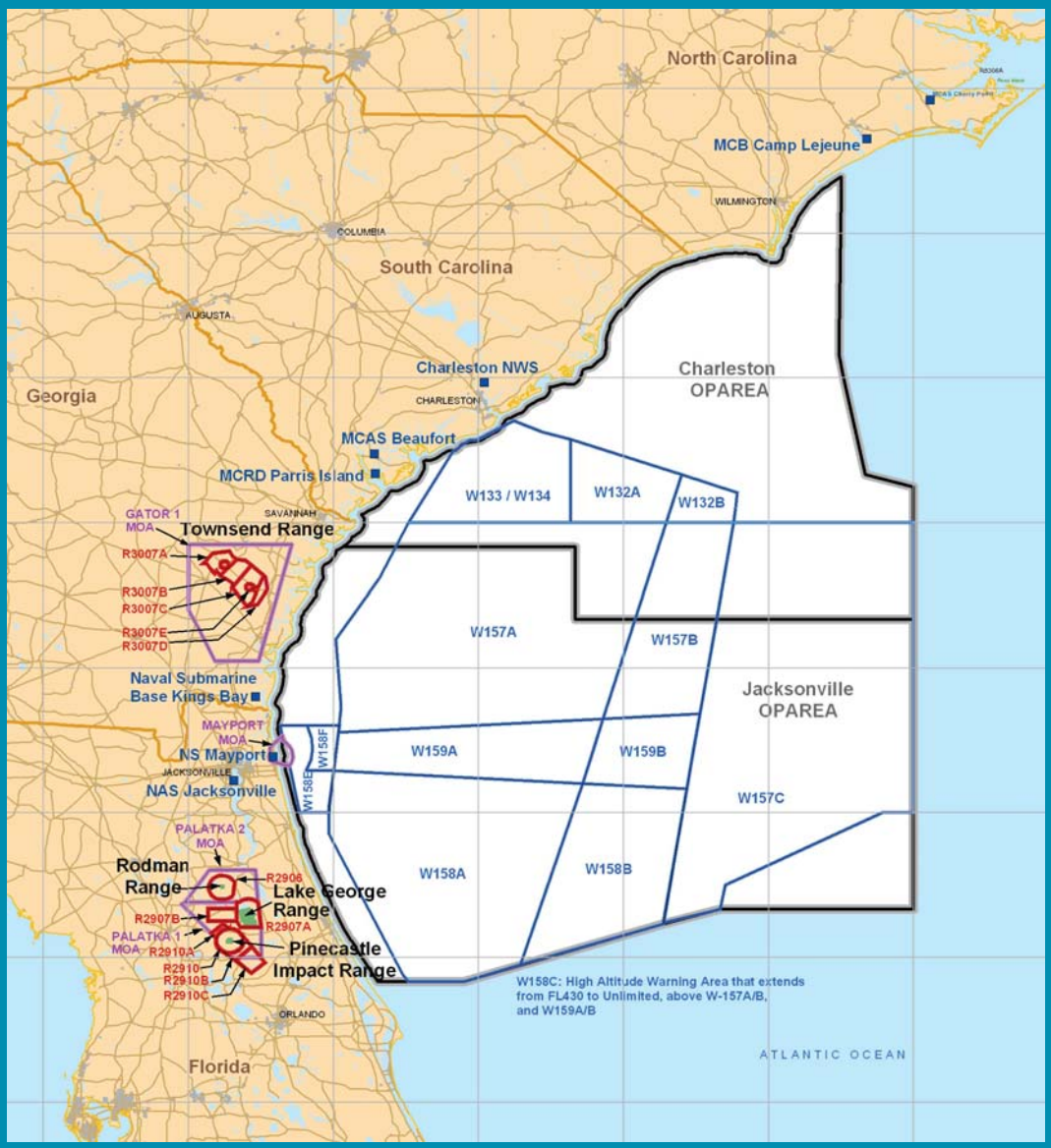
Jacksonville Range Complex Final Environmental Impact Statement/ Overseas Environmental Impact Statement (EIS/OEIS) Volume 2 Appendices



Prepared by:

United States Fleet ForcesDecem

March 2009

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JACKSONVILLE 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) 322-4960

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

Published March 2009

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APPENDIX A

COOPERATING AGENCIES AND ACCEPTANCE LETTERS

This appendix contains the following letters:

1. CNO letter dated 21 February 2007 to NMFS requesting NMFS to be a cooperative agency on JAX EIS/OEIS
2. NMFS acceptance letter dated 12 March 2007

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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 N456C/7U158028
21 February 2007

Dr. William T. Hogarth
Assistant Administrator
National Oceanic and Atmospheric
Administration (NOAA) Fisheries
1315 East West Highway
Silver Springs, 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/Overseas Environmental Impact Statement (EIS/OEIS) to evaluate potential environmental effects of using the Jacksonville Range Complex to support current, emerging, and future military activities as necessary to achieve and sustain Fleet readiness. The Proposed Action will further our statutory obligations under Title 10 of the United States Code governing the roles and responsibilities of the Navy.

In order to adequately evaluate the potential environmental effects of the Proposed Action, the Navy and National Marine Fisheries Service (NMFS) will need to work together on explosive acoustic effects to marine species protected under the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA). To assist in this effort, and in accordance with 40 CFR Part 1501 and the Council on Environmental Quality Cooperating Agency guidance issued on 30 January 2002, the Navy requests NMFS serve as a cooperating agency for the development of the EIS/OEIS.

The Proposed Action for the Jacksonville Range Complex EIS/OEIS is to:

- Maintain current levels of military readiness by training.
- Accommodate future increases in operational training tempo and support the deployment of naval forces.
- 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 operations.
- Support the acquisition and implementation into the Fleet of advanced military technology. The Jacksonville Range

Complex must adequately support the testing and training needed for new platforms and weapons systems.

- Implement investments to optimize range capabilities required to adequately support required training.

- Maintain the long-term viability of the Complex while protecting human health and the environment.

The No-Action Alternative is the continuation of training, testing, and supporting operations at baseline levels of activity.

The EIS/OEIS will address foreseeable activities in the particular geographical areas affected by the No-Action Alternative and action alternatives. This EIS/OEIS will include acoustic exposure modeling of explosive sources and an effects-analysis for marine mammals. The effects-analysis will be based upon validated Navy acoustic models for explosives and agreed upon Navy/NMFS criteria. In addition, other environmental resource areas that will be addressed as applicable in the EIS/OEIS include air quality; airspace; biological resources, including marine mammals and threatened and endangered species; cultural resources; geology and soils; hazardous materials and waste; health and safety; land use; noise; socioeconomics; transportation; utilities; visual and aesthetic resources; and water resources.

As the lead agency, the Navy will be responsible for overseeing preparation of the EIS/OEIS, which will include, but not be limited to the following:

- Gathering all necessary background information and preparing the EIS/OEIS and all necessary permit applications associated with explosive acoustic issues on the underwater ranges.

- Working with NMFS personnel to determine 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 meetings held in support of the NEPA process, and compiling any comments received.

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

Navy requests that NMFS, as cooperating agency, provide support as follows:

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

- Respond 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.

- Participate, as necessary, in meetings hosted by the Navy for discussion of EIS/OEIS related issues.

- Adhere to the overall project schedule agreed upon by the Navy and NMFS.

- Provide a formal, written response to this request.

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

Sincerely,

J.A. SYMONDS
Rear Admiral, U.S. Navy
Director, Environmental
Readiness Division

Copy to:
ASN (I&E)
DASN (E), (I&F)
OAGC (I&E)
FLTFORCOM, N4/7
FLTFORCOM, N77
Commander, Navy Region Southeast

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1315 East-West Highway
Silver Spring, Maryland 20910

THE DIRECTOR

MAR 12 2007

Admiral J.A. Symonds
Director, Environmental Readiness Division
Department of the Navy
2000 Navy Pentagon
Washington, DC 20350-2000

Dear Admiral Symonds:

Thank you for your letter requesting the National Marine Fisheries Service (NOAA Fisheries) be a cooperating agency in the preparation of an Environmental Impact Statement (EIS) to evaluate potential environmental effects of using the Jacksonville Range Complex to support current, emerging, and future military activities as necessary to achieve and sustain Fleet readiness. We support the Navy's decision to prepare an EIS on this activity and agree to be a cooperating agency, due, in part, to our responsibilities under section 101(a)(5)(A) of the Marine Mammal Protection Act (MMPA) and section 7 of the Endangered Species Act. We met with the Navy on February 7, 2007, and are currently working on a joint plan that will address how NOAA Fisheries and the Navy will cooperate during the development of multiple Navy EISs for Training Ranges and Major Exercises, including the Jacksonville Range Complex. Until the joint plan is complete, NOAA Fisheries will make every effort to support the Navy in the specific ways described in the Navy's February 21, 2007, letter.

If you need any additional information, please contact Ms. Jolie Harrison, (301) 713-2289, ext. 166.

Sincerely,

for William T. Hogarth, Ph.D.

THE ASSISTANT ADMINISTRATOR
FOR FISHERIES

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 JAX Range Complex and a Notice of Public Scoping Meetings (72 FR 3806-3807)
2. Notice of Public Hearing for the JAX Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement (73 FR 36495-36498)

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7. Impacts to public facilities and utilities.

8. Traffic, including navigation issues, and transportation related impacts.

9. Environmental justice.

10. Cumulative impacts.

11. Growth-inducing impacts.

4. Alternatives. Alternatives initially being considered for the proposed project development include the following:

(1) Marine Container Terminal with Rail Access and Back Channel Improvements (Preferred Alternative);

(2) Marine Container Terminal with Rail Access and Reduced Wharf and Back Channel Improvements;

(3) Multi-Use Storage Facility without Wharf and Back Channel Improvements (No Federal Action); and

(4) No Project/No Federal Action Alternative.

5. Scoping Process. The Corps and the Port will jointly conduct a scoping meeting for the proposed project. English and Spanish translation services will be provided at the meeting. The public scoping meeting will be held to receive public comment and assess public concerns regarding the appropriate scope of the DEIS/DEIR. Participation in the public meeting by federal, state, and local agencies and other interested organizations and persons is encouraged. The Corps will also be consulting with the U.S. Fish and Wildlife Service under the Endangered Species Act and Fish and Wildlife Coordination Act, and with the National Marine Fisheries Service under the Magnuson-Stevens Act. Additionally, the EIS/EIR will assess the consistency of the proposed Action with the Coastal Zone Management Act and potential water quality impacts pursuant to Section 401 of the Clean Water Act. The public scoping meeting for the Draft EIS/EIR will be held at the City Hall Council Chambers in Long Beach on February 22, 2007 at 6:30 p.m. Written comments will be received until March 14, 2007.

6. Availability of the DEIS/DEIR. The joint lead agencies expect the DEIS/DEIR to be published and circulated in July of 2007. A Public Hearing will be held during the public comment period for the DEIS/DEIR.

Dated: January 10, 2007.

David J. Castanon,

Chief, Regulatory Branch, Los Angeles District.

[FR Doc. E7–633 Filed 1–25–07; 8:45 am]

BILLING CODE 3710–KF–P

DEPARTMENT OF DEFENSE

Department of the Navy

[No. USN–2007–0005]

Proposed Collection; Comment Request

AGENCY: Department of the Navy, DoD.

ACTION: Notice.

SUMMARY: In compliance with Section 3506(c)(2)(A) of the Paperwork Reduction Act of 1995, the United States Naval Academy announces the proposed extension of a currently approved public information collection and seeks public comment on the provisions thereof. Comments are invited on: (a) Whether the proposed collection of information is necessary for the proper performance of the functions of the agency, including whether the information shall have practical utility; (b) the accuracy of the agency's estimate of the burden of the proposed information collection; (c) ways to enhance the quality, utility, and clarity of the information to be collected; and (d) ways to minimize the burden of the information collection on respondents, including through the use of automated collection techniques or other forms of information technology.

DATES: Consideration will be given to all comments received by March 27, 2007.

ADDRESSES: You may submit comments, identified by docket number and title, by any of the following methods:

• *Federal eRulemaking Portal: http://www.regulations.gov*. Follow the instructions for submitting comments.

• *Mail:* Federal Docket Management System Office, 1160 Defense Pentagon, Washington, DC 20301–1160.

Instructions: All submissions received must include the agency name, docket number and title for this **Federal Register** document. The general policy for comments and other submissions 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 contact information.

FOR FURTHER INFORMATION CONTACT: To request more information or to obtain a copy of the proposal and associated collection instruments, write to the Admissions Office, United States Naval Academy, 117 Decatur Road, Annapolis, MD 21402–5017, or contact LCDR Eric Brown at telephone number (410) 293–1822.

Title; Associated Form; and OMB Number: Candidate Application Procedures for the United States Naval Academy; USNA GRB 1110/11, 1110/12, 1110/14, 1110/15, 1110/91, 1110/92, and 1531/34; OMB Control Number 0703–0036.

Needs and Uses: This collection of information is necessary to determine the eligibility and evaluate overall competitive standing of candidates for appointment to the United States Naval Academy. An analysis of the information collected is made by the Admissions Board during the process in order to gauge the qualifications of individual candidates.

Affected Public: Individuals or households; Federal Government.

Annual Burden Hours: 56,000.

Number of Respondents: 14,000.

Responses per Respondent: 1.

Average Burden per Response: 4 hours.

Frequency: On occasion.

SUPPLEMENTARY INFORMATION:

Summary of Information Collection

This collection of information is necessary to determine the eligibility and evaluate overall competitive standing of candidates for appointment to the United States Naval Academy. An analysis of the information collected is made by the Admissions Board during the process in order to gauge the qualifications of individual candidates.

Dated: January 18, 2007.

Patricia L. Toppings,

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

[FR Doc. 07–330 Filed 1–25–07; 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 Jacksonville 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 the Navy (Navy) announces its intent to prepare an Environmental Impact Statement (EIS)/Overseas EIS to evaluate the potential environmental effects associated with

naval training in the Jacksonville (JAX) Range Complex. The Navy proposes to support current and emerging training operations and research, development, testing, and evaluation (RDT&E) activities at the JAX 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 changes; and (4) implementing enhanced range complex capabilities. The EIS/OEIS study area is the JAX Range Complex which consists of targets and instrumented areas, airspace, surface and subsurface operations areas (OPAREAs), and land range facilities. Together the JAX Range Complex encompasses: 27 square miles of land area; 62,596 nm² of special use airspace (SUA); and 50,090 nm² of sea space. The scope of actions to be analyzed in this EIS/OEIS includes current and proposed future Navy training, and RDT&E activities, within Navy-controlled operating areas, airspace, and ranges. It also includes proposed Navy-funded range capabilities enhancements, including infrastructure improvements that support range complex training and RDT&E activities. Training activities that involve the use of active sonar are conducted in the JAX Range Complex; however, those potential effects are being analyzed in detail in a separate document, the Atlantic Fleet Active Sonar Training EIS/OEIS. This 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 JAX Range Complex), and in the Gulf of Mexico. The results of this sonar EIS/OEIS will be incorporated into the JAX Range Complex EIS/OEIS to account for active sonar effects that could occur within the geographic area of the JAX Range Complex.

Dates and Addresses: Public scoping meetings will be held to receive oral and written comments on environmental concerns that should be addressed in the EIS/OEIS in the following cities: Charleston, South Carolina; Beaufort, South Carolina; Savannah, Georgia; and Jacksonville, Florida. Public scoping open houses will be held at the following dates, times, and locations: February 20, 2007, from 5 p.m. to 8 p.m. at the Embassy Suites in Charleston, SC; February 21, 2007, from 5 p.m. to 8 p.m. at the U.S. Army National Guard Armory in Beaufort, SC; February 22, 2007 from 5 p.m. to 8 p.m. at the Coastal Georgia Center in Savannah, GA; and February 23, 2007 from 5 p.m. to 8 p.m. at The Sea Turtle Inn, Atlantic Beach in Jacksonville, FL.

FOR FURTHER INFORMATION CONTACT: John Conway, Naval Facilities Engineering Command Southeast, 904–542–6159.

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, 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 JAX Range Complex to support current, emerging, and future training operations 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 10 U.S.C. 5062. Specifically, maintain current levels of military readiness by training in the JAX Range Complex; accommodate future increases in operational training tempo in the JAX 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 deploy significant combat power to multiple areas around the world at the same time in the event of a national crisis or contingency operation and consistent with the FRTP; support the testing and training needed for new vessels, aircraft, and weapons systems; and maintain the long-term viability of the JAX Range Complex while protecting human health and the environment.

Three alternatives will be evaluated in the EIS/OEIS including: (1) The No Action Alternative comprised of baseline operations and support of existing range capabilities; (2) Alternative 1 comprised of the No Action Alternative plus additional operations, expanded warfare missions, accommodation of force structure changes including training resulting from the introduction of new vessels, aircraft, and weapons systems, and the implementation of enhancements to range infrastructure; and (3) Alternative 2, comprised of 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; natural land resources; 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 Navy activities in the 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 March 13, 2007 and should be mailed to: Naval Facilities Engineering Command, Southeast, Building 135, PO Box 151, Ajax Street, Jacksonville, FL 32212–0151, Attention: Mr. John D. Conway, PG.

Dated: January 18, 2007.

M.A. Harivson,

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

[FR Doc. E7–1120 Filed 1–25–07; 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.

for National and Community Service, by any of the following two methods within 30 days from the date of publication in this **Federal Register**:

(1) By fax to: (202) 395–6974, Attention: Ms. Katherine Astrich, OMB Desk Officer for the Corporation for National and Community Service; and (2) Electronically by e-mail to: *Katherine_T._Astrich@omb.eop.gov*.

SUPPLEMENTARY INFORMATION: The OMB is particularly interested in comments which:

- Evaluate whether the proposed collection of information is necessary for the proper performance of the functions of the Corporation, including whether the information will have practical utility;
- Evaluate the accuracy of the agency's estimate of the burden of the proposed collection of information, including the validity of the methodology and assumptions used;
- Propose ways to enhance the quality, utility, and clarity of the information to be collected; and
- Propose ways to minimize the burden of the collection of information on those who are to respond, including through the use of appropriate automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, e.g., permitting electronic submissions of responses.

Comments

A 60-day public comment Notice was published in the **Federal Register** on March 4, 2008. This comment period ended May 4, 2008. No public comments were received from this notice.

Description

The Progress Report (PPR) was designed to assure that AmeriCorps*VISTA sponsors address and fulfill legislated program purposes, meet agency program management and grant requirements, and assess progress toward project plan goals agreed upon in the signing of the Memorandum of Agreement.

The Corporation seeks to revise the previously used Project Application to: (a) Better align the information requested on the Concept Paper and the Application; and (b) simplify the project plan while continuing to provide a robust tool for evaluating project performance.

The Corporation seeks to revise the previously used PPR to: (a) Reduce respondent burden; (b) enhance data elements collected via this information collection tool; (c) establish reporting periods consistent with the Corporation's integrated grants management and reporting policies.

The current PPR is used by AmeriCorps*VISTA sponsors and grantees to report progress toward accomplishing work plan goals and objectives, reporting actual outcomes related to self-nominated performance measures meeting challenges encountered, describing significant activities, and requesting technical assistance. The PPR is also used to collect demographic data elements used by the Corporation for aggregate reporting purposes. Submissions of the PPR are done quarterly.

The revised PPR will be divided into two separate parts in order to reduce burden and to increase data integrity. All demographic data elements will be removed from the quarterly submissions and added to an annual VISTA Progress Report Supplement (VPRS) due 30 days after the end of a fiscal year. The quarterly reports will retain their purpose of providing monitoring and oversight of individual projects, while the annual data collection will serve the purpose of aggregate performance reporting for the VISTA program. Burden will be reduced by collecting the demographic data elements once a year instead of quarterly. Data integrity will be increased by tying data elements to specific fiscal years rather than project reporting cycles.

Type of Review: Renewal.

Agency: Corporation for National and Community Service.

Title: AmeriCorps*VISTA Project Progress Report (PPR).

OMB Number: 3045–0043.

Agency Number: None.

Affected Public: AmeriCorps*VISTA sponsoring organizations.

PPR (Part A):

Total Respondents: 1000.

Frequency: Quarterly.

Average Time per Response: 7 hours.

Estimated Total Burden Hours: 28,000 hours.

Total Burden Cost (capital/startup): None.

Total Burden Cost (operating/maintenance): None.

VPRS (Part B):

Total Respondents: 1000.

Frequency: Annual.

Average Time Per Response: 8 hours.

Estimated Total Burden Hours: 8000 hours.

Total Burden Cost (capital/startup): None.

Total Burden Cost (operating/maintenance): None.

Dated: June 23, 2008.

Jean Whaley,

*Director, AmeriCorps*VISTA.*

[FR Doc. E8–14629 Filed 6–26–08; 8:45 am]

BILLING CODE 6050–$$–P

DEPARTMENT OF DEFENSE

Department of the Navy

Notice of Public Hearings for the Jacksonville 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 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 June 18, 2008. The National Marine Fisheries Service (NMFS) is a Cooperating Agency for the EIS/OEIS.

The EIS/OEIS evaluates 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) within the existing Jacksonville (JAX) Range Complex Operating Area (OPAREA). The JAX Range Complex geographically encompasses offshore, near-shore, and onshore OPAREA, ranges, and special use airspace (SUA).

Components of the JAX Range Complex encompass 50,090 square nautical miles (nm^2) of sea space and 62,596 nm^2 of SUA off the coasts of North Carolina, South Carolina, Georgia, and Florida, as well as 20 $miles^2$ of inland range area in north-central Florida. A Notice of Intent for this Draft EIS/OEIS was published in the **Federal Register** on January 26, 2007 (72 FR 3806).

The Navy will conduct four public hearings to receive oral and written comments on the Draft EIS/OEIS. Federal agencies, state agencies, and 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 EIS/OEIS.

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 JAX Range Complex Draft EIS/OEIS. Navy 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: July 28, 2008 at the Doubletree Guest Suites—Historic Charleston, 181 Church Street, Charleston, SC; July 29, 2008 at the Holiday Inn Beaufort; 2225 Boundry St., Beaufort, SC; July 30, 2008 at the Hyatt Regency Savannah, 2 W. Bay Street, Savannah, GA; July 31, 2008 at the Hyatt Regency Jacksonville—Riverfront; 225 E. Coastline Dr., Jacksonville, FL.

FOR FURTHER INFORMATION CONTACT: Naval Facilities Engineering Command, Atlantic, Attention, EV22CM (JAX EIS/OEIS PM), 6506 Hampton Boulevard, Norfolk, Virginia 23508–1278; facsimile: 757–322–4894 or *http://www.jacksonvillerangecomplexeis.com.*

SUPPLEMENTARY INFORMATION: The Navy has identified the need to support and conduct current and emerging training and RDT&E operations in the JAX Range Complex. The proposed action does not indicate major changes to JAX 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 JAX Range Complex that are necessary if the Navy is to maintain a state of military readiness commensurate with its national defense mission.

The EIS/OEIS addresses the training strategies described in the Fleet Readiness Training Plan (FRTP) that implement the Fleet Response Plan, which ensures continuous availability of agile, flexible, trained, and ready surge-capable (rapid response) forces. The recommended range enhancements that have the potential to impact the environment, as well as current and future training and testing operations that 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 JAX Range Complex to support and conduct current, emerging, and future training operations and RDT&E operations;
- Expand warfare missions supported by the JAX Range Complex; and
- Upgrade and modernize existing range capabilities to enhance and sustain 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 JAX 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 JAX Range Complex;
- Accommodate future increases in operational training tempo in the JAX Range Complex and support the rapid deployment of naval units or strike groups;
- Achieve and sustain readiness of ships and squadrons so the Navy can quickly surge significant combat power in the event 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 JAX 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 JAX 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 actions evaluated in the EIS/OEIS.

These potentially include:

- Increase use of contractor-operated small 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 helicopter warfare mission areas, and Multi-Mission Maritime Aircraft training operations; and
- Conduct mine warfare training using a temporary mine training area.

The proposed action is to support and conduct current and emerging training and RDT&E operations in the JAX Range Complex. To achieve this, the 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 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 decision to be made by the Assistant Secretary of the Navy (Installations & Environment) is to determine which alternative analyzed in the EIS/OEIS satisfies both the level and mix of training to be conducted and the range capabilities enhancements to be made within the JAX Range Complex that best meet the needs of the Navy given that all reasonably foreseeable environmental impacts have been considered.

Three alternatives were evaluated in the EIS/OEIS to ensure they met the purpose and need, giving due consideration to range complex attributes such as: The capability to support current and emerging Fleet tactical training and RDT&E requirements; the capability to support realistic, essential training at the level and frequency sufficient to support the FRTP; and the capability to support training requirements while following Navy Personnel Tempo of Operations guidelines. These alternatives include:

1. The No Action Alternative—Current Operations to include surge consistent with the FRTP;

2. Alternative 1—No Action Alternative plus: increase Operational Training, Expand Warfare Missions, Accommodate Force Structure Changes (includes changing weapon systems and platforms and homebasing new aircraft and ships), and implement enhancements, to the minimal extent possible to meet the components of the proposed action. This alternative is composed of all operations currently conducted (No Action Alternative) with modifications to current training or

introduction of new training. These would include: (a) Using more commercial aircraft to serve as oppositional forces rather than using Navy aircraft for Air-to-Air Missile Exercise, Surface-to-Air Gunnery Exercises, Air Intercept Control Exercises, and Detect-to-Engage Exercises; (b) the incorporation of anti-terrorism training into existing training events; (c) adjusting training levels to ensure that deployment can be stepped up quickly and at multiple locations in response to world events; and (d) conducting new or modified training associated with the introduction of the new MH–60 helicopter, and new organic mine countermeasure systems; and

3. Alternative 2 (Preferred Alternative)—Alternative 1 plus: additional mine warfare training capabilities, and implementation of additional enhancements to enable the range complex to meet future requirements.

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 JAX 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. The JAX Range Complex is a vital component of the Atlantic Fleet system of range complexes, necessary and critical to ensure that naval forces are prepared and certified ready for overseas deployment and combat operations. 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 computer simulation and classroom training are currently used by the Navy and effective training tools, they cannot exclusively replace live training because they do not replicate the atmosphere or experience that live training provides. Simulation cannot replicate the environment that is provided during 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 in that it would not sufficiently prepare our naval forces for combat. Therefore, this alternative is not evaluated in the EIS/OEIS.

3. Practice Ammunition Use—An alternative that would rely entirely on inert, practice ammunition use within the JAX Range Complex would not achieve the necessary levels of proficiency in firing weapons in a high stress and realistic environment. Inert, practice ammunition is utilized throughout the JAX Range Complex, and provides opportunity to implement a successful, integrated training program while reducing the risk and expense typically associated with live ammunition. As such, practice ammunition is already utilized extensively to enhance combat performance in the Navy's training program. However, while it is an essential component of training, practice ammunition cannot be used exclusively to train safely in an inherently unsafe combat environment. Consequently, this alternative fails to meet the purpose and need of the proposed action. Therefore, this alternative was not carried forward for analysis.

Twenty 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. 72, pp. 20032–20034) on April 14, 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 are expected.

The JAX Draft EIS/OEIS was distributed to Federal, State, and local agencies, elected officials, and other interested individuals and organizations on June 27, 2008. The public comment period will end on August 11, 2008. Copies of the JAX Draft EIS/OEIS are available for public review at the following libraries: Charleston County Library, 68 Calhoun Street; Charleston, SC; Beaufort County Public Library, 311 Scott Street, Beaufort, SC; Live Oak Public Libraries, 2002 Bull Street, Savannah, GA; Three Rivers Regional Library System, 208 Gloucester Street, Brunswick, GA; Jacksonville Public Library, 303 North Laura Street, Jacksonville, FL; Polk County Library Cooperative, 215 South Bougainvillea Avenue, Polk City, FL; and Marion County Public Library, 2720 East Silver Springs Boulevard, Ocala, FL.

The JAX Draft EIS/OEIS is also available for electronic public viewing at *http://www.jacksonvillerangecomplexeis.com.* A paper copy of the Executive Summary or a single CD with the JAX Draft EIS/OEIS will be made available upon written request by contacting Naval Facilities Engineering Command,

Atlantic Division; Attention: Code EV22CM (JAX 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 EV22CM (JAX 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.jacksonvillerangecomplexeis.com* during the comment period. All written comments must be postmarked by August 11, 2008 to ensure they become part of the official record. All comments will be addressed in the Final EIS/OEIS.

Dated: June 23, 2008.

T.M. Cruz,

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

[FR Doc. E8–14541 Filed 6–26–08; 8:45 am]

BILLING CODE 3810–FF–P

DEPARTMENT OF DEFENSE

Department of the Navy

Notice of Public Hearings for the Virginia Capes 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] 1500–1508); Department of the Navy Procedures for Implementing NEPA (32 CFR 775); Executive Order (EO) 12114, Environmental Effects Abroad of Major Federal Actions; and Department of Defense (DoD) regulations implementing EO 12114 (32 CFR 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 June 16, 2008. The National Marine Fisheries Service (NMFS) is a Cooperating Agency for the EIS/OEIS.

The EIS/OEIS evaluates 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) within the existing Virginia Capes (VACAPES) Range Complex Operating Area (OPAREA). The components of the VACAPES Range Complex include 28,672 square nautical miles (nm^2) of special use area (SUA) warning area; 27,661 nm^2 of offshore surface and subsurface OPAREA; and 18,092 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 VACAPES Range Complex. This area is referred to as the VACAPES Study Area. The VACAPES Study Area does not include any dry land. However, it does include the area from the mean high tide line east (seaward) to the 3nm boundary of the states of Delaware, Maryland, Virginia, and North Carolina. This 3-nm state boundary also serves as the western boundary of the VACAPES OPAREA. The VACAPES Study Area also includes 420 nm^2 of the lower Chesapeake Bay. A Notice of Intent (NOI) for the EIS/OEIS was published in the **Federal Register** on December 8, 2006 (**Federal Register** Volume 71, No. 236, pp 71143–71145). A revised NOI was issued in the **Federal Register** (Volume 72, No. 171, pp 50940–50941) on September 5, 2007 when training areas in the southern Chesapeake Bay were identified for analysis.

The Navy will conduct four public hearings to receive oral and written comments on the Draft EIS/OEIS. Federal agencies, state agencies, and 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 EIS/OEIS.

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 VACAPES Range Complex Draft EIS/OEIS. Navy 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: July 14, 2008 at the Princess Royale Oceanfront Hotel, 9100 Coastal Hwy., Ocean City, MD; July 15, 2008 at the Chincoteague Center, 6155 Community Dr., Chincoteague, VA; July 16, 2008 at the Virginia Beach Resort & Conference Ctr., 2800 Shore Dr., Virginia Beach, VA; and July 17, 2008 at the Hilton Garden Inn, 5353 N. Va. Dare Trail, Kitty Hawk, NC.

FOR FURTHER INFORMATION CONTACT: Naval Facilities Engineering Command, Atlantic, Attention, EV22ES (VACAPES EIS/OEIS PM), 6506 Hampton Boulevard, Norfolk, Virginia 23508–1278; facsimile: 757–322–4894 or *http://www.vacapesrangecomplexeis.com.*

SUPPLEMENTARY INFORMATION: The Navy has identified the need to support and conduct current and emerging training and RDT&E operations in the VACAPES Range Complex. The proposed action does not indicate major changes to VACAPES 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 VACAPES Range Complex that are necessary if the Navy is to maintain a state of military readiness commensurate with its national defense mission.

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

APPENDIX C

AGENCY CORRESPONDENCE

This appendix contains the following letters:

1. USFWS letter on review of the NOI.
2. Florida DEP coordination letter on review of the NOI.
3. CNO letter to NMFS dated November 16, 2007, requesting the initiation of early consultation with NMFS under Section 7 of the Endangered Species Act.
4. CNO letter dated 4 January 2008 to NMFS, transmitting the draft Biological Evaluation (BE).
5. OPNAV N45 letter dated 21 March 2008 to NMFS requesting a Letter of Authorization for Incidental Take of marine mammals.
6. NAVFAC Atlantic letter dated May 12, 2008 to USFWS transmitting Endangered Species Act Section 7 Consultation Package.
7. U.S. Fleet Forces letter dated 12 September 2007 of preliminary inquiry to South Carolina State Historic Preservation Office.
8. U.S. Fleet Forces letter dated 12 September 2007 of preliminary inquiry to Georgia State Historic Preservation Office.
9. U.S. Fleet Forces letter dated 12 September 2007 of preliminary inquiry to Florida State Historic Preservation Office.
10. CNO letter dated 15 September 2008 transmitting a replacement BE for NMFS consideration.
11. USFWS concurrence letter dated October 7, 2008.
12. NAVFAC Atlantic letter dated 9 February 2009 to Florida Office of Historic and Cultural Programs on finding of no historic properties affected.
13. NAVFAC Atlantic letter dated 9 February 2009 to South Carolina State Historic Preservation Office on finding of no historic properties affected.
14. NMFS letter dated 17 February 2009 on review of essential fish habitat assessment in the Draft EIS/OEIS, December 2008.
15. SAFMC letter dated 23 February 2009 on review of essential fish habitat assessment in the Draft EIS/OEIS, December 2008.
16. U.S. Fleet Forces letter dated 6 March 2009 to NMFS SERO in response to review of essential fish habitat assessment.

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
1875 Century Boulevard
Atlanta, Georgia 30345

MAR 2 0 2007

In Reply Refer To:
FWS/R4/ES

Mr. John D. Conway, PG
Naval Facilities Engineering Command, Southeast
Building 135, Ajax Street
P.O. Box 151
Jacksonville, Florida 32212-0151

Subject: Notice of Intent to Prepare an Environmental Impact Statement/Overseas Environmental Impact Statement for Navy Atlantic Fleet Training in the Jacksonville Range Complex

Dear Mr. Conway:

We have reviewed the January 26, 2007, *Federal Register* Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) for Navy Atlantic Fleet Training in the Jacksonville Range Complex. The NOI announces that the Department of Navy (Navy) intends to prepare an EIS/OEIS to evaluate the potential environmental effects associated with training, research, development, testing and evaluation (RDT&E) activities, and associated range capabilities enhancements in the Jacksonville (JAX) Range Complex.

The JAX Range Complex encompasses the coast of Georgia. The Fish and Wildlife Service's Georgia Ecological Services Sub-Office, Brunswick, Georgia, oversees the Georgian coast regarding federally listed species and should be contacted in regard to impacts related to the JAX Range Complex. A complete list of state and federally threatened or endangered species in the coastal counties, including Chatham, Bryan, Liberty, McIntosh, Glynn, and Camden can be obtained at the Georgia Ecological Services website http://www.fws.gov/athens/ . For additional site specific information, please contact the Georgia Heritage Program at 770/918-6411 or 706/557-3032 or visit their website http://www.georgiawildlife.com/ .

We specifically request that the Navy address all training, RDT&E activities, and range capabilities enhancements that could affect the federally listed manatee in the ocean ecosystem, including sonar, and low level jet airplane flights, that could affect federally protected bird species that have habitats in Georgia.

We also would like to request a hard copy of the portion of the EIS/OEIS that pertains to Georgia and the ocean environment adjacent to Georgia. Please send the EIS/OEIS materials to the Fish and Wildlife Service, Brunswick Sub-Office, 4270 Norwich Street, Brunswick, GA 31520.

If you have any questions about these comments, please contact, Kathy Chapman at the Brunswick Sub-Office at 912/265-9336 Ext. 24.

We appreciate the opportunity to provide these comments during the early planning stages of the proposed action.

Sincerely yours,

Noreen Walsh
Assistant Regional Director
Ecological Services

Florida Department of Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Charlie Crist
Governor

March 13, 2007

Mr. John D. Conway
Naval Facilities Engineering Command, Southeast
Building 135, Ajax Street
P. O. Box 151
Jacksonville, FL 32212-0151

RE: Department of the Navy - Scoping Notice - Jacksonville Range Complex Environmental Impact Statement - Off the Northeast Coast of Florida.
SAI # FL200702063046C

Dear Mr. Conway:

The Florida State Clearinghouse, pursuant to Presidential Executive Order 12372, Gubernatorial Executive Order 95-359, the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended, and the National Environmental Policy Act, 42 U.S.C. §§ 4321, 4331-4335, 4341-4347, as amended, has coordinated a review of the referenced scoping notice.

The Florida Fish and Wildlife Conservation Commission (FWC) recommends that the proposed EIS identify all protected and sensitive habitats that may be impacted by this project and provide a thorough evaluation of the impacts to all protected species throughout the project boundary. Additionally, staff requests the opportunity to review and comment on the draft EIS prior to implementation. Though FWC cannot determine whether the project would be consistent with Chapters 370 and 372, *Florida Statutes*, under the Florida Coastal Management Program/Coastal Zone Management Act, they note that the agency is committed to working with the Department of the Navy to ensure that the proposed activities will be consistent and potential impacts to fish and wildlife resources will be minimized.

Based on the information contained in the public notice and above state agency comments, the state has determined that, at this stage, the proposed federal action is consistent with the Florida Coastal Management Program (FCMP). The federal agency must, however, address the concerns identified by FWC staff prior to project

implementation. All subsequent environmental documents must be reviewed to determine the project's continued consistency with the FCMP. The state's continued concurrence with the project will be based, in part, on the adequate resolution of any issues identified during this and subsequent reviews.

Thank you for the opportunity to review this proposal. Should you have any questions regarding this letter, please contact Ms. Lauren P. Milligan at (850) 245-2170.

Yours sincerely,

Sally B. Mann

Sally B. Mann, Director
Office of Intergovernmental Programs

SBM/lm

cc: Mary Ann Poole, FWC

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

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

IN REPLY REFER TO

5090
Ser N456P/8U158090
21 March 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 the proposed at-sea training activities in the established Jacksonville (JAX) 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 JAX Range Complex. In addition, JAX Range Complex capabilities will be upgraded or modernized to enhance and sustain Navy training and testing. The proposed action will involve explosive operations. There will be no sonar use. Navy explosive detonations conducted during mine warfare, surface warfare, and strike 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. Note, enclosure (1) contains a remnant restricted distribution statement in the footer that has been removed in the electronic version.

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 W. David Noble at (757) 836-6938 or email william.d.noble@navy.mil.

Sincerely,

M. S. REISMEIER
CDR, JAGC, U.S. Navy
Acting Deputy Director
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 Jacksonville Range Complex (March 2008) delivered via FedEx under separate cover on 17 Mar 08.

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

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)

DEPARTMENT OF THE NAVY
COMMANDER
U.S. FLEET FORCES COMMAND
1562 MITSCHER AVENUE SUITE 250
NORFOLK, VA 23551-2487

5090
Ser N70/1906
September 12, 2007

South Carolina State Historic Preservation Office
Review and Compliance Coordinator
Archives & History Center
8301 Parklane Road
Columbia, SC 29223

Attention: Rebekah Dobrasko

Dear Ms. Dobrasko:

The Department of the Navy is preparing an Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) for Navy Atlantic Fleet training, Research, Development, Testing, and Evaluation (RDT&E) activities, and associated range capabilities enhancements (including infrastructure improvements) in the Jacksonville (JAX) Range Complex in accordance with the National Environmental Policy Act and Executive Order 12114. The purpose of this letter is to request comments from your agency, which may have an interest or duty to provide input on this project proposed by the Navy. In accordance with the National Environmental Policy Act (NEPA), this letter will serve as a preliminary inquiry as to any potential adverse impacts on environmental, cultural, or economic resources as result of the proposed project.

The Navy's primary mission is to maintain, train, equip, and operate combat-ready naval forces capable of winning wars, deterring aggression, and maintaining freedom of the seas. Training with the complex operating and weapons systems of submarines, surface ships, and aircraft in realistic combat conditions, employing potential threat scenarios is key to maintaining Fleet combat readiness and survival in actual wartime conditions. The Navy will analyze current and emerging training and RDT&E operations, expanded warfare missions, and modernization of existing range capabilities to enhance and sustain Navy training and testing in the JAX Range Complex.

Specifically, the Navy will review and assess current and future proposed Navy training and RDT&E operations within Navy-controlled operational areas, airspace, and ranges, and implementation of Navy-funded range capabilities enhancements such as: modernization of the current electronic aircraft warfare

5090
Ser N77/1904
September 12, 2007

missions; increase in small aircraft flights during training that simulate enemy aircraft; conduct of anti-terrorism surface strike group training; increasing unmanned aerial vehicle operations; and supporting organic mine countermeasures training using a temporary minefield training area. The EIS/OEIS will address potential environmental effects to the physical, biological, and socio-economic resources within the JAX Range Complex.

Details of JAX Range Complex requirements and additional information about the EIS/OEIS including background information on the proposed action, alternatives, environmental considerations, and public participation are provided in the attachment. You may submit written comments to: Naval Facilities Engineering Command, Atlantic, 6506 Hampton Blvd., Norfolk, VA 23508-1278, Attention: JAX Range Complex PM Code EV22CJM, facsimile (757) 322-4894.

Sincerely,

J. M. Hinson

J. M. HINSON
CAPT, USN
Director, Fleet Training

Enclosure: 1. Project Scoping Information

DEPARTMENT OF THE NAVY
COMMANDER
U.S. FLEET FORCES COMMAND
1562 MITSCHER AVENUE SUITE 250
NORFOLK, VA 23551-2487

5090
Ser N70/1905
September 12, 2007

Environmental Review Coordinator
Historic Preservation Division
Department of Natural Resources
34 Peachtree Street, NW
Suite 1600
Atlanta, GA 30303

Attention: Betsy Shirk

Dear Ms Shirk:

The Department of the Navy is preparing an Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) for Navy Atlantic Fleet training, Research, Development, Testing, and Evaluation (RDT&E) activities, and associated range capabilities enhancements (including infrastructure improvements) in the Jacksonville (JAX) Range Complex in accordance with the National Environmental Policy Act and Executive Order 12114. The purpose of this letter is to request comments from your agency, which may have an interest or duty to provide input on this project proposed by the Navy. In accordance with the National Environmental Policy Act (NEPA), this letter will serve as a preliminary inquiry as to any potential adverse impacts on environmental, cultural, or economic resources as result of the proposed project.

The Navy's primary mission is to maintain, train, equip, and operate combat-ready naval forces capable of winning wars, deterring aggression, and maintaining freedom of the seas. Training with the complex operating and weapons systems of submarines, surface ships, and aircraft in realistic combat conditions, employing potential threat scenarios is key to maintaining Fleet combat readiness and survival in actual wartime conditions. The Navy will analyze current and emerging training and RDT&E operations, expanded warfare missions, and modernization of existing range capabilities to enhance and sustain Navy training and testing in the JAX Range Complex.

Specifically, the Navy will review and assess current and future proposed Navy training and RDT&E operations within Navy-controlled operational areas, airspace, and ranges, and implementation of Navy-funded range capabilities enhancements such as: modernization of the current electronic aircraft warfare

missions; increase in small aircraft flights during training that simulate enemy aircraft; conduct of anti-terrorism surface strike group training; increasing unmanned aerial vehicle operations; and supporting organic mine countermeasures training using a temporary minefield training area. The EIS/OEIS will address potential environmental effects to the physical, biological, and socio-economic resources within the JAX Range Complex.

Details of JAX Range Complex requirements and additional information about the EIS/OEIS including background information on the proposed action, alternatives, environmental considerations, and public participation are provided in the attachment. You may submit written comments to: Naval Facilities Engineering Command, Atlantic, 6506 Hampton Blvd., Norfolk, VA 23508-1278, Attention: JAX Range Complex PM Code EV22CJM, facsimile (757) 322-4894.

