed, wind speed, bottom interaction, and bathymetry), impact ranges were estimated for each season and province. Note that the model is validated for use of the highly specialized bottom sediment databases and for range-varying environments. In addition, test calculations were made to account for bubble pulses.

Impact ranges and impact areas were estimated for many cases (1 OPAREA, 40 to 80 provinces per OPAREA, 4 seasons, and eight impact thresholds) -- too many to list here (approximately 1,000 cases

for 1 shot alone). The results are thus summarized in Table 2-2 according to intervals of water depth (e.g., locations for which water depths are between 100 m (110 yards) and 1,000 m [1,100 yards]).

2.3.2 Propagation Modeling

The approach begins with a high-fidelity acoustic model that has all of the required properties for the 'linear' problem. Since the OPAREA of interest includes shallow-water regions, the selected model must treat range-dependent environments and be able to exploit Navy standard bottom-sediment interaction approaches (e.g., the Navy Standard: OAML, 2002). It must cover a wide frequency band (up to about 10 kHz), and correctly account for caustics, surface cutoff, ducting, low-frequency cutoff, and important diffraction effects. Because of the wide bandwidth for small shots, wave-theory models (such as modal theory or parabolic equation method or finite-element approaches) are usually not practical, so that modified ray theory models are favored. Examples include Navy standard models (CASS/GRAB or ASTRAL) and the model used for long-range, flat bottom estimates in CHURCHILL and SEAWOLF - the REFMS model (Britt *et al.*, 1991). The CASS/GRAB model is well suited for small shots and is used in this assessment.

Consider first the linear case. The approach is to first calculate the impulse response of the channel. This is one of the standard applications for the CASS/GRAB model. Let $\delta(t)$ be the delta function, $s_o(t)$ be the pressure waveform at the source (at 1 m from the source), and $S(s_o(t), x; t)$ be the pressure time series of the field at location x. Then:

$S(\delta(t), x; t)$ is the impulse response at location x.

Now, $S(s, x; t)$ is linear in s, and it is trivially the case that $s_o(t) = s_o(t) \otimes \delta(t)$, where $\otimes$ denotes convolution. Hence,

$$S(s(t) , x; t) = S(s(t) \otimes \delta(t), x; t) = s (t) \otimes S(\delta(t), x; t).$$

Thus, given the impulse response, the field for any source waveform is available through simple convolution. This is a standard approach in sound wave modeling (e.g., Clay and Medwin, 1977).

The starting field (e.g., at 1 m), s(t), is prescribed as an idealized, exponentially decaying shock wave, followed by double-exponential bubble pulses, with negative pressures in between to ensure the impulse is zero (e.g., Weston, 1960).

The peak pressures of the bubble pulses are smaller than the peak pressure of the main pulse. The same is true for the positive impulse and the total energy. However, the bubble pulse contributions can change the shape of the energy spectrum. In the FIREX WITH IMPASS case, with small shot and shallow depth, the bubble pulse frequency is below 1 Hz, and the spectral modification does not affect which 1/3 octave band has greatest level. Thus, bubble pulse contributions are not included in these calculations. Note that for the approach used here, it is no more difficult to include the bubble pulses, but there is no reason to add this complication to the problem.

In regions of high pressure, non-linearities can be important -- particularly in the rate of decay of the peak pressure and in the increasing time constant for the pressure wave. Although total energy is minimally affected, the energy spectrum is sensitive to nonlinear effects. The usual approach to incorporating these effects in a ray model is to propagate the waveform for each ray path according to the similitude formulas. This is what is done, for example, in REFMS (Britt *et al.*, 1991).

The non-linear correction is made as follows. Let $S_n(x; t)$ be the idealized similitude waveform at location x, over time t. Then, for ranges at which the peak pressure is greater than 100 psi, the field is estimated as:

$$S(s(t) , x; t) = [\, |x|^2 S_n(x; t)] \otimes S(\delta(t), x; t)$$

Since the model yields the full time series at each location, it can directly calculate the peak pressure, positive impulse, Goertner modified positive impulse, energy spectrum, and frequency-band values (e.g., 1/3 octave band) of the EFD. This model uses the same (similitude) approach to account for non-linearities in water-borne shock wave propagation as does the REFMS model.

Note on Propagation by Weak Shock Theory

Weak shock theory dates to the 19th century and is used in all types of shock wave propagation (in air, in water, etc.). Gaspin (1983) recommends that it be used beyond a range of:

$$R_o = 12.0 * W^{1/3}$$

where W = explosive weight in pounds, and R_o = 'limiting range' in feet. For an 8-lb NEW charge, the range is only 24 ft (7.3 m). The recommendation is to use the similitude formulas to range R_o, and the weak shock formula, thereafter.

The weak shock formulas are:

$$P = Po * \{[1 + 2 * (R_o/L_o) * Ln (R/ R_o)]^{½} - 1\} / \{[R/ L_o] * Ln (R/ R_o)\}$$

$$T = To * [1 + 2 * (R/ L_o) * Ln (R/ R_o)]^{½}$$

where: $L_o = (\rho c^3 T_o) / (P_o \beta)$, P_o = peak pressure at R_o, T_o= time constant at R_o , ρc = acoustic impedance for seawater, β= coefficient of non-linearity for water (3.5).

These formulas have been published many times, with a recent, relevant example in Richardson *et al.* (1995). What is sometimes not noted is the comparison of the weak shock formulas with the similitude formulas, although Rogers (1977) does address this quite well. In particular, note that the weak shock theory and the Arons *et al.* (1949) similitude formulas are within 20% of each other for most parameters of interest in this assessment.

2.3.3 Underwater Explosive Measurements for Validation

Because of the special geometry of FIREX with IMPASS (especially the shallow and uncertain depth of the explosions), there are very few measurements that can be used directly to estimate the sound field. Measurements for small shots and deeper depths are available for some of the FIREX with IMPASS sites, and they are useful for determining bottom interaction properties. Results for these data sets have in most cases been analyzed and incorporated into the Navy databases (OAML, 2002) (which are used for this assessment). In that sense, the risk estimates have exploited the available propagation data.

2.4 Estimated Impact Ranges and Areas for a Single Exploding Shell

For a single 8-lb NEW charge, impact ranges are relatively short, and there is little dependence on season, water depth, or bottom properties for the OPAREA covered. Model estimates are summarized in **Table 2-1**.

The impact ranges for TTS based on energy levels are the same for both frequency limits (10 Hz and 100 Hz) in all cases for small explosives because of the broadness of the frequency spectrum. The same is true for behavioral disturbance.

There is little variability due to environmental conditions for any of the impact ranges in **Table 2-1**. In fact, the only case for which there is some variability (the TTS range for energy threshold), shows that most of this variability occurs in shallow water (less than 100 m (328 ft)). This result is as expected. However, greater variability is found in the estimation of TTS impact areas for multiple explosives -- primarily because of energy accumulation and hence, greater ranges for multiple shots.

Table 2-1 Estimated Impact Ranges[1] for Cetaceans and Sea Turtles for Explosion of a Single 5-Inch Shell

Criterion and Threshold	Estimated Impact Range
MMPA-Level A Harassment: 50% tympanic membrane (TM) rupture. Threshold: Energy above 1.17 in-lb/in2 [205 dB re 1 μPa2-s]	15-25 m (16 -28 yds)
MMPA-Level A Harassment: Onset of slight lung injury. Threshold: Goertner modified positive impulse exceeds threshold indexed to 13 psi-ms	40-45 m (44-50 yds)
MMPA-Level B Harassment: TTS for baleen whales. Threshold: 1/3 octave-band energy flux density level above 10 Hz exceeds 182 dB re 1 μPa2-s	71-80 m (78-88 yds)
MMPA-Level B Harassment: TTS for toothed whales and sea turtles. Threshold: 1/3 octave-band energy flux density level above 100 Hz exceeds 182 dB re 1 μPa2-s	71-80 m (78-88 yds)
MMPA-Level B Harassment: TTS. Threshold: 23 psi peak pressure [225 dB re 1 μPa]	255-275 m (280-300 yds)
MMPA-Level B Harassment: Behavioral disturbance for baleen whales. Threshold: 1/3 octave-band energy flux density level above 10 Hz exceeds 177 dB re 1 μPa2-s (multiple explosions only)	140-150 m (155-165 yds)
MMPA-Level B Harassment: Behavioral disturbance for toothed whales Threshold: 1/3 octave-band energy flux density level above 100 Hz exceeds 177 dB re 1 μPa2-s (multiple explosions only)	140-150 m (155-165 yds)

[1] ***These impact ranges assume detonation occurs at 1 ft (0.3 m) below the water's surface***

2.5 Impact Areas for Marine Mammals for a Full FIREX with IMPASS Event (39 Explosions)

Impact areas for a full FIREX WITH IMPASS event must account for the time and space distribution of 39 explosions, as well as the movement of animals over the several hours of the exercise. The reason is that impact areas depend on whether an animal is exposed to a single pressure wave or multiple waves over time.

As is discussed in detail below, the total impact area for the 39-shot event is calculated as the sum of small impact areas for 7 FIREX missions (each with 4-6 shells fired) and 1 pre-FIREX action (with 6 shells fired). For a single 5-shell mission, the total impact area is typically small (< 0.2 nm^2) and impact ranges also small (< 500 m (550 yards)). Because target locations are changed from mission to mission and because of the time lag between missions, it is highly unlikely that a cetacean would be within the small impact zone for more than one mission.

Section 2.5.1 outlines the approach to estimating the impact ranges and areas, and Section 2.5.2 gives an example in detail of the take estimate calculations for a typical case. Section 2.5.3 summarizes the resulting total impact areas for the FIREX WITH IMPASS OPAREAs and representative depth strata.

2.5.1 Example of How the Calculations of Estimated Impact Areas Are Made

The nominal FIREX WITH IMPASS event can be broken down into two components: 1) a 6-round Pre-FIREX, and 2) seven FIREX missions, each with 4-6 rounds. The time between pre-FIREX and the first FIREX mission, as well as the time between the individual FIREX missions is sufficiently large as to allow these components to be examined independently (i.e., their small impact areas calculated). The total impact area for an event can be calculated by adding together the component areas for the Pre-FIREX and the 7 FIREX missions.

In order to determine the size of the area potentially impacted for each component of the mission, an estimate must be made of the time that a typical animal could be present in the impact area. This is necessary to correctly gauge the total energy exposure that an animal would receive if exposed to the sound of more than one explosion.

Additionally, inaccuracies in the location of the shell impact points need to be included in this analysis. The reason is that, for the peak pressure threshold for harassment, the harassment area depends on the relative location of the shell impact locations. The nominal targeting error (i.e., the radius within which all shells should nominally land) based on previous training exercises is 100 yards (91m) for the Pre-FIREX rounds and 50 yards (46 m) for an entire mission's fire. Therefore, the six Pre-FIREX rounds should land within 100 yards (91 m) of the targeting point, and all 4-6 mission rounds should land within 50 yards (46 m) of the targeting point for that mission.

For small explosives detonated near the sea surface, the impact range for MMPA-Level B harassment for a single explosive is often determined by the 23-psi peak-pressure threshold for TTS, even for the typical multiple shots encountered in a single mission.