Sincerely,

J. M. HINSON
CAPT, USN
Director, Fleet Training

Enclosure: 1. Project Scoping Information

DEPARTMENT OF THE NAVY
COMMANDER
U.S. FLEET FORCES COMMAND
1562 MITSCHER AVENUE SUITE 250
NORFOLK, VA 23551-2487

5090
Ser N70/1904
September 12, 2007

State Historic Preservation Officer
Review and Compliance Section
R. A. Gray Building, 4th Floor
500 South Bronough Street
Tallahassee, Florida 32399-0250

Attention: Frederick P. Gaske

Dear Mr. Gaske:

The Department of the Navy is preparing an Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) for Navy Atlantic Fleet training, Research, Development, Testing, and Evaluation (RDT&E) activities, and associated range capabilities enhancements (including infrastructure improvements) in the Jacksonville (JAX) Range Complex in accordance with the National Environmental Policy Act and Executive Order 12114. The purpose of this letter is to request comments from your agency, which may have an interest or duty to provide input on this project proposed by the Navy. In accordance with the National Environmental Policy Act (NEPA), this letter will serve as a preliminary inquiry as to any potential adverse impacts on environmental, cultural, or economic resources as result of the proposed project.

The Navy's primary mission is to maintain, train, equip, and operate combat-ready naval forces capable of winning wars, deterring aggression, and maintaining freedom of the seas. Training with the complex operating and weapons systems of submarines, surface ships, and aircraft in realistic combat conditions, employing potential threat scenarios is key to maintaining Fleet combat readiness and survival in actual wartime conditions. The Navy will analyze current and emerging training and RDT&E operations, expanded warfare missions, and modernization of existing range capabilities to enhance and sustain Navy training and testing in the JAX Range Complex.

Specifically, the Navy will review and assess current and future proposed Navy training and RDT&E operations within Navy-controlled operational areas, airspace, and ranges, and implementation of Navy-funded range capabilities enhancements such as: modernization of the current electronic aircraft warfare

missions; increase in small aircraft flights during training that simulate enemy aircraft; conduct of anti-terrorism surface strike group training; increasing unmanned aerial vehicle operations; and supporting organic mine countermeasures training using a temporary minefield training area. The EIS/OEIS will address potential environmental effects to the physical, biological, and socio-economic resources within the JAX Range Complex.

Details of JAX Range Complex requirements and additional information about the EIS/OEIS including background information on the proposed action, alternatives, environmental considerations, and public participation are provided in the attachment. You may submit written comments to: Naval Facilities Engineering Command, Atlantic, 6506 Hampton Blvd., Norfolk, VA 23508-1278, Attention: JAX Range Complex PM Code EV22CJM, facsimile (757) 322-4894.

Sincerely,

J. M. Hinson

J. M. HINSON
CAPT, USN
Director, Fleet Training

Enclosure: 1. Project Scoping Information

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
EV22KAP:lfm
February 9, 2009

Mr. Fredrick Gaske
Director
Office of Historical and Cultural Programs
500 S. Bronough St.
Tallahassee, Florida 32399-0250

Subj: SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT (NHPA), DETERMINATION OF "NO HISTORIC PROPERTIES AFFECTED" FOR THE VIRGINIA CAPES RANGE COMPLEX TRAINING OPERATIONS

Dear Mr. Gaske:

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 Jacksonville Range Complex. The western boundary of the Jacksonville Operating Area is 3 nautical miles offshore. All proposed training operations will occur within the boundaries of the Jacksonville Operating Area with the exception of flare and mine laying exercises, which will occur within the Lake George Range Training Area.

The EIS/OEIS identifies three areas within the Jacksonville Range Complex where proposed training operations have the potential to impact submerged cultural resources. These areas are the Underwater Detonation Areas North and South, which are located off the coast of South Carolina, and the Lake George Range Training Area, which is located in north central Florida. The EIS/OEIS provides a detailed description of the training operations proposed for these areas and an assessment of the impacts to Cultural Resources (see Attachments A and B).

To further identify any cultural resources that might be within each area, the Southeastern Archaeological Research, Inc. conducted a literature review and applied a predictive model for submerged cultural resources. Review of available databases identified one shipwreck within Lake George, but it is likely located north of the Training Area and will not be affected by training exercises. Application of the predictive model indicates the Lake George Range Training Area has a low potential to contain submerged cultural resources. A copy of the 2009 technical memorandum describing the results of the literature search and predictive model are enclosed for your review as Attachment C.

One other activity that will potentially occur within the jurisdictional waters of Florida is precision anchoring. Navy vessels will drop anchor as close as possible to the two designated anchorage areas, which are approximately 3 nautical miles offshore of Naval Station Mayport.

5090
EV22KAP:lfm
February 9, 2009

Based on the results of the enclosed technical memorandum and the EIS/OEIS, the Navy has made the determination of no historic properties affected by the proposed operation of training activities within the jurisdictional waters of Florida. 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 Kelly Proctor at (757) 322-4686 or Bruce Larson at (757) 322-4885.

Sincerely,

Charles W. Walker

C. W. WALKER, P.E.
Head, Environmental Planning Branch
Environmental Business Line

Attachment:
A) Chapter 2 - Description of Proposed Action and Alternatives
B) Chapter 3.13 - Cultural Resources
C) Technical Memorandum

Copy to:
FFC (N77)
NAVFAC Southeast (EV)

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

IN REPLY REFER TO:
5090
EV22KAP:lfm
February 9, 2009

Ms. Elizabeth Johnson
Deputy State Historic Preservation Officer
State Historic Preservation Office
South Carolina Department of Archives and History
8301 Parklane Road
Columbia, SC 29223

Subj: SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT (NHPA), DETERMINATION OF "NO HISTORIC PROPERTIES AFFECTED" FOR THE JACKSONVILLE RANGE COMPLEX TRAINING OPERATIONS

Dear Ms. Johnson:

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 Jacksonville Range Complex. The western boundary of the Jacksonville Range Complex is 3 nautical miles offshore. Proposed training operations will not occur within state jurisdictional waters.

For your review, the following attachments are enclosed: Chapter 2 of the EIS/OEIS "Description of Proposed Action and Alternatives" and Chapter 3, Section 3.13 "Cultural Resources." Chapter 2 provides a description of the proposed training operations and their associated locations. Section 3.13 provides an assessment of the impacts to cultural resources as a result of the proposed training operations in the Jacksonville Operating Areas.

The EIS/OEIS identifies three areas within the Jacksonville Range Complex where proposed training operations have the potential to impact submerged cultural resources. These areas (Undet North, Undet South and the Lake George Range) are not located in South Carolina state waters.

The Navy has made the determination of no historic properties affected by the proposed operation of training activities within the jurisdictional waters of South Carolina. We request that within 30 days you provide your views and comments on our finding of no historic

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February 9, 2009

properties affected. If you have any questions, please contact Kelly Proctor at (757) 322-4686 or Bruce Larson at (757) 322-4885.

Sincerely,

Charles W. Walker

C. W. WALKER, P.E.
Head, Environmental Planning Branch
Environmental Business Line

Attachments:
(A) Chapter 2 - Description of Proposed Action and Alternatives
(B) Chapter 3.13 – Cultural Resources

Copy to:
FFC (N77)
NAVFAC Southeast (EV)

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701-5505
(727) 824-5317; FAX (727) 824-5300
http://sero.nmfs.noaa.gov/

February 17, 2009 F/SER47:KD/pw

David T. MacDuffee
U.S. Fleet Forces Command
1562 Mitscher Ave., Ste. 250, N774H
Norfolk, VA 23551-2487

Dear Mr. MacDuffee:

NOAA's National Marine Fisheries Service (NMFS) reviewed the draft Final Environmental Impact Statement/Overseas Environmental Impact Statement (FEIS/OEIS), dated December 2008, for the Jacksonville (JAX) Range Complex. The Department of the Navy is preparing the FEIS/OEIS to assess potential impacts over a 10-year period from various activities collectively designed to maintain fleet readiness by modernizing range capabilities and by expanding warfare missions supported at the JAX Range Complex. As indicated below, the NMFS Southeast Region, Habitat Conservation Division (NMFS HCD) is concerned about impacts the activities would likely have on deepwater coral and other habitats that are spawning and nursery areas for federally managed fishery species. We conclude the letter with recommendations to minimize and manage those impacts in an adaptive framework that would allow the proposed activities to commence while responding to new information about the distribution of coral and live/hardbottom habitat when that information becomes available.

NMFS is a cooperating agency for development of the FEIS/OEIS, and the NMFS Office of Protected Resources provided comments pertaining to the Endangered Species Act and Marine Mammal Protection Act under separate correspondence. As the nation's federal trustee for the conservation and management of marine, estuarine, and anadromous fishery resources, the following comments and recommendations are provided by NMFS HCD pursuant to authorities of the Fish and Wildlife Coordination Act and the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

Consultation History
NMFS HCD reviewed the Draft Environmental Impact Statement/Overseas Environmental Impact Statement (DEIS/OEIS), dated June 2008, and our comments on the DEIS/OEIS were forwarded to the Navy by the NMFS Office of Protected Resources. In the Essential Fish Habitat (EFH) Assessment included in the DEIS/OEIS, the Navy concluded "[additional] EFH consultation with NMFS is not required" because "implementation of the No Action Alternative, Alternative 1, or Alternative 2 would not result in unavoidable significant adverse effects to fish

populations, managed species, or essential fish habitat." Based on the information available in the EFH Assessment within the DEIS/OEIS, NMFS HCD determined this conclusion was premature because the Navy had not thoroughly considered the pending designation by the South Atlantic Fishery Management Council (SAFMC) of special management areas that would lie within the JAX Range Complex and because there were insufficient discussions of how the proposed activities could affect deepwater coral. We concluded our DEIS review by requesting the Navy contact NMFS HCD as soon as practicable to resolve these issues before the FEIS/OEIS was released.

Project Description

The JAX Range Complex includes the Jacksonville and Charleston Operating Areas (OPAREAs) and the Lake George and Rodman Ranges located within the upper portion of the St. Johns River Basin. Most of the Jacksonville and Charleston OPAREAs lie over the continental shelf (6,560 to 13,120 feet water depth) and Blake Plateau (2,100 to 3,300 feet water depth). The proposed action would increase or modify training, research, and testing operations from current levels as necessary to support the Fleet Response Training Plan. Baseline training operations typically conducted on the JAX Range Complex include: Mine Warfare (MIW) - Mine Laying, Mine Countermeasures, and Mine Neutralization; Surface Warfare - Missile Exercise (MISSILEX), Gunnery Exercise (GUNEX) (Air-to-Surface), GUNEX (Surface-to-Surface), Bombing Exercise (BOMBEX) (Air-to-Surface), and Laser Targeting; Air Warfare- Air Combat Maneuvers (ACM), Air Intercept Control, ACM Chaff Exercise, ACM Flare Exercise, MISSILEX (Air-to-Air), GUNEX (Surface-to-Air), and Detect to Engage; Strike Warfare- Firing Exercise, BOMBEX (Air-to-Ground), and Combat Search and Rescue and Convoy Operations; Electronic Combat- Electronic Combat Operations, Chaff Exercise, and Flare Exercise (Aircraft Self-Defense); and Other Training- Shipboard Electronic Systems Evaluation Facility Utilization. The activities described in the draft FEIS/OEIS include: vessel movements, aircraft overflights, towed mine warfare devices, temporary mineshape deployment/recovery, non-explosive practice munitions, underwater detonations and high explosive ordnance, and abandonment of expended material.

Essential Fish Habitat within the JAX Range Complex

The SAFMC has designated several habitats within the JAX Range Complex as EFH, including benthic substrate (e.g., sand, mud bottoms, shell/hash), live/hardbottom (e.g., approximately 679 artificial/manmade reefs, coral and coral reefs), pelagic *Sargassum*, and the Gulf Stream Current. The description of EFH provided within the draft FEIS/OEIS is adequate except that it should include tidal freshwater wetlands within the Lake George Range as EFH for white shrimp (*Litopenaeus setiferus*).

The SAFMC also has designated coral and live/hardbottom within the Charleston Bump and Gray's Reef National Marine Sanctuary as EFH-Habitat Areas of Particular Concern (HAPC) for coral and coral reefs; EFH-HAPCs are subsets of EFH that are either rare, particularly susceptible to human-induced degradation, especially important ecologically, or located in an environmentally stressed area. The Gray's Reef National Marine Sanctuary, which lies off Georgia, is a National Marine Sanctuary because of the exceptional live cover and associated organisms. Lastly, the SAFMC has designated offshore hardbottom where spawning normally occurs as EFH-HAPC for species within the snapper/grouper complex. The SAFMC recently

designated eight Marine Protected Areas (MPAs) that meet this requirement, and five of these areas occur in the JAX Range Complex[1]. Schobernd and Sedberry (2009) show additional hardbottom areas near the MPAs meet the requirement for EFH-HAPCs under the fishery management plan for the snapper/grouper complex.

In addition to the above designations that afford protection under the EFH provisions of the Magnuson-Stevens Act, the SAFMC has identified additional areas within the JAX Range Complex as warranting special protection. Based on research that shows the importance and rarity of deepwater coral habitats in the South Atlantic, SAFMC proposes designating deepwater coral areas off the coasts of North Carolina, South Carolina, Georgia, and Florida, as a coral-HAPC, which is similar to an EFH-HAPC designation and would provide this area with a heightened focus for protection by SAFMC when setting restrictions on fishing and developing formal policy statements regarding habitat impacts. Final designation of the coral-HAPCs by SAFMC is expected to occur by June. Oculina Bank is the existing coral-HAPC, and its northern edge is located about 10 miles south of the JAX Range Complex.

Reed et al. (2006) characterize deepwater coral habitats within and adjacent to the Jacksonville and Charleston OPAREAs as the Stetson *Lophelia* reefs, Savannah *Lophelia* reefs, and East Florida *Lophelia* reefs. The Stetson *Lophelia* reefs are an extensive region of *Lophelia* bioherms and lithoherms along the eastern Blake Plateau off South Carolina (822 m water depth) and include a 152-meter tall pinnacle with thickets of *Lophelia*. The Savannah *Lophelia* reefs are an extensive region of lithoherms along the western Blake Plateau off Georgia (depth 550 m) with reliefs of up to 60 meters and capped with *Lophelia*. The east Florida *Lophelia* reefs occur along a 222-km stretch off eastern Florida (depth 700-800 m) and appear to be *Lophelia* bioherms and lithoherms 5 to 152 meters tall. Deepwater corals are fragile and susceptible to physical destruction (Fossa et al. 2002), and these reefs may be hundreds to thousands of years old (Neuman et al. 1977).

In summary, the portion of the draft FEIS/OEIS (beginning on page 3-125) that discusses HAPCs should be updated. Two of the recently designated MPAs lie within the Jacksonville OPAREA (North Florida and Georgia) and three MPAs lie within the Charleston OPAREA (Charleston Deep Reef, Edisto, Northern South Carolina). The draft FEIS/OEIS states that four (rather than five) MPAs are located within the JAX Range (the Northern South Carolina MPA is omitted), and the draft FEIS/OEIS does not refer to these areas as EFH-HAPCs. The draft FEIS/OEIS also does not adequately discuss the coral-HAPCs; specifically, there is no discussion of the large area within the JAX Range Complex that is about to be designated as a coral-HAPC and the measures the Navy will take to minimize impacts within this special management area.

Impacts to Essential Fish Habitat

Cumulatively, the Navy estimates the activities proposed for the JAX Range Complex could impact 2.65 acres of coral and live/hardbottom habitat. The Navy views the impacts to coral and live/hardbottom habitat as not being significant because it is a small percentage of the hardbottom known to occur in the JAX Range Complex. The NMFS HCD is concerned that the

[1] The final designation was published in the Federal Register: January 13, 2009 (Volume 74, Number 8); Rules and Regulations, Page 1621-1631

impacts to live/hardbottom or deepwater corals may be more severe than predicted. The expended materials could pose a threat to the marine environment by breaking or damaging fragile deepwater corals that require decades or centuries to grow into formations. These formations provide spawning and nursery habitat for federally managed fisheries. In view of the importance of this habitat type, we recommend that all activities within the Jacksonville and Charleston OPAREAs that would result in the incidental or purposeful placement on the sea bottom of spent munitions be conducted a minimum of one kilometer away from known coral and live/hardbottom formations. A one-kilometer buffer is necessary because the extent that expended materials may drift before settling onto the bottom is unknown. In addition, because the OPAREAs have not been thoroughly mapped for corals, an adaptive management program is needed to characterize the deepwater habitat in the OPAREAs so that priority areas can be indentified and avoided during future training exercises.

NMFS HCD does not agree that expended materials would provide additional hardbottom habitat for attachment of coral and other hardbottom species. Rather, NOAA considers such materials to be marine debris, which is defined as any persistent, manufactured, or processed solid material that is directly or indirectly, intentionally or unintentionally, disposed of or abandoned into the marine environment (NOAA 2008). Marine debris includes a wide variety of objects (i.e., derelict fishing gear, lost vessel cargo, plastics) that pose a threat to the marine environment, human health, and/or navigation. Marine debris can damage habitats in a variety of ways, including a reduction in the structural complexity of habitats. In addition, marine debris can cause tissue abrasion and mortality of sessile invertebrates (Chiappone et al. 2002). The expended materials are not only a threat to EFH as they hit bottom, potentially damaging deepwater coral that may be centuries old, but the materials also would persistently degrade fishery habitat.

EFH Conservation Recommendations

NMFS HCD staff corresponded with the Navy via email and phone beginning on September 19, 2008. These discussions led to maps that overlay the JAX Range Complex, designated and proposed HAPCs, and designated MPAs. Recognizing that deepwater corals exist throughout much of the JAX Range Complex, NMFS HCD proposed to the Navy that NMFS would identify the higher priority reefs so the Navy could avoid those areas. Initially, the Navy responded favorably to this proposal, and NMFS HCD approached the SAFMC's Coral Advisory Panel to prioritize locations. The Panel indicated this approach was not practicable given that large areas of the seabottom within the JAX Range Complex have not been adequately surveyed; however, since the Navy would develop portions of this information while operating in the JAX Range Complex, adoption of an adaptive management approach seemed possible, and NMFS HCD relayed the revised proposal to the Navy. While the draft FEIS/OEIS includes the new maps clarifying the overlaps of the JAX Range Complex, HAPCs, and MPAs, no mitigation is proposed for impacts to deepwater corals and no adaptive management approach for mitigating impacts to corals is included. Therefore, NMFS concludes the proposed project would have an adverse impact on EFH. Section 305(b)(4)(A) of the Magnuson-Stevens Act requires NMFS to provide EFH conservation recommendations when an activity is expected to adversely impact EFH. Based on this requirement, NMFS provides the following:

EFH Conservation Recommendation

Bottom-disturbing activities within the JAX Range Complex shall avoid all areas within one kilometer of known coral formations and live/hardbottoms. NMFS would re-evaluate this recommendation if the Navy developed a plan for minimizing impacts to coral formations and live/hardbottoms over the 10-year period and implemented compensatory mitigation for any unavoidable impacts that occur to coral or live/hardbottoms. The mitigation could include mapping deepwater habitats within parts of the JAX Range Complex that would not otherwise be mapped as part of the Undersea Warfare Training Range or similar actions currently undergoing separate NEPA reviews. NMFS offers to assist the Navy in developing these plans.

Section 305(b)(4)(B) of the Magnuson-Stevens Act and its implementing regulation at 50 CFR Section 600.920(k) requires the Navy to provide a written response to this letter within 30 days of its receipt. If it is not possible to provide a substantive response within 30 days, an interim response should be provided to NMFS. A detailed response then must be provided prior to final approval of the action. The Navy's detailed response must include a description of measures proposed by your agency to avoid, mitigate, or offset the adverse impacts of the activity. If the Navy's response is inconsistent with our EFH Conservation Recommendation, the Navy must provide a substantive discussion explaining the reasons for not following the recommendation.

We appreciate the opportunity to provide these comments. Please direct related questions or comments to the attention of Ms. Kay Davy at our Charleston Area Office or Ms. Jocelyn Karazsia at our West Palm Beach Area Office. Kay may be reached at (843) 953-7202 or by e-mail at Kay.Davy@noaa.gov and Jocelyn may be reached at (561) 616-8880 extension 207 or by e-mail at Jocelyn.Karazsia@noaa.gov.

Sincerely,

Miles M. Croom

Miles M. Croom
Assistant Regional Administrator
Habitat Conservation Division

Literature Cited

Chiappone M., A., White, D. W. Swanson, and S. L. Miller. 2002. Occurrence and biological impacts of fishing gear and other marine debris in the Florida Keys. *Marine Pollution Bulletin* 44:597-604.

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cc:

SAFMC, Roger.Pugliese@safmc.net, Myra.Brouwer@safmc.net
NOAA PPI, Steve.Kokinakis@noaa.gov
N/NMS, David.Bizot@noaa.gov
F/PR, Jolie.Harrison@noaa.gov
F/SER, nmfs.ser.eis@noaa.gov
F/SER3, David.Bernhart@noaa.gov
F/SER4, David.Dale@noaa.gov
F/SER47, Jocelyn.Karazsia@noaa.gov, Kay.Davy@noaa.gov

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

4055 FABER PLACE DRIVE, SUITE 201
NORTH CHARLESTON, SOUTH CAROLINA 29409
TEL 843/571-4366 FAX 843/769-4520
Toll Free: 1-866-SAFMC-10
Email: safmc@safmc.net Web site: www.safmc.net

Duane Harris, Chairman
David M. Cupka, Vice-Chairman

Robert K. Mahood, Executive Director
Gregg T. Waugh, Deputy Executive Director

February 23, 2009

David T. MacDuffee
U.S. Fleet Forces Command
1562 Mitscher Ave., Ste. 250, N774H
Norfolk, VA 23551-2487

Dear Mr. MacDuffee:

The South Atlantic Fishery Management Council (SAFMC) offers the following comments on draft Environmental Impact Statement/Overseas Environmental Impact Statement (DEIS/OEIS), dated June 2008, for the proposed Jacksonville (JAX) Range Complex.

We understand the Department of the Navy prepared the draft FEIS/OEIS to assess potential impacts over a 10-year period from various activities collectively designed to maintain fleet readiness by modernizing range capabilities and by expanding the warfare missions supported at the proposed JAX Range Complex. The SAFMC supports and reiterates the Essential Fish Habitat (EFH) recommendations developed by the National Marine Fisheries Service Habitat Conservation Division (NMFS HCD) included at the end of this correspondence.

In accordance with the Magnuson-Stevens Act, the SAFMC has designated a number of habitats within the proposed JAX Range Complex as Essential Fish Habitat (EFH) for federally-managed species: including benthic substrate (e.g., sand, mud bottoms, shell/hash); live/hardbottom and coral and coral reefs; pelagic *Sargassum*; and the Gulf Stream current. In addition to EFH, the SAFMC has designated EFH-Habitat Areas of Particular Concern (EFH-HAPCs) for several managed species in the region. These areas are either rare; particularly susceptible to human-induced degradation; especially important ecologically; or located in an environmentally stressed area. This includes the Charleston Bump and Gray's Reef National Marine Sanctuary for coral and coral reefs; and for species in the snapper grouper complex, Council-designated Special Management Zones and offshore hardbottom where spawning normally occurs.

The SAFMC is concerned that activities in the area may also impact the Marine Protected Areas (MPAs), developed by the SAFMC to aid in rebuilding deepwater snapper grouper species. Five of the approved areas lie in the JAX Range Complex. Implementation of the MPAs through Amendment 14 to the Council's Snapper Grouper Fishery Management Plan protects a portion of the long-lived, deepwater snapper grouper species including snowy grouper, misty grouper, speckled hind, yellowedge grouper, warsaw grouper, golden tilefish, and blueline tilefish and

their habitat from directed fishing pressure. The designation of the eight areas in the South Atlantic as MPAs was effective on February 12, 2009.

The SAFMC is also concerned over the possible impact JAX Range Complex activities may have on deepwater coral ecosystems. The Council, over the last five years, developed an amendment to our Coral Fishery Management Plan to create five new deepwater Coral-HAPCs to protect what is thought to be the largest continuous distribution of pristine deepwater coral ecosystems in the world. The SAFMC is scheduled to approve the Coral-HAPCs for submission to the Secretary of Commerce by June 2009 with final implementation by winter 2009.

In conclusion, the SAFMC is opposed to increasing the amount of marine debris including the disposal of expended materials and supports NMFS's conclusion that the proposed project would have a substantial adverse impact on EFH and reiterates the agency's EFH Conservation Recommendations that: 1) bottom disturbing activities within the proposed JAX Range Complex shall avoid all areas within one kilometer of known and suspected coral formations and live/hardbottom; and, 2) that the Navy develop a plan for minimizing impacts to coral formations and live/hardbottom over a 10-year period and implement compensatory mitigation for any unavoidable impacts that occur to coral or live/hardbottom habitat. The mitigation could include mapping shelf, shelf-edge and deepwater habitats within parts of the proposed JAX Range Complex that would not otherwise be mapped as part of the Undersea Warfare Training Range or similar actions currently undergoing separate NEPA reviews.

Thank you for the opportunity to provide comments. Please direct questions or comments to Roger Pugliese or Myra Brouwer at the SAFMC office, (843) 571-4366.

Sincerely,

Duane Harris
Chairman

cc: (via electronic mail)
Council Members and Staff
Habitat Advisory Panel
Coral Advisory Panel
Pace Wilber, Kay Davy, and Jocelyn Karazsia, NMFS HCD
Phil Steele and Jack McGovern, NMFS SERO
Monica Smit-Brunello, NOAA GC
Bonnie Ponwith and Tom Jamir, NMFS SEFSC

DEPARTMENT OF THE NAVY
COMMANDER
U.S. FLEET FORCES COMMAND
1562 MITSCHER AVENUE SUITE 250
NORFOLK, VA 23551-2487

5090
Ser N4/7/82
March 06, 2009

Mr. Miles M. Croom
National Marine Fisheries Service
Southeast Regional Office
263 13th Avenue, South
St. Petersburg, FL 33701-5505

Dear Mr. Croom:

Thank you for National Marine Fisheries Services' (NMFS) review of U.S. Fleet Forces (USFF) preliminary Final Environmental Impact Statement (FEIS)/Overseas (OEIS), dated December 2008, for the Jacksonville (JAX) Range Complex. USFF received your letter containing essential fish habitat (EFH) conservation recommendations pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (MSA) on February 18, 2009. This letter serves as USFF's required 30-day written response to NMFS and the South Atlantic Fishery Management Council (SAFMC) pursuant to 16 United States Code (U.S.C.) 1855(b)(4)(B). The following responds specifically to the NMFS comments and conservation recommendations.

Description of Essential Fish Habitat within the Preliminary FEIS/OEIS. While NMFS confirmed the accuracy of USFF's description of EFH, NMFS also highlighted concern with several aspects of the preliminary FEIS/OEIS' description of EFH, including white shrimp EFH description, existing Habitat Areas of Particular Concern (HAPC), snapper/grouper marine protected areas (MPA), and proposed coral-HAPCs. NMFS noted that tidal freshwater wetlands around Lake George are considered EFH for white shrimp and USFF will add this description in the FEIS/OEIS. However, the addition of white shrimp EFH will not result in a change to USFF's determination of no adverse effect on EFH. The Lake George Range is located entirely within the internal waters of Lake George, with a buffer zone (0.6 to 4.7 miles) between the shoreline and the range (Figure 3.11-3 of the preliminary FEIS/OEIS). Since training and associated impacts occur within the boundaries of the range, wetlands and other shoreline habitats will not be adversely affected.

USFF agrees that coral and live/hardbottom within the Charleston Bump and Gray's Reef National Marine Sanctuary has been designated as HAPC for coral and coral reefs. These areas were included within Table 3.9-4 of the preliminary FEIS/OEIS which lists all of the HAPCs

designated for each management unit. USFF will also add the Charleston Bump HAPC to Figure 3.6-3 of the FEIS/OEIS.

All of the recently designated snapper/grouper MPAs were identified in Figure 3.6-3 of the preliminary FEIS/OEIS and discussed within the HAPC section (Section 3.9.2.4); however, as noted by NMFS, the text only mentions four of the five MPAs, with the exclusion of the Northern South Carolina MPA. While the MPAs were not specifically listed as HAPCs, USFF agrees that habitats within the MPAs that fall within the snapper grouper HAPC designation are HAPCs (e.g., medium to high profile offshore hardbottoms where spawning normally occurs, localities of known or likely periodic spawning aggregations). The preliminary FEIS/OEIS will be updated accordingly.

The coral-HAPCs proposed by the SAFMC are discussed within Section 3.9.2.4 of the preliminary FEIS/OEIS and are depicted in Figure 3.6-3. While the proposed coral-HAPCs have not been approved by the Council or the Secretary of Commerce and, as such, have not been formally designated, USFF did evaluate potential impacts from bottom-disturbing activities on deepwater coral and live/hardbottom habitats (*see* Section 3.9.3). USFF determined that some live hardbottom habitats, such as deepwater corals, would be damaged if they were struck by large objects. To assess the magnitude of this potential impact, USFF calculated the benthic impact footprint of bottom disturbing activities, including expended materials large enough to disturb the seafloor (i.e., non-explosive practice bombs/missiles and large caliber Naval gun shells) and the use of underwater detonations. Under the preferred alternative, the maximum area of benthic habitat affected by bottom-disturbing activities would be approximately 10,157 square feet, or 0.23 acres per year (2.33 acres over a 10-year period). According to data obtained from the SAFMC, the JAX Range Complex contains approximately 16,055,178 acres of live/hardbottom EFH. Over the 10-year planning period, the footprint represents less than 0.000001% of the total live/hardbottom EFH in the JAX Range Complex and, more importantly, it is unlikely that all expended materials would settle in areas of live/hardbottom, further reducing the footprint.

After carefully evaluating activities that may potentially disturb the seafloor, USFF concluded there would not be an adverse effect on EFH because the potential impacts were either minimal or temporary in nature. USFF used the "minimal/temporary" criteria to identify training activities falling within the EFH adverse effect definition. Any impacts that were either minimal or temporary did not reach the level of adverse effect. 50 Code of Federal Regulations

600.815(a)(2)(ii) and the EFH Final Rule[1] were used as guidance for this determination. Temporary effects are those that are limited in duration and allow the particular environment to recover without measurable impact (*see* 67 Fed. Reg. 2354). Minimal effects are those that may result in relatively small changes in the affected environment and insignificant changes in ecological functions (*see id.*). Based on USFF's assessment of bottom-disturbing activities in the JAX Range Complex, including their locations and estimated seafloor footprint, USFF continues to conclude that impacts on EFH are either minimal or temporary and based on the best available data, would only result in inconsequential changes to habitat.

NMFS EFH Conservation Recommendations. NMFS provided the following EFH conservation recommendation:

> Bottom-disturbing activities within the JAX Range Complex shall avoid all areas within one kilometer of known coral formations and live/hardbottoms. NMFS would re-evaluate this recommendation if the U.S. Navy developed a plan for minimizing impacts to coral formations and live/hardbottoms over the 10-year period, and implemented compensatory mitigation for any unavoidable impacts that occur to coral or live/hardbottoms. The mitigation could include mapping deepwater habitats within parts of the JAX Range Complex that would not otherwise be mapped as part of the Undersea Warfare Training Range, or similar actions currently undergoing separate National Environmental Policy Act reviews.

The enclosed map identifies the avoidance area recommended by NMFS (light green). The avoidance area includes 26,168 square nautical miles, or 52%, of the JAX Range Complex sea space. Clearly, avoiding over half of the Range Complex would result in significant limitations to USFF training and the U.S. Navy's ability to comply with 10 U.S.C. 5062, which requires the U.S. Navy to be organized, trained, and equipped primarily for prompt and sustained combat incident to operations at sea. Due to this significant restriction on training, USFF concludes that NMFS' conservation recommendation to avoid known coral formations and live/hardbottom by one kilometer is not practicable from a legal and military readiness perspective.

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[1] The EFH Final Rule highlights activities with impacts that are more than minimal and not temporary in nature, as opposed to those activities resulting in inconsequential changes to habitat (*see* 67 Fed. Reg. 2354).

Furthermore, NMFS' letter noted the SAFMC's conclusion that avoiding specific, high priority reefs within the JAX Range Complex would not be practicable given that large areas of the seafloor within the Range Complex have not been adequately surveyed (*see* NMFS letter at page 4).

As explained in the EFH Final Rule, "NMFS acknowledges that Federal agencies may disagree with EFH Conservation Recommendations for reasons that involve economic costs, public safety considerations, or other factors unrelated to the scientific merit of the recommendations, and the rule does not require a scientific justification in such cases" (67 Fed. Reg. 2368). Based on USFF's assessment of impact to training and the SAFMC's conclusion that the seafloor has not been adequately surveyed, USFF concludes that the NMFS recommendations are not scientifically defensible or practicable from a training, legal, or economic perspective.

NMFS also recommended minimizing impacts and compensatory mitigation for unavoidable impacts. USFF has incorporated numerous measures in the preliminary FEIS/OEIS (Ch. 5) that avoid and minimize impacts from training at-sea in the JAX Range Complex, including, among others: 1) eliminating the use of live bombs at sea; 2) prohibiting the use of explosive rounds during firing exercise events during North Atlantic right whale calving season; 3) restricting gunnery exercises to locations offshore and away from marine species migration routes; 4) prohibiting the use of underwater explosive charges within 1,000 ft of known live/hardbottom, artificial reefs, and shipwrecks; and 5) measures to prevent debris or ordnance from striking or falling on marine mammals, sea turtles, *Sargassum* rafts, or coral reefs (i.e., known reefs in nearshore waters). USFF disagrees that compensatory mitigation is necessary given the conclusion that no more than minimal or temporary impacts are expected.

USFF concurs with NMFS that certain high-value habitats, such as deepwater coral and sponges, likely exist within the range complex; however, their precise location and abundance are not fully understood. A complete picture of impacts from expended materials on these habitats, beyond the data currently available, will not be possible until: (1) the locations and abundance of deep-sea coral and sponge habitats are better understood; and (2) more precise data on the level of training within these habitats is collected. USFF is unable to commit to mapping benthic habitats beyond those efforts currently budgeted for and funded. USFF is willing to work with NMFS to establish an approach for improving coordination on data collection efforts and sharing such data to the extent national security and other U.S. Navy restrictions allow. Also, as data collection and other research results in new habitat data, USFF will continue

to reassess and incorporate such information into future environmental planning for the Range Complex.

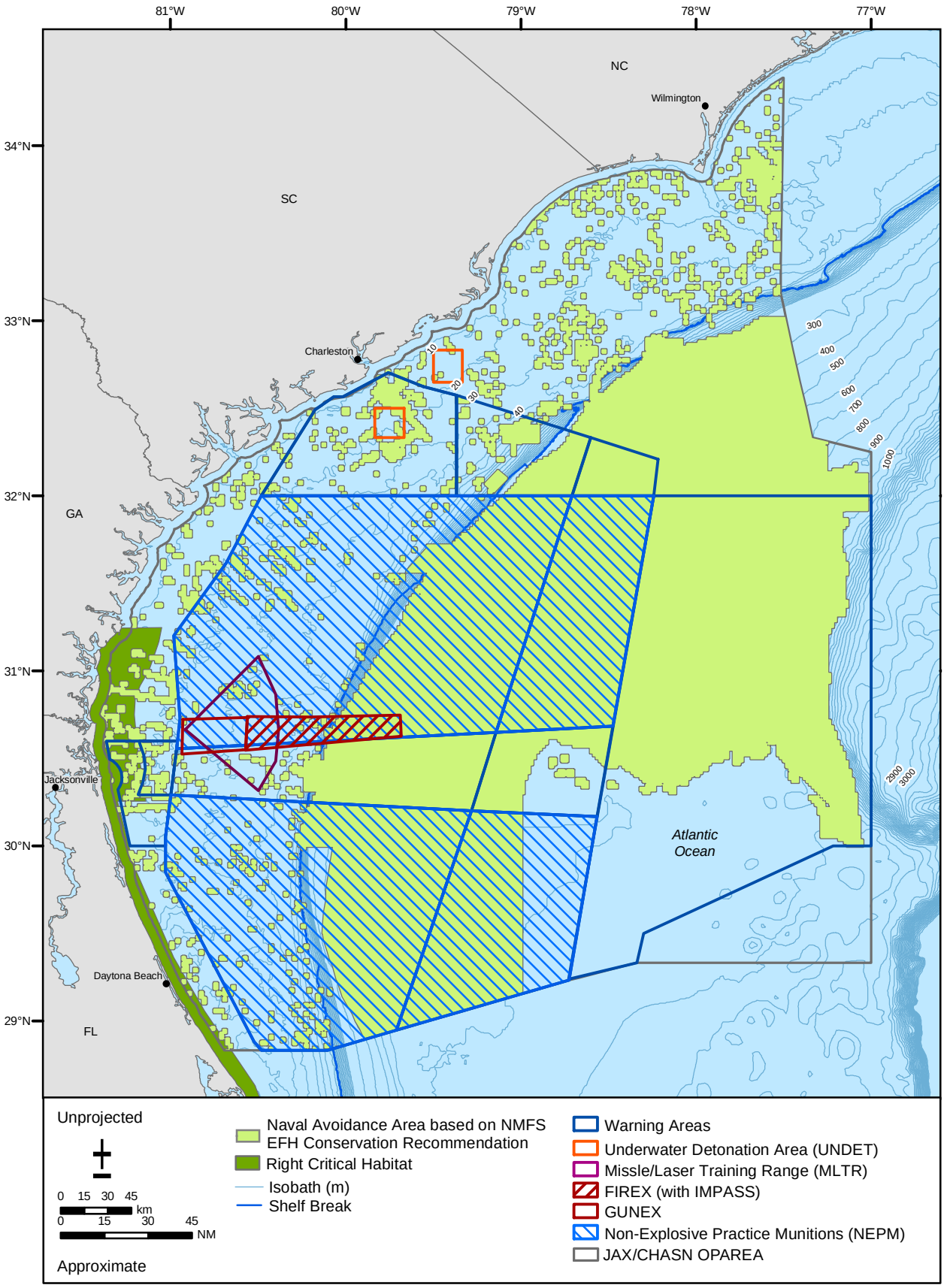
In conclusion, USFF appreciates NMFS' expertise and review of the preliminary FEIS/OEIS. The USFF point of contact on this matter is Mr. David MacDuffee (757) 836-8473, or E-Mail: david.macduffee@navy.mil.

Sincerely,

D. F. BAUCOM
Assistant Deputy Chief of Staff
for Operational Readiness
and Training

Enclosure: 1. Recommended avoidance area map of JAX Range Complex

Copy to: Mr. Duane Harris, South Atlantic Fishery Management Council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80°W
79°W
78°W
77°W
34°N
33°N
32°N
31°N
30°N
29°N
NC
SC
GA
FL
Wilmington
Charleston
Jacksonville
Daytona Beach
Atlantic Ocean
10
20
30
40
300
400
500
600
700
800
900
1000
2000
3000
Unprojected
0 15 30 45
km
0 15 30 45
NM
Approximate
Naval Avoidance Area based on NMFS EFH Conservation Recommendation
Right Critical Habitat
Isobath (m)
Shelf Break
Warning Areas
Underwater Detonation Area (UNDET)
Missle/Laser Training Range (MLTR)
FIREX (with IMPASS)
GUNEX
Non-Explosive Practice Munitions (NEPM)
JAX/CHASN OPAREA

APPENDIX D

CURRENT TRAINING AND OPERATIONS DESCRIPTIONS

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APPENDIX D
CURRENT TRAINING OPERATIONS WITHIN THE JACKSONVILLE RANGE COMPLEX

This Appendix D describes the training and RDT&E events conducted in the Jacksonville (JAX) 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
- Typical event duration
- Number of events ***currently*** conducted on an annual basis in the range complex

Where new platforms are evaluated as part of an EIS/OEIS, the events performed by such platforms are also described in this Appendix D (*e.g.*, MH-60R training events).

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 EXERCISE (MCM)

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/Sorties
Mine Countermeasures (MCM)[1]	MH-53E[2]	MK-103	1.5 hours	12 sorties
		MK-105	1.5 hours	12 sorties
		AQS-14A & AQS-24A	1.5 hours	54 sorties
	MH-60S[3]	OASIS	1.5 hours	none
		AQS-20A	1.5 hours	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-14A side-scan high-frequency mine hunting sonar. The AN/AQS-14A sonar is streamed, towed, and recovered by an MH-53 helicopter. It is used to detect, localize, and classify unburied bottom and moored mines. The system consists of three parts: a stabilized underwater vehicle housing the sonar, which is an active, multi-beam, side-looking sonar; a thin, armored, nonmagnetic, electro-mechanical tow cable; and an airborne electronic console within the helicopter. The 10.7-foot long underwater vehicle, which houses the sonar, can be maintained at a fixed depth above the sea floor or below the surface. Sonar information is presented on two continuous waterfall displays. An upgrade to the AN/AQS-14A system is the AN/AQS-24 that includes digital electronics, higher resolution, and an optional laser line scanner for target identification. A Post Mission Analysis (PMA) station is incorporated into the system for use with the contact tapes after the mission is complete to identify and classify mine-like contacts.
- 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, multibeam 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

1 Major exercises only; assume 3 carrier strike group COMPTUEX MIW events per year.
2 During major exercises four MH-53E would fly two 3-hour missions per day for 10 days.
3 During major exercises, three MH-60S would fly three 2-hour missions per day for 10 days.

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 (kts). The sled is typically towed at 20 to 25 kts, 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.
- AN/ALQ-220 Organic Airborne Surface Influence Sweep (OASIS). OASIS is a helicopter-deployed, towed-body, 10 feet long with a 20 inch diameter, which is self-contained, may be towed at speeds up to 40 kts 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-105 Magnetic Minesweeping System
- AN/AQS-14 Side-scan High-frequency Mine Hunting Sonar
- 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 kts depending on the system being used. The typical duration is 1.5 hours.

The use of training minefields of moored or bottom mines enhances feedback to equipment operators and quality of training attained.

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/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 kts 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	MH-60S	AMNS	1.5 hours	None
		RAMICS[4]	1.5 hours	None
	EOD	20 lb charges[5]	6-8 hours	18 events

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 20 lb explosive charges. 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.

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-53E and MH-60S with Airborne Mine Neutralization System (AMNS)

Basic Phase (Unit Level Training) Scenario
The AMNS (AN/ASQ-235) is deployed from an MH-53E or 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

4 Training performed only during major exercises; uses non-explosive, expendable moored mine shapes.
5 Net Explosive Weight (NEW). Shaded rows include high explosive (HE) ordnance.

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.

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. 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 LAYING

Fixed-winged aircraft and submarines lay offensive or defensive mines to create a tactical advantage for friendly forces. Offensive mines prevent enemy shipping from leaving an enemy port or area, or supplies from entering an enemy port or area. Defensive mines protect friendly forces and facilities by preventing enemy forces from entering the friendly port or area. Mine Laying events in the JAX Range Complex area conducted at the Lake George Range by fixed-wing aircraft.

Operation	Platform	System / Ordnance	Event Duration	Number of Events/Sorties
Mine Laying[6]	P-3C	BDU-45, MK-76 or BDU-48 (NEPM)	1 hour	10 sorties[7] (40 bombs)

P-3C with NEPM Mine Shapes

Basic Phase (Unit Level Training) Scenario
Fixed winged aircraft use precise navigation to lay a minefield pattern for a specific tactical situation. Most naval air laid mines are simply MK-80 series bombs that have a "mine kit" attached which acts as the mechanism for exploding the bomb at the right time to sink an enemy ship when it passes within the tactical radius of the mine.