TTS Harassment Calculation – Pre-FIREX Fire

For Pre-FIREX, four rounds (for Trend Analysis) are fired with a one-minute cycle time, followed by two rounds (for Verification) with a ten-second cycle rate. The target error is less than 100 yards (91 m).

For the peak pressure threshold for TTS, the impact area is no greater than the impact area of five widely-spaced shots (this assumes that the two verification rounds are nearly coincident in time and space) or:

$$\text{Area} = \pi * (300/2025)^2 * 5 = 0.345 \text{ nm}^2$$

where 300 yards is the impact range for 23-psi peak pressure threshold.

For the TTS energy threshold, the expected area is estimated to be no greater than:

$$\text{Area} = \pi * (215/2025)^2 = 0.035 \text{ nm}^2,$$

where 215 yards is the impact range for six shots.

TTS Harassment Calculation – Typical Mission

For the typical mission consisting of five rounds, the expected impact area is no greater than:

$$\text{Area} = \pi * ((300 + 50 + 68)/2025)^2 = 0.134 \text{ nm}^2$$

for the peak pressure threshold, and no greater than:

$$\text{Area} = \pi * (197/2025)^2 = 0.030 \text{ nm}^2,$$

for the energy threshold where 197 yards is the impact range for five shots. The peak pressure estimate assumes that the five rounds fall within 50 yards of the target, that the five rounds fall within 40 seconds, and that the average animal-swim distance for 40 seconds is about 68 yards (for a 3 knot or 1.7 yards/sec swim speed).

Following the same approach, expected impact areas are derived below.

Behavioral Disturbance – Pre-FIREX Fire

Estimated area based on energy threshold is:

$$\text{Area} = \pi * ((405)/2025)^2 = 0.126 \text{ nm}^2$$

where 405 yards is the impact range for six shots.

Behavioral Disturbance – Typical Mission

Estimated area based on energy threshold is:

$$\text{Area} = \pi * ((370)/2025)^2 = 0.105 \text{ nm}^2$$

where 370 yards is the impact range for five shots.

Injury Calculation – Pre-FIREX Fire

Estimated area based on positive impulse threshold is:

$$\text{Area} = \pi * (35/2025)^2 * 5 = 0.005 \text{ nm}^2$$

where 35 yards is the impact range for a single shot.

Estimated area based on energy threshold is:

$$\text{Area} = \pi * (69/2025)^2 = 0.004 \text{ nm}^2$$

where 69 yards is the impact range for six shots.

Injury Calculation – Typical Mission

Estimated area based on the positive impulse threshold is:

$$\text{Area} = \pi * (35/2025)^2 * 5 = 0.005 \text{ nm}^2$$

Estimated area based on the energy threshold is:

$$\text{Area} = \pi * ((63)/2025)^2 = 0.003 \text{ nm}^2$$

where 63 yards is the impact range for five shots.

Total Areas per Event

For **injury**, the total expected area per event is:

Total Area = Area (of one Pre-FIREX fire) + 2 * Area (one six-round mission) +
Area (one five-round mission) + 4 * Area (one four-round mission)
= 0.005 + 2 * (0.006) + 1 * (0.005) + 4 * (0.004) = 0.038 nm^2

For **TTS,** the total expected area is:

Total Area = Area (of one pre-calibration fire) + 2 * Area (one six-round mission) + Area (one five-round mission) + 4 * Area (one four-round mission) – Total Injury Area
= 0.345 + 2 * (0.145) + 1 * (0.134) + 4 * (0.123) – 0.038 = 1.223 nm^2.

For **behavioral disturbance**, the total expected area is:

Total Area = Area (of one pre-calibration fire) + 2 * Area (one six-round mission) + Area (one five-round mission) + 4 * Area (one four-round mission) – Total Injury Area – Total TTS Harassment Area
= 0.126 + 2*(0.126) + 1*(0.105) + 4*(0.083) – 0.038 – 1.223 = – 0.446 nm^2.

The negative total area derived for behavioral disturbance without TTS is the result of the factors in the analysis: (1) a peak pressure metric used to determine TTS (and injury) but not for behavioral

disturbance, and (2) the peak pressure threshold being used (23 psi) is not entirely scaled for the 8-Lb. NEW source.

These total areas, when multiplied by the animal densities, provide the take estimates for that animal species for the nominal exercise case of 39 five-inch shells, as previously described.

Note that although these are presented as "total areas" of harassment in order to calculate takes, this "total area" would not be impacted at any one time. The potential impacts would occur within a series of small impact areas associated with the pre-calibration rounds and missions, spread out over a period of several hours.

2.5.2 Summary of Estimated Impact Areas for Marine Mammals for a Full FIREX WITH IMPASS Event (39 Explosions)

Impact areas were estimated for each of the 50-80 environmental provinces in each OPAREA. Because sound propagation and animal densities are sensitive to water depth, a useful summary of the estimates is by depth strata. Note that the depth strata for the acoustic modeling were based on approximate 'octaves.' That is, the strata had depth intervals of 35-70 m, 70-150 m, 150-300 m, etc. Each was assigned a 'mean' water depth, with resulting values of 50, 100, 200, 500, 1000, 2000, and 4000 m.

A summary of the resulting impact areas is given in **Table 2-2** for the Navy Cherry Point Study Area and for selected depth strata.

Estimates for a given depth stratum are weighted averages of impact areas for those provinces which are within the depth limits. The weighting is according to the areas of the provinces. This weighted averaging is consistent with the assumption that a training site is equally likely to occur anywhere within the depth limits.

Table 2-2 Estimated Impact Areas for a Single 39-Shell Event (nm^2)

OPAREA	Depth Stratum	Impact Area for Injury @ 205 dB re 1 μPa^2-sec or 13 psi	Impact Area for TTS @ 182 dB re 1 μPa^2-sec or 23 psi	Impact Area for Behavioral Disturbance @ 177 dB re 1 μPa^2-sec (multiple detonations only)
CHPT	50 m – 100 m	0.038-0.054	1.11-1.17	0.46-2.02
CHPT	100 m – 1000 m	0.038-0.054	1.10-1.11	0.00-0.15
CHPT	> 1000 m	0.054-0.054	1.09-1.11	0.00-0.00

It is important to note here that there was a general lack of seasonal dependence for the impact area calculations. There was also little dependence on animal depth (assuming the conservative case that the animal is not close to the surface and do not benefit from the effects of surface 'cutoff'). In deep water, because the impact ranges are relatively short, the bottom and sound speed properties have little effect on sound propagation and the impact areas are typically about the same throughout.

CHAPTER 3 ACOUSTIC ANALYSIS FOR UNDERWATER EXPLOSIONS ASSOCIATED WITH BOMBEX AND MISSILEX

The following material provides an explanation of the marine mammal acoustic effects model used to estimate the acoustic impact of explosive ordnance associated with BOMBEX and MISSILEX training on marine mammals and sea turtles. The best available data were used in combination with an underwater explosion model and exercise simulation to predict impacts. The method by which predicted effects were quantified is described. Under the No Action and Alternative 1, BOMBEX training could take place in one location (Area 18). Under Alternative 2, no BOMBEX training will occur. MISSILEX training occurs in one location (Area 16 and 17) under all Alternatives. See Figures 1-1 and 1-2 for exercise locations.

3.1 MODEL DESCRIPTION

The modeling consists of five process components:

1. An exercise description including the type of weapons and acoustic sources used and their associated timelines and characteristics.
2. A physical oceanographic and geo-acoustic dataset for input to the acoustic propagation model for the planned exercise location and time of year.
3. An acoustic propagation model suitable for the source type to predict energy levels at ranges and depths from the source.
4. Marine animal density data for the test area.
5. A final calculation to multiply together the acoustic propagation results, the animal densities, and the number of operations.

3.1.1 Exercise Description

A timeline and sequence of weapon delivery was constructed from these records to form the basis of the test simulation. From this information, the order of weapon use, number of weapons fired, and time over which the weapons were fired is constructed.

3.1.2 Environmental Information for the Acoustic Propagation Model

Oceanographic data representative of the exercise locations were used to estimate propagation of the blast and acoustic energy using an analytical time-domain model for underwater explosions.

Environmental data parameters include bathymetry, sound speed profiles (SSP), and bottom type parameters including sediment characteristics, compressional and shear wave speed, density, and layer depth.

3.1.2.1 Bathymetry

The center latitude/longitude of the exercise boxes were used to determine the representative depth for each exercise location. The sites used for analysis of BOMBEX and MISSILEX were identified as Area 18 and Area 16 and 17 with given latitude and longitude locations as 33.20N, 77.08W and 33.80N, 77.04W, respectively.

3.1.2.2 Ocean Water Characteristics

Acoustic propagation at the exercise locations are mostly determined by the SSP due to deep water depths. For modeling, the SSP was partitioned into isovelocity water layers in order to calculate and

predict propagation of blast and acoustic energy. Environmental databases used for this analysis are limited to those that were unclassified. The Naval Oceanographic Office online

Generalized Digital Environment Model, version 2.5 was used to obtain monthly SSPs, which were accessed at https://128.160.23.42/gdemv/gdemv.html. Twelve SSPs, the average for each month, were examined for the most conservative, which is defined as the profile that results in the best propagation conditions and largest zone of influence (ZOI) for the test. The SSP was then partitioned into isovelocity layers so that no layer had a change in sound speed greater than 3.28 ft/s (1 m/s) for the model input file.

3.1.2.3 Ocean Sediment Characteristics

Given a description of the bottom sediment, the sound speed ratio and density were acquired from the database of Hamilton (1980). Parameters used in the selected acoustic model to define ocean sediments are the sediment velocity ratio and wet density. Specifically, the sediment shear wave velocity is calculated from the sediment velocity ratio as a function of the compressional wave velocity, also called sediment sound speed. **Table 3-1** summarizes the data used for the BOMBEX and MISSILEX sites.

Table 3-1 Water Depth and Sediment Properties for the of the BOMBEX and MISSILEX Sites

Site	Water Depth (m)	Bottom Sediment	Sound Speed Ratio	Density (gm/cm3)
CHPT Area 16/17	34	Sand	1.145	1.941
CHPT Area 18	350	Sand	1.145	1.941

3.1.3 Acoustic Propagation Model

Only explosive sources were utilized and the Reflection and Refraction Multi-Layered Ocean/Ocean Bottoms with Shear Wave Effects (REFMS) model (version 5.06) (Britt *et al.* 1991) was used for the acoustic predictions. REFMS is used to calculate peak maximum and minimum pressures, positive impulse, EFD total and 1/3 octave band spectra, and maximum EFD above 10Hz and above 100 Hz from underwater detonations. The REFMS model calculates the combined reflected and refracted shock wave environment for underwater explosions using a single, generalized model that is based upon Cagniard's linear wave propagation theory (Cagniard 1962; Britt *et al.* 1991), convolved with a nonlinear similitude source term for each individual source type. In order to predict propagation of the underwater explosions, some of the various explosive types are converted to TNT equivalents.