A flight a single MPA attempt to fly undetected to the area where the mines will be laid and use either a low or high altitude tactic to lay the mines. The aircrew typically drops a series of about four NEPM training shapes (MK-76, BDU-45, or BDU-48), making multiple passes in the same flight pattern, and dropping one or more shapes each time. The shapes are scored for accuracy as they enter the water, and the aircrew is later debriefed on their performance. The training shapes are usually NEPM and expendable and are usually not recovered. The typical duration is 1 hour.

Integrated and Sustainment Phase Training Scenarios
Typically do not differ from the Basic Phase Scenario, except that multiple aircraft are used (3 if a wing of MPA). This wing-level training evaluates the ability of the entire squadron package to plan, load, and execute the mission safely and accurately. The aircraft drop their shapes in a pre-determined pattern and return to the carrier or base. Since the final location of each mine shape is of tactical importance, the drops are scored and the shapes are recovered.

Training Considerations
Mine laying training is often completed in a trainer at the basic level, but when ranges are used it is important to have the proper scoring equipment available to accurately determine exactly where the mine shape is dropped, as precision is the training goal. Weapons Impact Scoring System (WISS) is available and used to score drops at Lake George.

6 This event is conducted at the Lake George Range.
7 A sortie is a single operational training or RDT&E event conducted by one aircraft identified by a take-off and a final landing; assumes 4 bombs/sortie.

SURFACE WARFARE

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/Sorties
Missile Exercise (MISSILEX) (Air to Surface) [8]	SH-60B[9], HH-60H, MH-60R/S	AGM-114 Hellfire (HE)	1 hour	30 sorties (30 missiles)
	P-3C and P-8A	AGM-65 Maverick (HE)	1 hour	3 sorties (3 missiles)

SH-60B, HH-60H, & MH-60R/S Helicopters with Hellfire 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 to the target. The laser designator may be onboard the helicopter firing the Hellfire, 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 at or just below the water's 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 duration is 1 hour.

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.

8 Laser or infra-red target on barge; uses HE ordnance.
9 Includes any of the following variants of the H-60: SH-60, HH-60H, MH-60R, and MH-60S.

P-3C and P-8A Aircraft with Maverick Missiles

Basic Phase (Unit Level Training) Scenario
Typically one aircraft will approach the at-sea surface target, from an altitude between 25,000 feet and 5,000 feet for Maverick, complete the internal targeting process, and launch the weapon at the target from beyond 12 nm for Maverick. The majority of unit level exercises involve the use of captive carry (NEPM, no release) training missiles; the aircraft perform all detection, tracking, and targeting requirements without actually releasing a missile. The typical duration is 1 hour.

Integrated and Sustainment Phase Training Scenarios
Typically do not differ from the Basic Phase Scenario, except that HE ordnance may be expended against a realistic target.

Training Considerations
Because of the expense and large safety footprints, the Navy launches very few HE missiles per year. The typical annual allocation is one Maverick per squadron fired with the principal objective of end-to-end tests. Maverick are currently only fired at sea at a decommissioned ship during a SINKEX.

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/Sorties
Gunnery Exercise (GUNEX) (Air-to-Surface)[10]	H-60 (all models)	.50 cal machine guns	1 hour	70 sorties (112,000 rounds)
	H-60 (all models), MH-68 (USCG)	M-240 (7.62 mm) machine gun	1 hour	84 sorties (192,000 rounds)
	SH-60B, MH-60R, MH-68 (USC)	.50 cal rifle	1 hour	14 sorties (140 rounds)

H-60 Helicopters with Side Door-Mounted .50 cal and 7.62 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 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
H-60 helicopters have a mission to support NSW operations, so they will also train with embarked NSW personnel. NSW personnel use .50 cal, 7.62 mm during this exercise.

10 Targets for helicopters is smoke float; F/A-18, F-35 (JSF) RDT&E only.

GUNNERY EXERCISE (SURFACE-TO-SURFACE) –BOAT (GUNEX (S-S) - BOAT)

A Navy small boat uses a machine gun to attack and disable or destroy a surface target that simulates another ship, boat, swimmer, floating mine, or near shore land targets.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
GUNEX (Surface-to-Surface) (Boat)	Harbor Defense Boats (Boston Whalers)[11]	.50 cal guns	1 hour	96 events (40,000 rounds)
		M-60 and M-240 (7.62 mm)	1 hour	96 events (44,800 rounds)
		M-19 (40 mm rounds)	1 hour	96 events (11,520 rounds)

A number of different types of boats are used depending on the unit using the boat and their mission. Boats are mostly used by NSW teams and Navy Expeditionary Combat Command (NECC) units (Naval Coastal Warfare, Inshore Boat Units, Mobile Security Detachments, Explosive Ordnance Disposal, and Riverine Forces). These units are used to protect ships in harbors and high value units, such as aircraft carriers, nuclear submarines, liquid natural gas tankers, *etc*., while entering and leaving ports, as well as to conduct riverine operations, insertion and extractions, and various naval special warfare operations.

The boats used by these units include: Small Unit River Craft (SURC), Combat Rubber Raiding Craft (CRRC), Rigid Hull Inflatable Boats (RHIB), Patrol Craft, and many other versions of these types of boats. These boats use inboard or outboard, diesel or gasoline engines with either propeller or water jet propulsion.

Navy Boats with .50 cal, 7.62 mm or 40 mm Machine Guns

This exercise is usually a live-fire exercise, but at times blanks may be used so boat crews can practice their ship-handling skills for the employment of weapons without being concerned with the safety requirements involved with bullet travel or HE weapons.

Basic Phase (Unit Level Training) Scenario

Boat crews may use high or low speeds to approach and engage targets simulating other boats, swimmers, floating mines, or near shore land targets with .50 cal, 7.62 mm, or 40 mm machine guns (about 200, 800, and 10 rounds, respectively).

The most common exercise target is a 50-gallon steel drum that is expended during the exercise and not recovered. Some ranges have ship hulk targets or target silhouettes alongside river banks to provide more realistic training opportunities depending on assigned missions. The typical duration is 1 hour.

Integrated and Sustainment Phase Training Scenarios

11 Navy Expeditionary Combat Command small boat live-fire gun qualifications and training; 32 training days per year with 2-4 training events per day.

Typically do not differ from the Basic Phase Scenario, except for the additional command and control coordination involved.

Training Considerations

The purpose of this exercise is to develop marksmanship skills and small boat ship-handling tactics skills required to employ these weapons. It usually lasts 1 hour.

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 cannon, .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)[12]	CG, DDG[13]	5" gun	3 hours	28 events (737 rounds)
	FFG[14]	76 mm gun	3 hours	52 events (871 rounds)
	CG, DDG, FFG[15]	.50 cal machine gun	3 hours	40 events (96,240 rounds)
		25 mm (NEPM) machine gun	3 hours	40 events (24,000 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 propellant charge and longer barrel.

Basic Phase (Unit Level Training) Scenario

A slow (5 kts) or high (30 kts) 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 period of about 3 hours. Live or NEPM training rounds may be used. 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 CG: Cruiser; DDG: Guided Missile Destroyer; FFG: Guided Missile Frigate; All rounds are NEPM.
13 Targets: High Speed Maneuvering Surface Target (HSMST), MK-33 SEPTAR, trimaran or radar reflective surface balloon (killer tomato).
14 This event uses HSMST, or radar reflective surface balloon (killer tomato) target.
15 Targets: 55 gallon drum, balloon (weather, Mylar, or target), or Floating At-Sea Target (FAST).

CG, DDG, FFG with .50 cal 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.

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 cannon, 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.

Integrated and Sustainment Phase Training Scenarios

Typically do not differ from the Basic Phase Scenario.

GUNNERY EXERCISE (SURFACE-TO-SURFACE)-FAST ATTACK CRAFT/FAST INSHORE ATTACK CRAFT (FAC/FIAC)

Surface ships, possibly with air support, defend themselves and/or a stationary high-value unit from attack by multiple enemy small fast attack boats with main battery guns, crew-served weapons and small arms. This non-firing training event evaluates sensor performance and exercises command and control functions among participating units, and is typically conducted during major exercises.

Operation	Platform	System/ Ordnance	Event Duration	Number of Events
GUNEX (Surface-to-Surface) (FAC/FIAC)	CG, DDG, FFG	N/A	2-3 hours	9 events

CG, DDG, FFG with Main Battery Guns, CSW and Small Arms (Non-Firing)

Fast Attack Craft/Fast Inshore Attack Craft events are non-firing exercises, which evaluate command and control sensors and not the guns themselves.

Basic Phase (Unit Level Training) Scenario
This is typically not a unit level training event.

Integrated and Sustainment Phase Training Scenarios

The FAC/FIAC exercise is a surface-warfare exercise designed to simulate enemy small-craft attacks on either a stationary high-value unit or on a surface ship. Surface ships and aerial assets participate in the exercise, while Navy High Speed Maneuverable Seaborne Targets (HSMSTs) or other small craft act as the opposing forces. The exercise is designed to evaluate sensor performance and to exercise command and control functions among the various participating units. Several scenarios are executed over the course of two to three days during an exercise to provide each surface combatant commander the opportunity to act as the Scene of Action (SAC) commander. Approximately five events take place per exercise. No ordnance is involved with this training.

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)	P-3C and P-8A	MK-20 (Cluster Bomb, HE)	1 hour	4 events (4 bombs)
		MK-82 (500 HE lb)	1 hour	6 events (24 bombs)
		MK-82 (I) BDU-45 (Bomb, NEPM)	1 hour	None
	F/A-18	MK-82 (500 lb HE bomb)	1 hour	9 events (36 bombs)
		MK-83 (1,000 lb HE bomb)	1 hour	3 events (12 bombs)
		MK-84 (2,000 lb HE bomb)	1 hour	1 event (1 bomb)
		MK-83 (NEPM)	1 hour	None
		MK-20 (Cluster bomb, NEPM)	1 hour	13 events (51 bombs)
		MK-76 (25 NEPM Bomb with small smoke charge)	1 hour	13 events (129 bombs)
		MK-82 (I) BDU-45 (Bomb, NEPM)	1 hour	45 events (180 bombs)

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

Unguided munitions: MK-76 and BDU-45 (NEPM training bombs); MK-80 series (NEPM or HE); MK-20 Cluster Bomb (NEPM or HE).

Basic Phase (Unit Level Training) Scenario
A flight of two aircraft will approach the target from an altitude of between 15,000 feet to less than 3,000 feet and, when on an established range, will adhere to designated ingress and egress routes. Typical bomb release altitude is below 3,000 feet and within a range of 1,000 yards for unguided munitions, and above 15,000 feet and in excess of 10 nm for precision-guided munitions. Exercises at night are normally done with captive carry (no drop) weapons because of safety considerations. Laser designators from participating aircraft, support aircraft, or ground support personnel are used to illuminate certified targets for use with lasers when using laser guided weapons.

When MK-82 and MK-83 bombs are released by the aircraft, they are typically released in pairs with three to four minute intervals between the drops. Because the MK-84 bomb is seldom used, it is released in one aircraft pass. 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 HE ordnance in the open ocean.
Unguided munitions: Usually conducted at land ranges with NEPM or HE ordnance, or water ranges with grounded ship hulks available for targets. MK-76 and BDU-48 NEPM bombs are the most common weapon allocation.

P-3C and P-8A Maritime Patrol Aircraft (MPA) with Unguided Munitions
Unguided munitions: MK-82 (500 lb bomb) (NEPM or HE); MK-20 (Rockeye cluster bomb) (NEPM or HE).

Basic Phase (Unit Level Training) Scenario
MPA use bombs to attack surfaced submarines and surface craft that would not present a major threat to the MPA itself. The MPA is larger and slower than an F/A-18, so its bombing tactics differ markedly. A single MPA approaches the target at a low altitude. The typical sortie duration is 1 hour.

Integrated and Sustainment Phase Training Scenarios
Typically do not differ from the Basic Phase Scenario, except that a more realistic target may be available and HE ordnance may be expended, such as during a SINKEX.

Training Considerations
MPA pilots can fulfill this training requirement against either a land or water target, but it is usually conducted within the Warning Area above a water range.

The annual ordnance expenditure allocation typically authorizes only a very limited number of HE munitions. This Commander Naval Air Force allocation should be reviewed if a specific number of HE weapons are needed for a specific requirement.

NOTE ON HUNG ORDNANCE: On rare occasion, aircraft with unexpended or "hung" explosive ordnance that was not safely delivered at a land range may not safely return to the aircraft carrier or home base without endangering the aircrew or ship/airbase support personnel. The range complex must have a controlled jettison area where the explosive ordnance may be released (often in a "safe"/unarmed mode) and in which appropriate warnings and surveillance ensure the protection of shipping and other civilian activities. Prior to use, naval surface vessels and aircraft will search the area for non-participating aircraft and surface traffic to ensure the area is clear and will adhere to stand off requirements from marine life. In the Jacksonville Range Complex, 31J is the designation jettison area; a location well offshore, away from coastal traffic and shipping lanes. This site is a published Warning Area and is known to mariners.

LASER TARGETING

Fixed-winged aircraft or helicopters use lasers to illuminate/designate enemy targets for destruction by the aircraft with laser guided bombs or missiles.

Operation	Platform	System / Ordnance	Event Duration	Number of Events/Sorties
Laser Targeting[16]	MH-60R/S	Hellfire Laser Fire Control System	1 hour	248 sorties
	P-3C	Maverick Laser Fire Control System	1 hour	24 sorties

MH-60R/S with Hellfire Laser Fire Control System; P-3C with Maverick Laser Fire Control System

This exercise is documented for aircraft when only the laser component of the exercise is conducted. It would be conducted in the same manner as if the aircraft was performing the supporting role as a laser designator or if the aircraft was dropping the weapon itself. If an actual HE, NEPM, or captive carry bomb or missile is used, then the exercise is documented as a BOMBEX or MISSILEX and may be either A-S or A-G depending in where the exercise is conducted. Laser designators from participating aircraft are used to illuminate certified targets for use with lasers as they would be when using laser guided weapons.

Basic Phase (Unit Level Training) Scenario
See BOMBEX (A-G) or (A-S) and MISSILEX (A-G) or (A-S). The typical sortie duration is 1 hour.

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

16 Laser targeting only; no missile fired.

VISIT BOARD SEARCH & SEIZURE / MARITIME INTERCEPTION OPERATIONS

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.

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[17]	Rigid Hull Inflatable Boat (RHIB) or similar small boat, and CG, DDG, FFG, LPD or LSD	N/A	2-3 hours	82 events
VBSS/MIO-Helicopter[18]	H-60	N/A	1.5 hours	54 sorties

VISIT BOARD SEARCH & SEIZURE / MARITIME INTERCEPTION OPERATIONS (VBSS/MIO) – SHIP

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

Basic Phase (Unit Level Training) Scenario
Ships will typically be on patrol in a designated ocean or restricted area to watch for vessels that may need to be inspected or seized. When a suspect vessel is sighted, the ship will approach the suspect vessel at a speed of 20 kts or more while preparing to launch its organic helicopter or small boat and using its radio 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.

17 This is a non-firing ULT event. Each ship must conduct one VBSS/MIO every six months. Target vessel is typically another strike group ship or Mobile Sea Range (MSR) vessel such as Prevail.
18 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.

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 helo and small boat will still be used to board the suspect vessel, but shipboard or NSW boarding teams with armed force may be required to make the boarding. Small arms with inert blanks may be used. Despite the notional description provided herein, in the Jacksonville Range Complex this is a non-firing event. 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 kts.

VISIT BOARD SEARCH & SEIZURE / MARITIME INTERCEPTION 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 Jacksonville 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/Sorties
Air Combat Maneuvers (ACM)	F/A-18[19]	Captive carry missiles or telemetry pods	1 hour	1,132 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 EA-18G 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 kts) to high subsonic (less than 600 kts). 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
- Section fighter maneuvers - two versus one adversary or more.

19 100% captive carry (no ordnance launched)

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 within a Warning Area or Restricted Airspace. These airspaces are designed to keep other aircraft clear of the area where military aircraft are conducting operations and thereby allow safe operations. The aircraft conducting ACM are often augmented with telemetry systems that document the exact location of each aircraft so that the tactics used by each aircraft may be reviewed and assessed from a training perspective. The CATM-9, captive carry air training missile, is installed on an aircraft where a "real" missile would be installed and allows the aircraft's "weapon system" to operate as if a "real" missile was installed. The CATM-9 is "captive", so it always stays connected to the aircraft.

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)	F/A-18	20 mm cannon	1 hour	45 sorties (7,500 rounds)

F/A-18C/E/F with Vulcan M61A1/A2 20 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.

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/Sorties
Air Intercept Control[20]	F/A-18, E-2C, CVN, CG, DDG, LHA, LHD	Air Search and Fire Control Radars	1-2 hours	32 events (150 sorties)

CVN, CG, DDG, LHA, LHD, F/A-18, E-2C with Air Search and Fire Control Radar

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 ship and aircraft platforms, 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 kts 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.

20 Air Intercept Control can have 2-6 aircraft per intercept; for purposes of analysis, 4 aircraft are used per intercept; E-2 aircraft may participate in AIC sorties.

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[21]	AIM-7, AIM-9, AIM-120 (30% HE, 70% NEPM)	1 hour	20 sorties (6 HE, 14 NEPM)

F/A-18 with AIM-7 Sparrow; AIM-9 Sidewinder; or AIM-120 AMRAAM (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 kts will approach a target from several miles away and, when within missile range, will launch its missile against the target. Missiles may have HE warheads or an inert telemetry head package. The missiles fired are not recovered.

The target is an unmanned aerial target drone (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. It 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.

21 This event uses targets: (BQM-74E) (33%), or Tactical Air Launched Decoys (TALD) (67%).

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.	None
	LHA, LHD	NATO Sea Sparrow (HE)	2 hrs.	None

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 NATO Sea Sparrow missiles.

Basic Phase (Unit Level Training) Scenario
The scenario for this exercise is the same as for a main battery gun exercise, but the simulated threat missile is engaged with the missile system. Both the SM-2 and NATO Sea Sparrow missiles have self-destruct mechanisms that will cause the missiles to explode after a pre-set period of flight time.

The BQM-74 target drone is used as a target for this exercise. The BQM is a subscale, subsonic, remote controlled ground or air launched target. The BQM-74 drones are launched from either G-1 Commercial Air Services aircraft or the Mobile Sea Range. The target speed and altitude can vary, but typically the target flies at 5000 feet altitude at 300 knots. A parachute deploys at the end of target flight to enable target recovery at sea, and potential target reuse. The exercise lasts about two hours.

MISSILEX (S-A) is conducted during daylight hours and beyond 12 nm from shore for safety purposes.

DETECT-TO-ENGAGE

Shipboard personnel use all shipboard sensors (search and fire control radars and Electronic Support Measures (ESM)) in the entire process of detecting, classifying, and tracking enemy aircraft and/or missiles up to the point of engagement, with the goal of destroying the threat before it can damage the ship.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
Detect-to-Engage	CG, DDG, FFG, LHA, LHD, LPD, LSD, CVN	Air search and fire control radars	1.5 hours	77 events

CVN, CG, DDG, FFG. LHA, LHD, LPD, LSD with Shipboard Search and Fire Control Radars, ESM Equipment, and Weapon Systems

Basic Phase (Unit Level Training) Scenario
Shipboard systems are manned at a specified condition of readiness that may range from a routine watch organization, where only essential systems are manned, all the way to general quarters, where every system is manned for full battle. System operators may or may not be alerted that the ship may come under "attack" so that a more realistic response will be achieved.

A simulated threat aircraft will approach the ship from more than 20 nm and may be expected to approach from well above 3,000 ft to just a few hundred feet above the water, and from 250 kts to supersonic in order to provide a wide range of threat profiles.

Once the ship has detected the threat aircraft, operators and watch teams use all of their capabilities to evaluate and track the threat and man and engage the required weapons systems to protect the ship.

A live air target, such as a commercial air service Lear Jet, is the principal external component for this exercise, but Fleet aircraft may also be used. This exercise may also be conducted in conjunction with additional ships. When additional ships are available, additional training may be achieved through the exchange of Link-16 data and voice communication reporting. The typical duration is 1.5 hour.

Integrated and Sustainment Phase Training Scenarios
Typically do not differ from the Basic Phase Scenario for the individual ship, except that more air threats will be present and may attack the ship from different directions at the same time.

An additional level of complexity is added during these scenarios from the reporting and coordination aspects between ships in the Strike Group, as specific ships are typically responsible for assigned areas around the Strike Group. Aircraft detected in these assigned areas are reported to all ships in the Strike Group and as the threat aircraft continues its approach, the assigned ship will report the engagement and destruction of the threat, or warning that the threat was not destroyed and that it needs to be engaged by another ship.

Additional levels of AW complexity are added in other exercises, such as the war-at-sea exercise (WASEX) where ship and aircraft of the Strike Group are coordinated by an AW Commander.

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

Ship gun crews engage threat aircraft or missile targets with their guns with the goal of disabling or destroying the threat.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
GUNEX (Surface-to-Air)[22]	CG, DDG	5" gun (NEPM)	2 hours	4 events (88 rounds)
	FFG	76 mm gun (NEPM)	2 hours	7 events (168 rounds)
	CG, DDG, FFG	20 mm Close-in Weapons System (CIWS)	2 hours	10 events (18,900 rounds)

CG, DDG with 5-inch or FFG with 76 mm Main Battery Guns

Basic Phase (Unit Level Training) Scenario
A simulated threat aircraft or anti-ship missile is detected by the ship's radar at about 10 nm at an altitude below 3,000 feet, a speed between 250 and 500 kts, and heading toward the ship. Main battery guns are manned and 5-inch or 76 mm rounds are fired at the threat with the goal of destroying the threat before it reaches the ship. This is a defensive exercise where about six rounds of 5-inch Variable Timed, Non-Fragmentation (VTNF) ammunition and 12 rounds of 76 mm ammunition per gun mount are fired at a target tow by a commercial air services Lear jet. The ship will maneuver to unmask its guns but will typically operate at 10 to 12 kts or less during the exercise. The exercise lasts about 2 hours which normally includes several non-firing tracking runs followed by one or more the firing runs. The target must maintain an altitude above 500 feet for safety reasons and is not destroyed during the exercise.

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

CG, DDG, FFG with 20 mm Close-in-Weapon System (CIWS)
The ordnance used is the 20 mm NEPM, ball ammunition made of tungsten, which has been replacing the former depleted uranium rounds.

Basic Phase (Unit Level Training) Scenario
The scenario for this exercise is the same as for the main battery gun exercise above, but the ships involved engage the simulated threat aircraft or missile with the CIWS. CIWS ships can expend between 900 to 1400 rounds per mount per firing run for a total of up to five runs during the typical 2-hour exercise. The actual number of rounds expended during this exercise is dependent on the ship class, the CIWS model installed, and the available ammunition allowance. Ships with 5-inch or 76 mm guns may conduct this exercise immediately before or after the main battery gun exercise.

There is also a Preventive Maintenance requirement to test fire CIWS prior to this exercise, called a Pre-action calibration firing (PACFIRE). A PACFIRE generally expends about 30 rounds per firing mount.

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

22 Exercises use towed banner targets

AMPHIBIOUS WARFARE

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
Firing Exercise (FIREX) with IMPASS	CG, DDG	5" gun (IMPASS)[23]	8 hours	10 events (390 HE rounds and 310 NEPM 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 with IMPASS

This exercise follows the same scenario as a 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

23 Seventy rounds per event (39 HE rounds and 31 NEPM rounds).

systems. The scoring system is deployed by the firing ship and consists of five sonobuoys set in a 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 (approximately 8 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.

STRIKE WARFARE

BOMBING EXERCISE (AIR-TO-GROUND) (BOMBEX [A-G])

Fixed-winged strike fighter aircraft deliver bombs and rockets against land targets, day or night, with the goal of destroying or disabling enemy vehicles, infrastructure, and personnel.

Operation	Platform	System / Ordnance	Event Duration	Number of Events/Sorties
BOMBEX (A-G)[24]	F/A-18	MK-76, BDU-48, BDU-45, MK-106 (NEPM)	1 hour	25 sorties (100 bombs)

F/A-18C/D/E/F with Unguided or Precision-guided Bombs
Unguided munitions: MK-76 and BDU-45 (NEPM training bombs).

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 usually establish a racetrack pattern around the target. The pattern is established in a predetermined horizontal and vertical position relative to the target to ensure that all participating aircraft follow the same flight path during their target ingress, ordnance delivery, target egress, and "downwind" profiles. This type of pattern is designed to ensure that only one aircraft will be releasing ordnance at any given time. The typical bomb release altitude is below 3,000 ft and within a range of 1,000 yards for unguided munitions; above 15,000 ft and may be 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 the aircraft dropping the bomb, a support aircraft, or ground support personnel are used to illuminate certified targets for use with lasers when using laser guided weapons. The average time for this exercise is about 1 hour.

Integrated and Sustainment Phase Training Scenarios
Typically involves a simulated strike scenario with a flight of four or more aircraft, with or without a designated opposition force (OPFOR). Participating aircraft attack the target using real-world tactics, which may require that several aircraft approach the target and deliver their ordnance, simultaneously, from several different altitudes and/or directions. An E-2 aircraft is typically involved in this exercise from a command and control perspective, and an EA-18G aircraft may provide electronic combat support in larger events, such as JTFEX.

Training Considerations
Strike fighter pilots can fulfill this training requirement against either a land or water target, but the land target is most common.
Unguided munitions: Usually conducted at land ranges with NEPM or HE ordnance, or water ranges with grounded ship hulks available for targets. MK-76 and BDU-48 NEPM bombs are the most common weapon allocation.

The major difference between a BOMBEX (A-S) and BOMBEX (A-G) is related to targets. Ground targets may include any combination of fixed and mobile targets. Fixed targets may include a bull's eye of concentric rings and real or simulated wheeled vehicles, convoys, trains, aircraft, buildings, petroleum and oil storage areas, personnel silhouettes, and artillery and missile sites. Mobile targets include remote-controlled wheeled vehicles. Any ashore BOMBEX target may be actively or passively augmented to provide radar, infrared, or electronic signals, or support laser designation.

24 Conducted at Rodman Range.

Feedback to participants is very important for this exercise and can include any combination of real-time and post-mission feedback from a Weapon Impact Scoring System (WISS) or instrumented range, real-time visual sighting by range observers or participating aircrews, and post-mission telephonic or facsimile debrief.

COMBAT SEARCH AND RESCUE (CSAR) AND CONVOY OPERATIONS

Helicopters use tactical procedures to rescue military personnel within a simulated hostile area of operation.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
Combat Search and Rescue and Convoy Operations	SH-60F, HH-60H, MH-60S	Blank machine gun ammunition, chemical lights	1- 1.5 hours	146 events[25]

HH-60H, SH-60F, MH-60S with Machine Guns

Basic Phase (Unit Level Training) Scenario
Helicopters fly below 3,000 feet at the best altitudes and speeds between 50 kts and 100 kts to approach the area where the suspected personnel to be rescued are located. Machine guns (7.62 mm or 5.56 mm) will be mounted in the side door, but blank ammunition is normally used in this exercise. NSW personnel may be embarked during this exercise to act as the rescue party. This NSW squad would debark from the helicopter, "rescue" the personnel to be recovered, and return to the helicopter to be removed from the area. This basic exercise would last about 1 - 1-1/2 hours.

Integrated and Sustainment Phase Training Scenarios
The basic procedures completed by the helicopter and embarked personnel are typically the same. The added complexity is the required coordination between rescue units and support from additional participants, such as E-2C and F/A-18C/E/F aircraft.

Convoy Operations
Personnel in vehicles and cargo trucks drive along roads using various unit tactics to provide defensive protection to their vehicles and personnel.

Basic Phase (Unit Level Training) Scenario
Eight to 10 vehicles consisting of Medium Tactical Vehicle Replacements (MTVR), Logistics Vehicle Systems (LVS), and High Mobility Multipurpose Wheeled Vehicles (HMMWVs) along with about two personnel per participating vehicle dive along a designated road and maintain alert for attack by opposition forces, mines or improvised explosive devices (IED). If attacked, units use small arms (.50 cal and 7.62 mm) to return fire with blanks or live ammunition and use unit tactics to defend their force. A range with pop-up targets and an opposing force greatly improves realism and quality of training. If a mine or an IED is located, action is taken to avoid it or neutralize it as appropriate.

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

Training Considerations
Convoy Operations are conducted to train military personnel to maintain the security and integrity of a military convoy of vehicles.

25 101 events for unit level training; an event equals a single sortie. 45 events for major exercises, an event is comprised of two H-60 helicopters while three F/A-18 aircraft are at high altitude providing close air support if needed.

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/Sorties
Electronic Combat Operations	EA-6B, EA-18G[26]	AN/ALQ-218, AN/ALQ-99, AN/USQ-113	1 hour	108 sorties
	CG, DDG, FFG, CVN, LHD, LPD, LSD	SLQ-32	1.5 hours	56 events

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.

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.

26 Major exercises only.

EA-18G with Active Jamming Systems

- AN/ALQ-218 Airborne Electronic Attack (AEA) Suite - capable of selective reactive and pre-emptive electronic jamming of enemy communications. It is designed to replace the AN/ALQ-99.
- AN/ALQ-99 Tactical Jamming System - provides jamming in support of strike or assault forces. It automatically detects and classifies an enemy's radar then automatically electronically jams the radar.
- AN/USQ-113 Communications Jamming System - used to jam enemy communications

Basic Phase (Unit Level Training) Scenario

The EA-18G supports strike aircraft by employing active jamming against threat search radars to mask the friendly inbound strike aircraft mission against threat antiaircraft weapons or command and control communication radios. Aircraft will typically fly at about 18,000 feet at about 400 kts in a racetrack pattern that will best support jamming the threat receivers. 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 typically employed during a major range event where jamming could be employed during strike or assault missions planned against opposing shore targets.

Training Considerations

Areas where active jamming may be employed are limited to not interfere with commercial RF signals or reveal current jamming capabilities.

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.

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	CG, DDG, FFG, LCC, LHA, LHD, LPD, LSD	MK-214 (seduction chaff)	3 hours	50 events (300 canisters)
	CG, DDG, FFG, LCC, LHA, LHD, LPD, LSD	MK-216 (distraction chaff)	3 hours	16 events (96 canisters)
	H-60B/R	RR-181/AL	1 hour	8 sorties (8 canisters)
	F/A-18	R-144, R-129	1 hour	377 sorties (3,770 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.

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.

F/A-18 and H-60B/R 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:

- AN/ALQ-190(V)1 - used by SH-60B/F and MPA. This canister is the size of a sonobuoy and can actually also be employed in the offensive role to create chaff corridors as well as decoy missiles and radars in the defensive role. RR-181 is the chaff contained within a AN/ALQ-190(V)1.
- RR-129A/AL - used by all naval airframes.
- 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.

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

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 (Aircraft Self-Defense)	F/A-18	MK-46 MOD 1C, MJU-8A/B, MJU-27A/B, MJU-32B, MJU-53B, SM-875/ALE	1 hour	12 sorties (60 flares)
	MH-60R/S		1 hour	56 sorties (1,680 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-18 and SH-60B/F; MH-60R/S; HH-60H 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.
- 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.

OTHER EVENTS

SHIPBOARD ELECTRONIC SYSTEMS EVALUATION FACILITY (SESEF) UTILIZATION

Surface ships utilize SESEF testing and evaluation capabilities on its combat systems which radiate or receive electromagnetic (EM) energy.

Operation	Platform	System / Ordnance	Event Duration	Number of Tests
Shipboard Electronic Systems Evaluation Facility (SESEF) Utilization	CG, DDG, FFG	Radio and radar only	Variable	1,937 tests

SESEF's are land based test facilities, established to facilitate testing of electromagnetic transmitting and receiving equipment for U.S. Navy, U.S. Coast Guard and Military Sealift Command vessels. Their coastal locations are near major fleet concentrations, in both transit and operational areas, and allow the individual SESEF's to meet scheduled and unscheduled testing requirements.

The SESEF facilities offer a wide variety of tests that fall into two basic categories:
- Quick-look operability testing
- System performance testing

Quick-look tests are generally conducted during transit to and from port, or while pier side. The SESEF is able to provide the ship a quick operational evaluation of the system(s) under test. The ship is normally provided a "Satisfactory/Unsatisfactory" type of test result(s) along with any detected system anomalies or problems. Tests may be combined to provide the ship with a full-up combat system Q/L evaluation.

The Q/L operability tests are defined as tests which:
- Are generally short in duration
- Require little or no advance scheduling
- Require little or no shipboard maneuvering
- May be accomplished pier side (Communications, Link-4A, Link-11, and Link 16)
- Require minimal internal shipboard coordination

Results of Q/L operability tests are provided via voice radio circuit. Hard copy results summary can be provided upon request. Examples of the SESEF Quick-look operability tests are:
- Communications
- IFF
- Link-4A, 11 and 16
- RBA (Drill)
- TACAN
- AN/ULM-4 ECM and ESM
- RDF
- URMTT
- AN/SRQ-4 LAMPS MK III

SESEF performance testing provides the ship with a detailed analysis and evaluation of the system(s) under test. The adherence to design specifications is measured and the system performance is compared to established standards. The testing requirements and the desired measurement precision dictate a higher

degree of control on the ship and coordination of its personnel. System performance tests are defined as tests which:

- Generally require longer periods of dedicated testing
- Require advance scheduling and coordination with SESEF
- May require scheduling and coordination with ISEA
- Require the ship to maneuver in a pre-defined geometry
- Require the ship in a certain geographic area (SESEF/RCS range)
- Require internal shipboard coordination

Results of system performance tests are usually provided via formal report. Examples of the SESEF System Performance Tests are:

- TACAN Certification
- ARP
- AN/ULM-4 ECM and ESM
- RDF Calibrations
- Various URMTT test scenarios
- AN/SRQ-4 LAMPS MK III
- RCS
- RBA (Score)

Source: The above information was obtained from the Naval Sea Systems Command Shipboard Test Execution Manual. 15 March 2006.

PRECISION ANCHORING

Surface ships train in choosing an anchorage location and releasing anchors in precise locations.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
Precision Anchoring	CG, DDG, FFG	None	Variable	168 anchorages

CG, DDG, and FFG Conducting Precision Anchorage

The selection of an anchorage is usually made by the navigator and then approved by the commanding officer.

Regardless of whether the anchorage is selected by higher authority or by the navigator, the following conditions typically apply:

- The anchorage should be at a position sheltered from the effects of strong winds and current.
- The bottom should be good holding ground, such as mud or sand.
- The water depth should be neither too shallow, hazarding the ship, nor too deep, facilitating the dragging of the anchor.
- The position should be free from such hazards to the anchor cable as fish traps, buoys, and submarine cables.
- The position should be free from such hazards as shoals and sandbars.
- There should be a suitable number of landmarks, daymarks, and lighted NAVAIDs available for fixing the ship's position both by day and by night.
- If boat runs to shore are to be made, the anchorage chosen should be in close proximity to the intended landing.

The anchorage location is plotted and the approach track is selected. Approach to the anchorage location is typically into the wind or current. The navigator obtains frequent fixes as the ship proceeds along its track, and keeps the bridge continually informed as to the position of the ship in relation to the track and the letting-go circle. The navigator recommends courses to get back onto track, if necessary. Since every ship has its own handling characteristics, speeds that should be ordered as the ship proceeds along the track are difficult to specify. In general, however, with 1,000 yards to go, most ships usually slow to a speed of 5 to 7 knots. Depending on wind and current, engines should be stopped when about 300 yards from the letting-go circle, and the anchor detail should be instructed to "stand by." As the vessel draws near the drop circle, engines are normally reversed so as to have all remaining headway off the ship as it passes over the letting-go circle. When the pelorus is exactly at the letting-go bearing, the word "Let go the anchor" is passed to the anchor detail, and the anchor is dropped. As the anchor is let go, the navigator should immediately call for a round of bearings to be taken, and he or she should record the ship's head. After the resulting fix is plotted, a line is extended from it in the direction of the ship's head, and the hawsepipe to pelorus distance is laid off along the line, thus plotting the position of the anchor at the moment that it was let go. If all has gone well, the anchor should have been placed within 50 yards of the center of the anchorage.

SMALL ARMS TRAINING

Navy personnel aboard harbor defense boats use small arms fire to disable floating or swimming targets.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
Small Arms Training	Harbor Defense Boats	MK3A2 anti-swimmer grenades [27]	1 hour	96 events (80 rounds)

The boats used by these units include: Small Unit River Craft (SURC), Combat Rubber Raiding Craft (CRRC), Rigid Hull Inflatable Boats (RHIB), Patrol Craft, and many other versions of these types of boats. These boats use inboard or outboard, diesel or gasoline engines with either propeller or water jet propulsion.

Harbor Defense Boats with Anti-Swimmer Grenades

Basic Phase (Unit Level Training) Scenario

Boat crews may use high or low speeds to approach and engage targets simulating swimmers or floating mines with anti-swimmer grenades. The most common exercise target is a 50-gallon steel drum that is expended during the exercise and not recovered. Targets simulate an enemy lone diver attempting to disable a Navy ship via explosive charges. After setting the desired detonation depth on the anti-swimmer grenade, the user drops the grenade over the side of the boat. The typical duration is 1 hour.

Integrated and Sustainment Phase Training Scenarios

Typically do not differ from the Basic Phase Scenario, except for the additional command and control coordination involved.

Training Considerations

The purpose of this exercise is to develop marksmanship skills and small boat ship-handling tactics skills required to employ these weapons. It usually lasts 1 hour.

27 Not all events involve use of anti-swimmer grenades.

RESEARCH, DEVELOPMENT, TESTING AND EVALUATION

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, Developmental 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 the equipment within a unit works well together. Table D-1describes 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 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 kts, 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.
	Weapons RDT&E	General air-to-air, air-to-surface, surface-to-air, and surface-to-surface missile exercises. Various rockets or missiles may be tested including but not limited to 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-65 LSR Maverick; AGM-119 Penguin; BQM 34/74 Firebee/Chukar; GQM-163 Coyote; AGM-62 Walleye; AGM-84 Harpoon. 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 and neutralization equipment from helicopters at sea. Mine detection equipment can include: AN/AQS-20A, Airborne Laser Mine Detection System (ALMDS), and Organic Airborne and Surface Influence Sweep (OASIS) system. Mine neutralization equipment can include Airborne Mine Neutralization System (AMNS) and Rapid Airborne Mine Clearance System (RAMICS)
	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. 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 SINKEX 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.