For the present determination of ZOIs for each mammal threshold, improvements were made to the REFMS tool to allow multiple depths and range points concurrently. Two separate case runs of REFMS were selected that concentrated points near the sea surface and detonation for impulse thresholds and a second distribution set that extended down to the sea floor and further away from the explosive for the peak pressure and EFD. The acoustic results of each were combined to yield a larger more comprehensive database for the mammal ZOI determinations. Thus, the discrete points of depth and range were;

Impulse Threshold

Depth (m): 0.5, 1.0, 2.0, 5.0, 15.0, 25.0, and 50.0

Range (nmi): 0.0026, 0.0087, 0.0148, 0.0207, 0.0415, 0.688, 0.1, 0.2, 0.3, 0.4, and 0.5

Peak Pressure and EFD Thresholds

Depth (m): 0.5, 1.0, 2.0, 5.0, 15.0, 50.0, 100.0, 150.0, and 200.0

Range (nmi): 0.0375, 0.05, 0.1, 0.2, 0.3, 0.4, 0.5, 1.0, 2.0, and 3.0

These two-dimensional (range and depth) distributions give 77 discrete points of REFMS results for evaluating the ZOIs of mammal thresholds based on peak positive impulse (psi-ms) and 90 points for ZOIs of thresholds in terms of the and peak pressure (psi) and EFD in 1/3-octave bands (dB) and total energy (dB). However, the numbers of points were reduced accordingly to accommodate the shallower depth (34m) of the Area 18 site.

3.1.4 Marine Animal Data

All density estimates that were used in the analysis are presented in the species descriptions located in Sections 3.7 and 3.8 of this EIS. Once the acoustic propagation model determines the impact areas or ZOIs, then they are multiplied by the animal density estimates and the number of events to determine exposure estimates.

3.2 Estimated Impact Areas

Table 3-2 presents the BOMBEX modeling results of the impact ranges for the Navy Cherry Point Study Area. **Table 3-3** presents the MISSILEX modeling results of the impact ranges for the Navy Cherry Point Study Area.

TABLE 3-2 ESTIMATED ZOIS (KM^2) FOR BOMBEX

Area	Ordnance	Estimated ZOI @ 177 dB re 1 μPa^2-sec				Estimated ZOI @ 182 dB re 1 μPa^2-sec or 23 psi (peak)				Estimated ZOI @ 205 dB re 1 μPa^2-sec or 13 psi-ms				Mortality			
		Win	Spr	Sum	Fall	Win	Spr	Sum	Fall	Win	Spr	Sum	Fall	Win	Spr	Sum	Fall
Cherry Point																	
Area 18	MK-82	111.73	113.11	99.58	106.92	NA	NA	NA	NA	2.59	2.59	2.59	2.80	<0.01	<0.01	<0.01	<0.01
	MK-83	313.06	267.24	158.07	182.02	NA	NA	NA	NA	4.98	4.98	5.13	4.69	<0.01	<0.01	<0.01	<0.01
	MK-84	NA	NA	NA	NA	9.73	10.99	10.14	9.73	0.62	0.62	0.62	0.62	<0.01	<0.01	<0.01	<0.01

Note: ZOIs for MK-82 and MK-83 bombs are modeled as multiple detonations (4 bombs dropped at same location). ZOI for MK-84 bombs are modeled as single detonations.

Note: Events were either modeled for 177 dB re 1 μPa^2-sec (1/3 octave bands) due to multiple detonations (MK-82 and MK-83 BOMBEX) or modeled for 182 dB re 1 μPa^2-sec (1/3 octave bands) or 23 psi (peak) due to single detonations (MK-84BOMBEX). Therefore, for MK-82 and MK-83 the NA refers to the criteria that were less dominant and therefore not used in the analysis. For MK-84 the NA refers to the fact that these events are not multiple detonations and therefore not modeled at 177 dB re 1 μPa^2-sec.

TABLE 3-3 ESTIMATED ZOIS (KM^2) FOR MISSILEX

Area	Ordnance	Estimated ZOI @ 182 dB re 1 μPa^2-sec or 23 psi (peak)				Estimated ZOI @ 205 dB re 1 μPa^2-sec or 13 psi-ms				Mortality			
		Win	Spr	Sum	Fall	Win	Spr	Sum	Fall	Win	Spr	Sum	Fall
Cherry Point													
Area 16 17	Hellfire	0.31	0.31	0.31	0.31	0.04	0.04	0.04	0.04	**<0.01**	**<0.01**	**<0.01**	**<0.01**
Area 16 17	TOW	0.39	0.39	0.35	0.39	0.04	0.04	0.04	0.04	**<0.01**	**<0.01**	**<0.01**	**<0.01**

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CHAPTER 4 ACOUSTIC ANALYSIS FOR UNDERWATER EXPLOSIONS ASSOCIATED WITH MINEX

4.1 Introduction

This appendix provides explanatory text for a risk assessment of the Navy Cherry Point Study Area MINEX sites. The driving sources of shock energy and noise in the water are from small (20 pounds explosive weight) charges of C-4. The analysis is done in a per shot/season format, so that exposure estimates are easy to determine for any combination of sites and seasons.

Since the MINEX explosive events are isolated in time, and hence in the same category as the ship shock trials, temporary threshold shift (TTS) is the sole criterion for MMPA-Level B harassment.

4.2 Characterization of Source Properties

For the acoustic analysis, the exploding shell is characterized here as a point source, with a 20 lb charge of high-energy explosive.

4.2.1 Depths of Animals and Explosions

For this analysis an assumption of a 1 ft (0.3 m) depth is made, and is more conservative than an assumption of a shallower detonation depth. Animal depths are selected to ensure the greatest direct path for the harassment ranges, and to give the greatest impact range for the injury thresholds; they are thus conservative. The latter is consistent with the approach of CHURCHILL.

4.2.2 Similitude Formulas for Source Properties

See Section 2.2.2, all background information is the same as for the FIREX WITH IMPASS modeling.

4.3 Environmental Provinces and Sound Propagation

4.3.1 Overview

To determine impact areas for the MINEX deployment sites, Navy standard acoustic models and databases were applied to environmental 'provinces' within which the ocean acoustic environments are expected to be similar. The environmental provincing follows naturally from the Navy databases.

4.3.2 Propagation Modeling

See Section 2.3.2, all background information is the same as for the FIREX WITH IMPASS modeling.

4.3.3 Underwater Explosive Measurements for Validation

Because of the special geometry of MINEX (especially the shallow and uncertain depth of the explosions), there are very few measurements that can be used directly to estimate the sound field. Measurements for small shots and deeper depths are available for some of the MINEX sites, and they are useful for determining bottom interaction properties. Results for these data sets have in most cases been analyzed and incorporated into the Navy databases (OAML 2002) (which are used for this assessment). In that sense, the risk estimates have exploited the available propagation data.

4.4 Estimated Impact Areas

As was the case, for FIREX with IMPASS, the modified CASS-GRAB shot-propagation model was used, together with existing environmental provinces for the MINEX sites. Because all the sites are shallow (less than 50 m), propagation model runs were made for bathymetry in the range from 10 m to 40 m.

Also, as had been the case for FIREX with IMPASS, variations in estimated impact ranges varied as much within a single area as from one area to another. There was, however, little seasonal dependence. As a result, the impact ranges are stated as mean value with a percentage variation. As a rule, in the case of ranges determined from energy metrics, the deeper the water the shorter the range.

Table 4-1 shows the results of the model estimation.

Table 4-1. Estimated Impact Areas

Threshold	Impact Area for 20-lb NEW
Estimated Impact Area @ 13 psi-msec	0.13 sq km ± 10%
Estimated Impact Area @ 182 dB re 1 μPa^2-sec	0.8 sq km ± 25%

MMPA-Level A impact areas are dominated by the onset slight lung injury criterion (pressure threshold). MMPA-Level B impact areas (for TTS) are dominated by the energy threshold. The results for the MMPA-Level A exposures resulting from the 13 psi criterion showed that there would be zero mortality exposures, so the modeling was not completed for the 30.5 psi mortality criteria.

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APPENDIX K REGULATORY FRAMEWORK

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APPENDIX K
RESOURCE REGULATORY FRAMEWORK

This appendix provides a general description of each resource and addresses the Federal, State, and local environmental review programs that do, or may, apply to the No Action Alternative, Alternative 1, and Alternative 2. Project facilities and activities will be implemented in accordance with applicable Federal laws and regulations and with State and local laws, regulations, programs, plans, and policies as applicable.

This Environmental Impact Statement (EIS)/Overseas EIS (OEIS) has been prepared and provided for public review in accordance with the Council on Environmental Quality regulations implementing the National Environmental Policy Act (NEPA) (40 Code of Federal Regulations [CFR] Part 1500-1508) and Presidential Executive Order (EO) 12114, *Environmental Effects Abroad of Major Federal Actions*.

In 1969, Congress enacted the NEPA, which provides for the consideration of environmental issues in federal agency planning and decision making. Regulations for federal agency implementation of the act were established by the President's CEQ. NEPA requires that federal agencies prepare an EIS for proposed actions with the potential to significantly affect the quality of human and natural environments. The EIS must disclose significant environmental impacts and inform decision makers and the public of the reasonable alternatives to the proposed action. Impacts to ocean areas of the Navy Cherry Point Study Area that lie within 22.2 kilometer (km) (12 nautical miles [nm]) of land (U.S. territory) are subject to analysis under NEPA. This is based on Presidential Proclamation 5928, issued December 27, 1988, in which the United States extended its exercise of sovereignty and jurisdiction under international law to 22.2 km (12 nm) from land. The Proclamation expressly provides that it does not extend or otherwise alter existing federal law or any associated jurisdiction, rights, legal interests, or obligations.

EO 12114 directs federal agencies to provide for informed decision making for major federal actions outside the United States, including the global commons, the environment of a non-participating foreign nation, or impacts on protect global resources. An Overseas EIS (OEIS) is required when an action has the potential to significantly harm the environment of the global commons. "Global commons" are defined as "geographical areas that are outside of the jurisdiction of any nation, and include the oceans outside the territorial limits (outside 22.2 km [12 nm] from the coast) and Antarctica. Global commons do not include contiguous zones and fisheries zones of foreign nations" (32 CFR 187.3). The Navy has published procedures for implementing EO 12114 in 32 CFR 187, Environmental Effects Abroad of Major Department of Defense Action, as well as the October 2007 Office of the Chief of Naval Operations Instruction (OPNAVINST) 5090.1C.

Unlike NEPA, EO 12114 does not require a scoping process. However, the EIS and OEIS have been combined into one document, as permitted under NEPA and EO 12114, in order to reduce duplication. Therefore the scoping requirements found in NEPA were implemented with respect to action occurring seaward of U.S. territorial waters (referred to in this EIS/OEIS as "U.S. territory"), and discussions regarding scoping requirements will reference the combined Navy Cherry Point EIS/OEIS. See section 1.5 for additional information regarding the Scope and Content of this EIS/OEIS and Section 1.6 for a detailed discussion of the environmental review process (to include scoping actions taken for this EIS/OEIS).

K 1. Bathymetry and Sediments

States' jurisdictional boundaries extend 3 nautical miles (nm) offshore of the coast. Impacts of operations evaluated under NEPA are further distinguished by state regulatory authorities where applicable. In addition, EO 13089, *Coral Reef Protection*, was issued on June 11, 1998, "to preserve and protect the biodiversity, health, heritage, and social and economic value of U.S. coral reef ecosystems and the marine environment." Another regulation protecting the underwater environment is the Marine Protection, Research, and Sanctuaries Act, which was enacted in 1972 by Congress. This Act prohibits dumping

material into the ocean that would unreasonably degrade or endanger human health or the marine environment. Where dredging and ocean dumping of the dredged materials occur, a permit must be issued by the U.S. Corp of Engineers (USACE), which is subject to U.S. Environmental Protection Agency's (USEPA) approval.

K 2. Military Expended Material

Resource Conservation and Recovery Act (RCRA): 42 USC § 6901 *et seq*. regulates management of solid waste and hazardous waste. The Military Munitions Rule clarifies when conventional and chemical military munitions become a hazardous waste under RCRA. RCRA provides that the USEPA may delegate authority to states to regulate hazardous waste under state law in lieu of RCRA. Regardless of USEPA-delegated hazardous waste authority, Navy facilities need to meet state hazardous waste substantive and procedural requirements under the Federal Facilities Compliance Act. These include the requirement to obtain state permits for hazardous waste management and disposal.

Military munitions are not considered hazardous waste under two conditions stated in the USEPA Military Munitions Rule and the Department of Defense (DoD) Interim Policy on Military Munitions (1997). Specifically, munitions are not considered hazardous waste when:

1) Used for their intended purpose, including training of military personnel and explosive emergency response specialists, research and development activities, and when recovered, collected, and destroyed during range clearance events.

2) Unused and being repaired, reused, recycled, reclaimed, disassembled, reconfigured, or subjected to other material recovery activities.

These two conditions cover virtually all the uses of missiles, munitions, and targets at the Cherry Point Range Complex.

Statutory hazardous waste authorities for North Carolina are contained in the following agencies and regulations (DoN, 2006).

In **North Carolina**, the Division of Waste Management – Hazardous Waste Section (a division of the Department of Environment and Natural Resources [DENR]) oversees the hazardous waste management rules, which include RCRA and state requirements. Several state rules, such as the hazardous waste generator classifications, are stricter than the federal rules. Hazardous waste generators, owners, and operators of TSDFs must pay an annual fee to DENR, based on the amount of waste generated or managed. North Carolina also has additional hazardous waste storage and generator reporting requirements. Hazardous waste laws and rules are in North Carolina General Statutes 130A-290 to 130A-309 and 15A North Carolina Administrative Code (NCAC) 13A.0101 to 15A NCAC 13A.0119. According to the 2002 North Carolina State Hazardous Waste Management Plan, North Carolina has an established Hazardous Waste Emergency Response Fund, but it is in need of a reliable funding source. When funds are depleted, the state will no longer be able to respond to emergency spill situations.

Petroleum, Oils, and Lubricants Management

The Oil Pollution Act of 1990 preserves state authority to establish laws governing oil spill prevention, response, and periodic drills and exercises. According to OPNAVINST 5090.1B Change 4 Chapter 10, DoD facilities, including Marine Corps facilities, are subject to state and local facility prevention and response planning requirements. However, Navy Shipboard Spill Contingency Plans (SCPs) are not subject to state regulations. Commands may, however, provide courtesy copies of SCPs to state regulators to promote strong, cooperative relationships with the local community. Statutory petroleum, oils, and lubricants (POL) management authorities for North Carolina are contained in the following agencies and regulations (DoN, 2006).

The **North Carolina** Oil Pollution and Hazardous Substances Control Act of 1978 (Article 21A. Part 1. General Provisions. § 143-215.75) created the Oil Pollution Control Program. North Carolina General Statute 143-215.94 allows cleanup costs to be imposed on those having control over the oil or other hazardous substances or causing or contributing to the discharge of oil or other hazardous substances. 15A 1 NCAC .0118 covers the standards for the management of used oil and 2 15A NCAC 0106 identifies hazardous waste.

K 3. Water Resources

K3.1 Federal Regulatory Requirements

Water resource regulations focus on the right to use water and the protection of water quality. The principal federal laws on protection of water quality are the Clean Water Act (CWA) (33 USC §1251, *et seq*.), the Rivers and Harbors Act (33 USC §401), and the Safe Drinking Water Act (SDWA) (42 USC §300f, *et seq*.). The CWA addresses surface water quality and preservation of wetlands. The Rivers and Harbors Act control the construction of structures and the discharge of fill into navigable waters of the United States. The SDWA addresses protection of drinking water supplies. The USEPA enforces both the CWA and the SDWA. Section 403 of the CWA provides for the protection of ocean waters (waters of the territorial seas, the contiguous zone, and the high seas beyond the contiguous zone) from point-source discharges. Under Section 403(a), USEPA or an authorized state may issue a permit for an ocean discharge only if the discharge complies with CWA guidelines for protection of marine waters. Under the CWA, territorial sea jurisdiction is defined as 3 nm from the coastal baseline [33 USC §1362 (8)].

The National Oceanic and Atmospheric Administration (NOAA) is also responsible for ocean water quality. NOAA is a trustee agency for coastal and marine resources under CWA, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also known as Superfund, the Coastal Zone Management Act (CZMA), and the Oil and Pollution Act (OPA). NOAA has established programs to monitor coastal environmental quality, protect marine habitat, and restore natural resources.

The CWA was amended in 1996 to authorize the DoD and USEPA to jointly establish Uniform National Discharge Standards (UNDS) for incidental liquid discharges from Armed Forces vessels. USEPA published final rules for Phase 1 of the UNDS program. In those rules, USEPA and the Marine Corps identified which discharges will require control standards and a marine pollution control device (MPCD). The rules also identify the mechanism by which states can petition USEPA and DoD to review whether or not a discharge should require control by a MPCD, or to review a federal performance standard for a MPCD. Finally, the rules establish the processes USEPA and the states must follow to establish no-discharge zones, where any release of a specified discharge is prohibited.

According to the OPNAVINST 5090.1B, Chapter 7, as required by EO 12088, *Federal Compliance with Pollution Control Standards*, and the CWA, Marine Corps facilities will comply with all substantive and procedural requirements applicable to point and non-point sources of pollution.

The CWA §402(p) establishes a framework for regulating storm water discharges under the National Pollution Discharge Elimination System (NPDES) program. 40 CFR Parts 122-125 set forth the NPDES regulations. Discharges of pollutants into waters of the United States are prohibited unless in compliance with an NPDES permit. The NPDES regulations allow authorized states to administer the NPDES program.

The CWA requires each state to establish water quality standards for its surface waters based on designated uses. For "impaired" water bodies, each state is supposed to develop total maximum daily loads (TMDL), which are the amount of pollutants that can be assimilated by a body of water without exceeding the water quality standards (WQS). Based on the developed TMDLs, the state or USEPA can limit any discharge of pollutants to a level sufficient to ensure compliance with state WQSs.

The TMDL program requires that states:

- Establish WQSs for its waters.
- Monitor the conditions of its waters.
- List waterbodies that do not meet WQSs with technology-based controls alone (303(d) list).
- Set priority rankings for the waterbodies listed.
- Establish TMDLs that meet WQSs for each listed waterbody.
- Solicit public comment.
- Submit 303(d) list and TMDLs to USEPA for approval.
- Incorporate TMDLs into the State's Continuing Planning Process.

K3.2 State Water Quality Requirements

To receive USEPA approval, each state's WQSs must include an anti-degradation statement and policy. The policy is intended to maintain existing uses and the level of water quality necessary to protect those uses. Under certain circumstances high quality waters may have their quality lowered, but their uses must still be protected and the public must be informed and involved in the decision to allow the quality to be lowered.

Statutory water quality authorities for North Carolina are contained in the following agencies and regulations.

North Carolina

According to North Carolina General Statute (NCGS) 130A Article 10, the Public Water Supply Section of the North Carolina DENR is responsible for the state's safe drinking water. The DENR also administers two major storm water permitting programs. The North Carolina Division of Water Quality (DWQ) is the agency responsible for statewide regulatory programs in ground water and surface water protection.

Current designated uses in the State of North Carolina include the following categories (NC DENR/DWQ, 2007):

Freshwater shall be assigned to one of the following classification:

- **Class C** – freshwater protected for secondary recreation, fishing, and aquatic life, including propagation and survival, and wildlife. All freshwater shall be classified to protect these uses at a minimum.
- **Class B** – freshwater protected for primary recreation that includes swimming on a frequent or organized basis and all Class C uses.
- **Class WS-I** – waters protected as water supplies that are essentially in natural and undeveloped watersheds. Point source discharges of treated wastewater are permitted pursuant to Rules .0104 and .0211 of this section. Local programs to control nonpoint sources and storm water discharges of pollution are required. Suitable for all Class C uses.
- **Class WS-II** – waters protected as water supplies that are generally in predominantly undeveloped watersheds. Point source discharges of treated wastewater are permitted pursuant to Rules .0104 and .0211 of this section. Local programs to control nonpoint sources and storm water discharges of pollution shall be required. Suitable for all Class C uses.
- **Class WS-III** – waters protected as water supplies that are generally in low to moderately developed watersheds. Point source discharges of treated wastewater are permitted pursuant to Rules .0104 and .0211 of this section. Local programs to control nonpoint sources and storm water discharges of pollution shall be required. Suitable for all Class C uses.

- **Class WS-IV** – waters protected as water supplies that are generally in moderately to highly developed watersheds. Point source discharges of treated wastewater are permitted pursuant to Rules .0104 and .0211 of this section. Local programs to control nonpoint sources and storm water discharges of pollution shall be required; suitable for all Class C uses.
- **Class WS-V** – waters protected as water supplies that are generally upstream of and draining to Class WSIV waters. No categorical restrictions on watershed development or treated wastewater discharges shall be required. However, the Commission or its designee may apply appropriate management requirements as deemed necessary for the protection of downstream receiving waters (15A NCAC 2B .0203); suitable for all Class C uses.
- **Class WL** – waters that meet the definition of wetlands found in 15A NCAC 2B .0202 except those designated as Class SWL.

Tidal Salt Waters shall be assigned to one of the following:

- **Class SC** – saltwaters protected for secondary recreation, fishing, and aquatic life, including propagation and survival, and wildlife. All saltwaters shall be classified to protect these uses at a minimum.
- C**lass SB** – saltwaters protected for primary recreation that includes swimming on a frequent or organized basis and all Class SC uses.
- **Class SA** – suitable for commercial shellfishing and all other tidal saltwater uses.
- **Class SWL** – waters that meet the definition of coastal wetlands as defined by 15A NCAC 2H .0205, and which are landward of the mean high water line, and wetlands contiguous to estuarine waters as defined by 15A NCAC 2H .0206.

The following are supplemental classifications:

- **Trout waters (Tr)** – freshwaters protected for natural trout propagation and survival of stocked trout.
- **Swamp waters (Sw)** – waters that have low velocities and other natural characteristics different from adjacent streams.
- **Nutrient Sensitive Waters (NSW)** – waters subject to growths of microscopic or macroscopic vegetation requiring limitations on nutrient inputs.
- **Outstanding Resource Waters (ORW)** – unique and special waters of exceptional state or national recreational or ecological significance that require special protection to maintain existing uses.
- **High Quality Waters (HQW)** – waters that are rated as excellent based on biological and physical/chemical characteristics through Division monitoring or special studies, native and special native trout waters (and their tributaries) designated by the Wildlife Resources Commission, primary nursery areas (PNA) designated by the Marine Fisheries Commission and other functional nursery areas designated by the Marine Fisheries Commission, all water supply watersheds either classified as WS-I or WS-II or those for which a formal petition for reclassification as WS-I or WS-II was received from the appropriate local government and accepted by the Division of Water Quality and all Class SA waters.
- **Future Water Supply (FWS)** – waters requested by a local government and adopted by the Commission as a future source for drinking, culinary, or food-processing purposes. The requirements for FWS may also be applied to waters formerly used for drinking water supply use, and currently classified for water supply use, at the request of local government(s) desiring protection of the watershed for future water supply use.