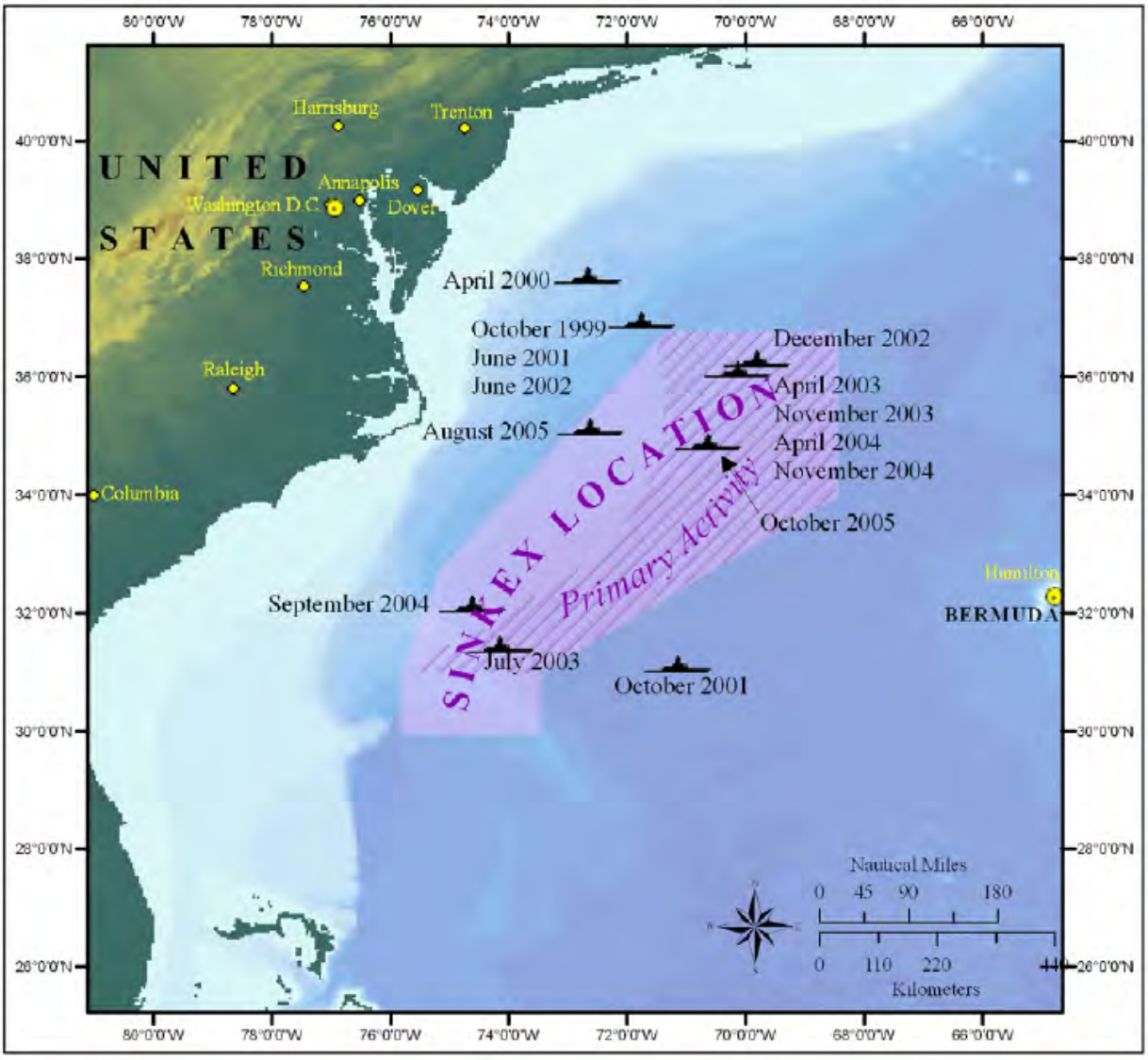

Figure D-1: Locations of Previous SINKEXs (NMFS 2006)

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APPENDIX E

WEAPONS SYSTEMS DESCRIPTIONS

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TYPICAL EXISTING TARGET SYSTEMS USED IN THE JAX 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

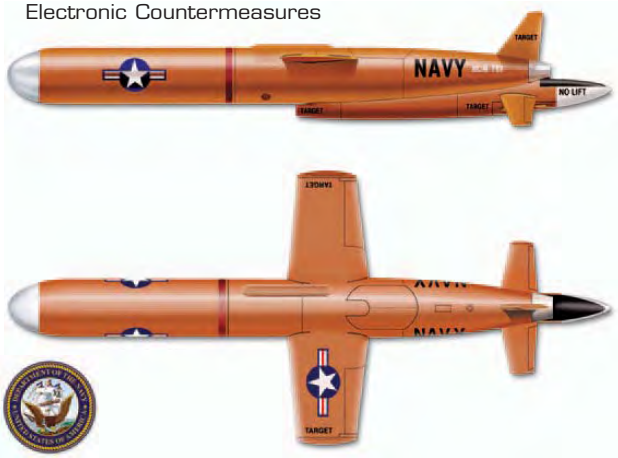
Length	12.95 ft (4.0 m)
Wingspan	5.78 ft (1.8 m)
Range	>350 nm (648.6 km)
Altitude	
Low	7 ft (2.1 m)
High	40,000 ft (12.2 km)
Speed	>515 Knots at Sea Level
Weight	455 lbs (206.4 kg)
Endurance	78 Minutes
Navigation	GPS/IMU
Fuel	Jet Fuel (JP-5, JP-8, or Jet A-1)

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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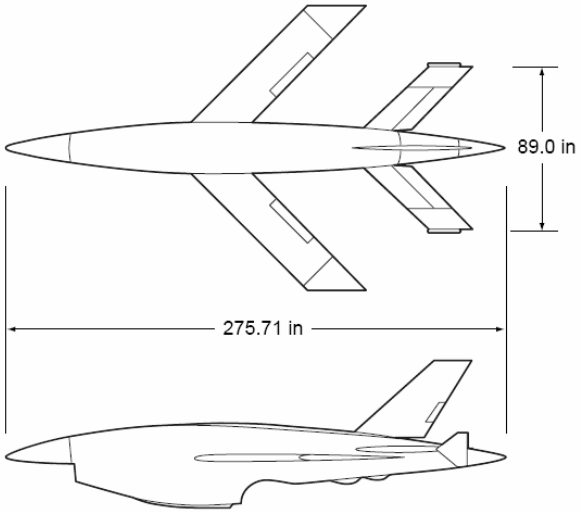
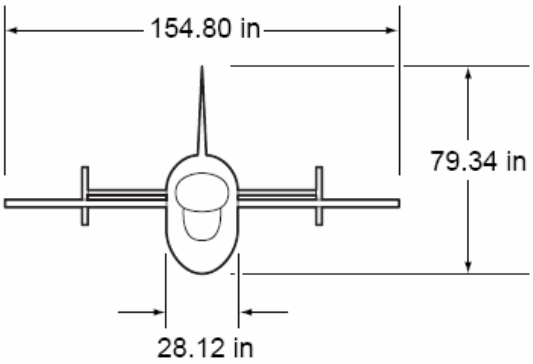
BQM-34S Firebee

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





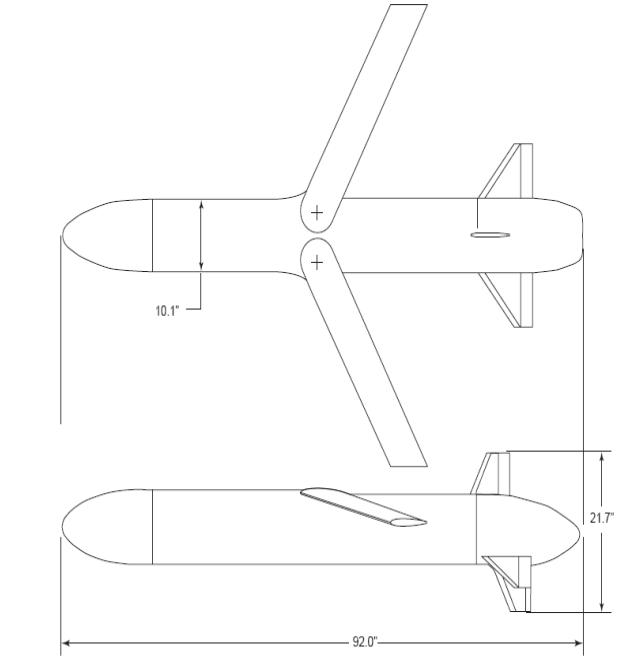
AN-ADM-141A/B Tactical Air-Launched Decoy (TALD)

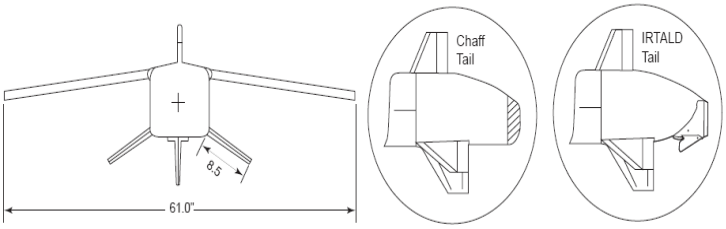
Description

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





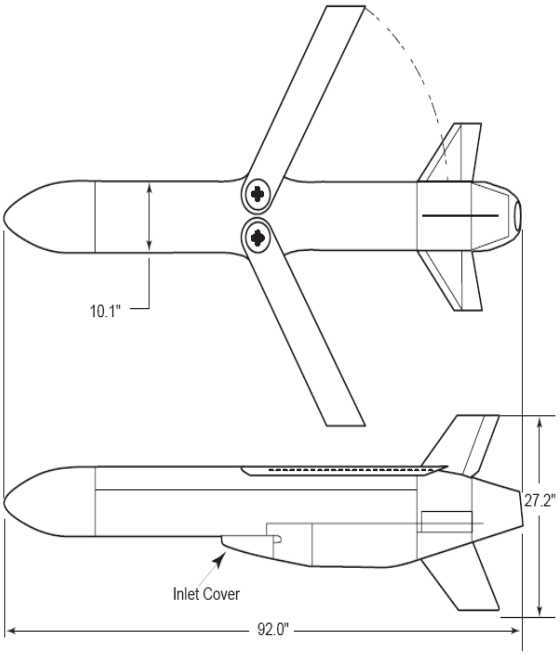
AN-ADM-141C Improved Tactical Air-Launched Decoy (ITALD)

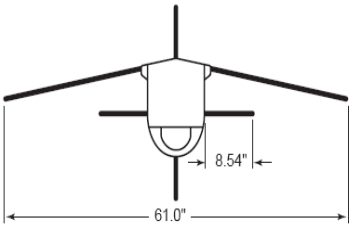
Description

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



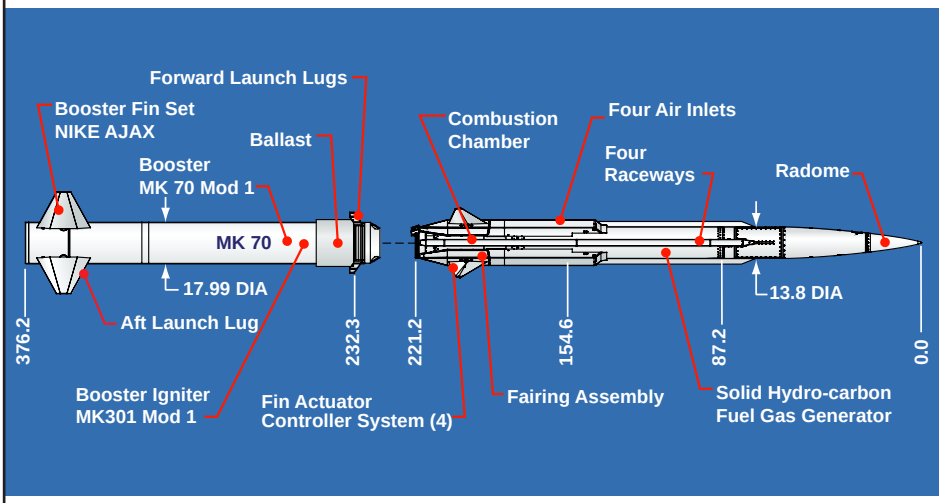


Wing Area: 2.74 ft²
Overall Length: 92 inches
Gross Weight: 375 lbs

FACT SHEET

GQM-163A Coyote

Supersonic Sea Skimming Target

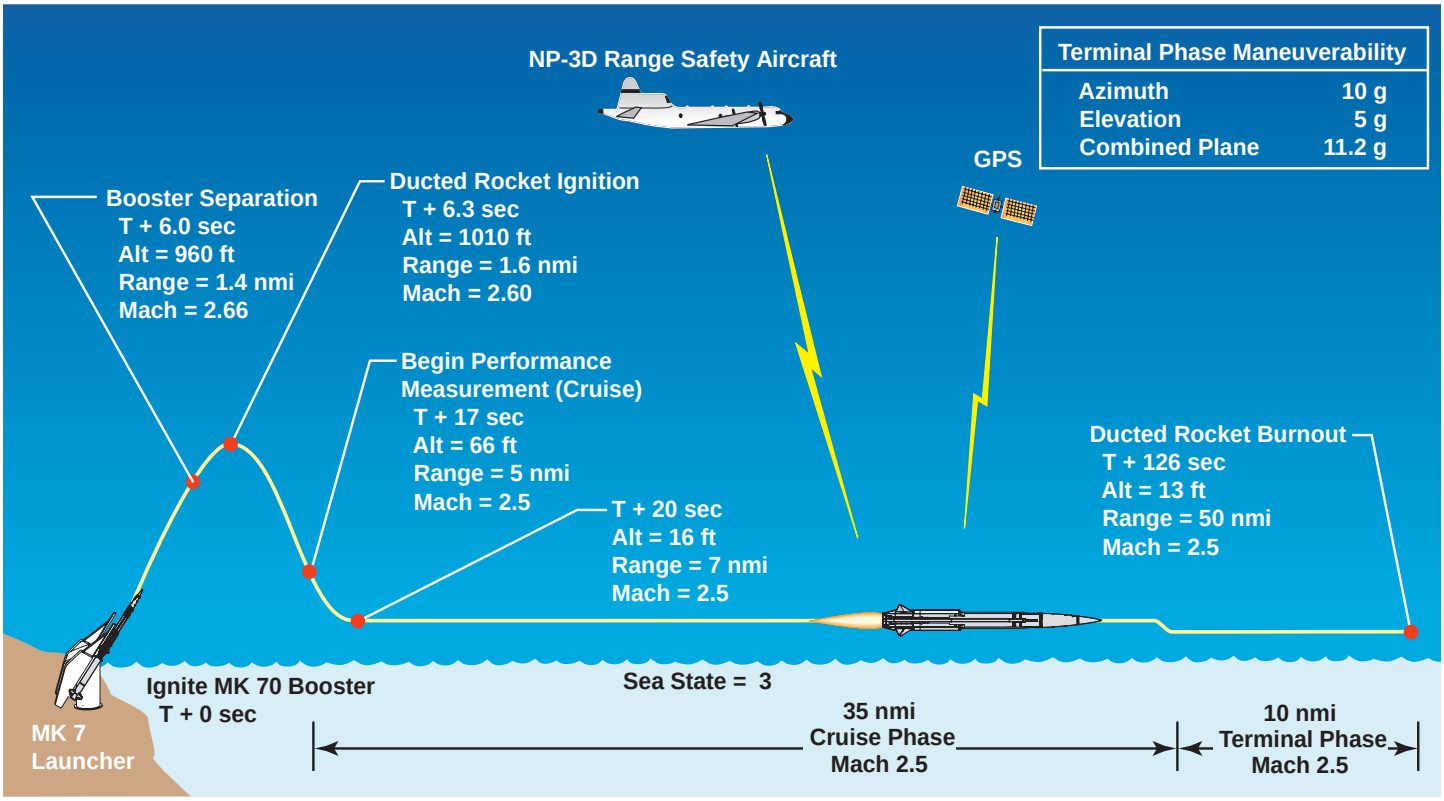


GQM-163A Program Overview

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
3380 South Price Road
Chandler, Arizona 85248

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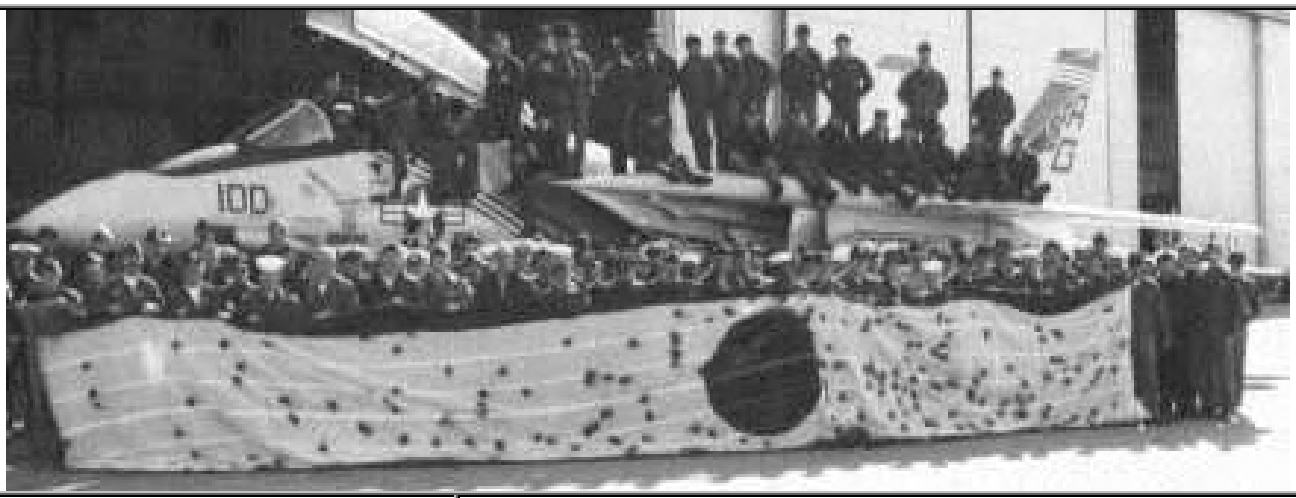
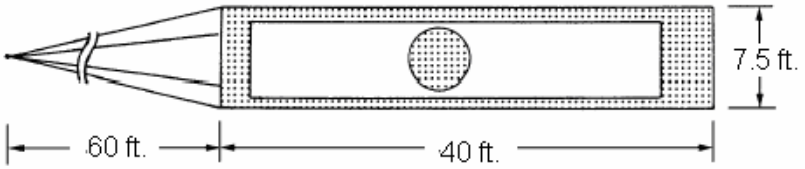
TDU-32A/B Rigid Tow Target



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

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AIRCRAFT

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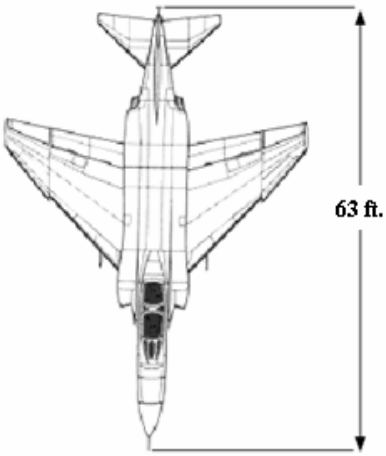
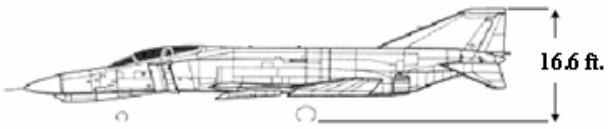
QF-4 Phantom[1]

Description

The QF-4 aircraft target is a full-scale, supersonic, high altitude, remotely controlled aircraft. It has been developed to support the test and evaluation of air to air, surface to air weapons and weapon systems. It has external stores capability including provisions for carrying external fuel tanks and special equipment pods. The remote control system features the Integrated Target Control System (ITCS) and employs nose-mounted or cockpit mounted television cameras for remote takeoff and landing. The remote control pilot flies the aircraft from a universal control console which closely duplicates the aircraft cockpit. The aircraft retains its manned configuration and is flown most of the time with a flight crew onboard for remote pilot training and other manned missions. The Tri-Service/Joint QF-4 is operational at Gulf Range and White Sands Missile Range (WSMR). To meet the Tri-Service full-scale aerial target requirements the Air Force uses the F-4E, F-4G, and RF-4C for conversion to the QF-4 configuration.

Physical Characteristics





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**

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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.

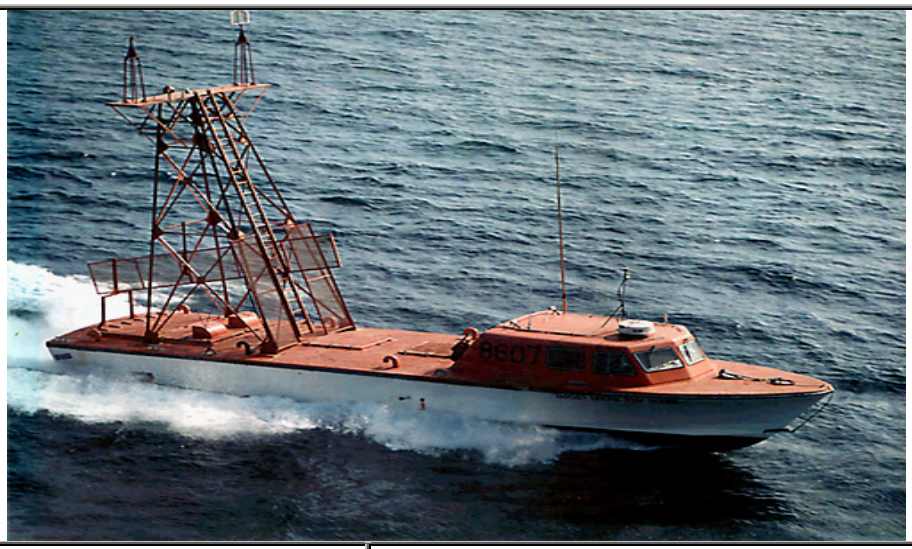
Physical Characteristics

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.

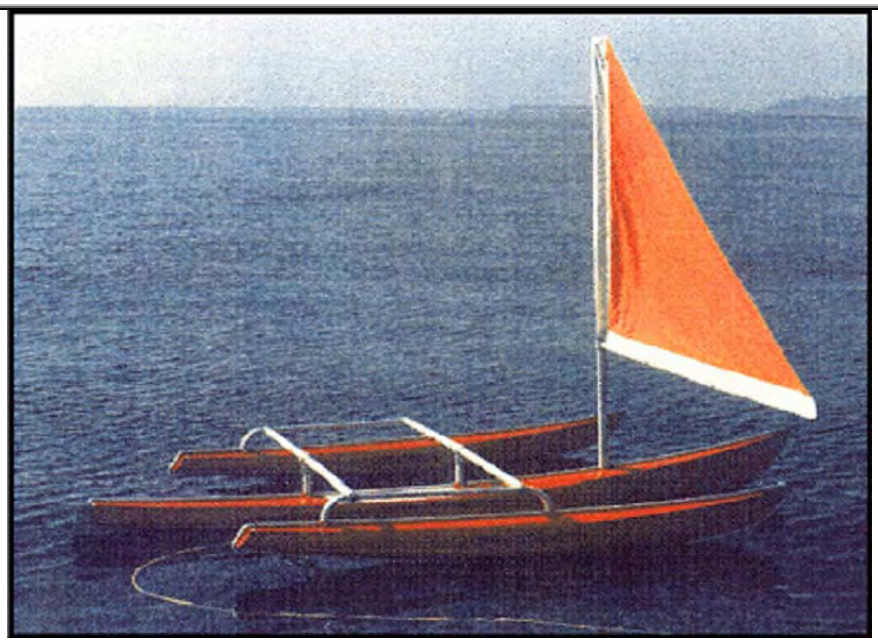
Physical Characteristics

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

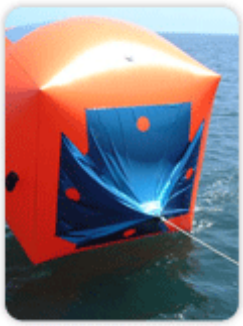
Radar Reflective Surface Balloon (Killer Tomato™)

Description

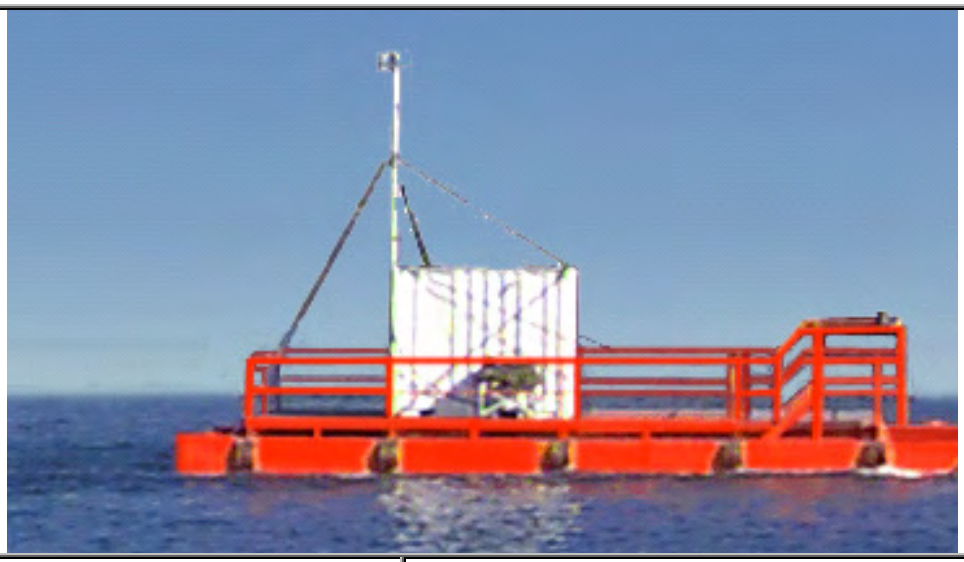
Killer Tomato™ Naval Gunnery Target balloon is an adrift target designed to stand upright on the wave surface without tumbling over in moderate sea states. Yields a radar signature to ship borne radar equipment from corner reflectors mounted in top corners of target. Can be detected 10+ miles away depending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

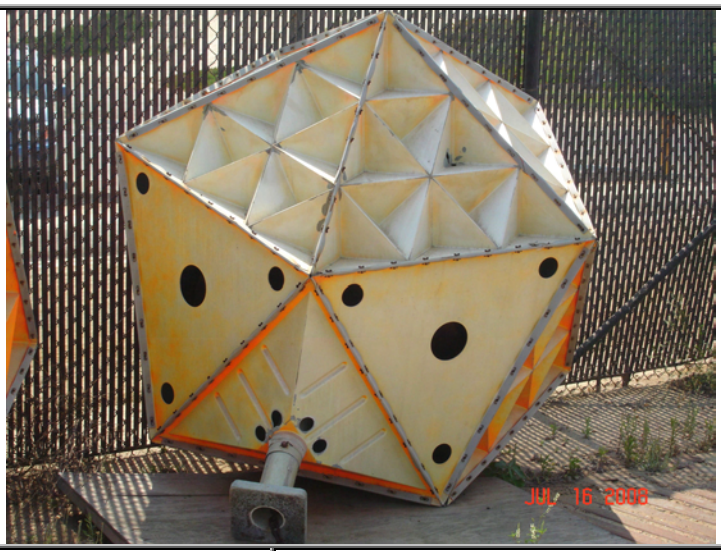
Physical Characteristics

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 JAX 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.

Contact: Tim Deaton
Global Strike Systems
The Boeing Company
(314) 232-5886
timothy.r.deaton@boeing.com

August 2008

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Integrated Defense Systems
P.O. Box 516
St. Louis, MO 63166
www.boeing.com

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.

Contact: Tim Deaton
Global Strike Systems
The Boeing Company
(314) 232-5886
timothy.r.deaton@boeing.com

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.

Raytheon Company
Missile Systems
Naval Weapon Systems
P.O. Box 11337
Tucson, Arizona
85734-1337 USA
520.794.5318 phone
520.794.3134 fax

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Raytheon

Customer Success Is Our Mission

Raytheon

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.

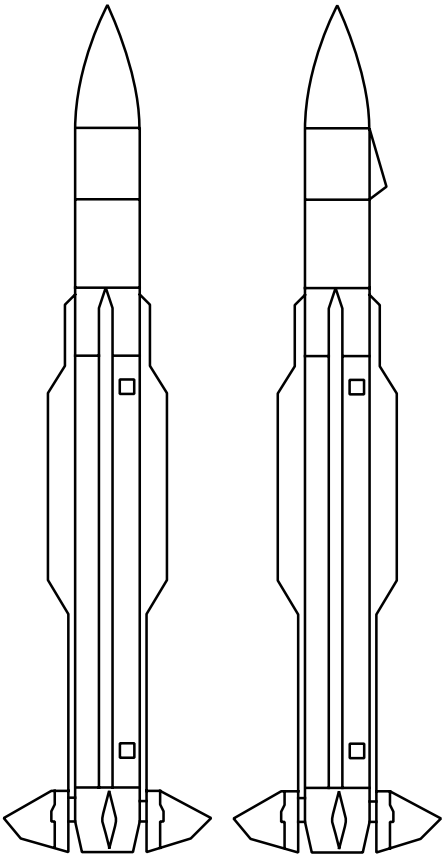
The SM-2 family continues to grow, as Canada, Japan, Germany, Korea, The Netherlands and Spain are deploying compatible surface combatants, and several other navies are in the process of defining requirements and ship configurations to support SM-2 applications.

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.

Raytheon Company
Missile Systems
Naval Weapon Systems
P.O. Box 11337
Tucson, Arizona
85734-1337 USA
520.794.9344 phone
520.794.0148 fax

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TS0074-30-02.8

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

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

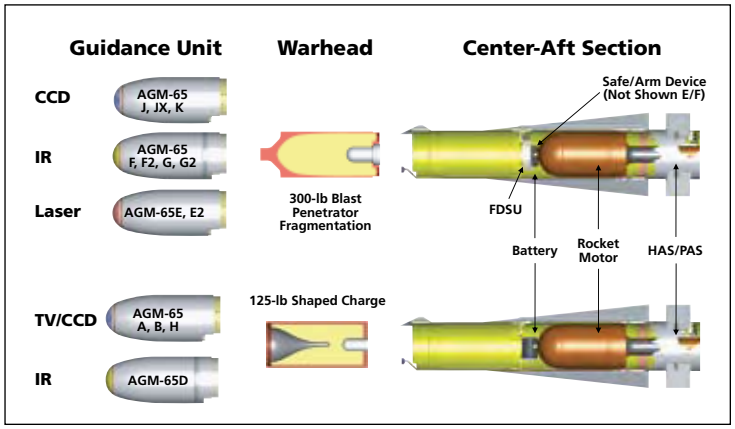
tracks laser energy reflected from a target being illuminated by a laser designator device, either airborne or ground-based. It was designed in the 1980s for defeating armored targets and providing close air support beyond the line of battle. Its analog SAL seeker provides long-range, lock-on, fire-and-forget 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.



Maverick Guidance Warhead Family Chart

Precision Against High-Speed Moving Targets

Surgical Precision

Assured Destruction

Raytheon Company
Missile Systems
Air Warfare Systems
P.O. Box 11337
Tucson, Arizona
85734-1337 USA
520.663.6540 phone
520.663.6402 fax

www.raytheon.com

LASER MAVERICK

Raytheon

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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	

Raytheon Company
Missile Systems
Air-to-Air
P.O. Box 11337
Tucson, Arizona
85734-1337 USA
520.794.9978 phone
520.794.8978 fax

www.raytheon.com

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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.

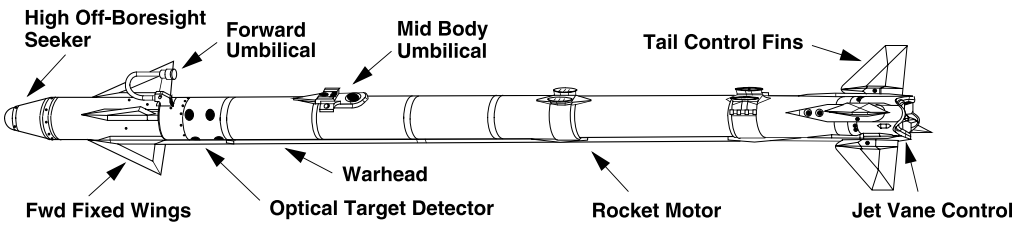
Smarter

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



Raytheon Company
Missile Systems
Air Warfare Systems
P.O. Box 11337
Tucson, Arizona
85734-1337 USA
520.794.1572 phone
520.794.8978 fax

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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

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

AMRAAM

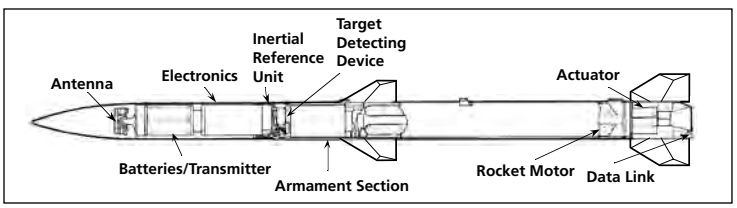
Harrier, Tornado, Harrier II Plus, the JAS-39 Gripen, JA-37 Viggen, and the Norwegian Advanced Surface-to-Air Missile System (NASAMS). Raytheon is currently integrating AMRAAM on the Joint Strike Fighter.

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	

Raytheon Company
Missile Systems
Air Warfare Systems
P.O. Box 11337
Tucson, Arizona
85734-1337 USA
520.794.0198 phone
520.794.8978 fax

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GUNS

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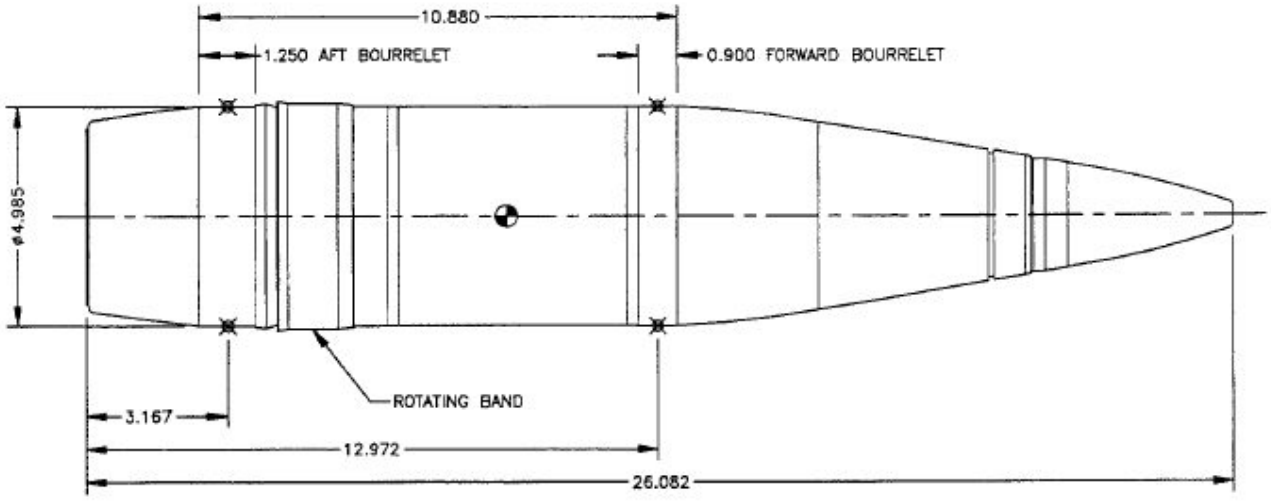
Mk-64 5” / 54 Caliber Blind, Loaded, & Plugged Naval Projectile



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

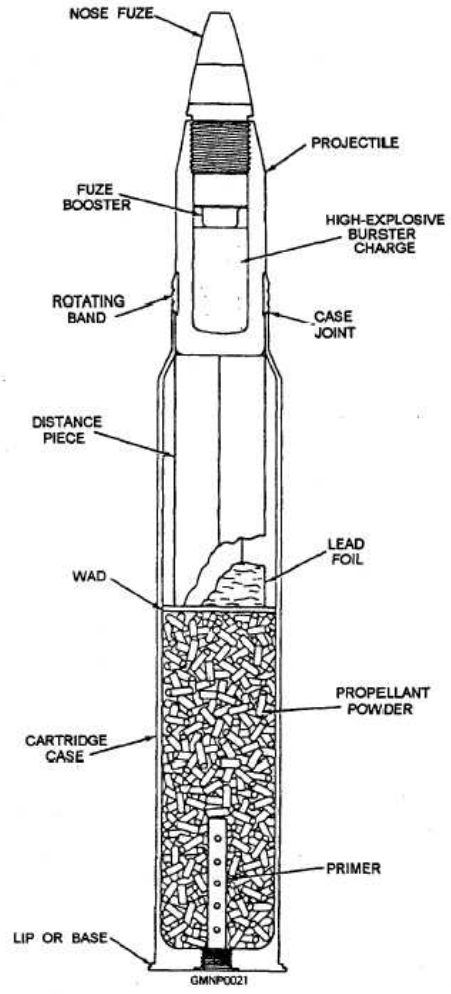
Description

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



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

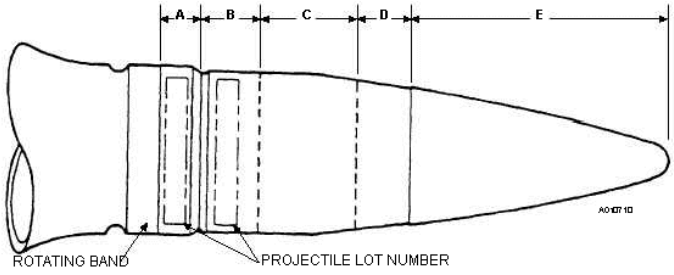
Usage: The PGU-28/B is the only projectile currently used by the Air Force and Navy for fixed wing air-to-air combat. This projectile is fired from the M61A1 gun system that is utilized by the F-14, F-15, F-16, and F/A-18 aircraft.

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

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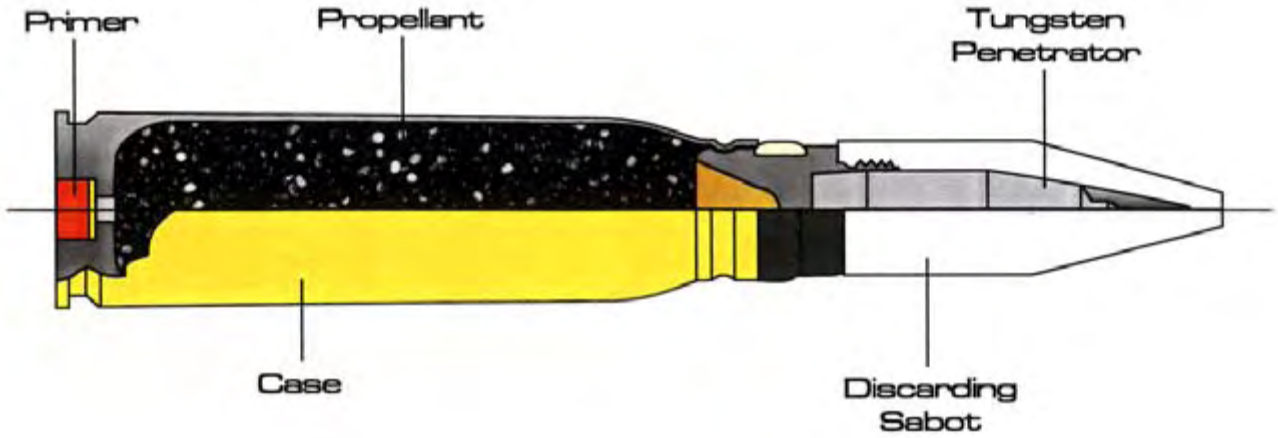
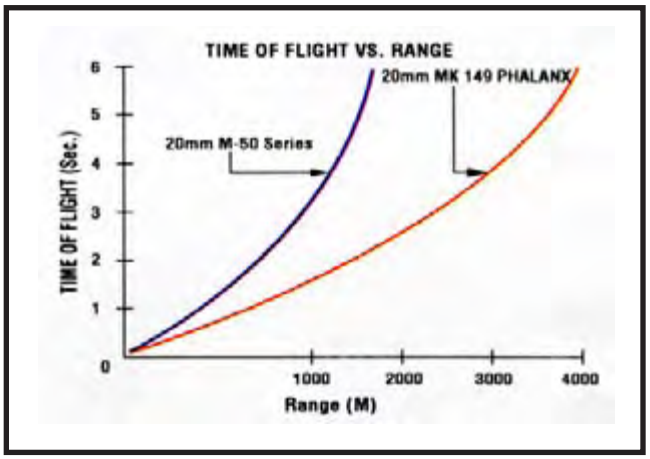
Approved for Public Release 09/30/05

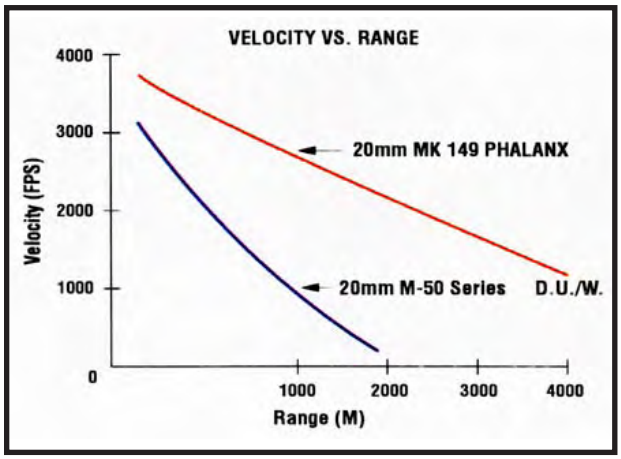
U.S. NAVY PHALANX AMMUNITION

20MM APDS-MK149

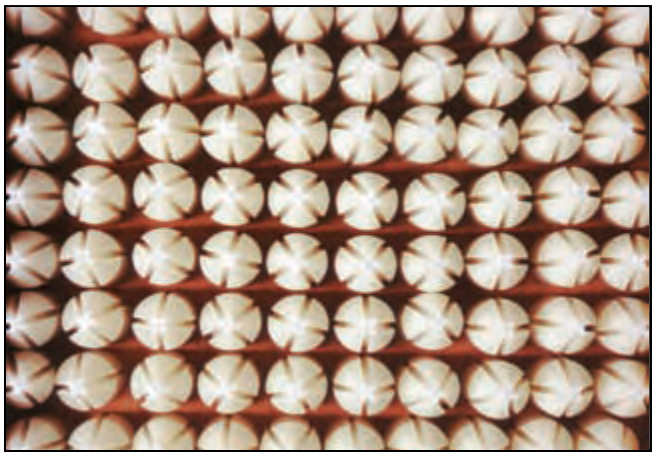




Short Time of Flight to Target



Optimized Exterior Ballistic Performance



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

GENERAL DYNAMICS
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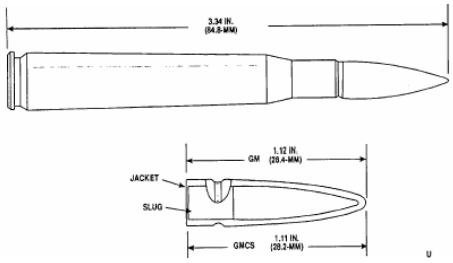
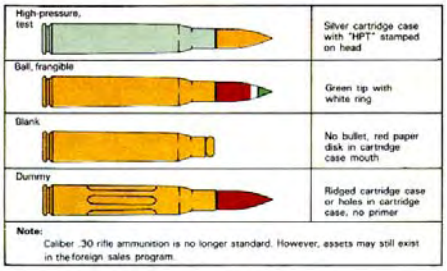
Ordnance Technical Data Sheet

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

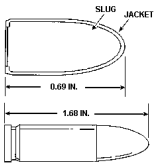
* **Single Base Propellant:** Single base propellants contain nitro cellulose as their chief ingredient. Single-base compositions are used as low-pressure propellants, such as those used in small arms ammunition. They may contain a stabilizer, inorganic nitrates, nitro-compounds, metallic salts, metals,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

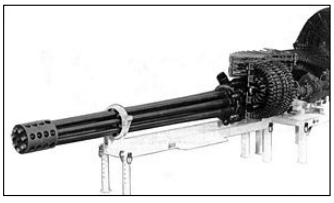
* Double-base propellant - Contains two explosive ingredients, commonly nitrocellulose and nitroglycerin.

Ordnance Technical Data Sheet
U.S. PROJECTILE, 30 MM

Nomenclature: 30 MM Projectile
Ordnance Family: Small Arms
DODIC: B109
Propellant: Nitrocellulose
Propellant weight: .083lbs
Item weight: 360 grams
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.

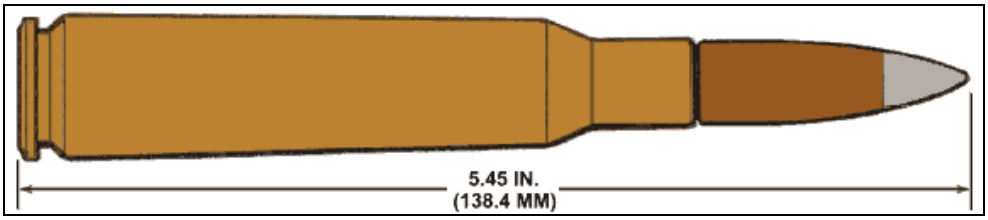
Description: Two airframes use a 30 mm round. The AH-64 Apache Helicopter which uses the M230 chain gun (see picture). The M788 is the practice 30mm round employed and is 30 x 113 mm with an effective range or 1,500 m and a max range of 4,500 m. Several ordnance variants are available, including: M788 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 grams
Diameter: 12.70 mm (.50 in)
Length: 138.40 mm (5.45 in.)
Projectile Weight: 622.5 grams
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 grams – WC846 - Nitrocellulose/Nitroglycerin
Cartridge weight: 392 grams
Projectile weight: 146 grams
Diameter: 7.62 mm
Cartridge Length: 2.8 in (71.1 mm)
Velocity: 2,750 fps (838 mps)

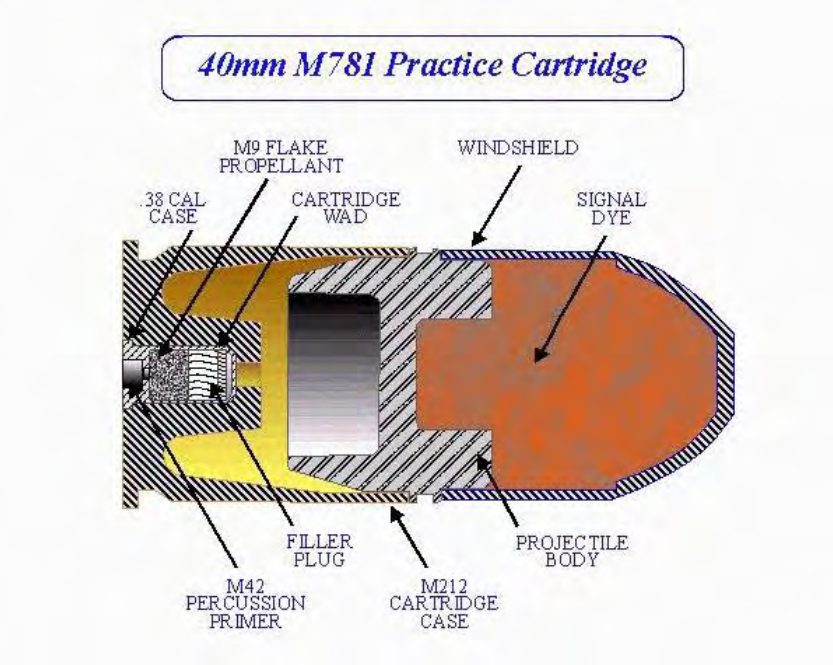
Usage: This cartridge is intended for use against personnel and unarmored targets.

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

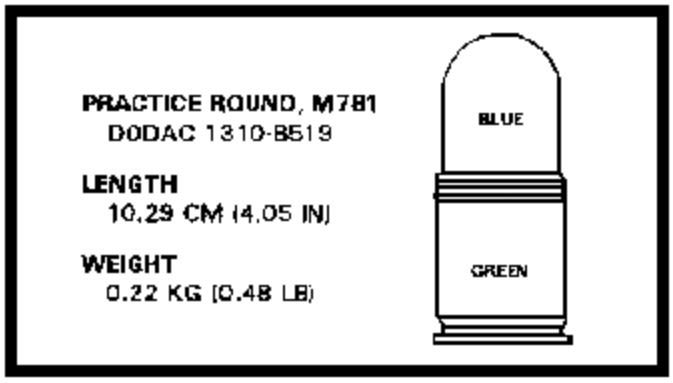


Figure 3-13. Practice round.

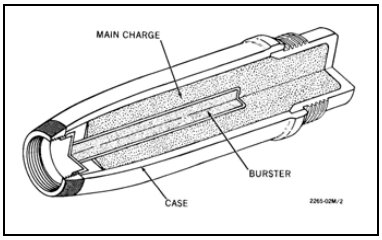
Ordnance Technical Data Sheet
U.S. ROCKET Warhead, 2.75 in, Practice, M156

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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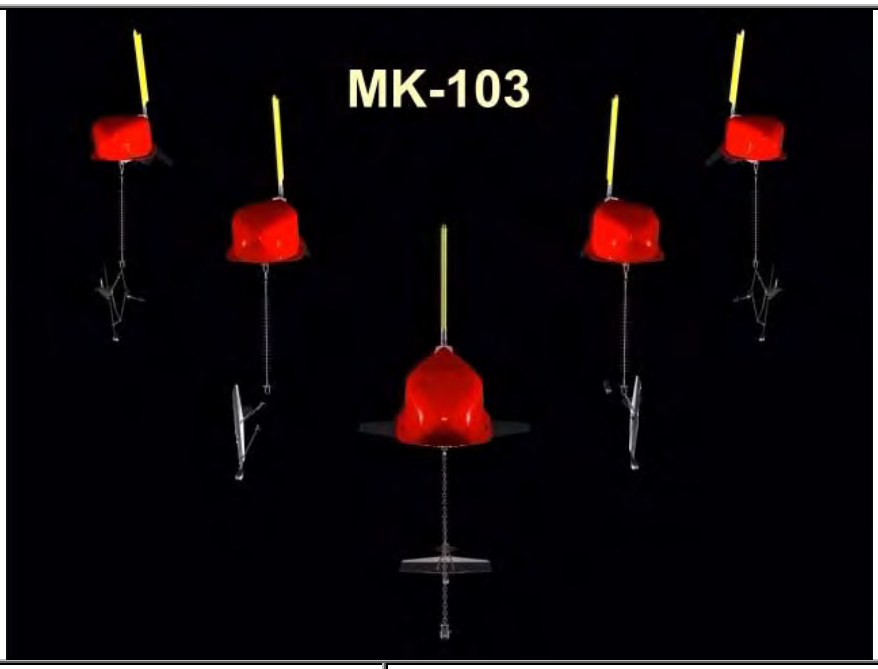
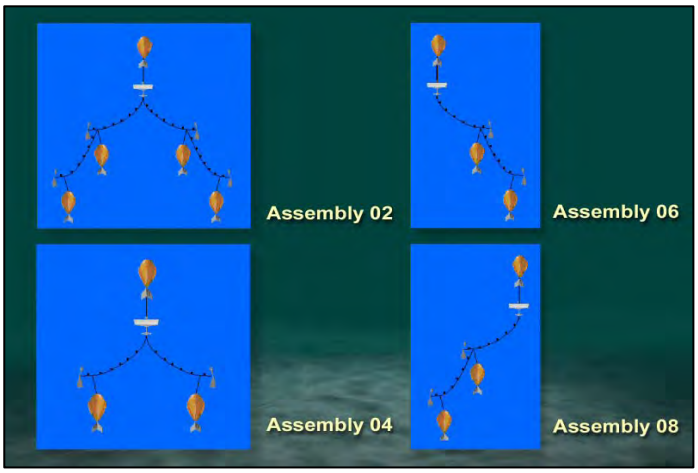
Mk-103 Mine Countermeasure System



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)

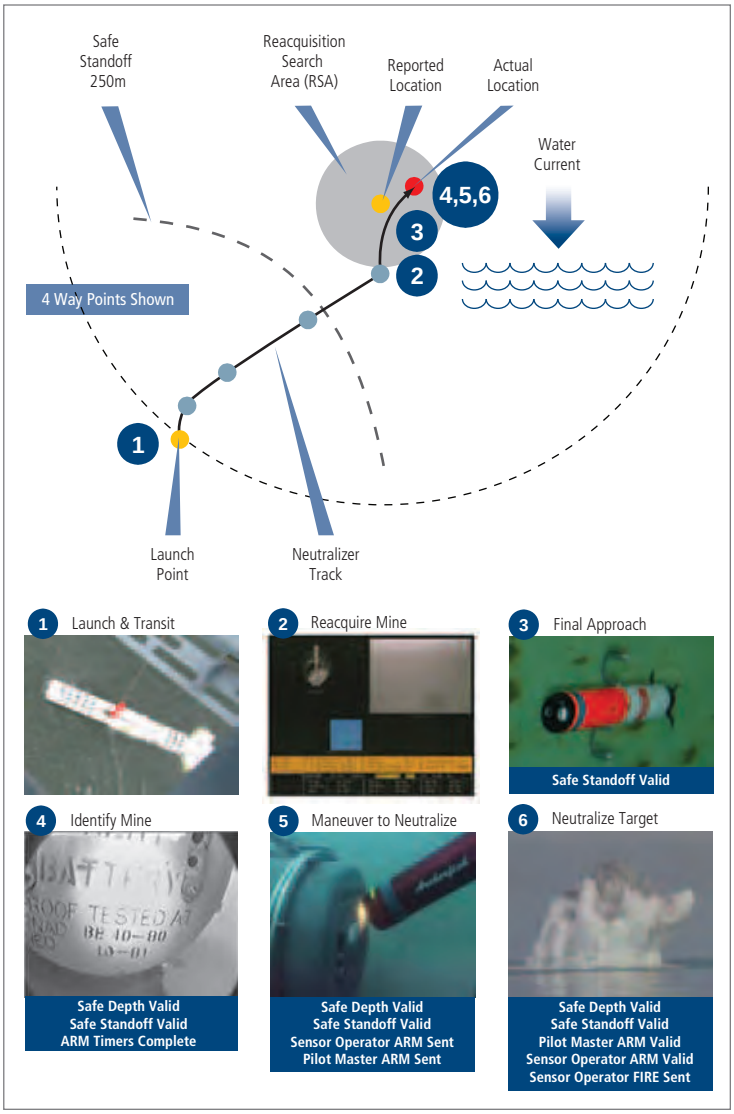
Launch Handling Subsystem Specifications

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



Raytheon Company
Integrated Defense Systems
50 Apple Hill Drive
Tewksbury, Massachusetts
01876 USA

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Raytheon

Customer Success Is Our Mission

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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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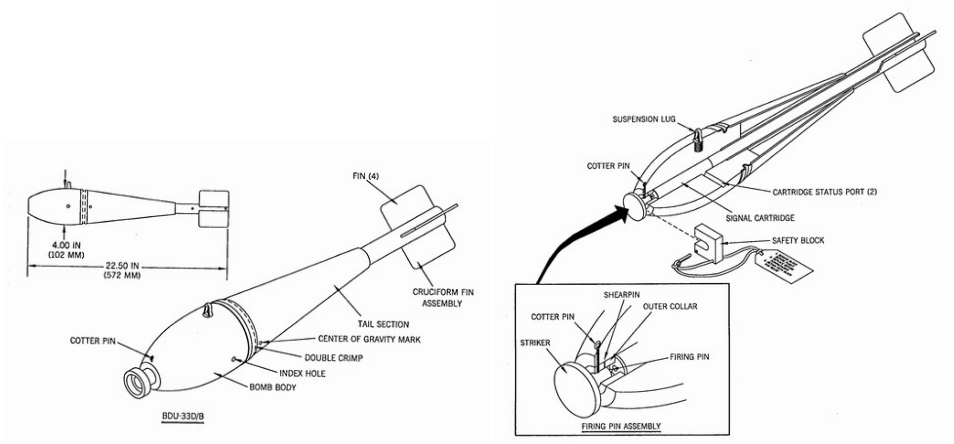
Ordnance Technical Data Sheet

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.

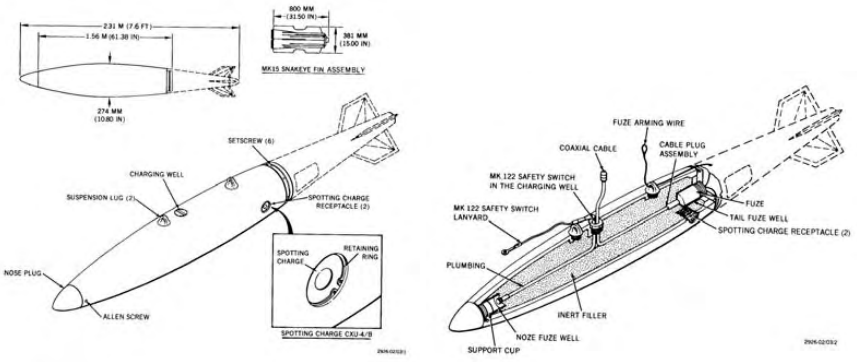
Reference: ORDATA Online.

***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.

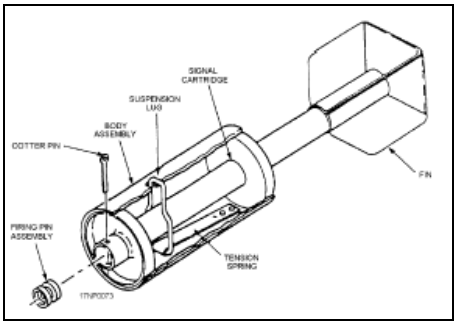
Nomenclature:	U.S. Bomb, Practice, BDU-48/B
Ordnance Family:	Bomb
DODIC:	E962
Filler:	Signal Cartridge, MK-4 MOD 3 or CXU-3A/B
Filler weight:	Not Provided
Item weight:	9.8 lbs
Diameter:	98.00 mm (3.86 in)
Length:	562.00 mm (22.13 in)
Maximum Range:	Not Provided
Fuze:	Impact or impact-inertia fired

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.

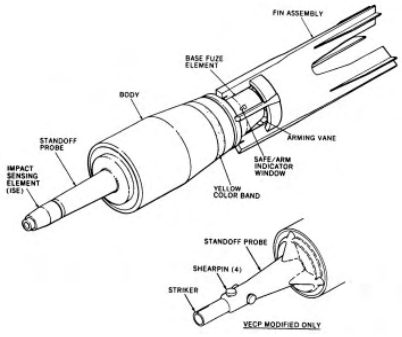
MK-20 Rockeye

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

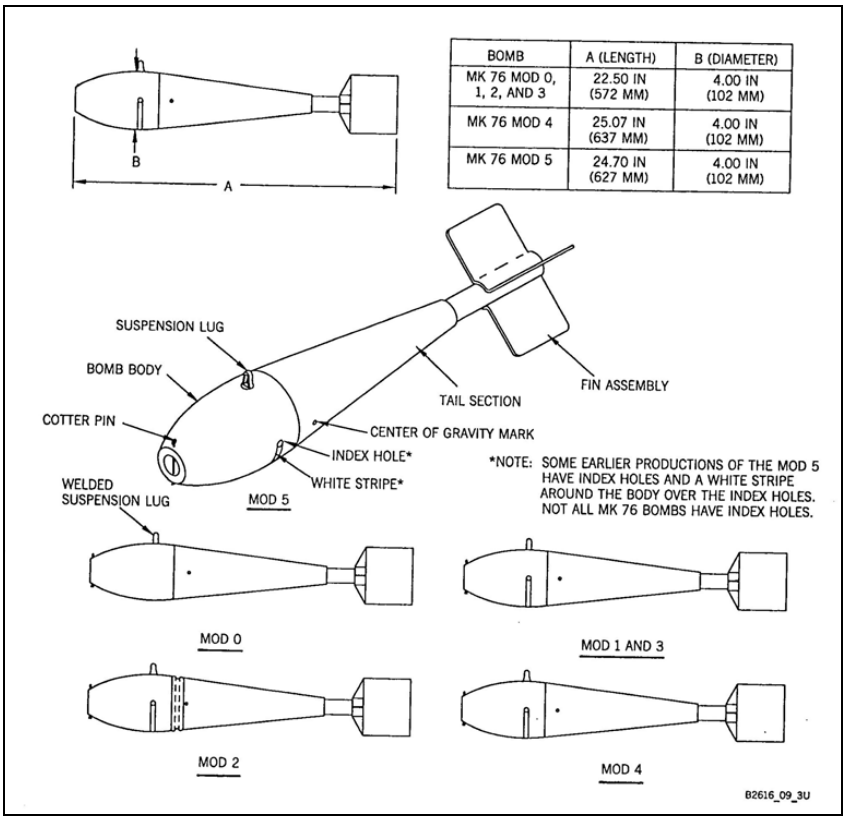
Usage: These are air-dropped, impact or impact-inertia-fired signal-generating practice bombs used to train aircrews in the bombing of surface targets.

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.

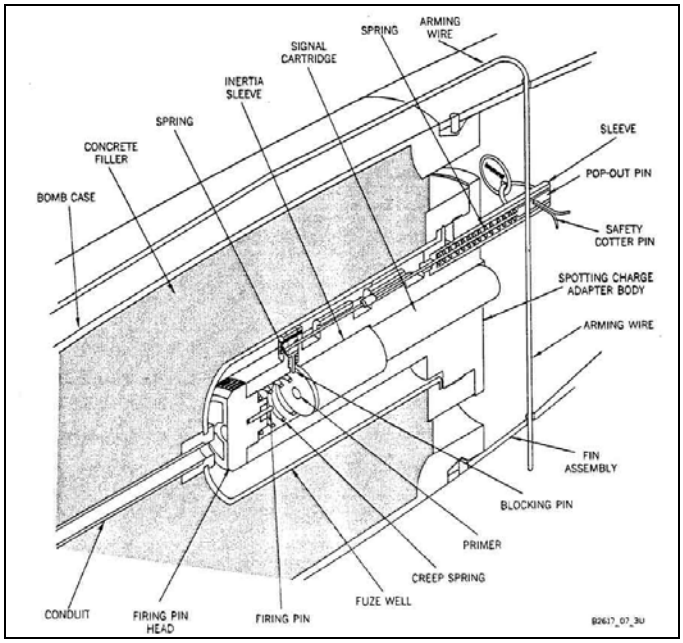
The MK-82 inert bomb is painted olive drab with a 38-millimeter (1.50-inch)-wide yellow band followed by a 51-millimeter (2.00-inch)-wide blue band on the nose. The markings SPOTTING CHARGE INSTALLED, (the date), and 6.25 POUNDS COMPOSITION C4, are stenciled in white on each side of the bomb next to 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.

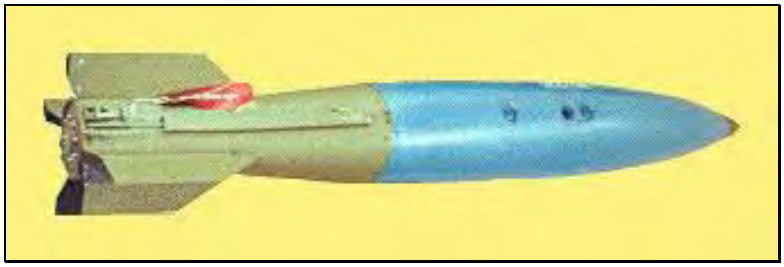
****Pyrotechnic** and screening devices contain combustible chemicals which, when ignited, rapidly generate a flame of intense heat, flash, infrared radiation, smoke or sound display (or combinations of these effects) for a variety of purposes. Compared to other explosive substances, pyrotechnics are 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



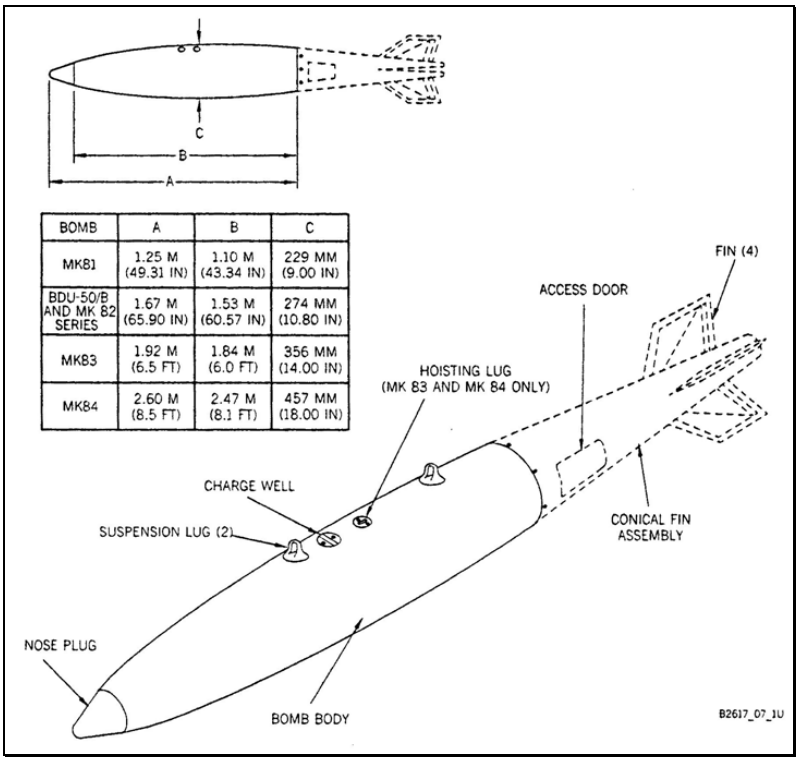
Nomenclature:	U.S. BOMB, 1,000-LB, PRACTICE, MK-83
Ordnance Family:	Bombs
DODIC:	E511
Explosive:	None
Item weight:	1,054 lbs
Diameter:	14 in (356 mm)
Length:	6.5 ft (1.92 m) nose to end of bomb body (does not include fin)
Frag Range:	20 m
Hazard:	Ejection; EMR; Frag; Explosive (HE); Movement; Proximity (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.

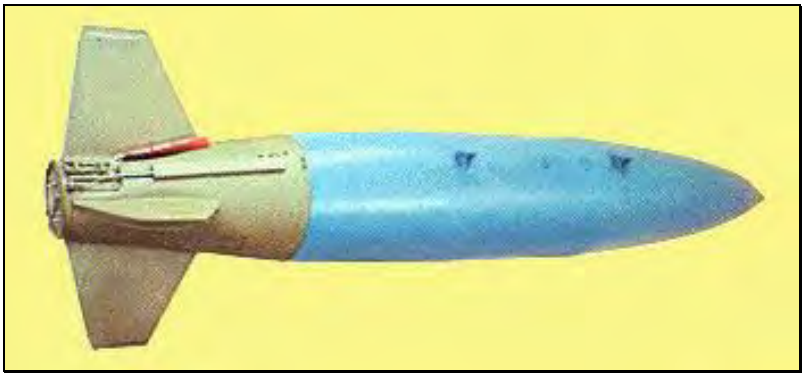
The MK-81 through MK-84 concrete- or sand-filled bombs are painted blue or olive drab, with white or black markings. Bombs fitted with a signal charge will have a brown or yellow band no wider than 76 millimeters (3.00 inches) circumscribed near the nose of the bomb. However, explosive-loaded practice 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

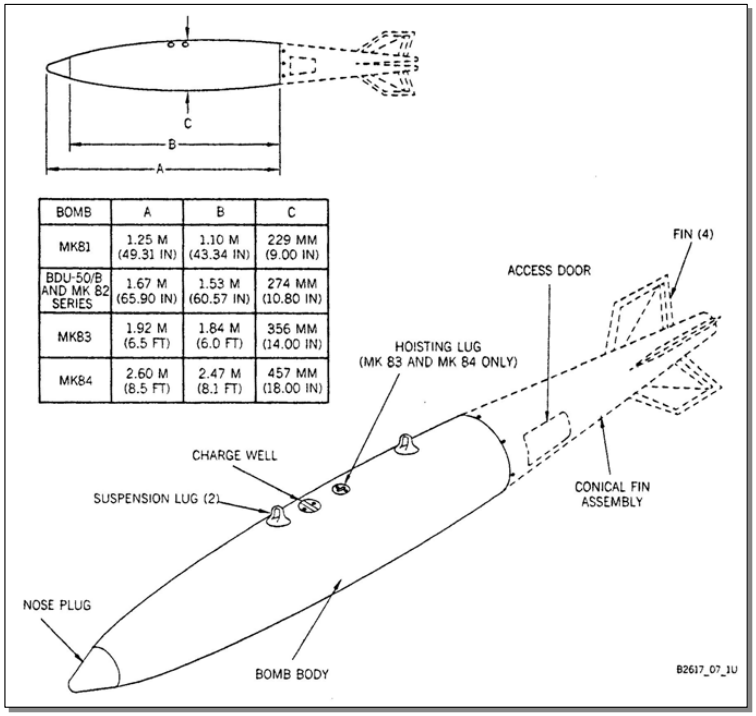


Nomenclature: U.S. BOMB, 2,000-LB, PRACTICE, MK 84
Ordnance Family: Bombs
DODIC: E9bd
Filler: Signal cartridge MK-4 Mod 3 (red phosphorus)
Item weight: 2,039 lbs
Diameter: 18 in (457 mm)
Length: 8.5 feet (2.6 m) without fin
Frag Range: 20 m
Hazard: Ejection; EMR; Frag; Explosive (HE); Movement; Proximity (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.

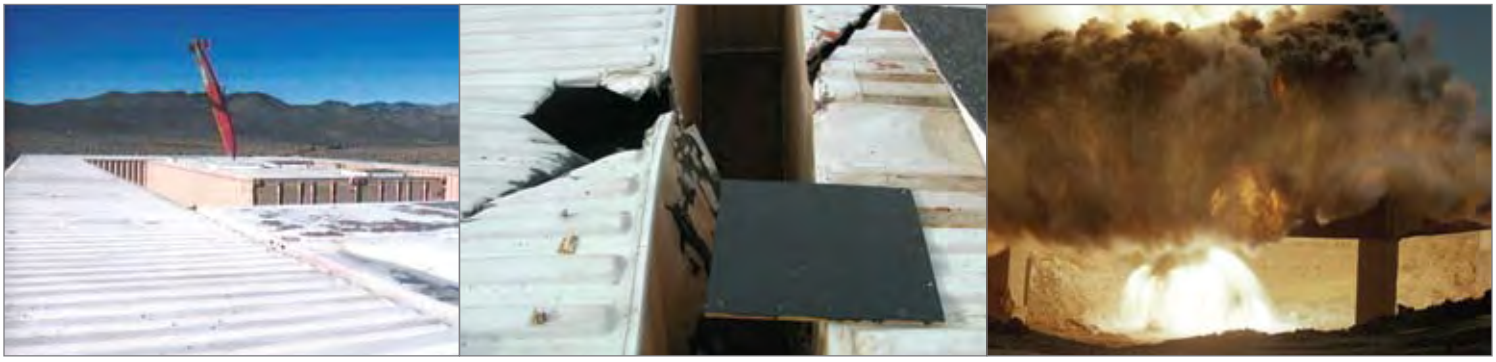
The family of JSOW precision strike weapons is modular in design with variants that can integrate different lethal submunitions, and a blast/ fragmentation unitary warhead and a hardened target penetrator that can be programmed for blast and fragmentation effects. JSOW targets vary from all types of 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.

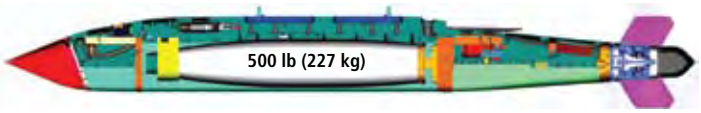
Since 1999, JSOW has been combat proven in operations Southern Watch, NATO Allied Force, Enduring Freedom and Iraqi Freedom with more than 400 weapons employed. More than 3,400 JSOWs have been produced.

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

PUBLIC INVOLVEMENT

F1: CORRESPONDENCE FROM GOVERNMENTAL AGENCIES, ORGANIZATIONS, AND PRIVATE ENTITIES AND INDIVIDUALS

During the public review process for the DEIS, 52 comments were received; 10 from government agencies, 37 from state agencies, and five from individuals. No comments were received from organizations.

F2: PUBLIC HEARINGS

Four public hearings were held 28-31 July 2008 to receive public comments on the JAX Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS). The hearings were held in Charleston, SC.; Beaufort, SC; Savannah, GA; and Jacksonville, FL.

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Correspondence from Governmental Agencies, Organizations, and Private Entities and Individuals on JAX Draft EIS/OEIS

Comment Tracking Code	Date	Affiliation	Author
Federal Agencies			
FA1	15 August 2008	U.S. Environmental Protection Agency	Heinz J. Mueller
FA2	11 August 2008	Marine Mammal Commission	Timothy J. Ragen
FA3	6 August 2008	Department of the Interior, Office of Environmental Policy and Compliance	Gregory Hogue
FA4	26 September 2008	Department of Army, Jacksonville District Corps of Engineers	Paul L. Grosskruger
State Agencies			
SA1	6 August 2008	South Carolina Department of Health and Environmental Control	Michelle Wilson
SA2	25 July 2008	Georgia Department of Natural Resources, Wildlife Resources Division	Dan Forster
SA3	23 July 2008	Georgia State Parks and Historic Sites	Eric VanDeGenachte
SA4	1 August 2008	Georgia State Clearinghouse	Barbara Jackson
SA5	8 August 2008	Georgia Coastal Resources Division	Susan Shipman
SA6	12 August 2008	Florida Department of Environmental Protection	Sally B. Mann
SA7	19 August 2008	Florida Environmental Quality Division	Robert Steven Pace
SA8	28 August 2008	North Carolina Department of Administration	Valerie W. McMillan
Organizations			
O1		no organization comments received	
Private Entities/Individuals			
P1	27 June 2008		jeanpublic (anonymous)
P2	30 June 2008	HQ USMC PM AAA	Joseph Finch
P3	28 July 2008		Larry Gelner
P4	31 July 2008		Thomas Wright
P5	11 August 2008		Paul Kersery

COMMENT LETTERS
JAX Draft EIS/OEIS
Comment Period 28 June 08 through 11 August 08

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

Comment FA1

August 15, 2008

Cheryl McGarrity
JAX EIS/OEIS PM
Code EV22CM
6506 Hampton Boulevard
Norfolk, Virginia 23508-1278

SUBJECT: Draft Environmental Impact Statement/Overseas Environmental Impact Statement for the Navy's Proposed Training at the Jacksonville Range Complex in North Carolina, South Carolina, Georgia, and Florida; CEQ Number 20080115

Dear Ms. McGarrity:

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 Jacksonville and Charleston operating areas, hereafter referred to as the Jacksonville (JAX) Range Complex.

A range complex, such as the JAX 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 JAX Range Complex geographically encompasses offshore, nearshore, and onshore operating areas and training ranges. This complex is made up of approximately 50,090 square nautical miles (nm^2) of sea space and 62,596 nm^2 of SUA off the coasts of North Carolina, South Carolina, Georgia, and Florida, as well as 20 square miles of inland ranges and associated Restricted Airspace of the Rodman Range and Lake George Range area in north-central Florida.

The Navy has identified the need to support and conduct current and emerging training and RDT&E operations in the JAX Range Complex. The proposed action does not include major changes to JAX 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 JAX 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 JAX 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 some increases in operations. Alternative 2 also includes the elimination of live bombing exercises and designation of specific 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 and their accumulation over time. 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 requests additional monitoring commitments to address these concerns. EPA offers the following additional 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 JAX 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.

FA1-01

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 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

FA1-02

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.

Hazardous Materials

FA1-03

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. 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.

FA1-04

On a related issue, range maintenance at Rodman Range is performed annually for the 1,000-foot diameter around the center of the target and every five years for the 3,000-foot diameter, which reduces the accumulation of military expended materials. EPA has concerns about the potential environmental impacts of the recovery efforts, particularly at Rodman Range. The Draft EIS is not clear on the nature of these recovery operations and the potential for environmental/wetlands impacts from clean-up operations. Could there be impacts on nesting and/or migrating birds, erosion, wetland vegetation impacts, suspended solids, etc? EPA recommends that these issues related to recovery efforts be discussed in the Final EIS.

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.

FA1-05

Since there have been no specific, quantitative studies of the extent and impacts of military expended material (MEM) in the JAX 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

FA1-06

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.

We rate this document EC-2 (Environmental Concerns). Enclosed is a summary of definitions for EPA ratings. We have concerns that the proposed action identifies the potential for impacts to the environment that should be avoided/minimized. We appreciate the opportunity to review 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 further.

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.

MARINE MAMMAL COMMISSION
4340 EAST-WEST HIGHWAY, ROOM 700
BETHESDA, MD 20814-4447

Comment FA2

11 August 2008

Naval Facilities Engineering Command, Atlantic Division
Attention: Code EV22CM (JAX EIS/OEIS PM)
6506 Hampton Boulevard
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) provided by the Navy to evaluate its planned training and defense-related research on the Jacksonville Range Complex Operating Area. The DEIS covers the potential environmental impacts over a 10-year period associated with Navy Atlantic Fleet training; research, development, testing and evaluation activities; and related range enhancements (including infrastructure improvements). Covered activities include vessel movements, aircraft overflights, mine warfare activities, weapons firing, high-explosive ordnance, and missile exercises. The DEIS does not include mid-frequency sonar training and exercises, which are covered in the environmental impact statement for the Atlantic Fleet Active Sonar Training activities. The Navy analyzes three alternative scenarios for the types and amount of activity on the Jacksonville operating area. The "no-action" alternative includes historical levels of activity plus surge effort consistent with the Fleet Readiness Training Plan. Alternative 1 includes the no-action alternative plus increased operational training, expanded warfare missions, changes in force structure, and minimal enhancements to meet the objectives of the proposed action. Alternative 2 includes Alternative 1 plus additional mine warfare training capabilities and additional enhancements to the range complex to meet future requirements. The Navy prefers Alternative 2.

The Marine Mammal Commission notes that in the recent past the Navy has made considerable progress in the development of a model (i.e., NODE report) for estimating the exposure of marine mammals to noise generated by Navy activities. The model appears to be a highly sophisticated effort to combine existing knowledge of marine mammal abundance and distribution with patterns of sound generation and propagation. The Marine Mammal Commission considers this to be ground-breaking science and commends the Navy for making such a contribution to our general understanding of the effects of anthropogenic sound on marine mammals and ecosystems. The second of the Commission's two recommendations below focuses on following up on the development of this model.

RECOMMENDATIONS

With regard to proposed activities at the Jacksonville Range Complex Operating Area, the Commission has identified two elements of the DEIS in need of further consideration and revision: (1) the no-action alternative does not comply with guidance from the Council on Environmental Quality and (2) the Navy report on marine mammal density estimates for operational areas would benefit from peer review. To address these concerns, the Marine Mammal Commission recommends that the Navy—

PHONE: (301) 504-0087
FAX: (301) 504-0099

- resubmit for public review a revised DEIS including (1) a true no-action alternative that consists solely of the current level of activity and fully analyzes the environmental effects of that level, (2) a new alternative based on a reduced level of activity, (3) a new alternative based on the current level of activity plus surge activities (described and analyzed in detail), and (4) any additional alternatives that the Navy wishes to consider and that are necessary to sharply define the issues and describe environmental effects, and

FA2-01

- submit the NODE report to independent scientific review in keeping with standard scientific process and make the report of that independent review panel available to the public before the Navy and National Marine Fisheries Service complete the final environmental impact statement and consider any associated rulemaking for incidental taking or incidental harassment authorization under the Marine Mammal Protection Act.

FA2-02

RATIONALE

Recommended revisions to the DEIS are as follows.

The No-Action Alternative

The Marine Mammal Commission has noted on a number of occasions that the Navy is misusing the "no-action" label. The Council on Environmental Quality (CEQ) has provided direction on the use of that term as set forth in question 3 of its "40 FAQs within the Memorandum for Federal NEPA Liaisons, Federal, State, and Local Officials and other Persons Involved in the NEPA Process" (http://nepa.gov/nepa/regs/40/1-10.HTM#3). That document compares two interpretations of the term, the first being that no management is undertaken, which does not apply in this case. The second interpretation is explained as involving "an action ... where ongoing programs initiated under existing legislation and regulations will continue, even as new plans are developed. In these cases "no action" is 'no change' from current management direction or level of management intensity." Here, "the 'no action' alternative may be thought of in terms of continuing with the present course of action until that action is changed" and "alternatives would include management plans of both greater and lesser intensity, especially greater and lesser levels of resource development."

We believe that the Navy's use of the term in this DEIS is improper on two counts. First, the DEIS does not include alternatives of greater and lesser intensity—all of its alternatives are of greater intensity. Secondly, its no-action alternative extends beyond current levels to include "surge" activities that have not been previously analyzed. That is, the level of activity covered under this alternative—and the associated environmental risk—are not the same as historical levels and would not meet even the most liberal interpretation of "no action."

Further, in the Executive Summary (page ES-4) and in the fuller analysis of options (pages 2-1 and 2-18), surge activities are described generally as constituting an increase in training and

research, development, testing, and evaluation activities to support the Fleet Readiness Training Plan (and therefore not a baseline historical activity) but are not described in detail or quantified, either in terms of the type and number of new activities or their potential environmental effects. Thus, the alternatives presented by the Navy do not compare a "no action" or "continued baseline" alternative to two alternatives of increased impact but instead comprise three alternatives that all involve incompletely described but increased effort and effects relative to historical levels. Moreover, the impacts of historical activities have not been evaluated and described in a National Environmental Policy Act (NEPA) analysis. In our view, the Navy's approach is inconsistent with and fails to meet the standards and intent of NEPA analysis. For that reason, the Marine Mammal Commission recommends that the Navy resubmit for public review a revised DEIS including (1) a true no-action alternative that consists solely of the current level of activity and fully analyzes the environmental effects of that level, (2) a new alternative based on a reduced level of activity, (3) a new alternative based on the current level of activity plus surge activities (described and analyzed in detail), and (4) any additional alternatives that the Navy wishes to consider and that are necessary to sharply define the issues and describe environmental effects.

NODE Animal Density Estimates

The foundation of the Navy's estimation of risk to marine mammals depends on a regionalized estimate of animal density derived from a contracted 2007 report entitled "Navy OPAREA density estimates (NODE) for the Southeast OPAREAS: VACAPES, CHPT, JAX/CHASN and Southeastern Florida and AUTEC-Andros. Final Report. Contract Number N62470-02-D-9997" (referenced on page 7-23 of the Jacksonville DEIS as "Navy, 2007b"). As noted previously, the Commission's initial review of this report indicates it is of generally high quality in terms of methods for integrating existing information into a quantitative estimate of regional animal density. The estimation procedure or model will almost certainly contribute significantly to our understanding of sound effects on marine mammals.

At the same time, the model constitutes a new area of scientific investigation, and the methods are still a matter of scientific discussion and debate within the expert community. For that reason, we believe it is critical that the Navy obtain adequate independent peer review of this report before applying it in the DEIS or using it to estimate take levels under the Marine Mammal Protection Act. The Marine Mammal Commission therefore recommends that the Navy submit the NODE report to independent scientific review in keeping with standard scientific process (e.g., as practiced by the National Research Council and most professional periodicals such as *Science* and *Nature*), and make the report of that independent review panel available to the public before the Navy and National Marine Fisheries Service complete the final environmental impact statement and consider any associated rulemaking for incidental taking or incidental harassment authorization under the Marine Mammal Protection Act.

Please contact me if you have any questions or wish to discuss our recommendations and comments.

Sincerely,

Timothy J. Ragen, Ph.D.
Executive Director

Cc: Craig Johnson, NOAA/NMFS OPR
Capt. Larry Rice, CNO N45
Hon. Donald Schregardus, DASN E

JAX Website Comments

Name: Gregory Hogue

Organization: Department of the Interior

Comment #: FA3

Date: August 06, 2008

Comment: FA3-01 The Department of the Interior has reviewed the DEIS associated with Testing and Training Activities in the Jacksonville Range Complex. We have no comments to offer for your consideration.

My contact information is below if you have any questions

Gregory Hogue
Regional Environmental Officer
Office of Environmental Policy and Compliance Department of the Interior
75 Spring St., SW, Room 1144
Atlanta, GA 30303
404-331-4524 (ofc)
404-331-1736 (FAX)
gregory_hogue@ios.doi.go

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

Comment FA4

REPLY TO
ATTENTION OF

CESAJ-PD-EC (1105-2-10a)

26 SEP 2008

MEMORANDUM FOR Commander, U.S. Fleet Forces Command, Department of the Navy, 1562 Mitscher Avenue, Suite 250, Norfolk, Virginia 23551-2487

SUBJECT: Comments on the Draft Environmental Impact Statement-JAX Range Complex.

FA4-01

1. If the proposed activity does not involve ocean disposal, dredging, building of structures in the water, or the discharge of dredged or fill material; there would be no requirement for a regulatory permit from this office. In accordance with part 334 of Title 33 of the Code of Federal Regulations, the Navy may request the U.S. Army Corps of Engineers to establish a "danger zone" or a "restricted area" to "provide security for Government property and/or protection to the public from the risks of damage or injury arising from the Government's use of that area". The point of contact for regulatory matters is Mr. Jon Griffin at 904 232-1680.

2. The proposed activity apparently has no direct impact on any of our civil works projects. This office will continue to work with the Navy with respect to common issues such as impacts to sea turtles, right whales, essential fish habitat, and other protected resources.

3. As always, we are available to provide the Navy technical support with respect to environmental, engineering, and permitting matters. The point of contact for technical support is Mr. Todd Fritz at 904 232-2409.

PAUL L. GROSSKRUGER
Colonel, Corps of Engineers
Commanding

JAX Website Comments

Name: Michelle Wilson

Organization: South Carolina Department of Health and Environment

Comment #: SA1

Date: August 06, 2008

Comment: SA1-01 The South Carolina Department of Health and Environmental Control (SCDHEC) acknowledges the completeness of the Navy's assessment of exercises on air quality in South Carolina. SCDHEC appreciates this completeness, specifically with regard to regulatory compliance.

If SCDHEC observes any abnormalities in air monitoring data that could be noted as an exceptional event, SCDHEC may request the Navy's assistance in provision of pertinent information regarding exercises that occurred during the relevant time period. This information would assist DHEC in determining whether the exercises contributed to the abnormal air monitoring data.

Thank you for the opportunity to submit these comments.

Noel Holcomb, Commissioner
Dan Forster, Director

Georgia Department of Natural Resources
Wildlife Resources Division

2070 U.S. Highway 278, S.E., Social Circle, Georgia 30025
(770) 918-6400

Comment SA2

July 25, 2008

Naval Facilities Engineering Command
Atlantic, Code EV22CM
6506 Hampton Blvd.
Norfolk, VA 23508-1278

Re: Draft Environmental Impact Statement (DEIS) / Overseas EIS (OEIS) evaluating potential environmental effects associated with testing and training activities in the Jacksonville (JAX) Range Complex.

Dear Sir or Madam:

Thank you for the opportunity to review the Draft Environmental Impact Statement (DEIS) / Overseas EIS (OEIS) for the Jacksonville (JAX) Range Complex. This document only addresses training and operations in waters off Georgia's coast. The document does not include an EIS for the Townsend Bombing Range (to be completed by the Marine Corps at a later date.) Therefore, in this letter we will only address issues related to marine resources that may be impacted by offshore training and operations.

Coastal waters within the Charleston and Jacksonville OPAREAs provide seasonal habitat for the highly endangered North Atlantic right whale (*Eubalaena glacialis*). Certain activities outlined in the DEIS may impact right whales negatively, most notably: 1) vessel transits, 2) ordnance detonations and 3) sonar operations1. The mitigation strategy outlined in the DEIS primarily entails operating in accordance with a Biological Opinion2 issued by NMFS in 1997. While some of the mitigation measures in the previous Biological Opinion are valid today (e.g. prohibition on north-south vessel transits), additional considerations are warranted given changes in our understanding of right whale demographics and habitat use. For example, aerial surveys and passive acoustic detection studies have shown that right whales are present throughout coastal South Carolina, Georgia and northeast Florida from December-April each year. Published studies have shone new light on the relationships between breeding female survival and population recovery (Caswell et al. 1999, Fujiwara and Caswell 2001) and ship speed and whale mortality (Laist et al. 2001, Vanerlaan and Taggart 2006). Moreover, NMFS published a revised Recovery Plan for the North Atlantic Right Whale in 2005. Given these changes, the Georgia DNR recommends that the Navy obtain a revised Biological Opinion from NMFS and integrate NMFS' recommendations into the Final EIS. The revised Biological Opinion and Final EIS should consider the following:

SA2-01

- North Atlantic right whales inhabit coastal waters off Florida and Georgia during November 15-April 15, and South Carolina and North Carolina during November 1-April 30.

SA2-02

- Right whales inhabit waters within 30 nautical miles of shore along the Georgia, North Carolina, South Carolina and northeast Florida coasts throughout the period listed above. This distribution is more expansive than the currently delineated Right Whale Southeast U.S. Critical Habitat. Vessel- and ordnance-related mitigation measures should apply to the Southeast U.S. Critical Habitat and all other areas that right whales are known to inhabit.

SA2-03

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1 The Navy addressed impacts of sonar on marine mammals in the separate AFAST DEIS/OEIS. The Georgia DNR commented on these impacts in a separate letter to the Navy during the AFAST DEIS/OEIS comment period.
2 Biological Opinion: Navy Activities off the Southeastern U.S. along the Atlantic Coast (NMFS 1997)

- The DEIS acknowledges that more information is needed regarding right whale distribution in deeper waters along the Southeast U.S. continental shelf (i.e. greater than 30 nautical miles offshore, the current eastern limit of aerial survey transect lines). The Navy should fund and implement an alternative detection system (e.g. passive acoustic detection) to determine the extent to which right whales inhabit waters seaward of 30 nautical miles. Such a system should be implemented in all areas where exercises are to be conducted. Mitigation measures should be followed in all areas inhabited by right whales.

SA2-04

SA2-05

- We applaud the Navy for their continued support of the Early Warning System (EWS) aerial survey system. The EWS surveys form the backbone of right whale research and management in the Southeast U.S (e.g. photo-ID data collection, detection of dead and entangled whales). The Navy should continue its support for the EWS in addition to any funding allocated to alternative detection systems (e.g. passive acoustic detection) or other right whale-related research. The Navy should also ensure that increases in Navy exercises do not impede EWS survey overflights (i.e. airspace closures).

SA2-06

- Navy vessels should operate at speeds of 10 knots (or minimum safe speed) when transiting through areas inhabited by right whales during the right whale season. Exercises requiring faster vessel speeds should be conducted at the minimum required speed. Right whales spend the majority of their time subsurface, making them difficult to detect visually. As such, reliance on shipboard lookouts as the primary means of reducing right whale collisions is not an effective alternative to vessel speed reductions.

SA2-07

- Detonation of ordnance should be prohibited in locations inhabited by right whales during the right whale season.

SA2-08

- Right whale mortality investigations are the primary means of monitoring anthropogenic impacts on right whales. Locating carcasses, towing carcasses to shore and locating appropriate sites for dissection and burial are complicated endeavors that require extensive cooperation and resources. The Navy should cooperate with NMFS and state natural resources agencies to facilitate right whale mortality investigations when dead right whales are located (e.g. providing towing vessels, providing access to Navy property for dissection and burial).

SA2-09

Again, thank you for giving us the opportunity to review this project. Please let me know if I can be of further assistance.