- **Unique wetlands (UWL)** – wetlands of exceptional state or national ecological significance that require special protection to maintain existing uses. These wetlands may include wetlands documented to the satisfaction of the Commission as habitat essential for the conservation of state or federally listed threatened or endangered species.

DENR's 1998 Compliance and Enforcement Policy for water quality strengthen enforcement and heighten compliance with state and federal water regulations. The policy calls for increased penalties for significant violators, delegated enforcement authority to regional officers, and a new penalty protocol for discharges from sewer collection systems. Pollution prevention (P2) is the preferred approach for achieving environmental protection, and the state has developed recognition and incentive programs that encourage facilities to go "beyond compliance."

The Coastal Resources Commission (CRC) was created when the General Assembly adopted the Coastal Area Management Act (CAMA) in 1974. The CRC establishes policies for the North Carolina Coastal Management Program and adopts implementing rules for both CAMA and the North Carolina Dredge and Fill Act. The commission designates areas of environmental concern, adopts rules and policies for coastal development within those areas, and certifies local land-use plans.

The North Carolina Coastal Management Program was approved by NOAA in 1981. The lead agency is the Division of Coastal Management within the DENR that implements and supervises all the various Coastal Zone Management programs in the state. North Carolina's coastal zone includes 20 coastal counties that in whole or in part are adjacent to, adjoining, intersected, or bounded by the Atlantic Ocean or any coastal sound (NOAA, 2007).

Some of the greatest challenges facing North Carolina's coastal zone are impacts from population growth and coastal development, including loss of sensitive coastal habitats and increased risks to life and property from coastal hazards. The Coastal Program is designed to address these issues, along with others, such as public access to beaches and other shore fronts, conservation and restoration of wetlands, and management of beach erosion (NOAA, 2007).

The North Carolina National Estuarine Research Reserve includes Corolla (Currituck Banks), Beaufort (Rachel Carson), and Wilmington (Masonboro Island and Zeke's Island). The estuarine system is the fourth largest in the nation and encompasses about two million acres (NOAA, 2007).

K 4. Air Quality

K4.1 Federal Air Quality Requirements

The USEPA is the agency responsible for enforcing the federal Clean Air Act (CAA) of 1970 and its 1977 and 1990 amendments (42 USC §7401, *et seq*.). The purpose of the CAA is to establish NAAQS, to classify areas as to their attainment status relative to the NAAQS, to develop schedules and strategies to meet the NAAQS, and to regulate emissions of criteria pollutants and air toxics to protect public health and welfare. Under the CAA, individual states are allowed to adopt ambient air quality standards and other regulations, provided they are at least as stringent as federal standards.

The USEPA requires each state to prepare a State Implementation Plan (SIP) that describes how that state will achieve compliance with the NAAQS. A SIP is a compilation of goals, strategies, schedules, and enforcement actions that will lead the state into compliance with all federal air quality standards. The predominant air quality regulations promulgated under the CAA potentially applicable to the proposed action include:

- National Ambient Air Quality Standards; and
- General Conformity Rule.

Implementation of the CAA is carried out through rules promulgated by the states through their respective agencies. For the proposed action, this includes, North Carolina (North Carolina Department of Environment and Natural Resources [NC DENR]).

K4.2 National Ambient Air Quality Standards

The CAA requires the USEPA to set NAAQS (40 CFR Part 50) for pollutants considered harmful to public health and the environment (Table K-1). The CAA established two types of national air quality standards (primary and secondary). Primary standards set limits to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

TABLE K-1 National Ambient Air Quality Standards

Pollutant	Primary Standards	Averaging Times	Secondary Standards
Carbon Monoxide	9 ppm (10 µg/m^3)	8-hour[1]	None
	35 ppm (40 µg/m^3)	1-hour[1]	None
Lead	1.5 µg/m^3	Quarterly Average	Same as Primary
Nitrogen Dioxide	0.053 ppm (100 µg/m^3)	Annual (Arithmetic Mean)	Same as Primary
Particulate Matter (PM_{10})	Revoked[2]	Annual[2] (Arithmetic Mean)	Same as Primary
	150 µg/m^3	24-hour[3]	Same as Primary
Particulate Matter ($PM_{2.5}$)	15.0 µg/m^3	Annual[4] (Arithmetic Mean)	Same as Primary
	35 µg/m^3	24-hour[5]	Same as Primary
Ozone	0.08 ppm	8-hour[6]	Same as Primary
	0.12 ppm	1-hour[7] (Applies only in limited areas)	Same as Primary
Sulfur Oxides	0.03 ppm	Annual (Arithmetic Mean)	None
	0.14 ppm	24-hour[1]	None
		3-hour[1]	0.5 ppm (1300 µg/m^3)

Source: USEPA, 2007[1], Last updated March 2nd, 2007.

Notes:

1. Not to be exceeded more than once per year.
2. Due to lack of evidence linking health problems to long-term exposure to coarse particle pollution, the agency revoked the annual PM_{10} standard (effective December 17, 2006).
3. Not to be exceeded more than once per year on average over 3 years.
4. To attain this standard, the 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0µg/m^3.
5. To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35µg/m^3 (effective December 17, 2006).
6. To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
7. (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤1, as determined by Appendix H. (b) As of June 15, 2005, USEPA revoked the 1-hour ozone standard in all areas, except the fourteen 8-hour ozone nonattainment Early Action Compact (EAC) Areas.

[1] Source: USEPA. 2007a. Air and Radiation: National Ambient Air Quality Standards (NAAQS). Website: http://www.epa.gov/air/criteria.html. Website accessed on 22 August 2007.

K4.3 General Conformity Rule

Section 176 (c) (1) of the CAA, commonly known as the General Conformity Rule (Conformity), requires federal agencies to assure that their actions conform to applicable implementation plans for achieving and maintaining the NAAQS for criteria pollutants. To ensure Conformity, a federal action must not contribute to new violations of ambient air quality standards, increase the frequency or severity of existing violations, or delay timely state and/or regional attainment of standards.

The USEPA rule implementing the conformity requirements, "Determining Conformity of General Federal Actions to State or Federal Implementation Plans," was published on 30 November 1993 at 58 FR 63214 and codified at 40 CFR Parts 51 and 93. Part 51, Subpart W, contains the General Conformity Rule provisions that must be incorporated into SIPs, including the requirement that States revise the SIPs to include the conformity requirements. Once a SIP has been revised and approved by USEPA, the conformity requirements become federally enforceable and federal agencies are subject to the conformity requirements as they appear in the SIP. In cases where a Federal Implementation Plan (FIP) is in effect, federal actions must conform to the requirements of the FIP. Each federal agency taking an action subject to the General Conformity Rule must make its own conformity determination (40 CFR Part 93.154).

A Conformity Review must be completed for every Navy action that generates air emissions in non-attainment or maintenance (formerly non-attainment) areas. The action proponent is responsible for the documentation. The Conformity Review can be satisfied by (1) a determination that the action is not subject to the General Conformity Rule, (2) a Record of Non-Applicability, or (3) a Conformity Determination.

The action proponent may make a determination that the proposed action is not subject to the General Conformity Rule. Actions not subject to the rule are actions that occur in attainment areas, and that do not generate emissions in non-attainment areas; or actions where the criteria pollutant emitted (or its precursors) is one for which the area is in attainment. If National Environmental Policy Act (NEPA) documentation is prepared for the action, the determination shall be described in that documentation; otherwise, no documentation is required. This EIS/OEIS includes the determination that all actions occurring in the attainment areas (i.e., coastal counties of North Carolina) are not subject to the General Conformity Rule.

K4.4 State Air Quality Requirements

North Carolina

The North Carolina Division of Air Quality is responsible for protecting and improving North Carolina's ambient air quality. North Carolina's air quality issues are governed by its SIP found in 40 CFR 51 and 40 CFR 52.1770 to 52.1783. Regulations can be found at the North Carolina Administrative Code (NCAC) as follows:

- 15A NCAC 2D Air Pollution Control Requirements; and
- 15A NCAC 2Q Air Quality Permitting Requirements.

The North Carolina Department of Environment and Natural Resources (NC DENR) has adopted the USEPA's NAAQS as the statewide ambient air quality standards. When the USEPA amended the standard for particulate matter, changing the regulated pollutant from total suspended particulates (TSP) to PM_{10} (PM_{10}: diameter $\leq$10 micrometers) that is inhalable, the NC DENR adopted the PM_{10} standard but continued to use both PM_{10} and TSP as monitoring indicators for the level of particulate matter. Therefore, the North Carolina ambient air quality standards include all of the NAAQS, plus a standard for TSP.

K 5. Noise Environment

The Navy meets its noise management obligations at air-to-ground training ranges (i.e., on-land targets) through the Range Air Installations Compatible Use Zone (RAICUZ) program found in OPNAV Instruction 3550.1A (DoN, 2008[2]). RAICUZ Program implementation includes developing current and future Range Compatibility Zones (RCZ) and current and prospective noise analysis for the range, partnering with appropriate federal, state, and local government agencies (working with these agencies for compatible land use near and around the ranges), considering operational alternatives as necessary, implementing a complaint response program in the surrounding communities, and developing strategies to protect the long term viability of the range while maintaining a high degree of public safety (DoN, 2008). However, because no air-to-ground training ranges are considered under this EIS/OEIS, the RAICUZ program is inapplicable here. All training spaces considered within this EIS/OEIS are over water.

The DoD has a similar program for air stations, called the Air Installation Compatibility Use Zone (AICUZ) program (DoN, 2002[3]). The foundation of the AICUZ program is an active local command effort to work with local, state, regional, other federal agencies, and community leaders to encourage compatible development of land adjacent to military airfields. The Navy is particularly susceptible to such encroachment with many of its installations located in high growth urban areas. The AICUZ process involves four basic steps:

- Develop, and periodically update, a study for each air installation to quantify aircraft noise zones and identify accident potential zones; develop a noise reduction strategy for impacted lands, both on and off the installation; prepare a compatible land use plan for the installation and surrounding areas; and develop a strategy to promote compatible development on land within these areas.
- Develop a prospective long-term (5 to 10 years) AICUZ analysis to illustrate impact on known future missions and how it will be implemented by the AICUZ program.
- Implement the AICUZ plan for the installation, including coordination with federal, state and local officials to maintain public awareness of AICUZ.
- Identify and program property rights acquisition and sound suppression projects when appropriate in critical areas, where action to achieve compatibility within AICUZ program guidelines through local land use controls is either impossible or has been attempted and proven unsuccessful.

K 6. Marine Communities

The various federal laws and regulations that afford protection and management of marine communities are primarily aimed at specific community components such as Endangered Species Act (ESA)-listed species and designated critical habitat; marine mammals; federally managed fish species and essential fish habitat (EFH); and migratory birds. Regulatory frameworks for these marine community components are presented below in K7, K8, and K9. The National Marine Sanctuaries Act and Executive Order 13089, *Coral Reef Protection*, also apply to marine communities.