Sincerely,

Dan Forster

DF:km

Georgia Department of Natural Resources
Parks, Recreation and Historic Sites Division
Becky Kelley, Director
2 MLK, Jr. Drive, Suite 1352, Atlanta, Georgia 30334
PHONE 404/656-9448 FAX 404/651-5871
director@dnr.state.ga.us

Comment SA3

Wednesday 23 July 2008

M.R. Harrell
Assistant Deputy Chief of Staff for
Operational Readiness and Training
DOD – Department of the Navy
1562 Mitscher Ave, Ste 250
Norfolk, VA 23551-2487

Dear Mr. Harrell,

This is a response from the Parks, Recreation and Historic Sites Division of the Georgia Department of Natural Resources (PRHSD) as it relates to the Jacksonville Range Complex EIS/OEIS as requested in a letter from M.R. Harrell dated June 27, 2008.

The primary interest of the PRHSD is related to the use and operation of the Townsend Range Complex.

The Jacksonville Range Complex EIS/OEIS does not address the Townsend Range Complex (per Table 1.4.1 on page 1-10). While the PRHSD does steward properties proximate to the "Warning Areas" of the Jacksonville OPAREA and Charleston OPAREA, the activities outlined in the EIS/OEIS are not expected to impact those properties.

SA3-01 As a result, the PRHSD has no outstanding comments to offer on the EIS/OEIS and declares **a finding of no significant impact** on the resources and interests of the PRHSD is anticipated from the alternatives outlined in the EIS/OEIS.

SA3-02 The PRSHD understands that the Marine Corps will be publishing an Environmental Assessment (EA) for the Townsend Range Complex sometime around August 2008 (per page 1-17). We would be interested in receiving notice of its availability.

SA3-03 As we understand it, the Townsend Range Complex is not authorized for live ordnance and that only inert bombs are authorized. The PRHSD would be interested in any changes related to the future use of live ordnance at the Townsend Range Complex.

Thank you for the opportunity to comment.

Sincerely,

Eric VanDeGenachte

Eric VanDeGenachte
Special Projects Manager

C:
Becky Kelley, Director PRHSD
Wally Woods, Chief of Operations, PRHSD

Comment SA4

OFFICE OF PLANNING AND BUDGET

Sonny Perdue
Governor

Trey Childress
Director

GEORGIA STATE CLEARINGHOUSE MEMORANDUM
EXECUTIVE ORDER 12372 REVIEW PROCESS

TO: Commander
NFEC, Atlantic
Code EV22CM
6506 Hampton Blvd.
Norfolk, VA 23508-1278

FROM: Barbara Jackson BJ
Georgia State Clearinghouse

DATE: 8/1/2008

SUBJECT: Executive Order 12372 Review

APPLICANT: Dept. of the Navy

PROJECT: DEIS/OEIS: Jacksonville (JAX) Range Complex

STATE ID: GA080701007

FEDERAL ID: 5090 Ser N77/2559

SA4-01 The State level review of the above referenced document has been completed. As a result of the environmental review process, the activity this document was prepared for has been found to be consistent with state social, economic, physical goals, policies, plans, and programs with which the State is concerned.

Additional Comments: The applicant/sponsor is advised to note additional comments from DNR's Historic Preservation Division.

/bj
Enc.: DNR/EPD, July 31, 2008
HPD, July 9, 2008

Form SC-4-EIS-4
January 1995

GEORGIA STATE CLEARINGHOUSE MEMORANDUM
EXECUTIVE ORDER 12372 REVIEW PROCESS

TO: Barbara Jackson
Georgia State Clearinghouse
270 Washington Street, SW, Eighth Floor
Atlanta, Georgia 30334

FROM: DR. CAROL COUCH [signature: Carol A Couch]
DNR/EPD/DIRECTOR'S OFFICE

SUBJECT: Executive Order 12372 Review

APPLICANT: Dept. of the Navy

PROJECT: DEIS/OEIS: Jacksonville (JAX) Range Complex

STATE ID: GA080701007

FEDERAL ID: 5090 Ser N77/2559

DATE: 7.31.08

☒ This notice is considered to be consistent with those state or regional goals, policies, plans, fiscal resources, criteria for developments of regional impact, environmental impacts, federal executive orders, acts and/or rules and regulations with which this organization is concerned.

This notice is not consistent with:

☐ The goals, plans, policies, or fiscal resources with which this organization is concerned. (Line through inappropriate word or words and prepare a statement that explains the rationale for the inconsistency. (Additional pages may be used for outlining the inconsistencies. Be sure to put the GA State ID number on all pages).

☐ The criteria for developments of regional impact, federal executive orders, acts and/or rules and regulations administered by your agency. Negative environmental impacts or provision for protection of the environment should be pointed out. (Additional pages may be used for outlining the inconsistencies. Be sure to put the GA State ID number on all pages).

☐ This notice does not impact upon the activities of the organization.

NOTE: Should you decide to FAX this form (and any attached pages), it is <u>not</u> necessary to mail the originals to us. [404-656-7916]

RECEIVED
JUL 31 2008
GEORGIA
STATE CLEARINGHOUSE

Form SC-3
Sept. 2007

Georgia Department of Natural Resources

Noel Holcomb, Commissioner

Historic Preservation Division

W. Ray Luce, Division Director and Deputy State Historic Preservation Officer
34 Peachtree Street, Suite 1600, Atlanta, Georgia 30303
Telephone (404) 656-2840 Fax (404) 657-1040 http://www.gashpo.org

MEMORANDUM

TO: Barbara Jackson
Georgia State Clearinghouse
Office of Planning and Budget
270 Washington Street, SW, Eighth Floor
Atlanta, Georgia, 30334

FROM: Elizabeth Shirk
Environmental Review Coordinator
Historic Preservation Division

RE: Finding of "No Historic Properties Affected"

PROJECT: **Jacksonville Range Complex-JAX**
Federal Agency: Navy
Applicant: Navy
GA-080701-007

COUNTY: **Statewide, Georgia**

DATE: July 8, 2008

The Historic Preservation Division has reviewed the information received concerning the above-mentioned project. Our comments are offered to assist federal agencies and project applicants in complying with the provisions of Section 106 of the National Historic Preservation Act.

SA4-02

Based on the information submitted, HPD believes that no historic properties or archaeological resources that are listed in or eligible for listing in the National Register of Historic Places will be affected by this undertaking. Please note that historic and/or archaeological resources may be located within the project's area of potential effect (APE), however, at this time it has been determined that they will not be impacted by the above-referenced project. Furthermore, any changes to this project as proposed will require further review by our office for compliance with the Section 106 process.

If we may be of further assistance contact me at (404) 651-6624 or Michelle Volkema, Environmental Review Specialist at (404) 651-6546. Please refer to the project number assigned above in any future correspondence regarding this project.

ES:mcv

cc: State of Georgia Regional Development Centers

GEORGIA
Coastal Resources Division

August 8, 2008

Comment SA5

Naval Facilities Engineering Command
Atlantic, Code EV22CM
6506 Hampton Blvd.
Norfolk, Virginia 23508-1278

RE: Consistency Determination for DEIS/OEIS JAX Range Complex, Florida to North Carolina

Dear Sir or Madam:

Staff of the Georgia Coastal Management Program (GCMP) has reviewed your June 27, 2008 letter, attached release information, and Draft Environmental Impact Statement/Oversees Environmental Impact Statement evaluating potential environmental effects associated with testing and training activities of the Jacksonville (JAX) Range Complex. The Navy has identified the need to support and conduct current and emerging training and RDT&E operations in the Jacksonville, Florida and Charleston, South Carolina operating areas (OPEREA), referred to as the JAX Range Complex. The geographic scope of the EIS/OEIS includes airspace, seaspace, and undersea space of the JAX Range Complex from the mean high tide lines (MHTL) of North Carolina, South Carolina, Georgia and Florida east to the 3-nautical-mile boundary. The Atlantic Fleet Active Sonar Training (AFAST) EIS/OEIS is incorporated by reference for the analysis of this EIS/OEIS for active sonar as it pertains to the JAX Range Complex.

The waters offshore of Georgia, Florida and South Carolina are the only known calving grounds for the endangered North Atlantic right whale. Approximately one quarter of the North Atlantic right whale population inhabits these waters annually between November 15th and April 15th. Themitigation strategy outlined in the DEIS to address impacts on North Atlantic right whales primarily entails operating in accordance with a Biological Opinion (BO) issued by the National Marine Fisheries Service (NMFS) in 1997. This eleven-year-old BO fails to take into consideration changes in our understanding of right whale demographics and habitat use as outlined in the July 25, 2008 letter from the Georgia Department of Natural Resources' Wildlife Resources Division (attached).

SA5-01

The DEIS/OEIS as currently written is inconsistent with Title 27, Georgia's Game and Fish Code, and therefore is **not consistent** with the GCMP to the maximum extent practicable. Modifications to the proposed project that would bring the action into compliance with the enforceable policies of the GCMP include:

SA5-02

- Apply vessel- and ordnance-related mitigation measures to limit negative impacts on North Atlantic right whales when operating within 30 nautical miles of the Georgia coast between November 15th and April 15th.

SA5-03

- Conduct or provide research concluding that right whales are not present in waters greater than 30 nautical miles from Georgia between November 15th and April 15th each year, or apply vessel- and ordinance-related mitigation measures when operating within all coastal shelf waters adjacent to the Georgia coast between November 15th and April 15th.

Georgia Department of Natural Resources • Coastal Resources Division
One Conservation Way • Brunswick, Georgia 31520
TEL: (912) 264-7218 • FAX: (912) 262-3143 • WEB: http://crd.dnr.state.ga.us

JAX Range Complex
August 8, 2008

- SA5-04 Ensure that the Early Warning System (EWS) right whale aerial survey program is not impeded (i.e. airspace closures) by increases in Navy exercises.
- SA5-05 Limit vessel speeds to 10 knots (or minimum safe speed) while transiting through waters inhabited by right whales between November 15th and April 15th. Exercises requiring greater vessel speeds should be scheduled outside of the right whale season or in locations not inhabited by right whales.
- SA5-06 Prohibit detonation of ordnance between November 15th and April 15th in all areas inhabited by right whales. Exercises requiring ordnance detonation may impact right whales negatively and should be scheduled outside of the right whale season.
- SA5-07 Prohibit the use of Atlantic Fleet Active Sonar Training (AFAST) between November 15th and April 15th (refer to Georgia Department of Natural Resources letter dated March 31, 2008, attached).
- SA5-08 Additionally, the Navy is urged to cooperate with NMFS and state natural resource agencies to facilitate right whale mortality investigations by providing towing vessels and access to Navy property or by towing whales to other suitable property for dissection and burial.

If you have any questions regarding federal consistency, please contact Kelie Moore at (912) 264-7218. If you have any technical questions, please contact Brad Winn or Clay George at (912) 262-3336.

Sincerely,

Susan Shipman
Director

Attachments

SS/km

cc: DNR/WRD/Nongame

Florida Department of Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Charlie Crist
Governor

Jeff Kottkamp
Lt. Governor

Michael W. Sole
Secretary

Comment SA6

August 12, 2008

Commander
Naval Facilities Engineering Command, Atlantic
Code EV22CM (JAX EIS/OEIS PM)
6506 Hampton Blvd.
Norfolk, VA 23508-1278

RE: Department of the Navy – Draft Environmental Impact Statement/Overseas Environmental Impact Statement for Atlantic Fleet Training in the Jacksonville Range Complex – Off the Northeast Coast of Florida.
SAI # FL200806304318C (Reference SAI # FL200702063046C)

Dear Commander:

The Florida State Clearinghouse, pursuant to Presidential Executive Order 12372, Gubernatorial Executive Order 95-359, the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended, and the National Environmental Policy Act, 42 U.S.C. §§ 4321, 4331-4335, 4341-4347, as amended, has coordinated a review of the subject Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS).

The Florida Fish and Wildlife Conservation Commission (FWC) notes that the proposed activities are located within the geographic range of the endangered North Atlantic right whale, the endangered West Indian manatee, multiple species of marine turtles, other whales and dolphins. As stated in the Draft EIS/OEIS, many of the current and proposed operations have the potential to stress and adversely impact those species. FWC requests that the recommendations provided by staff be incorporated into Chapter 5, *Mitigation Measures* of the Draft EIS/OEIS. A number of comments and recommendations on the potential effects of range operations have been provided, including suggestions that:

- Navy training operations not impede regularly scheduled Early Warning System aerial surveys;
- The EIS acknowledge that there may be cumulative effects from increased operations and that the Navy dedicate funding and support for research to understand the possible effects on protected species;
- Mitigation measures be implemented for all protected marine species listed as possibly occurring in the areas of operation;

- Proper reporting, operational delays and assistance be provided for marine species injuries and deaths;
- Night-time operations be limited and slower vessel speeds implemented due to difficulties in marine animal detection; and
- Explosive detonation and acoustic training exercises be limited during right whale calving season.

Please refer to the enclosed FWC letter for further comments and recommendations.

Based on the information contained in the Draft EIS/OEIS and enclosed state agency comments, the state has determined that, at this stage, the proposed federal activities are consistent with the Florida Coastal Management Program. The concerns identified by the FWC must be addressed, however, prior to project implementation. The state's continued concurrence with the project will be based, in part, on the adequate resolution of issues identified during this and subsequent reviews.

Thank you for the opportunity to review the draft document. Should you have any questions regarding this letter, please contact Ms. Lauren P. Milligan at (850) 245-2170.

Yours sincerely,

Sally B. Mann

Sally B. Mann, Director
Office of Intergovernmental Programs

SBM/lm
Enclosure

cc: Mary Ann Poole, FWC

August 8, 2008

RECEIVED
AUG 12 2008
OIP / OLGA

Lauren P. Milligan, Environmental Manager
Florida State Clearinghouse
Florida Department of Environmental Protection
3900 Commonwealth Blvd., Mail Station 47
Tallahassee, FL 32399-3000

Florida Fish and Wildlife Conservation Commission

Commissioners
Rodney Barreto
Chair
Miami

Brian S. Yablonski
Vice-Chair
Tallahassee

Kathy Barco
Jacksonville

Ronald M. Bergeron
Fort Lauderdale

Richard A. Corbett
Tampa

Dwight Stephenson
Delray Beach

Kenneth W. Wright
Winter Park

Executive Staff
Kenneth D. Haddad
Executive Director

Nick Wiley
Assistant Executive Director

Karen Ventimiglia
Deputy Chief of Staff

Office of Policy and Stakeholder Coordination
Mary Ann Poole
Director

(850) 410-5272
(850) 922-5679 FAX

Managing fish and wildlife resources for their long-term well-being and the benefit of people.

620 South Meridian Street
Tallahassee, Florida
32399-1600
Voice: (850) 488-4676

Hearing/speech impaired:
(800) 955-8771 (T)
(800) 955-8770 (V)

MyFWC.com

Subject: Duval Co., SAI #FL200806304318C, JAX Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) for the United States Fleet Forces

Dear Ms. Milligan:

The Florida Fish and Wildlife Conservation Commission (FWC), Imperiled Species Management Section, has coordinated agency review of the Draft Environmental Impact Statement (DEIS)/Overseas EIS (OEIS) as it pertains to the Jacksonville Range Complex project, and provides the following comments and recommendations in accordance with the Coastal Zone Management Act/Florida Coastal Management Program and the National Environmental Policy Act.

Project Description

As part of the DEIS, the Navy proposes to support and conduct current and emerging training and research, development, testing, and evaluation operations and to upgrade Navy training and testing for the Jacksonville Range Complex. For the purposes of this DEIS, the Jacksonville Range Complex includes the Jacksonville Area of Operation (JAX OPAREA), the Lake George Range and the Rodman Range. The DEIS states that the potential effects associated with the active sonar component of these exercises are analyzed separately in the Atlantic Fleet Active Sonar Training (AFAST) EIS. In addition, the Navy has prepared a DEIS proposing to homeport additional Atlantic Fleet surface ships at Naval Station Mayport. The alternatives proposed in this EIS/OEIS include the following:

No Action Alternative – Current Operations to include surge consistent with the existing Fleet Readiness Training Plan. A brief summary of current operations include:

Vessel movements (steaming days/year) is 1,000

Aircraft overflights (sorties/year) is 2,538; Towed Mine Warfare devices (sorties/year) is 78

Towed Mine Warfare devices (sorties/year) is 78

Weapons firing (Non-explosive Practice Munitions only, or NEPM, per year) is

Underwater Explosions/detonations; (High explosive ordnance, or HE, per year) is

Bombs MK-82	60
Bombs MK-83	12
Bombs MK-84	1
Bombs MK-20	4
Missiles (Hellfire, Maverick, AIM)	39
Naval gun shells	390
20-lb charges	18
Anti-swimmer	

Bombs	500
Missiles	14
Cannon shells	42,900
Naval gun shells	2,174
Small caliber	485,180
M19	11,520
grenades	80

Expended Material (MEM)

Targets	40
Chaff	4,174
Flares	1,740
Marine markers	300

Alternative 1 – Current operations plus an increase in Operational Training, Expand Warfare Missions, Accommodate Force Structure Changes (includes changing weapon systems and platforms and homebasing new aircraft and ships), and implement enhancements, with modifications to current training or introduction of new training. These would include: a) using more commercial aircraft to serve as oppositional forces rather than using Navy aircraft for Air-to-Air Missile Exercise, Surface-to-Air Gunnery Exercises, Air Intercept Control Exercises, and Detect-to-Engage Exercises; b) the incorporation of anti-terrorism training into existing training events; c) adjusting training levels to ensure that deployment can be stepped up quickly and at multiple locations in response to world events; and d) conducting new or modified training associated with the introduction of the new MH-60 helicopter, and new organic mine countermeasure systems.

Vessel movements (steaming days/year) is 1,050 (50 more than current)

Aircraft overflights (sorties/year) is 2,869 (331 more than current)

Towed Mine Warfare devices (sorties/year) is 150 (72 more than current)

Weapons firing (Non-explosive Practice Munitions only, or NEPM, per year) is

Bombs 500 (same as current)
Missiles 15 (1 more than current)
Cannon shells 47,200
(4,300 more than current)
Naval gun shells 2,372
(198 more than current)
Small caliber 50,3240
(18,060 more than current)
M19 12,700 (1,180 more than current)

Underwater Explosions/detonations; (High explosive ordnance, or HE, per year) is

Bombs MK-82	60 (same as current)
Bombs MK-83	12 (same as current)
Bombs MK-84	1 (same as current)
Bombs MK-20	4 (same as current)
Missiles (Hellfire, Maverick, AIM)	80 (41 more than current)
Naval gun shell	390 (same as current)
20-lb charges	12 (6 less than current)
Anti-swimmer Grenades	80 (same as current)

Expended Material (MEM)

Targets	44 (4 more than current)
Chaff	4,663 (429 more than current)
Flares	2,470 (730 more than current)
Marine markers	300 (same as current)

Alternative 2 (Preferred Alternative) – Alternative 1 plus and implement enhanced Mine Warfare Training Capability including increases in operations, with the exception of an elimination of live bombing exercises, and the designation of Mine Warfare (MIW) Training Areas in the JAX and Charleston operating areas.

Vessel movements (steaming days/year) is 1,050 (50 more than current)

Aircraft overflights (sorties/year) is 3,224 (686 more than current)*

Towed Mine Warfare devices (sorties/year) is 456 (378 more than current)*

Weapons firing; (Non-explosive Practice Munitions only, or NEPM, per year) is

Bombs	836 (336 more than current)*
Missiles	15 (1 more than current)
Cannon shells	47,200 (4,300 more than current)
Naval gun shells	2,372 (198 more than current)
Small caliber	50,3240 (18,060 more than current)
M19	12,700 (1,180 more than current)

Underwater Explosions/detonations; (High explosive ordnance, or HE, per year) is

Bombs MK-82	0 (60 less than current)*
Bombs MK-83	0 (12 less than current)*
Bombs MK-84	0 (1 less than current)*
Bombs MK-20	0 (4 less than current)*
Missiles (Hellfire, Maverick, AIM)	80 (41 more than current)
Naval gun shells	390 (same as current)
20-lb charges	12 (6 less than current)
Anti-swimmer grenades	80 (same as current)

Expended Material (MEM)

Targets	44 (4 more than current)
Chaff	4,663 (429 more than current)
Flares	2,470 (730 more than current)
Marine markers	300 (same as current)

* Represents a higher or lower number than Alternative 1.

Issues of Concern

The proposed activities are within the geographic range of the endangered North Atlantic right whale (*Eubalaena glacialis*) and the endangered West Indian manatee (*Trichechus manatus latirostris*), and multiple species of marine turtle, other whales, and dolphins. As stated in the DEIS, many of the current and proposed operations have the potential to stress and adversely impact most of these species. Mitigation measures for these activities are outlined in Chapter 5 of the DEIS, and the FWC suggests incorporating our recommendations into this chapter.

Lake George Range

As stated in the DEIS, the Lake George area has some natural springs along the lake, specifically Salt Spring and Silver Glen Spring. These springs provide some thermal benefits to manatees traveling north and south in the St. Johns River system. Manatees move through this area to access Blue Spring farther south, which is the largest warm water refuge for manatees in the St. Johns River system. The 2006-2007 manatee census conducted in the winter timeframe at Blue Spring documented 265 total individuals noted

over the winter with a maximum single day count of 193. The number of manatees using Blue Spring has continued to increase from 11 in the 1970-71, to 35 in 1980-81, to 63 in 1990-91, to 153 in 2000-01, to the latest confirmed counts of 265 for the 2006-07.

For the Little Lake George and Lake George areas, eight manatees have died from all causes from January 1974 to May 2008. Of these eight deaths, there were three watercraft-related, one related to human activity other than use of watercraft, one natural, and three undetermined deaths. No carcasses were reported in the immediate vicinity of the Lake George bombing range. With an increase in use of the Blue Spring area, there is likely increasing manatee use in the vicinity of Lake George as well.

No live ordnance is currently authorized for Lake George. This range supports air-to-surface training with inert practice bombs with targets within approximately 2.3 miles wide by 8 miles long. Currently, MIW exercises in the form of mine laying (dropping NEPM bombs from aircraft onto targets) occurs on the Lake George Range with 10 sorties (40 bombs) a year. The DEIS proposes an increase in Electronic Combat in the form of Flare exercises with an increase from 56 sorties to 80 (an additional 46 sorties, with 720 more flares a year).

The stressors and risks to manatees associated with these activities include the possibility of reducing habitat value during the migration seasons altering behavioral and migratory patterns (disturbance), the possibility of being struck by a NEPM (collision), the possibility of being struck by any support vessels that may be used in the exercises (collision), and ingestion of military expended materials.

JAX OPAREA

Whales, dolphins, and marine turtles may all be found within the area of operation. Because no activities are proposed on beaches where marine turtles nest, potential impacts to marine turtles are limited to those associated with the open-water activities. The distribution of right whales is more sizable than currently delineated as critical habitat. Other marine mammal species may also inhabit the area of operation, even if sightings have not been reported.

Alternative 2 proposes to eliminate the High Explosive bombing exercises (77 fewer bombs), reduce the mine neutralization exercises (6 fewer 20-lb charges), and increase the High Explosive surface warfare exercises (41 more missiles). High-explosive missiles used in air-to-surface exercises explode near the water surface. With the introduction of the MH-60 helicopters (projected to be 105), there will be increased use of sonar and sonar mine hunting gear related to mine warfare exercise.

The stressors and risks to these protected marine species associated with these activities include the possibility of reducing habitat value during the migration seasons, altering behavioral and migratory patterns (disturbance), the possibility of being struck by a NEPM (collision), vessel movements (disturbance and collision), Towed MIW devices (strikes), use of sonar (disturbance and impact), underwater detonations and explosions (disturbance and impact), and ingestion of military expended materials.

Recommendations

The FWC makes the following recommendations for the DEIS based on our understanding of the proposal and its associated mitigation measures.

General recommendations

- We acknowledge and appreciate the Navy's continued support in the existing Early Warning System (EWS) aerial survey efforts. The number of Navy whale sightings reported to EWS over the years has been invaluable, and we encourage this reporting to be standard operating procedure. We concur with the use of the EWS system in the Navy's training operations, and encourage the Navy to mitigate interactions between whales and Navy helicopters and fixed-wing aircraft including the minimization of low-level overflights. We also recommend that the EIS state that Navy training operations will not impede regularly scheduled EWS surveys.

SA6-01

- Chapter 6, regarding direct, indirect, and cumulative impacts, states that "no significant cumulative impacts to marine mammals would occur in U.S. territorial waters as a result of training activities from ....Alternative 2." We recommend that the EIS acknowledge that there may be cumulative effects of the proposed increased operations and that the Navy should be willing to fund and support research designed to understand the possible effects on protected species.

SA6-02

SA6-03

- Mitigation measures proposed for these training exercises should be implemented for all protected marine species listed as possibly occurring in the area of operation outlined in the DEIS.

SA6-04

- If any protected marine species are injured or killed during training exercises, or if any cetacean strandings take place near or at the time of training events, or if an injured or dead protected marine animal is sighted by Navy observers, it should be reported to the National Marine Fisheries Service (NMFS) stranding network and the FWC Hotline at 1-888-404-FWCC. If any protected marine species are injured or killed during training exercises or if strandings occur, all training activities should be halted or delayed until the cause of the strandings, injuries or deaths is determined and addressed. Navy assistance and cooperation in locating, towing and providing other resources during these events would be appreciated.

SA6-05

Lake George Range

- There does not appear to be a section in Chapter 5 for Lake George Range Mitigation Measures. While we realize that the NEPM exercises are currently ongoing, we recommend that the Navy reduce the potential for strikes and disturbance by implementing similar measures used for At-Sea Mine Laying (non-explosive) training events (5.8.12).

SA6-06

- It is not clear if vessels, even for support, are involved with the current or proposed exercises for the Lake George Range. Table 3.11-3 seems to indicate that it is not a factor; however, if support vessels are used, we recommend that vessels travel at slow speed.

SA6-07

JAX OPAREA

- Chapter 5.5 discusses mitigation measures, including personnel training as lookouts and watchstanders. Protocols are included that address watching for marine animals at night. Please be aware that the ability to detect marine animals, particularly small ones like marine turtles, is difficult during daylight hours and is almost impossible at night, especially at a distance. In addition, most marine animals spend the majority of their time underwater, making them difficult to detect. Because of the inherent inaccuracy of detecting animals with lookouts, we recommend the following:

SA6-08

  - All exercises involving the use of high explosives near or in the water should be conducted during daylight hours only;
  - Navy vessels should operate at a maximum of 10 knots (or minimum safe speed) when traveling through right whale habitat (see discussion below) during calving season (see discussion below); and
  - Navy vessels should operate at a maximum of 10 knots (or minimum safe speed) when traveling through right whale habitat at night. If faster vessel speeds are required for an exercise, it should be conducted at the minimum speed required.

- FWC recommends that the Navy coordinate with the NMFS to update right whale information and the dates for the calving season. The DEIS states that Firing Exercise (FIREX) with Integrated Maritime Portable Acoustic Scoring and Simulator System (IMPASS) activities are limited to months of the year outside of right whale calving season, stated as December 1 to March 31. Based on more recent published studies, it may be more appropriate to consider right whale calving season between November 15 and April 15.

  - All exercises involving the use of high explosives/detonation near or in the water should be restricted to those months outside of the right whale calving season. This would include not only FIREX with IMPASS, but appears to also include Air-To-Surface Missile exercises, Mine Neutralization Training involving Underwater Detonations and Minesweeping using equipment towed by helicopters.

SA6-09

  - Mitigation measures for training activities during right whale calving season should be implemented in all right whale habitat, and not limited to the boundaries of designated critical habitat. We encourage the Navy to develop and implement the ideas, particularly passive acoustic monitoring, discussed in the Integrated Comprehensive Monitoring Program for these exercises. Additional data by visual observation and passive acoustic monitoring, particularly in those areas outside of designated critical habitat, would reduce the potential adverse impacts to marine species from

these activities, as well as provide a better delineation of species distribution.

Conclusions

In summary, FWC does not object to the preferred alternative (Alternative 2) provided that the EIS demonstrates that the adverse effects of increased sonar, increased vessel and aircraft traffic, increased mine towing activities, and increased air-to-surface missile explosions are sufficiently addressed. The recommendations in the previous sections of this correspondence are provided in order to help address these issues, as well as previous correspondence from FWC regarding the AFAST EIS.

We appreciate the opportunity to provide input on these activities proposed by the Navy. If you or your staff would like to coordinate further on the recommendations contained in this letter, I will be glad to help make the necessary arrangements. Please contact me at (850) 410-5272 or email me at maryann.poole@MyFWC.com. If your staff has any technical questions regarding our comments concerning manatees or marine turtles, please contact Mary Duncan at mary.duncan@MyFWC.com. If your staff has any technical questions regarding our comments concerning whales or dolphins, please contact Tom Pitchford at tom.pitchford@MyFWC.com.

Sincerely,

Mary Ann Poole

Mary Ann Poole, Director
Office of Policy and Stakeholder Coordination

map/mpd
Navy Atlantic Fleet_1576
ENV 1-3-2
cc: John Milio, USFWS, Jacksonville
Barb Zoodsma, NOAA, Fernandina Beach

ENVIRONMENTAL AND COMPLIANCE DEPARTMENT

Jacksonville
Where Florida Begins.

Comment SA7

August 19, 2008

Department of the Navy
Naval Facilities Engineering Command
Atlantic, Code EV22CM
6506 Hampton Blvd.
Norfolk, VA 23508-1278

RE: Environmental Impact Statement - Jacksonville Range Complex

Gentlemen:

SA7-01

The Environmental Quality Division (EQD) has reviewed the subject document, dated June 27, 2008. At this time EQD has no comments regarding the subject proposal.

EQD appreciates the opportunity to review such proposals.

Respectively,

Robert Steven Pace, P.E.
Environmental Engineering Manager, Sr.

RSP/rdr

c: Vincent Seibold, P.E., Chief, EQD
File

Environmental Quality Division
117 W. Duval Street, Suite 225 | Jacksonville, FL 32202 | Phone: 904.630.4900 | Fax: 904.630.3638 | www.coj.net

North Carolina
Department of Administration

Comment SA8

Michael F. Easley, Governor

Britt Cobb, Secretary

August 28, 2008

Capt. J.M. Hinson
Department of the Navy
Naval Facilities Engineering Command
Code EV22CM
6506 Hampton Blvd.
Norfolk, VA 23508-1278

Re: SCH File # 08-E-0000-0395; DEIS; Testing and training activities in the Jacksonville (JAX) Range Complex off the coasts of NC (Brunswick, New Hanover, Pender and Onslow Counties), SC, GA, FL. View document at http://www.JacksonvilleRangeComplexEIS.com.

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. According to G.S. 113A-10, when a state agency is required to prepare an environmental document under the provisions of federal law, the environmental document meets the provisions of the State Environmental Policy Act. Attached to this letter for your consideration are the comments made by agencies in the course of this review.

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, Director
State Environmental Policy Act

Attachments

cc: Region P
Region O

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

NCDENR

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 Coordinator

SUBJECT: 08-0395 Jacksonville Range Complex DEIS

DATE: August 22, 2008

The Department of Environment and Natural Resources has reviewed the proposed information. The attached comments are for the applicant's information.

Thank you for the opportunity to review.

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/

One North Carolina Naturally

NCDENR
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

July 31, 2009

Melba McGee
Environmental Coordinator
Office of Legislative & Intergovernmental Affairs
Department of Environment and Natural Resources
1601 Main Service Center
Raleigh, NC 27699-0001

SUBJECT: Jacksonville Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) Offshore North Carolina (SCH#08-0395 and DCM#20080094)

Dear Ms. McGee:

Thank you for the opportunity to review the "*Jacksonville Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS)*" (DEIS, June 2008) prepared by the United States Fleet Forces. The study area of this DEIS is the offshore area from Onslow County, North Carolina down to Volusia County, Florida. This DEIS evaluates the potential environmental effects of continued Navy Atlantic Fleet Training operations over a 10-year planning horizon. The purpose of this review is to evaluate the adequacy of the environmental analysis contained in the DEIS. Below are the comments of the North Carolina Division of Coastal Management.

- Section 3.12.3.3 of the DEIS states that the Navy will be making a consistency submission to the State of North Carolina. However, Table 4.1-1 does **not** identify North Carolina as one of the States to receive a consistency submission from the Navy. Furthermore, Section 4.2.1 states that the Navy will be preparing consistency submissions for the "*affected states*", but the names of the affected states were not stated[1]. We request that the Navy clarify whether a consistency submission will be made to North Carolina. Also that the names of the "*affected states*" be explicitly acknowledged in Section 4.2.1.

SA8-01

- Chapter 5 of the DEIS is a discussion of mitigation measures. This section principally focuses on how proposed training exercises will be conducted to minimize adverse effects to marine animals. However, this section does not address how proposed training exercises will be managed to avoid and/or minimize the discharge of debris resulting from training exercises into the marine environment. Sections 3.2, 6.2.17 and 6.2.1.8 of the DEIS raise the question

SA8-02

[1] DCM recognizes that Table 4.1-1 would constitute a listing of the "*affected states*".

400 Commerce Avenue, Morehead City, North Carolina 28557-3421
Phone: 252-808-2808 \ FAX: 252-247-3330 \ Internet: www.nccoastalmanagement.net

of trash, expended training materials, hazardous waste, and biotoxins being discharged into the marine environment. Embedded in this issue is the cumulative incremental effect of these discharges.

Section 3.2.1 of the DEIS notes: "*Navy ships are required to conduct operations at-sea in such a manner as to minimize or eliminate any adverse impacts on marine environment.*" Section 3.2.1 of the DEIS also references mitigative measures, such as the "*2005 Hazardous Materials Minimization, Hazardous Waste Reutilization and Disposal Guide.*" Section 3.2.3.3 of the DEIS notes "*All hazardous waste would continue to be managed in compliance with applicable laws and regulations. No changes in hazardous material management practices are anticipated under Alternative 2.*"

SA8-03

While the DEIS contains commitments to manage waste materials so that they will have minimal impact, DCM would encourage the Navy to further explore the cumulative incremental effects of these discharges into the marine environment and possible mitigative measures to retrieve, if possible, and to appropriately dispose of these materials. Further, DCM would encourage the Navy to enhance Chapter 5 of the DEIS as a summary of all proposed mitigative measures.

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
Steve Everhart, Division of Coastal Management

NORTH CAROLINA STATE CLEARINGHOUSE
DEPARTMENT OF ADMINISTRATION
INTERGOVERNMENTAL REVIEW

STATE NUMBER: 08-E-0000-0395 H12
DATE RECEIVED: 06/30/2008
AGENCY RESPONSE: 08/05/2008
REVIEW CLOSED: 08/10/2008

MS RENEE GLEDHILL-EARLEY
CLEARINGHOUSE COORD
DEPT OF CUL RESOURCES
ARCHIVES-HISTORY BLDG - MSC 4617
RALEIGH NC

REVIEW DISTRIBUTION
CAPE FEAR COG
DEHNR - COASTAL MGT
DENR LEGISLATIVE AFFAIRS
DEPT OF AGRICULTURE
DEPT OF CUL RESOURCES
DEPT OF TRANSPORTATION
EASTERN CAROLINA COUNCIL

CH 08- 1625
A - RW4ff 7-22-08

7/31/08

PROJECT INFORMATION
APPLICANT: Department of the Navy
TYPE: National Environmental Policy Act
ERD: Draft Environmental Impact Statement
DESC: Testing and training activities in the Jacksonville (JAX) Range Complex off the coasts of NC (Brunswick, New Hanover, Pender and Onslow Counties), SC, GA, FL. View document at http://www.JacksonvilleRangeComplexEIS.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:

[X] NO COMMENT

SA8-04

[ ] COMMENTS ATTACHED

SIGNED BY: Renee Gledhill-Earley by mpm

DATE: 7/24/08

faxZERO

Send a fax for free

Comment P1

Recipient Information

Name: t cruz
Company: nafec jacksonville bombing/destruction
Fax #: 7573224894

Sender Information

Name: jeanpublic
Email address: jeanpublic@yahoo.com

Recd 6/27/00

i cannot attend the hearings. but the navy overreaches to cause environmental destruction. the navy can train in afghanistan. the navy can train in iraq, but stop bombing the heck out of america. the navy seems bent on destroying america with its horror against marine life. the navy is out of line. i oppose this plan. jean public 15 elm st florham park nj 07932

P1-01

Federal Register: June 27, 2008 (Volume 73, Number 125)]
[Notices]
[Page 36495-36498]
From the Federal Register Online via GPO Access [wais.access.gpo.gov]
[DOCID:fr27jn08-38]

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DEPARTMENT OF DEFENSE

Department of the Navy

Notice of Public Hearings for the Jacksonville 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.] Sec. 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 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 June 18, 2008. The National Marine Fisheries Service (NMFS) is a Cooperating Agency for the EIS/OEIS.

The EIS/OEIS evaluates 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) within the existing Jacksonville (JAX) Range Complex Operating Area (OPAREA). The JAX Range Complex geographically encompasses offshore, near-shore, and onshore OPAREA, ranges, and special use airspace (SUA).

Components of the JAX Range Complex encompass 50,090 square nautical miles (nm2) of sea space and 62,596 nm 2 of SUA off the coasts of North Carolina, South Carolina, Georgia, and Florida, as well as 20 miles2 of inland range area in north-central Florida. A Notice

of Intent for this Draft EIS/OEIS was published in the Federal Register on January 26, 2007 (72 FR 3806).

[[Page 36496]]

The Navy will conduct four public hearings to receive oral and written comments on the Draft EIS/OEIS. Federal agencies, state agencies, and local agencies and interested individuals are

JAX Website Comments

Name: Joseph Finch

Organization: HQ USMC PM AAA

Comment #: P2

Date: June 30, 2008

Comment: P2-01 In looking out 10 years, did you address a water training area for Expeditionary fighting Vehicles that will be fielded to the Marine Corps Reserves at Jacksonville??

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
Jacksonville Range Complex Environmental Impact Statement / Overseas Environmental Impact Statement

Comment P3

The U.S. Navy has prepared a Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) for the Jacksonville 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.jacksonvillerangecomplexeis.com**
3) Faxing this form to (757) 322-4894, Attention: Code EV22CM (JAX EIS/OEIS PM)
4) Mailing this form to:

Naval Facilities Engineering Command Atlantic
Attention: Code EV22CM (JAX EIS/OEIS PM)
6506 Hampton Blvd
Norfolk, VA 23508-1278

☐ *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 August 11, 2008.

Name: Larry Gelwen Date: 7-28-08

Organization/Affiliation:

Address:* 525 Niven Drive

City, State, Zip Code: York Haven, PA 17370

Comments: Exc Program! Go for it!

P3-01

(Use reverse side for additional comment)

Visit **www.jacksonvillerangecomplexeis.com** for project information.

*Provide your mailing address to receive future notices about the Jacksonville Range Complex EIS/OEIS.

JAX Website Comments

Name: Thomas Wright

Organization:

Comment #: P4

Date: July 31, 2008

Comment: P4-01 The lack of attendance at the JAX Range presentation in Savannah was due to a lack of notice, not a lack of interest. The Savannah maritime community supports the US Navy's plans for off-shore ranges. The Navy's approach is balanced, considerate of the environment and an important resource in the defense of our country.

JAX Website Comments

Name: Paul Kersery

Organization:

Comment #: P5

Date: August 11, 2008

Comment: P5-01 I am in favor of cutting the number of explosive drops from 60 to 0. I am aware that this proposal suggests increasing non explosive drops. I, like the Savannah Morning News, hopes the top brass gives this idea a healthy salute.

Paul Kersery

Cross Reference Index by Comment Tracking Number
JAX Draft EIS/OEIS

Comment No.	Comment	Response
FEDERAL AGENCIES		
FA1- U. S. Environmental Protection Agency		
FA1-01	Asks what additional impacts from CAS to supplement Navy training would be reasonably foreseeable and recommends this be addressed in FEIS.	As indicated in the FEIS, Commercial Air Services use established civilian airfields. Potential impacts from the use of Commercial Air Services are addressed in sections 3.4 Air Quality and 3.5 Airborne Noise. Cumulative impacts are addressed in 6.4.4 Air Quality and 6.4.5 Airborne Noise.
FA1-02	Asks for information on success of mitigation measures and recommends this be addressed in FEIS.	With the available data, it is not possible to assess the effectiveness of the proposed mitigation measures. No mitigation is 100% effective; however refer to section 5.10 for a discussion on mitigation effectiveness, such as percentage of marine mammals spotted during a survey. The Navy is developing a monitoring plan with NMFS to assess the efficacy and practicality of the monitoring and mitigations proposed. See section 5.3 for a summary of the monitoring plan.
FA1-03	Requests additional information and a discussion of efforts to minimize and reduce the amount of hazardous materials deposited into the aquatic environment from training activities.	With the exception of recoverable floating, towed, and airborne targets, most items expended during navy at-sea training events are not recovered, as they rapidly sink and recovery is not practicable. 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. The impact of training materials expended in the marine environment will be a focus of that program. The preferred alternative proposed in this document provides an example of the Navy's commitment to reduce our potential impact on the marine environment. Under the preferred alternative, at sea bombing operations conducted within the Jacksonville OPAREA will eliminate the use of explosive filled bombs. Only non-explosive practice munitions will be used in these training events. See Section 3.2.3.

FA1-04	Requests additional information on the recovery efforts for range maintenance at Rodman Range.	Operational Range Clearance (ORC) efforts are conducted in accordance with the Navy's ORC policy and the Rodman ORC Plan, dated 2 Apr 2004. Specifically for Rodman, ORC activities will predominantly involve the (manual) collection of recoverable sub scale (less than/equal to 25 lb) non-explosive practice munitions (NEPM). Section 3.11 of this EIS addresses biological resources at Rodman, and concludes that ordnance related material will have no effect on biological resources at Rodman Range.
FA1-05	Recommends the Integrated Comprehensive Monitoring Program include a commitment to study and monitor impacts of MEM in the aquatic environment.	The ICMP has been defined by N45/USFF/NAVFAC Atlantic as relevant only to MMPA and ESA issues involving Marine Mammals and Sea Turtles. However, 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.
FA1-06	Recommends more specificity on the content of the ICMP.	As outlined in the NMFS Proposed Rule, the finalization of the overall ICMP will not be completed until late 2009. A summary of the Jacksonville Range Complex monitoring plan can be found in Section 5.3
FA2- Marine Mammal Commission		
FA2-01	Suggests that the no action alternative does not comply with CEQ guidance and recommends that Navy resubmit for public review a revised DEIS.	Additional information on alternatives considered, but eliminated, can be found in section 2.2.7
FA2-02	Recommends that Navy submit the NODE report to independent scientific reviewers.	The NODE Report was submitted to NMFS scientists for review. This report is available on the project website: http://www.jacksonvillerangecomplexeis.com
FA3- Department of the Interior		
FA3-01	Provides notice that the DOI has reviewed the DEIS and have no comments to offer for consideration.	No response required
FA4- Department of the Army, Jacksonville District Army Corps of Engineers		
FA4-01	Provides notice that no permit from this office is required and the proposed activity has no direct impacts on civil works projects.	No response required
STATE AGENCIES		
SA1- South Carolina Department of Health and Environment		

SA1-01	Acknowledges the completeness of the Navy's assessment of exercises on air quality.	No response required
SA2- Georgia Department of Natural Resources, Wildlife Resources Division		
SA2-01	Recommends the Navy obtain a revised BO from NMFS and integrate NMFS' recommendations into the FEIS.	The Navy is obtaining a revised Biological Opinion from NMFS and will implement the proposed action in accordance with NMFS requirements. See separate documentation from NMFS.
SA2-02	Provides that NARW inhabit coastal waters off FL and GA during 15 November to 15 April; SC and NC during 1 November to 30 April.	These revised dates were considered in our consultation with NMFS.
SA2-03	Provides that NARW inhabit waters within 30 nm of shore along GA, NC, SC, and northeast FL. Recommended that vessel- and ordnance-related mitigation measures should apply to all areas that NARW are known to inhabit.	Chapter 5 of the FEIS, and our Record of Decision provide mitigation measures for the NARW. These measures were developed in conjunction with NMFS.
SA2-04	Recommends that Navy fund and implement an alternative detection system to aerial surveys for NARW to determine the extent that NARW inhabit waters seaward of 30 nm. Recommended that the alternative detection system be implemented in all areas where exercises are to be conducted.	The Navy has funded and is currently implementing passive acoustic monitoring near the shelf edge off North Carolina and will deploy 2 additional passive acoustic recording devises off Jacksonville, FL to monitor for the presence of marine mammals beyond 30 nmi. Plans are being executed to expand aerial survey coverage off Jacksonville, Florida to sample the area from 30 nmi to beyond the shelf break. As part of planned exercise monitoring, passive acoustic detection buoy arrays will also be deployed to monitor a sampling of navy exercises. The passive acoustic data collected in addition to the shipboard and aerial survey data collected in these areas will enable the Navy to better determine the extent North Atlantic right whales use the areas beyond 30 nmi. Mitigation measures have been developed using the best available data and are further developed in the ESA and MMPA compliance processes with the NMFS and are implemented wherever the navy operates.
SA2-05	Recommended that mitigation measures be followed in all areas inhabited by NARW.	Chapter 5 of the FEIS, and our Record of Decision provide mitigation measures for the NARW. These measures were developed in conjunction with NMFS.
SA2-06	Recommends that Navy continue supporting EWS aerial surveys and ensure that increases in Navy exercises do not impede EWS surveys.	FACSFAC Jacksonville is actively engaged in the Navy's effort to protect Northern Right Whales as well as other marine mammals. FACSFAC Jacksonville can coordinate with spotter aircraft before, and via radio during, flights in order to ensure they have access to the Warning areas consistent with the safe conduct of training by Navy units. Contracted spotter pilots are invited to meet controllers and staff at the facility at NAS Jacksonville before season commences and discuss procedures for clearance into and out of FACSFAC airspace.