K6.1 National Marine Sanctuaries Act

The National Marine Sanctuaries Act prohibits the destruction of, loss of, or injury to any sanctuary resource managed under law or regulations, and any violation of the act, any regulations, or permits issued thereunder (16 U.S.C. 436). In addition, Section 304(d) of the National Marine Sanctuaries Act (16 U.S.C. 1434[d]) requires federal agencies to consult with the Secretary of Commerce, through

[2] DoN. 2008. OPNAV Instruction 3550.1A. Range Air Installation Compatible Use Zone (RAICUZ) Program. 28 January 2008.

[3] DoN. 2002. OPNAV Instruction 11010.36B Air Installation Compatible Use Zone (AICUZ) Program. 19 December 2002.

NOAA, on federal agency actions, internal or external, to any national marine sanctuary that are likely to destroy, cause the loss of, or injure any sanctuary resource. Under Section 304(d), if NOAA determines that the action is likely to destroy, cause the loss of, or injure sanctuary resources, NOAA shall recommend reasonable and prudent alternatives that can be taken by a federal agency to protect sanctuary resources. The federal agency may choose not to follow these alternatives provided the reasons are submitted in writing. However, if the head of a federal agency takes an action other than an alternative recommended by NOAA and such action results in the destruction of, loss of, or injury to a sanctuary resource, the head of the agency shall promptly prevent and mitigate further damage and restore or replace the sanctuary resource in a manner approved by NOAA. Regulations for each designated national marine sanctuary specifically address military and defense activities. The *Monitor* National Marine Sanctuary is located in the Navy Cherry Point Study Area.

K6.2 Executive Order 13089, *Coral Reef Protection*

In accordance with Executive Order 13089, Coral Reef Protection (1998), all federal agencies whose actions may affect U.S. coral reef ecosystems shall: (1) identify their actions that may affect U.S. coral reef ecosystems; (2) utilize their programs and authorities to protect and enhance the conditions of such ecosystems; and (3) to the extent permitted by law, ensure that any actions they authorize, fund, or carry out will not degrade the conditions of such ecosystems.

K 7. Marine Mammals

K7.1 Marine Mammal Protection Act

The Marine Mammal Protection Act (MMPA) of 1972 (16 U.S.C. § 1371) established, with limited exceptions, a moratorium on the "taking" of marine mammals in waters or on lands under U.S. jurisdiction. The act further regulates "takes" of marine mammals in the global commons (i.e., the high seas) by vessels or persons under U.S. jurisdiction. The term "take," as defined in Section 3 (16 USC 1362) of the MMPA, means "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal." "Harassment" was further defined in the 1994 amendments to the MMPA, which provided two levels of "harassment," Level A (potential injury) and Level B (potential disturbance).

The National Defense Authorization Act (NDAA) of Fiscal Year (FY) 2004 (Public Law [PL] 108-136) amended the definition of harassment as applied to military readiness activities or scientific research activities conducted by or on behalf of the federal government, consistent with Section 104I(3) [16 USC 1374 I(3)]. The FY 2004 NDAA adopted the definition of "military readiness activity" as set forth in the FY 2003 NDAA (PL 107-314). Military training activities within the Cherry Point Range Complex constitute military readiness activities as that term is defined in PL 107-314 because training activities constitute "training and operations of the Armed Forces that relate to combat" and constitute "adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use." For military readiness activities, the relevant definition of harassment is any act that:

- Injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild ("Level A harassment").
- Disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering to a point where such behavioral patterns are abandoned or significantly altered ("Level B harassment") [16 USC 1362 (18)(B)(i)(ii)].

Section 101(a)(5) of the MMPA directs the Secretary of the Department of Commerce to allow, upon request, the incidental (but not intentional) taking of marine mammals by U.S. citizens who engage in a specified activity (exclusive of commercial fishing), if certain findings are made and regulations are issued. Permission will be granted by the Secretary for the incidental take of marine mammals if the

taking will have a negligible impact on the species or stock and will not have an unmitigable adverse impact on the availability of such species or stock for taking for subsistence uses.

K7.2 Endangered Species Act

The ESA of 1973 (50 CFR, 16 U.S.C 1536) established protection over and conservation of threatened and endangered species and the ecosystems upon which they depend. An "endangered" species is a species that is in danger of extinction throughout all or a significant portion of its range, while a "threatened" species is one that is likely to become endangered within the foreseeable future throughout all or in a significant portion of its range. The U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) jointly administer the ESA and are also responsible for the listing of species (i.e., the labeling of a species as either threatened or endangered). The USFWS has primary management responsibility for management of terrestrial and freshwater species, while the NMFS has primary responsibility for marine species and anadromous fish species (species that migrate from saltwater to freshwater to spawn). The ESA allows the designation of geographic areas as critical habitat for threatened or endangered species.

The ESA requires federal agencies to conserve listed species and consult with the USFWS and/or NMFS to ensure that proposed actions that may affect listed species or critical habitat are consistent with the requirements of the ESA. The ESA specifically requires agencies not to "take" or "jeopardize the continued existence of" any endangered or threatened species, or to destroy or adversely modify habitat critical to any endangered or threatened species. Under Section 9 of the ESA, "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect. Under Section 7 of the ESA, "jeopardize the continued existence of" means to engage in any action that would be expected to reduce appreciably the likelihood of the survival and recovery of a listed species by reducing its reproduction, numbers, or distribution. The ESA is applicable to six species of endangered whales that potentially occur in the Navy Cherry Point Study Area (50 CFR §402.02).

K 8. Sea Turtles

The ESA, which is discussed above in K7.2, is applicable to all five species of sea turtles that potentially occur in the Navy Cherry Point Study Area.

K 9. Fish and Essential Fish Habitat

K9.1 Magnuson-Stevens Fishery Conservation and Management Act

The Fishery Conservation and Management Act of 1976 (16 U.S.C. § 1802), later changed to the Magnuson Fishery Conservation and Management Act in 1980, established a 200 nm fishery conservation zone in U.S. waters and a regional network of Fishery Management Councils. The Fishery Management Councils are composed of federal and state officials, including the USFWS, which oversee fishing activities within the fishery management zone. In 1996, the Magnuson Fishery Conservation and Management Act was reauthorized and amended as the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), known more popularly as the Sustainable Fisheries Act. The MSFCMA mandated numerous changes to the existing legislation designed to prevent overfishing, rebuild depleted fish stocks, minimize bycatch, enhance research, improve monitoring, and protect fish habitat.

One of the most significant mandates in the MSFCMA is the EFH provision, which provides the means to conserve fish habitat. The EFH mandate requires that the regional Fishery Management Councils, through federal Fishery Management Plans (FMP), describe and identify EFH for each federally managed species, minimize to the extent practicable adverse effects on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitats. Congress defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 USC 1802[10]). The term "fish" is defined in the MSFCMA as "finfish, mollusks, crustaceans, and all other

forms of marine animals and plant life other than marine mammals and birds." The regulations for implementing EFH clarify that "waters" include all aquatic areas and their biological, chemical, and physical properties, while "substrate" includes the associated biological communities that make these areas suitable fish habitats (CFR 50:600.10). Habitats used at any time during a species' life cycle (*i.e.,* during at least one of its life stages) must be accounted for when describing and identifying EFH. In addition to EFH designations, areas called habitat areas of particular concern (HAPC), which are a subset of designated EFH that is especially important ecologically to a species/life stage and/or is vulnerable to degradation, are also to be designated to provide additional focus for conservation efforts (50 CFR 600.805-600.815). Categorization as HAPC does not confer additional protection or restriction to designated areas.

Authority to implement the MSFCMA is given to the Secretary of Commerce through the NMFS. The MSFCMA requires that EFH be identified and described for each federally managed species. The NMFS and regional Fishery Management Councils determine the species distributions by life stage and characterize associated habitats, including HAPC. The MSFCMA requires federal agencies to consult with the NMFS on activities that may adversely affect EFH, or when the NMFS independently learns of a federal activity that may adversely affect EFH. The MSFCMA defines an adverse effect as "any impact which reduces quality and/or quantity of EFH [and] may include direct (*e.g.,* contamination or physical disruption), indirect (*e.g.,* loss of prey or reduction in species' fecundity), site-specific or habitat wide impacts, including individual, cumulative, or synergistic consequences of actions" (50 CFR 600.810).

As discussed in Section 3.9.2, Affected Environment, EFH has been designated in the Navy Cherry Point Range Complex. The Navy has determined that the preferred alternative would have no adverse effect to EFH. Therefore, EFH consultation with NMFS is not required. Impacts to EFH are addressed in Section 3.9 of this EIS/OEIS.

K9.2 Sustainable Fisheries Act

One of the most significant mandates in the SFA is the EFH provision, which provides the means to conserve fish habitat. The SFA requires that regional Fishery Management Councils (FMC) identify EFH for federally managed species (i.e., species covered under fishery management plans (FMP)). The SFA requires federal agencies to consult with the NMFS on activities that may adversely affect EFH, or when the NMFS independently learns of a federal activity that may adversely affect EFH. An adverse effect is defined as "any impact which reduces quality and/or quantity of EFH [and] may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey or reduction in species' fecundity), site-specific or habitat wide impacts, including individual, cumulative, or synergistic consequences of actions" (50 CFR 600.810).

K9.3 Endangered Species Act

The ESA, which is discussed above in K.7.2, is applicable to the shortnose sturgeon and smalltooth sawfish. Portions of the Navy Cherry Point Study Area is within the historic ranges of these species.

K 10. Sea Birds and Migratory Birds

K10.1 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) of 1918 (50 CFR 10.13) is the primary legislation in the United States established to conserve migratory birds. It implements the United States' commitment to four bilateral treaties, or conventions, for the protection of a shared migratory bird resource. The MBTA prohibits the taking, killing, or possessing of migratory birds unless permitted by regulation. On December 2, 2003, the President signed the 2003 National Defense Authorization Act. The Act provides that the Secretary of the Interior shall exercise his/her authority under the MBTA to prescribe regulations

to exempt the Armed Forces from the incidental take prohibitions of the MBTA during military readiness activities authorized by the Secretary of Defense.

Congress defined military readiness activities as all training and operations of the Armed Forces that relate to combat and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use. Congress further provided that military readiness activities do not include: (A) the routine operation of installation operating support functions, such as administrative offices, military exchanges, commissaries, water treatment facilities, storage facilities, schools, housing, motor pools, laundries, morale, welfare, and recreation activities, shops and mess halls; (B) the operation of industrial activities; or (C) the construction or demolition of facilities used for a purpose described in (A) or (B). The training operations that would occur in the Cherry Point Range Complex under the proposed action are military readiness activities.

The final rule authorizing the Department of Defense to take migratory birds during military readiness activities was published in the Federal Register on February 28, 2007. The regulation can be found at 50 CFR Part 21. The regulation provides that the Armed Forces must confer and cooperate with the USFWS on the development and implementation of conservation measures to minimize or mitigate adverse effects of a military readiness activity if it determines that such activity may have a significant adverse effect on a population of a migratory bird species.

The requirement to confer with the USFWS is triggered by a determination that the military readiness activity in question will have a significant adverse effect on a population of migratory bird species. An activity has a significant adverse effect if, over a reasonable period of time, it diminishes the capacity of a population of a migratory bird species to maintain genetic diversity, to reproduce, and to function effectively in its native ecosystem. A population is defined as "a group of distinct, coexisting, same species, whose breeding site fidelity, migration routes, and wintering areas are temporally and spatially stable, sufficiently distinct geographically (at some point of the year), and adequately described so that the population can be effectively monitored to discern changes in its status." Assessment of impacts should take into account yearly variations and migratory movements of the impacted species.

K10.2 Endangered Species Act

The ESA, which is discussed above in K.7.2, is applicable to the two federally listed seabird species (Bermuda petrel, *Pterodroma cahow* and roseate tern, *Sterna dougallii*) that potentially occur in the Navy Cherry Point Study Area.

K 11. Land Use

States' jurisdictional boundaries extend 3 nm offshore. Impacts of operations evaluated under NEPA are further distinguished by State regulatory authorities where applicable.

Congress ceded title to the submerged lands to the states through the Submerged Lands Act of 1953 (SLA) (43 U.S.C. §§1301-1315 [2002]). However, the U.S. retained its navigational servitude and asserted paramount rights to conduct any activity on the submerged lands that promotes commerce, navigation, national defense, or international affairs. Marine Corps training activities may need to be coordinated with the appropriate state agencies in order to avoid state or private uses that might conflict with the United States' paramount right to conduct national defense or navigational activities over state submerged lands.

K 12. Cultural Resources

Numerous laws and regulations mandate that possible effects on important cultural resources be considered during the planning and execution of federal undertakings. These laws define the compliance process and federal agency responsibilities, as well as prescribe the relationship among other involved

agencies such as the Advisory Council on Historic Preservation (ACHP) and the State Historic Preservation officer (SHPO).

These mandates include provisions of NEPA and Sections 106 and 110 of the National Historic Preservation Act (NHPA) and their implementing regulations at 40 Code of Federal Regulations (CFR) 1500 and 36 CFR 800, respectively. Section 110 of the NHPA requires federal agencies to inventory resources present in the Area of Potential Effect (APE). Section 106 requires the agency to evaluate these resources for eligibility for listing on the National Register of Historic Places (NRHP). The federal agency must also take into account the effects of their actions on properties listed or eligible for listing on the NRHP, and provide the ACHP an opportunity to comment on the project. The ACHP regulations at 36 CFR 800 specify a process of consultation to help meet this requirement.

Other relevant laws include the 1906 Antiquities Act (16 USC 431); the Historic Sites Act of 1935; Submerged Lands Act of 1953; the Archaeological Resource Protection Act of 1979 (16 USC 470aa-470-mm), which prohibits removal of items of archaeological interest from federal lands without a permit; the Abandoned Shipwreck Act of 1987; and the Abandoned Shipwreck Act Guidelines (NPS, 2007) (55 FR 50116, 55 FR 51528, and 56 FR 7875). The Abandoned Shipwreck Act extended the jurisdiction of abandoned shipwrecks in U.S. waters, considering them U.S. property, and transferred management authority to the states. However, lost U.S. Naval vessels and downed aircraft remain the property of the United States regardless of where they were lost or the passage of time. These resources are administered by the U.S. Naval Historical Center. Commissioned Confederate vessels are the property of the United States and are administered by the General Services Administration.

In 2004, the Sunken Military Craft Act (passed as Title XIV of the FY 2005 National Defense Authorization Act) preserved the "sovereign status of sunken U.S. military vessels and aircraft by codifying both their protected sovereign status and permanent U.S. ownership regardless of the passage of time" or where they are located, in recognition of the probable historic status of the craft and the fact that they often contain the remains of U.S. military personnel. The Sunken Military Craft Act explicitly states that the protection of the law "shall not be extinguished by the passage of time, regardless of when the sunken military craft sank regardless of age" (Trocolli, *et al*., 2005).

Government-to-government consultation with federally recognized American Indian tribes is required by Executive Order 13007, May 24, 1996. Military regulatory mandates include DoD Directive 47 10.I.

An Integrated Cultural Resources Management Plan (ICRMP) is an internal compliance and management tool used by the Marine Corps to integrate the installation's cultural resources program with ongoing mission activities. No ICRMP has been completed, nor is required, for the at-sea portion of the Cherry Point Range Complex, and no comprehensive underwater surveys of cultural resources have been conducted.

Under the NHPA, the APE is defined as the Cherry Point OPAREA. Because all the APE/study area is in the open ocean and offshore areas, the only identified cultural resources present are historic shipwrecks or unidentified obstructions. Note that, depending on location, vessel affiliation, and whether the wreck meets the criteria of abandonment, shipwrecks in coastal waters may fall under the jurisdiction of the individual state, one or more federal agencies, or may belong to other nations. The APE includes any locales where underwater trenching, demolition, placement of systems, infrastructure, or equipment might affect submerged ruins, sites, features, or wrecks.

K 13. Transportation

States' jurisdictional boundaries for transportation extend 3 nm offshore of the coast. Impacts of operations evaluated under NEPA are further distinguished by State regulatory authorities where applicable.

K 14. Demographics

Demographic information is assessed to ensure federal agencies focus their attention on human health and environmental conditions in minority and low-income communities and to ensure that disproportionately high and adverse human health or environmental effects on these communities are identified and addressed per EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations* (1994) and EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (1997).

K 15. Regional Economy

The regional economy is important to the analysis of the Alternatives due to the requirements imposed by EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations* (1994) and EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (1997) that requires federal agencies to focus their attention and address effects on human health or environmental effects on these communities.

K 16. Recreation

States' jurisdictional boundaries for recreation extend 3 nm offshore of the coast. Impacts of operations evaluated under NEPA are further distinguished by State regulatory authorities where applicable.

K 17. Environmental Justice

The communities of minority, low-income, and children are important to the analysis of the alternatives due to the requirements imposed by EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations* (1994) and EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (1997) which requires federal agencies to focus their attention and address effects on human health or environmental effects on these communities.

K 18. Public Health and Safety

All range safety precautions and regulations contained in COMLANTFLTINST 3120.26, Atlantic Fleet Operating Areas and Warning Areas, apply in the OPAREA. In addition, FACSFAC VACAPES imposes additional safety requirements, which may be waived by the FACSFAC VACAPES Commanding Officer as the situation dictates.

K 19. Atlantic Fleet Active Sonar Training (AFAST) Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS)

Impacts to ocean areas of the AFAST Study Area that lie within 22.2 kilometers [km] [12 nm of land (territorial seas) are subject to analysis under NEPA. This is based on Presidential Proclamation 5928, issued December 27, 1988, in which the United States extended its exercise of sovereignty and jurisdiction under international law to 22.2 km (12 nm) from land, although the Proclamation expressly provides that it does not extend or otherwise alter existing federal law or any associated jurisdiction, rights, legal interests, or obligations.

This document was also prepared in accordance with Presidential EO 12114, *Environmental Effects Abroad of Major Federal Actions*, which directs federal agencies to provide for informed decision making for major federal actions outside the United States, including the global commons, the environment of a non-participating foreign nation, or impacts on protected global resources. An OEIS is required when an action has the potential to significantly harm the environment of the global commons. Global commons are defined as "geographical areas that are outside of the jurisdiction of any nation, and include the oceans outside territorial limits (outside 22.2 km [12 NM] from the coast) and Antarctica. Global commons do not include contiguous zones and fisheries zones of foreign nations" (32 Code of Federal Regulations [CFR] 187.3). Impacts to areas within the AFAST Study Area that lie outside 22.2 km (12 NM) (Figure 1-2) are analyzed using the procedures set out in EO 12114 and associated implementing regulations.

The Proposed Action requires assessment of effects both within and outside U.S. territory; therefore, the document is being prepared as an EIS/OEIS under the authorities of both NEPA and EO 12114. Chapter 4 of this EIS/OEIS contains italicized text that describes the effects that occur in areas located within the U.S. territory, while non-italicized text describes the effects that occur in areas located outside the U.S. territory. In addition to NEPA and EO 12114, this document complies with a variety of other environmental regulations including MMPA, ESA, MSFCMA, and MBTA. Two other regulations are described relevant to this EIS/OEIS are described below.

K19.1 Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) provides assistance to states, in cooperation with federal and local agencies, for developing land and water use programs for their respective coastal zones. It is important to note that a state's coastal zone extends seaward to 5.6 km (3 NM), except for the Texas and Florida Gulf Coasts, where the coastal zone extends seaward to 16.7 km (9 nm).

The CZMA requires that any federal agency activity within or outside the coastal zone that affects any land or water use, or natural resource of the coastal zone be carried out in a manner that is consistent, to the maximum extent practicable, with the enforceable policies of NOAA-approved state coastal management programs. Under the CZMA, the Navy must determine whether the proposed action will have reasonably foreseeable effects to state coastal zone uses or resources. If there are reasonably foreseeable effects, then the Navy must ensure, to the maximum extent practicable, that the activities are consistent with the enforceable policies of each respective state. Both direct and indirect effects are considered. Where required, a determination under the CZMA would be submitted to the applicable state(s') coastal zone management agency.

K19.2 National Marine Sanctuary Act

The National Marine Sanctuaries Act (NMSA) prohibits the destruction, loss of, or injury to any sanctuary resource managed under law or regulations and any violation of the act, any regulations, or permits issued thereunder (16 USC 436). In addition, section 304(d) of the NMSA (16 USC 1434(d)) requires federal agencies to consult with the Secretary of Commerce, through NOAA, on federal agency actions internal or external to any national marine sanctuary that are likely to destroy, cause the loss of, or injure any sanctuary resource (for Stellwagen Bank National Marine Sanctuary, the threshold is "may" destroy, cause the loss of, or injure). Under section 304(d), if NOAA determines that the action is likely to destroy, cause the loss of, or injure sanctuary resources, NOAA shall recommend reasonable and prudent alternatives that can be taken by a federal agency to protect sanctuary resources. The federal agency may choose not to follow these alternatives provided the reasons are submitted in writing. However, if the head of a federal agency takes an action other than an alternative recommended by NOAA and such action results in the destruction of, loss of, or injury to a sanctuary resource, the head of the agency shall promptly prevent and mitigate further damage and restore or replace the sanctuary resource in a manner approved by NOAA. Regulations for each designated national marine sanctuary specifically address military and defense activities.

K 20. Cooperating Agencies

The CEQ's regulations implementing NEPA allow federal agencies (as lead agencies) to invite tribal, state, and local governments, as well as other federal agencies, to serve as cooperating agencies in the preparation of EISs. The lead agency maintains the responsibility of supervising the development of the EIS, which addresses the potential effects associated with activities connected to the Proposed Action.

Upon request of the lead agency, any other federal agency that has jurisdiction can serve as a cooperating agency. In addition, any other federal agency with special expertise on any environmental issue that should be addressed in the EIS may serve as a cooperating agency upon request of the lead agency. The cooperating agency, upon request by the lead agency, is

responsible for assisting in the development of information and preparing environmental analyses associated with the agency's area of expertise.

The Navy requested that NMFS participate as a cooperating agency in the preparation of this EIS/OEIS, and NMFS agreed to cooperating agency status (Appendix A, Agency Correspondence). NMFS is a cooperating agency primarily because of its responsibilities pursuant to Section 101(a)(5)(A) of the MMPA and Section 7 of the ESA.