SA2-07	Recommends that Navy vessels operate at 10 knots (or minimum safe speed) when transiting areas inhabited by NARW during the right whale season.	The Navy operates at minimum safe speed consistent with current mitigation measures. A "slow, safe speed" is situationally dependent to allow the ship to maneuver around any navigational hazards (such as right whales) and relies upon the judgment and experience of the Navy captain. The mitigation measures will be determined in consultation with NMFS.
SA2-08	Recommends that ordnance detonation be prohibited in locations inhabited by NARW during the right whale season.	The FEIS includes mitigation measures pertaining to live ordnance developed through Section 7 Consultation with NMFS.
SA2-09	Recommends that Navy coordinate with NMFS and state natural resources agencies to facilitate NARW mortality investigations.	Part of consultation with NMFS under MMPA involves the development of a Stranding Response Plan. The Plan includes a protocol and coordination that would occur during a mortality event. See the NMFS Final Rule for more detail.
SA3- Georgia State Parks and Historic Sites		
SA3-01	Declares a finding of no significant impact on the resources and interests of the Parks, Recreation, and Historic Sites Division is anticipated from the alternatives outlined in the EIS/OEIS.	No response required
SA3-02	Requests notice for the Townsend Range Complex EA when available.	The Townsend Range Complex is the responsibility of USMC and they will provide appropriate notices.
SA3-03	Requests notice of any changes related to the future use of live ordnance at the Townsend Range Complex.	The Townsend Range Complex is the responsibility of USMC and they will provide appropriate notices.
SA4- Georgia State Clearinghouse		
SA4-01	Provides notice that the state level review for the JAX DEIS/OEIS has been completed and found to be consistent with state social, economic, physical goals, policies, plans, and programs with which the State is concerned.	No response required
SA4-02	Provides notice that the Historic Preservation Division, Georgia Department of Natural Resources has reviewed the JAX DEIS/OEIS and believes that no historic properties or archaeological resources that are listed in or eligible for listing in the National Historic Preservation Act will be affected by this undertaking.	No response required
SA5- Georgia Coastal Resources Division		

SA5-01	Provides notice that the JAX DEIS/OEIS is inconsistent with Title 27, Georgia's Game and Fish Code and therefore is not consistent with the Georgia Coastal Management Program to the maximum extent practicable.	The Navy has submitted a federal consistency determination for state agency review.
SA5-02	Recommends the following modification to bring the action into compliance with the enforceable policies of the GCMP: apply vessel- and ordnance-related mitigation measures to limit negative impacts on NARW when operating within 30 nm of the GA coast between 15 November and 15 April.	The Navy has submitted a federal consistency determination for state agency review. Chapter 5 of the FEIS, and our Record of Decision provide mitigation measures for the NARW. These measures were developed in conjunction with NMFS.
SA5-03	Recommends the following modification to bring the action into compliance with the enforceable policies of the GCMP: conduct or provide research concluding that NARW are not present in waters greater that 30 nm from GA between 15 November and 15 April each year, or apply vessel- and ordnance-related mitigation measures when operating within all coastal shelf waters adjacent to the GA coast between 15 November and 15 April.	Chapter 5 of the FEIS, and our Record of Decision provide mitigation measures for the NARW. These measures were developed in conjunction with NMFS.
SA5-04	Recommends the following modification to bring the action into compliance with the enforceable policies of the GCMP: ensure that the Early Warning System right whale aerial survey program is not impeded (*i.e.*, airspace closures) by increases in Navy exercises.	See Navy response to comment SA2-06
SA5-05	Recommends the following modification to bring the action into compliance with the enforceable policies of the GCMP: limit vessel speeds to 10 knots (or minimum safe speed) while transiting through waters inhabited by right whales between 15 November and 15 April. Exercises requiring greater vessel speeds should be scheduled outside right whale season or in locations not inhabited by right whales.	Chapter 5 of the FEIS, and our Record of Decision provide mitigation measures for the NARW. These measures were developed in conjunction with NMFS.
SA5-06	Recommends the following modification to bring the action into compliance with the enforceable policies of the GCMP: prohibit detonation of ordnance between 15 November and 15 April in all areas inhabited by right whales.	Chapter 5 of the FEIS, and our Record of Decision provide mitigation measures for the NARW. These measures were developed in conjunction with NMFS.

SA5-07	Recommends the following modification to bring the action into compliance with the enforceable policies of the GCMP: prohibit the use of AFAST between 15 November and 15 April.	Chapter 5 of the FEIS, and our Record of Decision provide mitigation measures for the NARW. These measures were developed in conjunction with NMFS.
SA5-08	Recommends the following modification to bring the action into compliance with the enforceable policies of the GCMP: cooperate with NMFS and state natural resources agencies to facilitate right whale mortality investigations.	See Navy response to comment SA2-09
SA6- Florida Department of Environmental Protection		
SA6-01	Recommends the DEIS state that Navy training operations will not impede regularly scheduled EWS surveys.	See Navy response to comment SA2-06
SA6-02	Recommends DEIS acknowledge that there may be cumulative effects.	The Navy has determined that cumulative effects resulting from the proposed action are not significant. Chapter 6 includes the analysis.
SA6-03	Suggests the Navy should fund and support research designed to understand possible effects of the action on protected species.	In order to further understand the potential impacts from the proposed action, the Navy is developing a range complex monitoring plan. In addition, the Navy is developing an overarching Integrated Comprehensive Monitoring Plan (ICMP) that will organize and provide a framework for monitoring across all of the Navy's range complexes. 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.
SA6-04	Recommends that mitigation measures should be implemented for all protected species listed as possibly occurring in the area of operation.	Chapter 5 of the FEIS, and our Record of Decision provide mitigation measures for all protected species. These measures were developed in conjunction with NMFS.
SA6-05	Recommends reporting incidents to the NMFS stranding network and FWC Hotline.	See Navy response to comment SA2-09
SA6-06	Recommends Navy implement similar measures used for At-Sea Mine Laying (Section 5.8.12) for Lake George Range mitigation in Chapter 5.	The Navy consulted with USFWS for mitigation measures at Lake George. See revisions in Section 3.11 and 5.7.20

SA6-07	Recommends if support vessels are used for exercises at Lake George that vessels travel at slow speed.	The Navy does not anticipate the use of support vessels for exercises at Lake George.
SA6-08	Recommends conducting exercises using HE near or in water during daylight hours only and operating Navy vessels at a maximum of 10 knots (or minimum safe speed) when travelling through NARW habitat.	Chapter 5 of the FEIS, and our Record of Decision provide mitigation measures for all protected species. These measures were developed in conjunction with NMFS.
SA6-09	Recommends coordinating with NMFS to update NARW calving season to between 15 November and 15 April; restricting use of HE near or in water to months outside calving season; implementing mitigation measures during NARW calving season to all habitat, not just designated critical habitat; and developing and implementing passive acoustic monitoring.	These issues are addressed through consultation with NMFS through the MMPA and ESA compliance process and additional mitigation measures may be developed as appropriate for the NARW. See Navy response to comment SA2-04 for details regarding specific monitoring efforts.
SA7- Florida Environmental Quality Division		
SA7-01	Provides notice that FEQD has reviewed the DEIS and has no comments.	No response required
SA8- North Carolina Department of Administration		
SA8-01	Requests the Navy submit a consistency determination to NC.	The Navy has submitted a consistency determination to North Carolina Division of Coastal Management.
SA8-02	Questions how proposed training exercises will be managed to avoid or minimize the discharge of debris into the marine environment.	With the exception of recoverable floating, towed, and airborne targets, most items expended during navy at-sea training events are not recovered, as they rapidly sink and recovery is not practicable. 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. The impact of training materials expended in the marine environment will be a focus of that program. The preferred alternative proposed in this document provides an example of the Navy's commitment to reduce our potential impact on the marine environment. Under the preferred alternative, at sea bombing operations conducted within the Jacksonville OPAREA will eliminate the use of explosive filled bombs. Only non-explosive practice munitions will be used in these training events. See Section 3.2.3.
SA8-03	Encourages the Navy to further explore the cumulative incremental effects of waste materials discharges into the marine environment.	See Navy response to comment SA8-02. As additional information becomes available, the Navy will update analysis as appropriate.

SA8-04	Provides notice of no comment from review of DEIS by North Carolina Department of Cultural Resources.	No response required.
PRIVATE ENTITIES/INDIVIDUALS		
P1- jeanpublic (anonymous)		
P1-01	Expresses opposition to the proposed action.	No response required.
P2- Joseph Finch		
P2-01	Requests consideration for JAX Marine Corps Reserves training	Thank you for your comment. Future USMC reserve unit training events with the Expeditionary Fighting Vehicle were not considered as part of the Jacksonville Proposed Action
P3- Larry Gelner		
P3-01	Expresses support for the proposed action.	No response required
P4- Thomas Wright		
P4-01	Expresses support for the proposed action.	No response required
P5- Paul Kersery		
P5-01	Expresses support for eliminating BOMBEX under Alternative 2.	No response required

PUBLIC HEARINGS

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INTRODUCTION

Four public hearings were held 28-31 July 2008 to receive public comments on the JAX Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS). The hearings were held in Charleston, SC.; Beaufort, SC; Savannah, GA; and Jacksonville, FL. The following is information resulting from each of these hearings.

PUBLIC HEARING #1

The first public hearing was held in Charleston, SC, at the Doubletree Guest Suites–Historic Charleston; July 28, 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. No person from the general public made a presentation. Eleven people attended the open house, the hearing, or both. One written comment was 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.

Jacksonville Range Complex
Environmental Impact Statement/ Overseas Environmental Impact Statement
Public Hearing Attendance List – July 2008

Attendance List

Name: Tania Usettle	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address:	
City/State/Zip: Williamsburg VA.	
E-mail:	
Organization/Constituency Represented (if any):	

Name: Braxton Davis	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address: 1362 McMillan Ave	
City/State/Zip: Charleston SC 29405	
E-mail: DavisBC@dhec.sc.gov	
Organization/Constituency Represented (if any): SCDHEC	

Name: David K. Shimp	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address: 1551 Ben Sawyer Blvd 4B	
City/State/Zip: Mt. Pleasant, SC 29464	
E-mail: d.shimp@comcast.net	
Organization/Constituency Represented (if any): SC Naval Militia, Navy League	

Name: Thomas J. Brown	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address: 664 Pelzer Drive	
City/State/Zip: Mt. Pleasant, SC 29464	
E-mail: Thomasjbrown@comcast.net	
Organization/Constituency Represented (if any):	

Date:________________

Jacksonville Range Complex

Environmental Impact Statement/ Overseas Environmental Impact Statement

Public Hearing Attendance List – July 2008

Attendance List

Name Melissa Rada	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address 867 McMillan Ave	
City/State/Zip 29405	
E-mail radams@dhec.sc.gov	
Organization/Constituency Represented (if any) SCDHEC-OCRM	

Name Jim Flatley	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address 488 Rice Hope Dr.	
City/State/Zip Mt. Pleasant SC 29464	
E-mail jhflatley@comcast.com	
Organization/Constituency Represented (if any) Navy - Retired	

Name Curtiss S Davis	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address 107 Nightingale Manor	
City/State/Zip Charleston SC 29418	
E-mail	
Organization/Constituency Represented (if any)	

Name DAVID CURFMAN	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address 9829 ORIOLE DR	
City/State/Zip CHESAPEAKE, VA 23321	
E-mail	
Organization/Constituency Represented (if any)	

Date:_____

Jacksonville Range Complex

Environmental Impact Statement/ Overseas Environmental Impact Statement

Public Hearing Attendance List – July 2008

Attendance List

Name Betty S. Jernigan

Address 2806 Wood Hill Dr.

City/State/Zip Jacksonville, FL 32256

E-mail

Organization/Constituency Represented (if any)

The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box.
☐ CD

Name

Address

City/State/Zip

E-mail

Organization/Constituency Represented (if any)

The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box.
☐ CD

Name

Address

City/State/Zip

E-mail

Organization/Constituency Represented (if any)

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☐ CD

Name

Address

City/State/Zip

E-mail

Organization/Constituency Represented (if any)

The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box.
☐ CD

Date:______________________

Jacksonville Range Complex

Environmental Impact Statement/ Overseas Environmental Impact Statement

Public Hearing Attendance List – July 2008

Attendance List

Name Wanda Hughes Todd	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address 710 15th Ave	
City/State/Zip Surfside Beach SC 29575	
E-mail	
Organization/Constituency Represented (if any)	

Name	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address	
City/State/Zip	
E-mail	
Organization/Constituency Represented (if any)	

Name	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address	
City/State/Zip	
E-mail	
Organization/Constituency Represented (if any)	

Name	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address	
City/State/Zip	
E-mail	
Organization/Constituency Represented (if any)	

Date:______________________

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
Jacksonville 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 Jacksonville 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.jacksonvillerangecomplexeis.com**
3) Faxing this form to (757) 322-4894, Attention: Code EV22CM (JAX EIS/OEIS PM)
4) Mailing this form to:

Naval Facilities Engineering Command Atlantic
Attention: Code EV22CM (JAX EIS/OEIS PM)
6506 Hampton Blvd
Norfolk, VA 23508-1278

☐ *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 August 11, 2008.

Name: Larry Gelwen Date: 7-28-08

Organization/Affiliation:

Address:* 525 Niven Drive

City, State, Zip Code: York Haven, PA 17370

Comments: Exc Program! Go for it!

(Use reverse side for additional comment)

Visit **www.jacksonvillerangecomplexeis.com** for project information.

*Provide your mailing address to receive future notices about the Jacksonville Range Complex EIS/OEIS.

PUBLIC HEARING #2

The second public hearing was held in Beaufort, SC, at the Holiday Inn Beaufort; July 29, 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. No person from the general public made a presentation. Nine 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, comment forms, and transcript of the formal hearing.

Jacksonville Range Complex

Environmental Impact Statement/ Overseas Environmental Impact Statement

Public Hearing Attendance List – July 2008

Attendance List

Name Connie Lynn Beer **Address** PO Box 1171 **City/State/Zip** Beaufort, SC 29901 **E-mail** cbeer@hargray.com **Organization/Constituency Represented (if any)** City of Bft City Council	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name David Butler II **Address** ~~1803 Port Republi~~ Post Office Box 1538 **City/State/Zip** Beaufort / SC / 29901 **E-mail** david.e.butler@mail.house.gov **Organization/Constituency Represented (if any)** Cong. Joe Wilson	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name SCOTT BREWER **Address** PSC 20005 MCI EAST **City/State/Zip** CAMP LEJEUNE, NC 28542-0005 **E-mail** SCOTT.A.BREWER@USMC.MIL **Organization/Constituency Represented (if any)** MCI EAST	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name Mike Sores **Address** 112 Refuge Drive **City/State/Zip** Beaufort SC **E-mail** — **Organization/Constituency Represented (if any)** —	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD

Date: _____

Jacksonville Range Complex

Environmental Impact Statement/ Overseas Environmental Impact Statement

Public Hearing Attendance List – July 2008

Attendance List

Name DAVID WILSON **Address** MCAS BEAUFORT **City/State/Zip** **E-mail** DAVID.L.WILSON4@USMC.MIL **Organization/Constituency Represented (if any)**	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name Kimberly Fleming **Address** MCI EAST PSC 20005 **City/State/Zip** CAMP LEJEUNE, NC 28542 **E-mail** Kimberly.h.fleming@usmc.mil **Organization/Constituency Represented (if any)** MCIEAST	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name Linda Blount **Address** **City/State/Zip** **E-mail** **Organization/Constituency Represented (if any)**	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name **Address** **City/State/Zip** **E-mail** **Organization/Constituency Represented (if any)**	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD

Date:_____

Jacksonville Range Complex

Environmental Impact Statement/ Overseas Environmental Impact Statement

Public Hearing Attendance List – July 2008

Attendance List

Name Billy Drawdy **Address** **City/State/Zip** Beaufort, SC **E-mail** william.drawdy@usmc.mil **Organization/Constituency Represented (if any)** MCAS Beaufort	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name Charee Hoffman **Address** **City/State/Zip** Hampton VA 23669 **E-mail** **Organization/Constituency Represented (if any)**	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name **Address** **City/State/Zip** **E-mail** **Organization/Constituency Represented (if any)**	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name **Address** **City/State/Zip** **E-mail** **Organization/Constituency Represented (if any)**	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD

Date: _____

PUBLIC HEARING #3

The third public hearing was held in Savannah, GA, at the Hyatt Regency Savannah; July 30, 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. No person from the general public made a presentation. One person 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, comment forms, and transcript of the formal hearing.

Jacksonville Range Complex
Environmental Impact Statement/ Overseas Environmental Impact Statement
Public Hearing Attendance List – July 2008

Attendance List

Name Richard Morgan	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address PO Box 889	
City/State/Zip Savannah GA 31402	
E-mail richard.w.morgan@usace.army.mil	
Organization/Constituency Represented (if any) US Army Corps of Engineers	

Name	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address	
City/State/Zip	
E-mail	
Organization/Constituency Represented (if any)	

Name	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address	
City/State/Zip	
E-mail	
Organization/Constituency Represented (if any)	

Name	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address	
City/State/Zip	
E-mail	
Organization/Constituency Represented (if any)	

Date:______________________

PUBLIC HEARING #4

The fourth and final public hearing was held in Jacksonville, FL, at the Hyatt Regency Jacksonville – Riverfront; July 31, 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. No person from the general public made a presentation. Six 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, comment forms, and transcript of the formal hearing.

Jacksonville Range Complex

Environmental Impact Statement/ Overseas Environmental Impact Statement

Public Hearing Attendance List – July 2008

Attendance List

Name Bill Raspe **Address** 12637 Plummer Grand Rd **City/State/Zip** JAX, FL 32258 **E-mail** **Organization/Constituency Represented (if any)**	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name Paul Kunicki **Address** 2382 Sadler Rd **City/State/Zip** Fernandina Beach, FL 32034 **E-mail** **Organization/Constituency Represented (if any)** NOAA, NMFS	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name MIRIAM S. GALBT **Address** 1805 Royal Fern Ln **City/State/Zip** ORANGE PARK FL 32003 **E-mail** **Organization/Constituency Represented (if any)** US NAVY NASSAU PAO	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name EP FROEHLICH **Address** 11188 SCHOONER CT **City/State/Zip** **E-mail** EFROELH96@COMCAST.NET **Organization/Constituency Represented (if any)** JACKSONVILLE AREA SHIPYARD ASSO.	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD

Date:_____

Jacksonville Range Complex

Environmental Impact Statement/ Overseas Environmental Impact Statement

Public Hearing Attendance List – July 2008

Attendance List

Name ROBERT P. BIRTALAN	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address 11191 SCHOONER CT.	
City/State/Zip JACKSONVILLE FL.	
E-mail bbirtalan@atlanticmarine.com	
Organization/Constituency Represented (if any) ATLANTIC MARINE	

Name	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address	
City/State/Zip	
E-mail	
Organization/Constituency Represented (if any)	

Name	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address	
City/State/Zip	
E-mail	
Organization/Constituency Represented (if any)	

Name	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address	
City/State/Zip	
E-mail	
Organization/Constituency Represented (if any)	

Date:____________________

Jacksonville Range Complex
Environmental Impact Statement/ Overseas Environmental Impact Statement
Public Hearing Attendance List – July 2008

Attendance List

Name Debra Birtalan Address 11191 Schooner Ct. City/State/Zip Jax, Fl 32225 E-mail Organization/Constituency Represented (if any)	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name Address City/State/Zip E-mail Organization/Constituency Represented (if any)	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name Address City/State/Zip E-mail Organization/Constituency Represented (if any)	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name Address City/State/Zip E-mail Organization/Constituency Represented (if any)	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD

Date:

APPENDIX G

COASTAL ZONE MANAGEMENT

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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 of each state's CZMP located within the Study Area. Based on the limitations discussed in Section 2.4, the enforceable policies of each state's CZMP, and pursuant to 15 CFR 930.39, the U.S. Navy prepared and submitted a Consistency Determination for the state of Florida. Additionally, the U.S. Navy prepared and submitted Negative Determinations pursuant to 15 CFR § 930.35 for the states of North Carolina, South Carolina and Georgia. The status of these submissions is shown in Table G-1 as of February 20, 2009.

Table G-1. Status of CZMA Determination Submissions

State	Submission Type	Status
Florida	Coastal Consistency Determination	Concurrence received January 5, 2009
Georgia	Negative Determination	Conditional Concurrence received February 17, 2009. The Navy is coordinating with NOAA/NMFS and will respond accordingly.
North Carolina	Negative Determination	Concurrence received February 9, 2009
South Carolina	Negative Determination	No response received within the 60 day timeline, concurrence presumed.

A copy of each CZMA determination letter is enclosed in this appendix, as well as any received state response.

DEPARTMENT OF THE NAVY
COMMANDER
U.S. FLEET FORCES COMMAND
1562 MITSCHER AVENUE SUITE 250
NORFOLK, VA 23551-2487

5090
Ser N4/7/1100
December 19, 2008

Ms. Lauren P. Milligan
Florida State Clearinghouse
Department of Environmental Protection
3900 Commonwealth Blvd, M.S. 47
Tallahassee, FL 32399-3000

Dear Ms. Milligan:

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 in the Jacksonville (JAX) Range Complex. The purpose of the Proposed Action is to: 1) Achieve and maintain Fleet readiness using the JAX Range Complex to support and conduct current, emerging, and future training operations and RDT&E operations; 2) Expand warfare missions supported by the JAX 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 will be conducted in a manner consistent with the enforceable policies of Florida's approved coastal management program. The basis for this "Coastal 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 containing the JAX Draft Environmental Impact Statement (DEIS)/Overseas EIS (OEIS) and appendices which was published and released to the public for comment on June 27, 2008[2] in compliance with the National Environmental Policy Act and Executive Order 12114. Further information regarding the JAX DEIS/OEIS may be obtained by visiting the project's website: www.jacksonvillerangecomplexeis.com.

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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 state's federally approved coastal management plant. 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] See Federal Register, Vol. 73, No. 125, Friday, June 27, 2008, pages 36495 to 36498.

5090
Ser N4/7/1100
December 19, 2008

Since the publication of the JAX DEIS/OEIS in the Summer of 2008, the U.S. Navy recently completed an informal consultation with the U.S. Fish and Wildlife Service (USFWS) on October 7, 2008, to address the proposed activities and its potential impact upon certain endangered and threatened species. The informal consultation with USFWS is documented in Enclosure (3).

In accordance with 15 Code of Federal Regulations (CFR) Section 930.32, the Department of the Navy has reviewed Florida's coastal management program and associated enforceable policies and has determined that the proposed activities occurring within Florida's coastal zone are consistent to the maximum extent practicable.

In accordance with 15 CFR Section 930.41(a), Florida 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. Kelly Proctor, Naval Facilities Engineering Command, Atlantic, (757) 322-4728.

Florida's concurrence will be presumed if its response is not received by the U.S. Navy (Atlantic Fleet) within 60 days from receipt of this Determination. Florida's response or other inquiries should be sent to: Naval Facilities Engineering Command, Atlantic, ATTN: Code EV22 (JAX EIS/OEIS Project Manager), 6506 Hampton Blvd., Norfolk, VA 23508-1278; or Facsimile (757) 322-4805. If additional information should be required, requests for such information should be requested within ten days of receipt of this Consistency Determination.

Sincerely,

J. W. MURPHY
Deputy Chief of Staff
for Operational Readiness
and Training

Enclosures:
1. Federal Agency CZMA Consistency Determination for Florida
2. JAX DEIS/OEIS CD-Rom
3. USFWS Informal Consultation

FEDERAL AGENCY COASTAL ZONE MANAGEMENT ACT (CZMA) CONSISTENCY DETERMINATION FOR FLORIDA

INTRODUCTION

This document provides the State of Florida with the Department of the Navy's (U.S. Navy) Consistency Determination under the CZMA, 16 United States Code (USC) § 1456 Section 307 (c) (1) [or (2)] and 15 Code of Federal Regulations (CFR) § 930 (c), for training and testing activities in the Jacksonville (JAX) Range Complex. The information in this Consistency Determination is provided pursuant to 15 CFR § 930.39.

The Proposed Action of the JAX Range Complex Environmental Impact Statement (EIS)/Overseas EIS (OEIS) has potential to affect Florida's coastal zone resources as described in this CZMA Consistency Determination.

The following information is based upon a review of Florida's Coastal Management Program (CMP) and its associated enforceable policies, and information provided by the Florida Department of Environmental Protection.

The State of Florida 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.

Section 304(1) of the CZMA defines the seaward extent of a state's coastal zone as "*to the outer limit of state title and ownership under the Submerged Lands Act (43 United States Code [USC] 1301 et. seq.).*" Under the Submerged Lands Act, Florida's title and ownership extends 5.6 kilometers (km) (3 nautical miles [nm]) into the Atlantic Ocean and, in accordance with United States vs. Louisiana, *et. al*., 364 U.S. 502 (1960), approximately 16.7 km (9 nm) into the Gulf of Mexico. The entire State of Florida and the waters therein are also considered a part of the coastal zone. The JAX Range Complex activities encompass direct federal activities that would take place inside the State of Florida'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 Florida's coastal zone.

Florida Statute Chapter 372.072(b) and (c), an enforceable policy of the CMP, defines an endangered/threatened species as *any species of fish and wildlife naturally occurring in Florida, whose prospects of survival are in jeopardy due to modification or loss of habitat; overutilization for commercial, sporting, scientific, or educational purposes; disease; predation; inadequacy of regulatory mechanisms; or other natural or man-made factors affecting its continued existence*. Therefore, because of the potential that training and testing activities in the JAX Range Complex could impact sea turtles and marine mammals, and because sea turtles and marine mammals are threatened/endangered species found within the State of Florida, these activities must be consistent to the maximum extent practicable with the enforceable policies of the CMP.

The National Marine Fisheries Service (NMFS) is a cooperating agency for the JAX 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 Florida's Coastal Zone

The United States Department of the Navy (U.S. Navy) used a screening process to identify 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, 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
- Aircraft Overflights
- Towed Mine Warfare Devices
- Temporary mineshape deployment/recovery
- Non-explosive practice munitions
- Underwater detonations and high explosive ordnance
- Military expended materials

Most of the activities would be conducted in the offshore Operating Areas (OPAREAs) in the Atlantic Ocean, beginning at 3 nm from the coastline and extending seaward. Activities that would be conducted in the OPAREAs include:

- Mine Warfare: Mine Countermeasures and Mine Neutralization;
- Surface Warfare: Missile Exercise (MISSILEX), Gunnery Exercise (GUNEX) (Air-to-Surface), GUNEX (Surface-to-Surface), Bombing Exercise (BOMBEX) (Air-to-Surface), and Laser Targeting;
- Air Warfare: Air Combat Maneuvers (ACM), Air Intercept Control, ACM Chaff Exercise, ACM Flare Exercise, MISSILEX (Air-to-Air), GUNEX (Surface-to-Air), and Detect to Engage;
- Strike Warfare: Firing Exercise;
- Electronic Combat: Electronic Combat Operations, Chaff Exercise; and
- Other Training: Shipboard Electronic Systems Evaluation Facility Utilization.

Fewer activities would be conducted on the inland ranges in Florida (Rodman Range and Lake George Range). These activities would include:

- Mine Warfare: Mine Laying at Lake George Range;
- Strike Warfare: BOMBEX (Air-to-Ground) with non-explosive practice munitions, and Combat Search and Rescue and Convoy Operations at Rodman Range; and
- Electronic Combat: Flare Exercise at Rodman Range

Specific details of the current and proposed operations conducted in the JAX Range Complex are presented in Chapter 2 of the EIS/OEIS (refer to the enclosed CD file in PDF format). Military training activities conducted offshore of Florida in the Gulf of Mexico (GOMEX) are not covered in the JAX EIS/OEIS, but are covered in the GOMEX EIS/OEIS (public release of the Draft EIS/OEIS is expected December 2009).

CONSISTENCY DETERMINATION

In accordance with 15 CFR § 930.39, the Department of the Navy has reviewed Florida's CMP and associated enforceable policies and has determined that the U.S. Navy's Proposed Action is consistent to the maximum extent practicable with the enforceable policies of the CMP. The findings presented below are based on the analyses presented in Chapter 3, Affected Environment and Environmental Consequences of the JAX Range Complex EIS/OEIS.

PROPOSED FEDERAL AGENCY ACTION

The U.S. Navy has prepared an EIS/OEIS to assess the potential environmental impacts over a 10-year planning horizon. The proposed activities evaluated in the EIS/OEIS are associated with U.S. Navy Atlantic Fleet training; research, development, testing, and evaluation (RDT&E) activities; and associated range capabilities enhancements in the JAX and Charleston OPAREAs, hereafter referred to as the JAX Range Complex. The EIS/OEIS is expected to be completed in the Spring of 2009. The JAX Range Complex geographically encompasses offshore, near-shore, and onshore OPAREAs, ranges, and special use airspace (SUA). Components of the JAX Range Complex encompass 50,090 square nautical miles

(nm^2) of sea space and 62,596 nm^2 of SUA off the coasts of North Carolina, South Carolina, Georgia, and Florida, as well as 20 square miles of inland range area in north-central Florida. The geographic scope of the EIS/OEIS includes the airspace, seaspace, and undersea space of the JAX Range Complex, including the area from the mean high tide line, up to and extending seaward from the 3 nm western boundary of the OPAREAs, hereafter referred to as the JAX Study Area. Also included are the inland ranges and associated restricted airspace of the Rodman Range and Lake George Range (refer to Chapter 2 of the EIS/OEIS for specific locations in the range complex).

The EIS/OEIS has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 USC § 4321); the Council of Environmental Quality Regulations for implementing the procedural provisions of NEPA (Title 40 CFR Parts 1500-1508); Department of the Navy Procedures for Implementing NEPA (32 CFR 775); Executive Order (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, this document was written to satisfy the requirements of both NEPA and E.O. 12114.

In accordance with 50 CFR Part 401.12, the U.S. Navy submitted a Biological Evaluation 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 the ESA. The U.S. Navy evaluated Essential Fish Habitat and made a determination of no effect. In accordance with the MMPA (16 USC Section 1371[a][5]), the U.S. Navy submitted a request for a Letter of Authorization to NMFS for the incidental taking of marine mammals by the Proposed Action. The U.S. Navy submitted a Consultation Package to the U.S. Fish and Wildlife Service (USFWS) in accordance with legal requirements set forth under regulations implementing Section 7 of the ESA (50 CFR 402; 16 USC 1536 (c)) for listed species under their jurisdiction. The USFWS provided in their concurrence letter dated October 7, 2008 that the Proposed Action may affect but would not adversely affect listed species. These documents are provided electronically in PDF format on the enclosed CD.

Proposed Action

The Proposed Action is to support and conduct current and emerging training and RDT&E operations in the JAX Range Complex. To achieve this, the U.S. Navy proposes to:

- Increase or modify training and RDT&E operations from current levels as necessary in support of the Fleet Readiness 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.

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. 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 that implement the Fleet Response Plan, which ensures continuous availability of agile, flexible, trained, and ready surge-capable (rapid response) forces.

The purpose for the Proposed Action is to:

- Achieve and maintain Fleet readiness using the JAX Range Complex to support and conduct current, emerging, and future training operations and RDT&E operations;
- Expand warfare missions supported by the JAX 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 JAX Range Complex furthers the U.S. Navy's execution of its congressionally mandated roles and responsibilities under Title 10 USC § 5062. To implement this Congressional mandate, the U.S. Navy needs to:

- Maintain current levels of military readiness by training in the JAX Range Complex;
- Accommodate future increases in operational training tempo in the JAX 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 JAX 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 JAX 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 actions evaluated in the EIS/OEIS. These potentially include:

- Increase use of contractor-operated small 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 helicopter warfare mission areas, and Multi-Mission Maritime Aircraft training operations; and
- Conduct mine warfare training using a temporary mine training area.

FEDERAL CONSISTENCY REVIEW

Florida's CMP is comprised of 23 state statutes, which constitute 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 U.S. Navy has determined that the JAX Range Complex activities are consistent to the maximum extent practicable with the enforceable policies of Florida's CMP based on the following information, data, and analysis (given as a summary in the table and presented as comprehensive analysis in Chapter 3 of the EIS/OEIS).

Pursuant to 15 CFR § 930.41, the Florida 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). Florida's concurrence will be presumed if the U.S. Navy (Atlantic Fleet) does not receive its response within 60 days from receipt of this Determination. Florida's response should be sent to Naval Facilities Engineering Command, Atlantic, Attn: Code EV22 (JAX EIS/OEIS Project Manager), 6506 Hampton Blvd., Norfolk, Virginia 23508-1278.

Table 1. Florida Coastal Management Program Consistency Review

Statute (Florida Statute)	Consistency	Scope
Chapter 161 *Beach and Shore Preservation*	The Proposed Action would not adversely affect beach and shore management. No construction activities would occur.	Authorizes the Bureau of Beaches and Coastal Systems in the FDEP to regulate construction on or seaward of the state's beaches.
Chapter 163, Part II *Growth Policy; County and Municipal Planning; Land Development Regulation*	The Proposed Action would not affect local government comprehensive plans.	Requires local governments to prepare, adopt, and implement comprehensive plans that encourage the most appropriate use of land and natural resources in a manner consistent with the public interest.
Chapter 186 *State and Regional Planning*	The Proposed Action would not affect state-level planning requirements.	Details state-level planning requirements. Requires the development of special statewide plans governing water use, land development, and transportation.
Chapter 252 *Emergency Management*	The Proposed Action would not have an effect on the ability of the state to respond to or recover from natural or man-made disasters.	Provides for planning and implementation of the state's response to, efforts to recover from, and the mitigation of natural and manmade disasters.
Chapter 253 *State Lands*	The Proposed Action would not have an effect on the state's administration of public lands and property of this state. No significant impacts would result from deposition of expended training materials and their accumulation over time.	Addresses the state's administration of public lands and property of this state and provides direction regarding the acquisition, disposal, and management of all state lands.
Chapter 258 *State Parks and Reserves*	The Proposed Action would not impact the administration or management of state parks and preserves.	Addresses administration and management of state parks and preserves.
Chapter 259 *Land Acquisition for Conservation or Recreation*	The Proposed Action would not have an effect on the acquisition of environmentally endangered and outdoor recreation lands.	Authorizes acquisition of environmentally endangered lands and outdoor recreation lands.
Chapter 260 *Recreational Trails System*	The Proposed Action would not have an effect on the acquisition of land to create a recreational trails system.	Authorizes acquisition of land to create a recreational trails system and to facilitate management of the system.

Statute (Florida Statute)	Consistency	Scope
Chapter 267 *Historical Resources*	The Proposed Action would not impact historical resources of the state. Most of the approximately 900 shipwrecks in the JAX Study Area are along the coastline, with approximately 200 shipwrecks scattered in off-shore waters. 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 and Chapter 267, Florida Statute.	Addresses management and preservation of the state's archaeological and historical resources.
Chapter 288 *Commercial Development and Capital Improvements*	The Proposed Action would not have an effect on commercial development or capital improvements	Provides the framework for promoting and developing the general business, trade, and tourism components of the state economy.
Chapter 334 *Transportation Administration*	The Proposed Action would not have an effect on the state's policy concerning transportation administration.	Addresses the state's policy concerning transportation administration.
Chapter 339 *Transportation Finance and Planning*	The Proposed Action would not have an effect on the finance and planning needs of the state's transportation system.	Addresses the finance and planning needs of the state's transportation system.
Chapter 370 *Saltwater Fisheries*	The Proposed Action would not affect federally-listed fish species. Temporary disruptions to recreational and commercial fisheries could occur, but would be localized and for a short duration. No long-term effects to these resources would occur.	Addresses management and protection of the state's saltwater fisheries.
Chapter 372 *Wildlife*	The Proposed Action would not adversely affect terrestrial species; the Navy concluded informal consultation with USFWS. Effects to marine wildlife resources (including ESA-listed sea turtles and marine mammals) would be addressed through the federal consultation processes (Biological Evaluation and Letter of Authorization) with the National Marine Fisheries Service.	Addresses the management of the wildlife resources of the state, including Florida's Endangered and Threatened Species.

Statute (Florida Statute)	Consistency	Scope
Chapter 373 *Water Resources*	The Proposed Action would not have a significant impact on water quality from expended components.	Addresses the state's policy concerning water uses and quality.
Chapter 375 *Multipurpose Outdoor Recreation; Land Acquisition, Management, and Conservation*	The Proposed Action would not impact the state's development or evaluation of multipurpose outdoor recreation plans.	Develops comprehensive multipurpose outdoor recreation plans.
Chapter 376 *Pollutant Discharge Prevention and Removal*	The Proposed Action would not result in significant pollutant discharges. The U.S. Navy follows the standards for incidental liquid discharges from vessels of the Armed Forces, effective 9 June 1999. An NPDES permit is not required for the Proposed Action.	Addresses transfer, storage, and transportation of pollutants, and cleanup of pollutant discharges.
Chapter 377 *Energy Resources*	The Proposed Action would not have a significant effect on energy exploration.	Addresses regulation, planning, and development of energy resources of the state.
Chapter 380 *Land and Water Management*	Under the Proposed Action, development of state lands would not occur. Activities would avoid Areas of Critical State Concern and areas with approved state resource management plans, such as aquatic preserves, national estuarine research reserves, and national marine sanctuaries. Changes to coastal infrastructure or use of state funds for infrastructure planning, designing, or construction would not occur. The Proposed Action would not involve the generation of solid waste within the state's coastal zone. All solid waste disposals would be conducted in accordance with U.S. Navy policies and procedures.	Establishes land and water management policies to guide and coordinate local decisions relating to growth and development.
Chapter 381 *Public Health, General Provisions*	The Proposed Action does not involve the construction of an on-site sewage treatment and disposal system	Establishes public policy concerning the state's public health system.
Chapter 388 *Mosquito Control*	The Proposed Action would not affect mosquito control efforts.	Addresses mosquito control efforts in the state.

Statute (Florida Statute)	Consistency	Scope
Chapter 403 *Environmental Control*	The Proposed Action would not result in significant adverse impacts to air quality. Most emissions would occur above 3,000 feet and are considered to be above the atmospheric inversion layer; therefore, without impact on the local air quality. Based on the EIS/OEIS analysis it was determined that the Clean Air Act general conformity Rule does not apply for the Proposed Action.	Addresses environmental control in the state, including discharges to surface waters of the state, air pollutant emissions, the generation and transportation of hazardous wastes, and solid waste management.
Chapter 582 *Soil and Water Conservation*	Activities at Rodman Range are conducted in accordance with the Navy's Operational Range Clearance Program as specified in the DEIS/OEIS.	Provides for the control and prevention of soil erosion.

Florida Department of
Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Charlie Crist
Governor

January 5, 2009

Ms. Kelly Proctor
Naval Facilities Engineering Command, Atlantic
Code EV22 (JAX EIS/OEIS PM)
6506 Hampton Blvd.
Norfolk, VA 23508-1278

RE: Department of the Navy - Draft Environmental Impact Statement/Overseas Environmental Impact Statement for Atlantic Fleet Training in the Jacksonville Range Complex - Off the Northeast Coast of Florida.
SAI # FL200806304318C (Reference SAI # FL200702063046C)

Dear Ms. Proctor:

The Florida State Clearinghouse previously coordinated a review of the referenced Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) under the following authorities: Presidential Executive Order 12372; Section 403.061(40), *Florida Statutes*; the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended; and the National Environmental Policy Act, 42 U.S.C. §§ 4321, 4331-4335, 4341-4347, as amended.

The Florida Fish and Wildlife Conservation Commission (FWC) noted that the proposed activities are located within the geographic range of the endangered North Atlantic right whale, the endangered West Indian manatee, multiple species of marine turtles, other whales and dolphins. As stated in the Draft EIS/OEIS, many of the current and proposed operations have the potential to stress and adversely impact those species. FWC requests that the recommendations provided by staff be incorporated into Chapter 5, *Mitigation Measures* of the Draft EIS/OEIS. A number of comments and recommendations on the potential effects of range operations have been provided, including suggestions that:

- Navy training operations not impede regularly scheduled Early Warning System aerial surveys;
- The EIS acknowledge that there may be cumulative effects from increased operations and that the Navy dedicate funding and support for research to understand the possible effects on protected species;

- Mitigation measures be implemented for all protected marine species listed as possibly occurring in the areas of operation;
- Proper reporting, operational delays and assistance be provided for marine species injuries and deaths;
- Night-time operations be limited and slower vessel speeds implemented due to difficulties in marine animal detection; and
- Explosive detonation and acoustic training exercises be limited during right whale calving season.

Please refer to the enclosed FWC letter for further comments and recommendations.

Based on the information contained in the Draft EIS/OEIS and enclosed state agency comments, the state has determined that, at this stage, the proposed federal activities are consistent with the Florida Coastal Management Program. The concerns identified by the FWC must be addressed, however, prior to project implementation. The state's continued concurrence with the project will be based, in part, on the adequate resolution of issues identified during this and any subsequent reviews.

Thank you for the opportunity to review the draft document. Should you have any questions regarding this letter, please contact Ms. Lauren P. Milligan at (850) 245-2170.