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APPENDIX L TOW MISSILE GUIDE WIRE CORROSION REPORT

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Corrosion and Degradation of TOW Missile Guide-Wires in Marine Environments

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December 31, 2008

Abstract
This report presents assessments of corrosion and disintegration rates for enamel coated-, copper plated –carbon steel guide-wires in marine environments. Guide-wires are used in certain missiles guidance and probe systems. Sequential disintegrations of the coating, copper plating and the carbon-steel core of the guide-wire have been assessed under a range of material specifications and environmental conditions.

1. Introduction

Numerous factors can affect the rate of corrosion and/or disintegration of materials in very diverse and complex marine environments.[1-5] These factors may include:

- **i)** **material and metallurgical properties and specifications** (type, thickness and chemical characteristics of coating(s) and/or plating(s), grade and contents of the alloys etc) and
- **ii)** **environmental conditions** (such as, temperature, oxygen content and salinity of the seawater, sunlight level, emersion depth, current conditions and velocity, mechanical stress, microorganisms, biofouling, etc).

In this report, efforts have been made to assess corrosion and disintegration rate of the guide-wires in a range of material specifications and marine environmental conditions.

2. Specifications of the Guide-Wire

Specifications for the guide-wires provided for this study are as follow:

Composition:	High Carbon Steel, copper plated and cold drawn
Coating:	All guide-wires coated with Enamel, 0.00043" thick
Tensile strength:	10 lb. / strand min.
Diameter:	0.00575" +/- 0.0001 inch (coated); 0.00490" +/- 0.0001 inch (before coating)
Length:	3750 m

The type of the enamel coating, thickness of the copper plating, and the grade of carbon steel used in the guide-wires, have not been provided. Thus, attempts have been made to assess the disintegration rate of the guide-wire for a “reasonable” range of material specifications as described below..

Enquiries from metal plating facilities indicated that copper plating thicknesses between 0.2 to 0.5 mil (1 mil = 1” /1000) are common. Thus, this range of thickness for the copper plating has been used for this assessment.

Using the known thickness of the enamel coating (0.00043” = 0.43 mil), the range of the thickness for copper plating (0.2 to 0.5 mil), and the given diameter of the coated wire (5.75 mil),

the possible range of diameter for the carbon-steel core of the guide wire can be determined, as follow;

Thickness of the Enamel Painting;	0.425 mil
Thickness of the Copper Plating;	0.2 to 0.5 mil
Diameter of the Carbon-Steel Core	4.5 to 3.95 mil

The grade of the carbon steel used as core of the guide-wire has not been specified. For this assessment the corrosion rates for carbon steel-1010, 1020 and A-36 have been used.

3. Corrosion and Degradation of the Guide-Wire

Sequential failure and corrosions-degradations of **a)** the enamel coating, **b)** copper plating and **c)** carbon steel core of the guide wire have been assessed in various marine environments and are described below.

3a. Failure of the Outer Enamel Coating

Coating damage and substrate corrosion may manifest themselves in a range of different modes, but coating failure generally involves a serial sequence of events:

- Defect or crack formations;
- Uptake of water ions and oxygen from the environment;
- Loss of adhesion, condensation of bulk electrolyte at the coating metal interface; and
- Initiation and propagation of substrate corrosion.

In aggressive marine environments, electrolytes may penetrate through defects and cracks on the coating, resulting in loss of adhesion and blistering and consequently rusting of the metal substrate. Polyethylene enamel, commonly used as protective-insulating coating on wires, degrades in sea water due to oxidation, caused by oxygen dissolved in the water. Once oxidation begins, cracks grow in the coating due to environmental stress. In addition, studies have shown[1], when polyethylene insulation is in direct contact with copper, as is the case in the guide-wires, oxidation of polyethylene is accelerated due to catalytic action of the copper (Ref 1. *Seawater Corrosion Handbook- Behavior of Nonmetallic Materials*, pg 457).

Available data indicate that moisture uptake by epoxy enamels[2] (shown in Figure 1) can

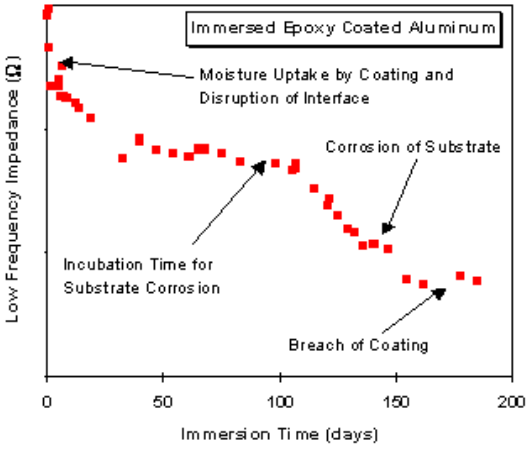

Figure 1. Impedance spectra of coating during degradation (Ref. 2)

take place in less than ten days of the exposure to seawater and corrosion of the metal substrate can start in about 2 months. Aggressive marine environments and stress due to dynamic currents and waves can accelerate the rate of coating failure, particularly on long wires, by developing cracks faster.

3b. Corrosion and Failure of the Copper Plating

Several studies report different corrosion rates for copper and/or copper alloys depending upon the condition of the tests and the environment.[1,3,4] Table 1 lists type of copper plating, different corrosion rates (CR, in units of mil per year, mpy) values used in this assessment, the corresponding marine condition and the derived Degradation Time (*DT in month*) of the plating layer.

Table 1. Corrosion Rates* (**CR, mil per year, mpy**), derived Degradation Times (**DT, month**) for copper plating with thicknesses of 0.2 mil and 0.5 mil and at various marine conditions.

Plating Alloy ***Thickness (Th)***	**Near Surface** [1]	**Sea Depth-2500 ft** [1]	**Sediment-2500 ft**[1]	**Quiet Flow** [4]	**Flowing** [4]
Copper ***Th = 0.2 mil***	CR=1.6 *DT ~1.5*	CR=1.0 *DT ~2.4*	CR=0.3 *DT ~8*	No data	No data
Th = 0.5 mil	*DT ~ 4*	*DT ~6.0*	*DT ~20*		
Cu/Ni, 90/10 ***Th = 0.2 mil***	No data	No data	No data	CR=0.24 *DT ~10*	CR=0.48 *DT ~ 5*
Th = 0.5 mil				*DT ~ 25*	*DT ~ 12*

* Corrosion rate data from references 1 and 4

These results indicate, depending upon the type and thickness, the plating can disintegrate in about 1.5 months for copper plating with thickness of 0.2 mil to about 25 months for Copper/Nickel-90/10 plating with thickness of 0.5 mil.

Please see Attachment 1 for Corrosion Rate Conversion

3c. Corrosion and Degradation of Carbon Steel Core

Carbon and low alloy steels are not resistant to corrosion in natural environments. High salinity and oxygen in seawater can accelerate the corrosion rate of carbon steels.

In this assessment the Degradation Time (*DT*) of the wire has been derived from the following equation:

DT (month) = [diameter (d, mil) x 12 (month)] / [Corrosion Rate (mpy) x 2]

Multiplying the CR by a factor of 2, accounts for the fact that corrosion of the wire will occur from two directions of the wire-diameter. Table 2 lists the type and diameter of the carbon steel, CR (in units of mpy) used for this assessment and the derived DT (in months).

Table 2. Corrosion Rates* (**CR, mil per year, mpy**), derived Disintegration Times (**DT, month**) for different carbon steel type and diameters and at various marine conditions.

Carbon Steel Type & *Diameter (d)*	**Semi-Submerged[3]**	**Fully Submerged[1,3]**
G1010 *d=3.95 mil* *d=4.50 mil*	CR = 2.5 *DT~ 10* *DT~ 11*	CR = 1.5 *DT ~ 16* *DT ~ 18*
G1020 *d=3.95 mil* *d=4.50 mil*	CR = 3.0 *DT ~ 8* *DT ~ 9*	CR = 2.4 DT ~ 10 DT ~ 11
A-36 *d=3.95 mil* *d=4.50 mil*	No data	CR = 3.0 *DT ~ 8* *DT ~ 9*

* Corrosion rate data from references 1 and 3.

The data presented in Table 2, indicate that degradation times for carbon steel core of the guide wire can vary from about 8 months to 18 months depending upon the diameter of the core and type of the carbon steel.

Numerous environmental factors may significantly affect the corrosion rates. For example, sulfate reducing bacteria (SRB) have been reported to increase the carbon steel corrosion rates by a factor of about 3.5.[4]

Please see Attachment 1 for Corrosion Rate Conversion

4. Summary- Estimates of Combined Disintegration Times for the Guide-Wires

Assuming a sequential failure and/or degradation of the enamel coating (DT ~ 2 month), the copper plating (DT ~ 1.5 – 25 months) and the core carbon-steel (DT ~ 8 to 18 months), a minimum of about 12 months and a maximum of about 45 months is required for total degradation of the guide wires. These assessments can be applicable for guide wires with the material specifications, and in environments examined in this report. However, as mentioned earlier several factors can significantly affect the corrosion and degradation rates. These may include:

Temperature, in general, the warmer tropical marine environments are more corrosive for most alloys than colder waters.[1,4]

Biofouling, sulfate reducing bacteria (SRB) can substantially increase the carbon steel corrosion rates. [5]

Oxygen, higher oxygen content of seawater (for example at lower depth) and more sun light can accelerate the corrosion rates. [1,4]

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Attachment 1

Corrosion Rate Conversion

The following tables provide a simple way to convert data between the most common corrosion units in usage, i.e. corrosion current (mA cm^{-2}) , mass loss (g m^{-2} day^{-1}) and penetration rates (milli-inch y^{-1} or mpy) for all metals or for steel

	mA cm^{-2}	**mm $year^{-1}$**	**mpy**	**g m^{-2} day^{-1}**
mA cm^{-2}	1	3.28 M/nd	129 M/nd	8.95 M/n
mm $year^{-1}$	0.306 nd/M	1	39.4	2.74 d
mpy	0.00777 nd/M	0.0254	1	0.0694 d
g m^{-2} day^{-1}	0.112 n/M	0.365 /d	14.4 /d	1

- where:
  - mpy = milli-inch per year
  - n = number of electrons freed by the corrosion reaction
  - M = atomic mass
  - d = density

Note: The Table should be read from left to right, i.e.:
1 mA cm^{-2} = (3.28 M/nd) mm y^{-1} = (129 M/nd) mpy = (8.95 M/n) g m^{-2} day^{-1}

For example, if the metal is steel or iron (Fe), n = **2**, M = **55.85** g and d = **7.88** g cm^{-3} and the Table of conversion becomes:

	mA cm^{-2}	**mm $year^{-1}$**	**mpy**	**g m^{-2} day^{-1}**
mA cm^{-2}	1	11.6	456	249
mm $year^{-1}$	0.0863	1	39.4	21.6
mpy	0.00219	0.0254	1	0.547
g m^{-2} day^{-1}	0.00401	0.0463	1.83	1

Note: The Table should be read from left to right, i.e.:
1 mA cm^{-2} = 11.6 mm y^{-1} = 456 mpy = 249 g m^{-2} day^{-1}