Yours sincerely,

Sally B. Mann

Sally B. Mann, Director
Office of Intergovernmental Programs

SBM/lm
Enclosures

Project Information	
Project:	FL200806304318C
Comments Due:	08/04/2008
Letter Due:	08/22/2008
Description:	DEPARTMENT OF THE NAVY - DRAFT ENVIRONMENTAL IMPACT STATEMENT/OVERSEAS ENVIRONMENTAL IMPACT STATEMENT FOR ATLANTIC FLEET TRAINING IN THE JACKSONVILLE RANGE COMPLEX - OFF THE NORTHEAST COAST OF FLORIDA.
Keywords:	NAVY - DEIS, ATLANTIC FLEET TRAINING, JACKSONVILLE RANGE COMPLEX - NE FLORIDA
CFDA #:	99.300

Agency Comments:

FISH and WILDLIFE COMMISSION - FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

The FWC notes that the proposed activities are located within the geographic range of the endangered North Atlantic right whale, the endangered West Indian manatee, multiple species of marine turtles, other whales and dolphins. As stated in the DEIS, many of the current and proposed operations have the potential to stress and adversely impact these species. FWC requests that the recommendations provided by staff be incorporated into Chapter 5, "Mitigation Measures" of the DEIS. A number of comments and recommendations on the potential effects of training range operations have been provided, including suggestions that: Navy training operations not impede regularly scheduled Early Warning System aerial surveys; the EIS acknowledge that there may be cumulative effects from increased operations and that the Navy dedicate funding and support for research to understand the possible effects on protected species; mitigation measures be implemented for all protected marine species listed as possibly occurring in the areas of operation; proper reporting, operational delays and assistance be provided for marine species injuries and deaths; night-time operations be limited and slower vessel speeds implemented due to difficulties in marine animal detection; and explosive detonation and acoustic training exercises be limited during right whale calving season. Please refer to the enclosed FWC letter for further comments and recommendations.

STATE - FLORIDA DEPARTMENT OF STATE

No Comment/Consistent

ENVIRONMENTAL PROTECTION - FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

No Comments

For more information or to submit comments, please contact the Clearinghouse Office at:

3900 COMMONWEALTH BOULEVARD, M.S. 47
TALLAHASSEE, FLORIDA 32399-3000
TELEPHONE: (850) 245-2161
FAX: (850) 245-2190

Visit the Clearinghouse Home Page to query other projects.

Florida Fish and Wildlife Conservation Commission

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Karen Ventimiglia
Deputy Chief of Staff

Office of Policy and Stakeholder Coordination
Mary Ann Poole
Director
(850) 410-5272
(850) 922-5679 FAX

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32399-1600
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Hearing/speech impaired:
(800) 955-8771 (T)
(800) 955-8770 (V)
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August 8, 2008

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Lauren P. Milligan, Environmental Manager
Florida State Clearinghouse
Florida Department of Environmental Protection
3900 Commonwealth Blvd., Mail Station 47
Tallahassee, FL 32399-3000

Subject: Duval Co., SAI #FL200806304318C, JAX Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) for the United States Fleet Forces

Dear Ms. Milligan:

The Florida Fish and Wildlife Conservation Commission (FWC), Imperiled Species Management Section, has coordinated agency review of the Draft Environmental Impact Statement (DEIS)/Overseas EIS (OEIS) as it pertains to the Jacksonville Range Complex project, and provides the following comments and recommendations in accordance with the Coastal Zone Management Act/Florida Coastal Management Program and the National Environmental Policy Act.

Project Description

As part of the DEIS, the Navy proposes to support and conduct current and emerging training and research, development, testing, and evaluation operations and to upgrade Navy training and testing for the Jacksonville Range Complex. For the purposes of this DEIS, the Jacksonville Range Complex includes the Jacksonville Area of Operation (JAX OPAREA), the Lake George Range and the Rodman Range. The DEIS states that the potential effects associated with the active sonar component of these exercises are analyzed separately in the Atlantic Fleet Active Sonar Training (AFAST) EIS. In addition, the Navy has prepared a DEIS proposing to homeport additional Atlantic Fleet surface ships at Naval Station Mayport. The alternatives proposed in this EIS/OEIS include the following:

No Action Alternative – Current Operations to include surge consistent with the existing Fleet Readiness Training Plan. A brief summary of current operations include:

Vessel movements (steaming days/year) is 1,000

Aircraft overflights (sorties/year) is 2,538; Towed Mine Warfare devices (sorties/year) is 78

Towed Mine Warfare devices (sorties/year) is 78

Weapons firing (Non-explosive Practice Munitions only, or NEPM, per year) is

Underwater Explosions/detonations; (High explosive ordnance, or HE, per year) is

Bombs MK-82	60
Bombs MK-83	12
Bombs MK-84	1
Bombs MK-20	4
Missiles (Hellfire, Maverick, AIM)	39
Naval gun shells	390
20-lb charges	18
Anti-swimmer	

Bombs	500
Missiles	14
Cannon shells	42,900
Naval gun shells	2,174
Small caliber	485,180
M19	11,520
grenades	80

Expended Material (MEM)

Targets	40
Chaff	4,174
Flares	1,740
Marine markers	300

Alternative 1 – Current operations plus an increase in Operational Training, Expand Warfare Missions, Accommodate Force Structure Changes (includes changing weapon systems and platforms and homebasing new aircraft and ships), and implement enhancements, with modifications to current training or introduction of new training. These would include: a) using more commercial aircraft to serve as oppositional forces rather than using Navy aircraft for Air-to-Air Missile Exercise, Surface-to-Air Gunnery Exercises, Air Intercept Control Exercises, and Detect-to-Engage Exercises; b) the incorporation of anti-terrorism training into existing training events; c) adjusting training levels to ensure that deployment can be stepped up quickly and at multiple locations in response to world events; and d) conducting new or modified training associated with the introduction of the new MH-60 helicopter, and new organic mine countermeasure systems.

Vessel movements (steaming days/year) is 1,050 (50 more than current)

Aircraft overflights (sorties/year) is 2,869 (331 more than current)

Towed Mine Warfare devices (sorties/year) is 150 (72 more than current)

Weapons firing (Non-explosive Practice Munitions only, or NEPM, per year) is

Bombs 500 (same as current)
Missiles 15 (1 more than current)
Cannon shells 47,200
(4,300 more than current)
Naval gun shells 2,372
(198 more than current)
Small caliber 50,3240
(18,060 more than current)
M19 12,700 (1,180 more than current)

Underwater Explosions/detonations; (High explosive ordnance, or HE, per year) is

Bombs MK-82	60 (same as current)
Bombs MK-83	12 (same as current)
Bombs MK-84	1 (same as current)
Bombs MK-20	4 (same as current)
Missiles (Hellfire, Maverick, AIM)	80 (41 more than current)
Naval gun shell	390 (same as current)
20-lb charges	12 (6 less than current)
Anti-swimmer Grenades	80 (same as current)

Expended Material (MEM)

Targets	44 (4 more than current)
Chaff	4,663 (429 more than current)
Flares	2,470 (730 more than current)
Marine markers	300 (same as current)

Alternative 2 (Preferred Alternative) – Alternative 1 plus and implement enhanced Mine Warfare Training Capability including increases in operations, with the exception of an elimination of live bombing exercises, and the designation of Mine Warfare (MIW) Training Areas in the JAX and Charleston operating areas.

Vessel movements (steaming days/year) is 1,050 (50 more than current)

Aircraft overflights (sorties/year) is 3,224 (686 more than current)*

Towed Mine Warfare devices (sorties/year) is 456 (378 more than current)*

Weapons firing; (Non-explosive Practice Munitions only, or NEPM, per year) is

Bombs 836 (336 more than current)*
Missiles 15 (1 more than current)
Cannon shells 47,200 (4,300 more than current)
Naval gun shells 2,372 (198 more than current)
Small caliber 50,3240 (18,060 more than current)
M19 12,700 (1,180 more than current)

Underwater Explosions/detonations; (High explosive ordnance, or HE, per year) is

Bombs MK-82 0 (60 less than current)*
Bombs MK-83 0 (12 less than current)*
Bombs MK-84 0 (1 less than current)*
Bombs MK-20 0 (4 less than current)*
Missiles (Hellfire, Maverick, AIM) 80 (41 more than current)
Naval gun shells 390 (same as current)
20-lb charges 12 (6 less than current)
Anti-swimmer grenades 80 (same as current)

Expended Material (MEM)

Targets 44 (4 more than current)
Chaff 4,663 (429 more than current)
Flares 2,470 (730 more than current)
Marine markers 300 (same as current)

* Represents a higher or lower number than Alternative 1.

Issues of Concern

The proposed activities are within the geographic range of the endangered North Atlantic right whale (*Eubalaena glacialis*) and the endangered West Indian manatee (*Trichechus manatus latirostris*), and multiple species of marine turtle, other whales, and dolphins. As stated in the DEIS, many of the current and proposed operations have the potential to stress and adversely impact most of these species. Mitigation measures for these activities are outlined in Chapter 5 of the DEIS, and the FWC suggests incorporating our recommendations into this chapter.

Lake George Range

As stated in the DEIS, the Lake George area has some natural springs along the lake, specifically Salt Spring and Silver Glen Spring. These springs provide some thermal benefits to manatees traveling north and south in the St. Johns River system. Manatees move through this area to access Blue Spring farther south, which is the largest warm water refuge for manatees in the St. Johns River system. The 2006-2007 manatee census conducted in the winter timeframe at Blue Spring documented 265 total individuals noted

over the winter with a maximum single day count of 193. The number of manatees using Blue Spring has continued to increase from 11 in the 1970-71, to 35 in 1980-81, to 63 in 1990-91, to 153 in 2000-01, to the latest confirmed counts of 265 for the 2006-07.

For the Little Lake George and Lake George areas, eight manatees have died from all causes from January 1974 to May 2008. Of these eight deaths, there were three watercraft-related, one related to human activity other than use of watercraft, one natural, and three undetermined deaths. No carcasses were reported in the immediate vicinity of the Lake George bombing range. With an increase in use of the Blue Spring area, there is likely increasing manatee use in the vicinity of Lake George as well.

No live ordnance is currently authorized for Lake George. This range supports air-to-surface training with inert practice bombs with targets within approximately 2.3 miles wide by 8 miles long. Currently, MIW exercises in the form of mine laying (dropping NEPM bombs from aircraft onto targets) occurs on the Lake George Range with 10 sorties (40 bombs) a year. The DEIS proposes an increase in Electronic Combat in the form of Flare exercises with an increase from 56 sorties to 80 (an additional 46 sorties, with 720 more flares a year).

The stressors and risks to manatees associated with these activities include the possibility of reducing habitat value during the migration seasons altering behavioral and migratory patterns (disturbance), the possibility of being struck by a NEPM (collision), the possibility of being struck by any support vessels that may be used in the exercises (collision), and ingestion of military expended materials.

JAX OPAREA

Whales, dolphins, and marine turtles may all be found within the area of operation. Because no activities are proposed on beaches where marine turtles nest, potential impacts to marine turtles are limited to those associated with the open-water activities. The distribution of right whales is more sizable than currently delineated as critical habitat. Other marine mammal species may also inhabit the area of operation, even if sightings have not been reported.

Alternative 2 proposes to eliminate the High Explosive bombing exercises (77 fewer bombs), reduce the mine neutralization exercises (6 fewer 20-lb charges), and increase the High Explosive surface warfare exercises (41 more missiles). High-explosive missiles used in air-to-surface exercises explode near the water surface. With the introduction of the MH-60 helicopters (projected to be 105), there will be increased use of sonar and sonar mine hunting gear related to mine warfare exercise.

The stressors and risks to these protected marine species associated with these activities include the possibility of reducing habitat value during the migration seasons, altering behavioral and migratory patterns (disturbance), the possibility of being struck by a NEPM (collision), vessel movements (disturbance and collision), Towed MIW devices (strikes), use of sonar (disturbance and impact), underwater detonations and explosions (disturbance and impact), and ingestion of military expended materials.

Recommendations

The FWC makes the following recommendations for the DEIS based on our understanding of the proposal and its associated mitigation measures.

General recommendations

- We acknowledge and appreciate the Navy's continued support in the existing Early Warning System (EWS) aerial survey efforts. The number of Navy whale sightings reported to EWS over the years has been invaluable, and we encourage this reporting to be standard operating procedure. We concur with the use of the EWS system in the Navy's training operations, and encourage the Navy to mitigate interactions between whales and Navy helicopters and fixed-wing aircraft including the minimization of low-level overflights. We also recommend that the EIS state that Navy training operations will not impede regularly scheduled EWS surveys.

- Chapter 6, regarding direct, indirect, and cumulative impacts, states that "no significant cumulative impacts to marine mammals would occur in U.S. territorial waters as a result of training activities from ....Alternative 2." We recommend that the EIS acknowledge that there may be cumulative effects of the proposed increased operations and that the Navy should be willing to fund and support research designed to understand the possible effects on protected species.

- Mitigation measures proposed for these training exercises should be implemented for all protected marine species listed as possibly occurring in the area of operation outlined in the DEIS.

- If any protected marine species are injured or killed during training exercises, or if any cetacean strandings take place near or at the time of training events, or if an injured or dead protected marine animal is sighted by Navy observers, it should be reported to the National Marine Fisheries Service (NMFS) stranding network and the FWC Hotline at 1-888-404-FWCC. If any protected marine species are injured or killed during training exercises or if strandings occur, all training activities should be halted or delayed until the cause of the strandings, injuries or deaths is determined and addressed. Navy assistance and cooperation in locating, towing and providing other resources during these events would be appreciated.

Lake George Range

- There does not appear to be a section in Chapter 5 for Lake George Range Mitigation Measures. While we realize that the NEPM exercises are currently ongoing, we recommend that the Navy reduce the potential for strikes and disturbance by implementing similar measures used for At-Sea Mine Laying (non-explosive) training events (5.8.12).

- It is not clear if vessels, even for support, are involved with the current or proposed exercises for the Lake George Range. Table 3.11-3 seems to indicate that it is not a factor; however, if support vessels are used, we recommend that vessels travel at slow speed.

JAX OPAREA

- Chapter 5.5 discusses mitigation measures, including personnel training as lookouts and watchstanders. Protocols are included that address watching for marine animals at night. Please be aware that the ability to detect marine animals, particularly small ones like marine turtles, is difficult during daylight hours and is almost impossible at night, especially at a distance. In addition, most marine animals spend the majority of their time underwater, making them difficult to detect. Because of the inherent inaccuracy of detecting animals with lookouts, we recommend the following:

    - All exercises involving the use of high explosives near or in the water should be conducted during daylight hours only;
    - Navy vessels should operate at a maximum of 10 knots (or minimum safe speed) when traveling through right whale habitat (see discussion below) during calving season (see discussion below); and
    - Navy vessels should operate at a maximum of 10 knots (or minimum safe speed) when traveling through right whale habitat at night. If faster vessel speeds are required for an exercise, it should be conducted at the minimum speed required.

- FWC recommends that the Navy coordinate with the NMFS to update right whale information and the dates for the calving season. The DEIS states that Firing Exercise (FIREX) with Integrated Maritime Portable Acoustic Scoring and Simulator System (IMPASS) activities are limited to months of the year outside of right whale calving season, stated as December 1 to March 31. Based on more recent published studies, it may be more appropriate to consider right whale calving season between November 15 and April 15.

    - All exercises involving the use of high explosives/detonation near or in the water should be restricted to those months outside of the right whale calving season. This would include not only FIREX with IMPASS, but appears to also include Air-To-Surface Missile exercises, Mine Neutralization Training involving Underwater Detonations and Minesweeping using equipment towed by helicopters.
    - Mitigation measures for training activities during right whale calving season should be implemented in all right whale habitat, and not limited to the boundaries of designated critical habitat. We encourage the Navy to develop and implement the ideas, particularly passive acoustic monitoring, discussed in the Integrated Comprehensive Monitoring Program for these exercises. Additional data by visual observation and passive acoustic monitoring, particularly in those areas outside of designated critical habitat, would reduce the potential adverse impacts to marine species from

these activities, as well as provide a better delineation of species distribution.

Conclusions

In summary, FWC does not object to the preferred alternative (Alternative 2) provided that the EIS demonstrates that the adverse effects of increased sonar, increased vessel and aircraft traffic, increased mine towing activities, and increased air-to-surface missile explosions are sufficiently addressed. The recommendations in the previous sections of this correspondence are provided in order to help address these issues, as well as previous correspondence from FWC regarding the AFAST EIS.

We appreciate the opportunity to provide input on these activities proposed by the Navy. If you or your staff would like to coordinate further on the recommendations contained in this letter, I will be glad to help make the necessary arrangements. Please contact me at (850) 410-5272 or email me at maryann.poole@MyFWC.com. If your staff has any technical questions regarding our comments concerning manatees or marine turtles, please contact Mary Duncan at mary.duncan@MyFWC.com. If your staff has any technical questions regarding our comments concerning whales or dolphins, please contact Tom Pitchford at tom.pitchford@MyFWC.com.

Sincerely,

Mary Ann Poole

Mary Ann Poole, Director
Office of Policy and Stakeholder Coordination

map/mpd
Navy Atlantic Fleet_1576
ENV 1-3-2
cc: John Milio, USFWS, Jacksonville
Barb Zoodsma, NOAA, Fernandina Beach

COUNTY: ALL
Jax USN - DEIS

DATE: 6/30/2008
COMMENTS DUE DATE: 8/4/2008
CLEARANCE DUE DATE: 8/11/2008
SAI#: FL200806304318C
REFER TO: FL200702063046C

MESSAGE: 2008-04552

STATE AGENCIES	WATER MNGMNT. DISTRICTS	OPB POLICY UNIT	RPCS & LOC GOVS
ENVIRONMENTAL PROTECTION			
FISH and WILDLIFE COMMISSION			
X STATE			

The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized as one of the following:

- **Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.**
- X **Direct Federal Activity (15 CFR 930, Subpart C). Federal Agencies are required to furnish a consistency determination for the State's concurrence or objection.**
- **Outer Continental Shelf Exploration, Development or Production Activities (15 CFR 930, Subpart E). Operators are required to provide a consistency certification for state concurrence/objection.**
- **Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.**

Project Description:

DEPARTMENT OF THE NAVY - DRAFT ENVIRONMENTAL IMPACT STATEMENT/OVERSEAS ENVIRONMENTAL IMPACT STATEMENT FOR ATLANTIC FLEET TRAINING IN THE JACKSONVILLE RANGE COMPLEX - OFF THE NORTHEAST COAST OF FLORIDA.

To: Florida State Clearinghouse

AGENCY CONTACT AND COORDINATOR (SCH)
3900 COMMONWEALTH BOULEVARD MS-47
TALLAHASSEE, FLORIDA 32399-3000
TELEPHONE: (850) 245-2161
FAX: (850) 245-2190

EO. 12372/NEPA

- ☑ No Comment
- ☐ Comment Attached
- ☐ Not Applicable

Federal Consistency

- ☑ No Comment/Consistent
- ☐ Consistent/Comments Attached
- ☐ Inconsistent/Comments Attached
- ☐ Not Applicable

From:
Division/Bureau: Division of Historical Resources
Bureau of Historic Preservation

Reviewer: Edwards, S. Laura A. Kammerer, Deputy SHPO

Date: 8/5/08 8.5.2008

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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 N4/7/1101
December 19, 2008

Ms. Barbara Neale, Director
Office of Ocean & Coastal Resource Management
Department of Health and Environmental Control
1362 McMillan Ave., Suite 400
Charleston, SC 29405-2029

Dear Ms. Neale:

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 in the Jacksonville (JAX) Range Complex. The purpose of the Proposed Action is to: 1) Achieve and maintain Fleet readiness using the JAX Range Complex to support and conduct current, emerging, and future training operations and RDT&E operations; 2) Expand warfare missions supported by the JAX 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 Federal Coastal Zone Management Act of 1972, as amended, we have determined that the Proposed Action will: (1) be conducted in a manner consistent with the enforceable policies of South Carolina's approved coastal management program, and (2) not impact natural or cultural resources of the State's coastal zone. The basis for this "Negative 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 containing the JAX Draft Environmental Impact Statement (DEIS)/Overseas EIS (OEIS) and appendices which was published and released to the public for comment on June 27, 2008[2] in compliance with the National Environmental Policy Act and Executive Order 12114. Further information regarding the JAX DEIS/OEIS may be obtained by visiting the project's website: www.jacksonvillerangecomplexeis.com.

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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 state's federally approved coastal management plant. 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] See Federal Register, Vol. 73, No. 125, Friday, June 27, 2008, pages 36495 to 36498.

5090
Ser N4/7/1101
December 19, 2008

Since the publication of the JAX DEIS/OEIS in the Summer of 2008, the U.S. Navy recently completed an informal consultation with the U.S. Fish and Wildlife Service (USFWS) on October 7, 2008, to address the proposed activities and its potential impact upon certain endangered and threatened species. The informal consultation with USFWS is documented in Enclosure (3).

In accordance with 15 CFR § 930.35, the Department of the Navy has reviewed South Carolina's coastal management program and associated enforceable policies and has determined that the proposed activities in the JAX Range Complex would have no reasonably foreseeable effects to the State's coastal zone or its resources.

In accordance with 15 CFR § 930.35(c), the State of South Carolina has 60 days from the receipt of this document in which to concur with or object to this Negative Determination, or to request an extension under 15 CFR § 930.41(b). Given the critical nature of this training, we are seeking your concurrence with our Negative Determination, and as a possible means to expedite this process, my staff is prepared to discuss this proposal in more detail and answer any questions you or your staff may have. Our point of contact is Ms. Kelly Proctor, Naval Facilities Engineering Command, Atlantic, (757) 322-4728.

South Carolina's concurrence will be presumed if its response is not received by the U.S. Navy (Atlantic Fleet) within 60 days from receipt of this Determination. South Carolina's response or other inquires should be sent to: Naval Facilities Engineering Command, Atlantic, Attn: Code EV22 (JAX EIS/OEIS Project Manager), 6506 Hampton Blvd., Norfolk, Virginia 23508-1278; or Facsimile (757) 322-4805. If additional information should be required, requests for such information should be requested within ten days of receipt of this Negative Determination. Further information regarding these DEIS/OEIS documents may be obtained by visiting the project's website: www.jacksonvillerangecomplexeis.com.

Sincerely,

J. W. MURPHY
Deputy Chief of Staff
for Operational Readiness
and Training

Enclosures: 1. Federal Agency CZMA Negative Determination for South Carolina
2. JAX DEIS/OEIS CD-Rom
3. USFWS Informal Consultation

FEDERAL AGENCY COASTAL ZONE MANAGEMENT ACT (CZMA) NEGATIVE DETERMINATION FOR SOUTH CAROLINA

INTRODUCTION

This document provides the State of South Carolina with the Department of the Navy's (U.S. Navy) Negative Determination under CZMA 16 USC § 1451 et seq. and 15 Code of Federal Regulations (CFR) § 930.35 for training and testing activities in the Jacksonville (JAX) Range Complex.

This CZMA Negative Determination addresses the Proposed Action of the JAX Range Complex Environmental Impact Statement (EIS)/Overseas (OEIS).

NEGATIVE DETERMINATION

In accordance with 15 CFR § 930.35, the Department of the Navy has reviewed South Carolina's Coastal Management Program (CMP) and associated enforceable policies and has determined that the U.S. Navy's Proposed Action will have no effects on any coastal use or resource. No activities would be conducted on land in South Carolina.

PROPOSED FEDERAL AGENCY ACTION

The U.S. Navy has prepared an EIS/OEIS to assess the potential environmental impacts over a 10-year planning horizon. Three alternatives were analyzed; Alternative 2 is the Preferred Alternative. The proposed activities evaluated in the EIS/OEIS are associated with U.S. Navy Atlantic Fleet training; research, development, testing, and evaluation (RDT&E) activities; and associated range capabilities enhancements (including infrastructure improvements) in the Jacksonville and Charleston operating areas (OPAREAs), hereafter referred to as the JAX Range Complex. The EIS/OEIS is expected to be completed in the Spring of 2009. The JAX Range Complex geographically encompasses offshore, near-shore, and onshore OPAREA, ranges, and special use airspace (SUA). Components of the JAX Range Complex encompass 50,090 square nautical miles (nm^2) of sea space and 62,596 nm^2 of SUA off the coasts of North Carolina, South Carolina, Georgia, and Florida, as well as 20 square miles of inland range area in north-central Florida. The geographic scope of the EIS/OEIS includes the airspace; seaspace; and undersea space of the JAX 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, hereafter referred to as the JAX Study Area. Also included are the inland ranges and associated restricted airspace of the Rodman Range and Lake George Range (refer to the enclosed CD file in PDF format for Chapter 2 of the EIS/OEIS on specific locations in the range complex).

The EIS/OEIS has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 USC § 4321); the Council of Environmental Quality Regulations for implementing the procedural provisions of NEPA (Title 40 CFR Parts 1500-1508); Department of the Navy Procedures for Implementing NEPA (32 CFR 775); Executive Order (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, this document was written to satisfy the requirements of both NEPA and E.O. 12114.

In accordance with 50 CFR Part 401.12, the U.S. Navy submitted a Biological Evaluation 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 the National Marine Fisheries Service (NMFS) under the Endangered Species Act (ESA). The U.S. Navy evaluated Essential Fish Habitat and made a determination of no effect. In accordance with the Marine Mammal

Protection Act (16 USC §1371[a][5]), the U.S. Navy submitted a request for a Letter of Authorization to NMFS for the incidental taking of marine mammals by the Proposed Action. The U.S. Navy submitted a Consultation Package to the U.S. Fish and Wildlife Service (USFWS) in accordance with legal requirements set forth under regulations implementing Section 7 of the ESA (50 CFR 402; 16 USC 1536 (c)) for listed species under their jurisdiction. The USFWS provided in their concurrence letter dated October 7, 2008 that the Proposed Action may affect but would not adversely affect listed species. These documents are provided electronically in PDF format on the enclosed CD.

Proposed Action

The Preferred Alternative is to support and conduct current and emerging training and RDT&E operations in the JAX Range Complex. To achieve this, the U.S. Navy proposes to:

- Increase or modify training and RDT&E operations from current levels as necessary in support of the Fleet Readiness 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.

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. 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 that implement the Fleet Response Plan, which ensures continuous availability of agile, flexible, trained, and ready surge-capable (rapid response) forces.

The purpose for the Preferred Alternative is to:

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

The need for the Preferred Alternative is to provide range capabilities for training and equipping combat-capable naval forces ready to deploy worldwide. In this regard, the JAX Range Complex furthers the U.S. Navy's execution of its congressionally mandated roles and responsibilities under Title 10 USC § 5062. To implement this Congressional mandate, the U.S. Navy needs to:

- Maintain current levels of military readiness by training in the JAX Range Complex;
- Accommodate future increases in operational training tempo in the JAX 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 JAX 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 JAX 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 actions evaluated in the EIS/OEIS. These potentially include:

- Increase use of contractor-operated small 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 helicopter warfare mission areas, and Multi-Mission Maritime Aircraft training operations; and
- Conduct mine warfare training using a temporary mine training area.

SOUTH CAROLINA'S COASTAL MANAGEMENT PROGRAM

As defined by the South Carolina's CMP (S.C. Code Ann. §§ 48-39-20 A-F, §§48-39-30 A,B1,2,3], §§ 48-39-50 A,C,M, §§ 48-39-80 A-E), coastal area includes all lands, all coastal waters, and submerged lands seaward to the State's jurisdictional limits and all lands and waters in the counties of the State which contain one or more of the critical areas. These counties are Beaufort, Berkeley, Charleston, Colleton, Dorchester, Horry, Jasper, and Georgetown. Critical areas include coastal waters, tidelands, beaches, and primary oceanfront sand dunes. The coastal zone extends seaward to 3 nm into the Atlantic Ocean. South Carolina's CMP is comprised of 14 resource policies for activities in the coastal zone subject to management (Table 1). The policies are those which the Office of Ocean and Coastal Resource Management are authorized to enforce through the authority of the CMP and the South Carolina Coastal Management Act of 1977.

Table 1. South Carolina Coastal Management Program

Enforceable Policy	Summary
Residential Development	The Proposed Action does not include residential development, and would not affect such programs.
Transportation Facilities	The Proposed Action does not include development of: ports; roads and highways; airports; railways; or parking facilities, and would not affect such programs.
Coastal Industries	The Proposed Action does not include development of: agriculture; forestry (silviculture); mineral extraction; manufacturing; fish and seafood processing; or aquaculture, and would not affect such programs.
Commercial Development	The Proposed Action does not include commercial development, and would not affect such programs.
Recreation and Tourism	The Proposed Action does not include park or commercial recreation development, and would not affect such programs.
Marine Related Facilities	The Proposed Action does not include development of: marinas; boat ramps; docks and piers; or a dock master plan, and would not affect such programs.
Wildlife and Fisheries Management	The policy addresses OCRM issuance or review and certification of permit applications within the coastal zone as well as development of artificial reefs

Enforceable Policy	Summary
	and impoundments. The Proposed Action does not include activity within the coastal zone that requires submission of any type of permit application. No artificial reefs or impoundments would be developed or altered by the proposed activities.
Dredging	The Proposed Action does not include dredging, dredged material disposal, or underwater salvage.
Public Services and Facilities	The Proposed Action does not include facility development for: sewage treatment; solid waste disposal; public/quasi-public buildings; dams and reservoirs; or water supply.
Erosion Control	The Proposed Action does not include construction or other activities within South Carolina that would result in appreciable soil erosion.
Energy and Energy-Related Facilities	The Proposed Action does not include construction or other activities that involve energy and energy-related facilities.
Activities in Areas of Special Resource Significance	The policy addresses OCRM issuance or review and certification of permit applications within the coastal zone. The Proposed Action does not include activity within the coastal zone that requires submission of any type of permit application. The Proposed Action does not include construction or other activities that would result in disturbance of barrier islands; dune areas; navigation channels; public open spaces; or wetlands.
Stormwater Management Guidelines	The Proposed Action does not include land use, land-based activities, or land-based construction within the South Carolina coastal zone, and therefore, South Carolina stormwater runoff management is not applicable to the Proposed Action.
Mitigation Guidelines	This policy addresses development projects in the eight county coastal zone of South Carolina which require state or federal permits or are direct federal activities. The Proposed Action does not include a development project within South Carolina's coastal zone.

FEDERAL REVIEW

Pursuant to 15 CFR § 930.41, the State of South Carolina 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). South Carolina's concurrence will be presumed if the U.S. Navy (Atlantic Fleet) does not receive its response within 60 days from receipt of this Determination. South Carolina's response should be sent to Naval Facilities Engineering Command, Atlantic, Attn: Code EV22 (JAX EIS/OEIS Project Manager), 6506 Hampton Blvd., Norfolk, Virginia 23508-1278.

DEPARTMENT OF THE NAVY
COMMANDER
U.S. FLEET FORCES COMMAND
1562 MITSCHER AVENUE SUITE 250
NORFOLK, VA 23551-2487

5090
Ser N4/7/1102
December 19, 2008

Ms. Kelie Cochran
Federal Consistency Coordinator
Georgia Coastal Management Program
Georgia Department of Natural Resources
One Conservation Way, Suite 300
Brunswick, GA 31520-8687

Dear Ms. Cochran:

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 in the Jacksonville (JAX) Range Complex. The purpose of the Proposed Action is to: 1) Achieve and maintain Fleet readiness using the JAX Range Complex to support and conduct current, emerging, and future training operations and RDT&E operations; 2) Expand warfare missions supported by the JAX 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 will: (1) be conducted in a manner consistent with the enforceable policies of Georgia's approved coastal management program, and (2) not impact natural or cultural resources of the State's coastal zone. The basis for this "Negative 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 containing the JAX Draft Environmental Impact Statement (DEIS)/Overseas EIS (OEIS) and appendices which was published and released to the public for comment on June 27, 2008[3] in compliance with the National Environmental Policy

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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 plant. 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.

[3] See Federal Register, Vol. 73, No. 125, Friday, June 27, 2008, pages 36495 to 36498.

Act and Executive Order 12114. Further information regarding the JAX DEIS/OEIS may be obtained by visiting the project's website: www.jacksonvillerangecomplexeis.com.

In accordance with 15 Code of Federal Regulations (CFR) Section 930.35, the Department of the Navy has reviewed Georgia's coastal management program and associated enforceable policies and has determined that the proposed activities would have no reasonably foreseeable effects to the State's coastal zone or its resources.

Comments received from Ms. Susan Shipman, Director of Georgia's Coastal Resources Division dated August 8, 2008, stated that the DEIS/OEIS is not consistent with Georgia's Coastal Management Program (CMP) and provided information that would bring the Proposed Action into compliance with the enforceable policies of Georgia's CMP. In response, effects to marine wildlife resources (including Endangered Species Act listed sea turtles and marine mammals) would be addressed through the federal consultation processes (Biological Evaluation and Letter of Authorization) with the National Marine Fisheries Service. Mitigation measures for protection of North Atlantic right whales would be implemented from November through April, including the Early Warning System, safe vessel speeds, restrictions for ordnance detonation, and stranding response plan. In addition, the proposed activities addressed in the JAX DEIS/OEIS will occur beyond 12 nautical miles (nm) from the coastline of Georgia and its coastal zone.

Since the publication of the JAX DEIS/OEIS in the Summer of 2008, the U.S. Navy recently completed an informal consultation with the U.S. Fish and Wildlife Service (USFWS) on October 7, 2008, to address the proposed activities and its potential impact upon certain endangered and threatened species. The informal consultation with USFWS is documented in Enclosure (3).

In accordance with 15 CFR Section 930.35(c), the State of Georgia has 60 days from the receipt of this document in which to concur with or object to this Negative Determination, or to request an extension under 15 CFR Section 930.41(b). Given the critical nature of this training, we are seeking your concurrence with our Negative Determination. As a possible means to expedite this process, my staff is prepared to discuss this proposal in more detail and answer any questions you or your staff may have. Our point of contact is Ms. Carolyn Vidrine, Naval Facilities Engineering Command, Atlantic, (757) 322-4728.

Georgia's concurrence will be presumed if its response is not received by the U.S. Navy (Atlantic Fleet) within 60 days from receipt of this Determination. Georgia's response or other inquiries should be sent to: Naval Facilities Engineering Command, Atlantic, Attn: Code

5090
Ser N4/7/1102
December 19, 2008

EV22 (JAX EIS/OEIS Project Manager), 6506 Hampton Blvd., Norfolk, Virginia 23508-1278; or Facsimile (757) 322-4805. If additional information should be required, requests for such information should be requested within ten days of receipt of this Consistency Determination.

Sincerely,

J. W. MURPHY
Deputy Chief of Staff
for Operational Readiness
and Training

Enclosures:
1. Federal Agency CZMA Consistency Determination for Georgia
2. JAX DEIS/OEIS CD-Rom
3. USFWS Informal Consultation

FEDERAL AGENCY COASTAL ZONE MANAGEMENT ACT (CZMA) NEGATIVE DETERMINATION FOR GEORGIA

INTRODUCTION

This document provides the State of Georgia with the Department of the Navy's (U.S. Navy) Negative Determination pursuant to CZMA 16 United States Code (USC) § 1451 *et seq*. and 15 Code of Federal Regulations (CFR) § 930.35. This CZMA Negative Determination addresses the Proposed Action for the Jacksonville (JAX) Range Complex Draft Environmental Impact Statement (EIS) /Overseas EIS (OEIS).

The State of Georgia 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. The Georgia Shore Protection Act (Official Code of Georgia Annotated [OCGA] 2-5-230, *et seq*.) is the primary legal authority for protection and management of Georgia's shoreline. It designates the State of Georgia's coastal zone as the 11 coastal counties and all waters of the State within those counties including the coastal ocean to the limit of state jurisdiction, which is 5.6 kilometers (3 nautical miles [nm] into the Atlantic Ocean), and all submerged lands within. The JAX Range Complex activities encompass direct federal activities that would not take place inside the State of Georgia'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, in particular endangered aquatic wildlife.

As defined in OCGA 27-3-130 entitled *Endangered Wildlife*, the Endangered Wildlife Act provides for identification, inventory, and protection of animal species that are rare, unusual, or in danger of extinction. The protection offered to these species is limited to those that are found on public lands of the State. Therefore, because of the potential that training and testing activities in the JAX Range Complex could impact sea turtles and marine mammals, and because the protection of sea turtles and marine mammals are addressed under OCGA 27-3-130, the proposed activities must be consistent to the maximum extent practicable with the enforceable policies of the Georgia Coast Management Plan (CMP).

The National Marine Fisheries Service (NMFS) is a cooperating agency for the JAX 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.

NEGATIVE DETERMINATION

In accordance with 15 CFR § 930.35, the U.S. Navy has reviewed Georgia's CMP and its associated enforceable policies, and information provided by the Georgia Department of Natural Resources Coastal Resources Division. The U.S. Navy has determined that implementation of the Preferred Alternative for the JAX Range Complex EIS/OEIS will have no effects on any coastal use or resource in Georgia's coastal zone. Activities would be conducted in the offshore Operating Areas (OPAREAs), beyond 12 nm from the coastline of Georgia and extending seaward. No activities would be conducted on land in Georgia. Specific details of the current and proposed operations conducted in the JAX Range Complex are presented in Chapter 2 of the EIS/OEIS (refer to the enclosed CD file in PDF format).

PROPOSED FEDERAL AGENCY ACTION

The U.S. Navy has prepared an EIS/OEIS to assess the potential environmental impacts over a 10-year planning horizon. Three alternatives were analyzed; Alternative 2 is the Preferred

Alternative. The proposed activities evaluated in the EIS/OEIS are associated with U.S. Navy Atlantic Fleet training; research, development, testing, and evaluation (RDT&E) activities; and associated range capabilities enhancements (including infrastructure improvements) in the JAX and Charleston OPAREAs. The EIS/OEIS is expected to be completed in the Spring of 2009. The JAX Range Complex geographically encompasses offshore, near-shore, and onshore OPAREAs, ranges, and special use airspace (SUA). Components of the JAX Range Complex encompass 50,090 square nautical miles (nm^2) of sea space and 62,596 nm^2 of SUA off the coasts of North Carolina, South Carolina, Georgia, and Florida, as well as 20 mi^2 of inland range area in north-central Florida. The geographic scope of the EIS/OEIS includes the airspace; seaspace; and undersea space of the JAX Range Complex, including the area from the mean high tide line, up to and extending seaward from the 3 nm western boundary of the OPAREAs, hereafter referred to as the JAX Study Area. Also included are the inland ranges and associated restricted airspace of the Rodman Range and Lake George Range (refer to Chapter 2 of the EIS/OEIS for specific locations in the range complex).

The EIS/OEIS has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 USC § 4321); the Council of Environmental Quality Regulations for implementing the procedural provisions of NEPA (Title 40 CFR Parts 1500-1508); Department of the Navy Procedures for Implementing NEPA (32 CFR 775); Executive Order (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, this document was written to satisfy the requirements of both NEPA and E.O. 12114.

In accordance with 50 CFR Part 401.12, the U.S. Navy submitted a Biological Evaluation 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 the ESA. In accordance with the MMPA (16 USC Section 1371[a][5]), the U.S. Navy submitted a request for a Letter of Authorization to NMFS for the incidental taking of marine mammals by the Proposed Action. The U.S. Navy submitted a Consultation Package to the U.S. Fish and Wildlife Service in accordance with legal requirements set forth under regulations implementing Section 7 of the ESA (50 CFR 402; 16 USC 1536 (c)) for listed species under their jurisdiction. These documents are provided electronically in PDF format on the enclosed CD.

Proposed Action

The Proposed Action is to support and conduct current and emerging training and RDT&E operations in the JAX Range Complex. To achieve this, the U.S. Navy proposes to:

- 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. Under the Preferred Alternative, all components of the Proposed Action 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 Negative 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. 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 that implement the Fleet Response Plan, which ensures continuous availability of agile, flexible, trained, and ready surge-capable (rapid response) forces.

The purpose for the Proposed Action is to:

- Achieve and maintain Fleet readiness using the JAX Range Complex to support and conduct current, emerging, and future training operations and RDT&E operations;
- Expand warfare missions supported by the JAX 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 JAX Range Complex furthers the U.S. Navy's execution of its congressionally mandated roles and responsibilities under Title 10 USC § 5062. To implement this Congressional mandate, the U.S. Navy needs to:

- Maintain current levels of military readiness by training in the JAX Range Complex;
- Accommodate future increases in operational training tempo in the JAX 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 JAX 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 JAX 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 actions evaluated in the EIS/OEIS. These potentially include:

- Increase use of contractor-operated small 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 helicopter warfare mission areas, and Multi-Mission Maritime Aircraft training operations; and
- Conduct mine warfare training using a temporary mine training area.

FEDERAL CONSISTENCY REVIEW

Georgia's CMP is comprised of 33 state codes, which constitute the enforceable policies of the CMP. State codes addressed as part of the Georgia CMP consistency review and considered in the analysis of the Proposed Action are discussed in Table 1 below. The U.S. Navy has determined that implementation of the Preferred Alternative will have no effects on any coastal use or resource in Georgia's coastal zone based on the following information, data, and analysis (given as a summary in the table and presented as comprehensive analysis in Chapter 3 of the EIS/OEIS). Most of the testing and training activities would be conducted in the offshore OPAREAs, beyond 12 nm from the coastline of Georgia and extending seaward. In addition, this Federal Consistency Review addresses the comments dated August 8, 2008 from Ms. Susan Shipman, Director of Georgia's Coastal Resources Division.

Pursuant to 15 CFR § 930.41, the State of Georgia 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). Georgia's concurrence will be presumed if the U.S. Navy (Atlantic Fleet) does not receive its response within 60 days from receipt of this Determination. Georgia's response should be sent to Naval Facilities Engineering Command, Atlantic, Attn: Code EV22 (JAX EIS/OEIS Project Manager), 6506 Hampton Blvd., Norfolk, Virginia 23508-1278.

Table 1. Georgia Coastal Management Program Consistency Review

Statute (Georgia Statute)	Consistency	Scope
OCGA 12-9-1 *Air Quality*	The Proposed Action would not result in significant adverse impacts to air quality. Most emissions would occur above 3,000 feet and are considered to be above the atmospheric inversion layer; therefore, without impact on the local air quality. Based on the EIS/OEIS analysis it was determined that the Clean Air Act general conformity Rule does not apply for the Proposed Action.	Establishes the state standards and programs, where necessary, for air quality, air emissions, construction, and release of hazardous air contaminants.
OCGA 27-4-251 *Aquaculture Development*	The Proposed Action would not impact procedures of the Aquaculture Development Commission.	Establishes the commission to study development of aquaculture.
OCGA 52-7-1 *Boat Safety*	The Proposed Action would not impact the safety of recreational or commercial vessels. A Notice To Airmen (NOTAM) and Notice To Mariners (NOTMAR) would be provided as required prior to exercises. Temporary disruptions to recreational and commercial fisheries could occur, but would be localized and for a short duration. No long-term effects to these resources would occur.	Provides safe boating standards on lakes, rivers, and coastal waters. Prohibits boating except at piers and marinas in waters 1,000 feet or less from Jekyll Island, Tybee Island, St. Simons Island, and Sea Island.
OCGA 12-5-320 *Coastal Management*	The Proposed Action would not impact planning activities within the coastal zone or the implementation of development requirements.	Addresses the requirements for development and implementation of coastal resource protection and their sustainable development. Requires the coordination of agencies when planning activities in the coastal zone.
OCGA 12-5-280 *Coastal Marshlands Protection*	The Proposed Action would not take place on land in Georgia. Therefore, no impacts would occur to tidal marshes, mudflats, and marshlands. Training activities would not impact estuaries.	Provides for protection of tidal wetlands through limitations and permitting of activities in these areas. Identifies exempted actions.

Statute (Georgia Statute)	Consistency	Scope
		Includes activities that take place in marshland, intertidal area, mudflats, tidal water bottoms, and salt marsh area within estuarine areas.
OCGA 12-5-370 *Safe Dams*	The Proposed Action would not impact inspections and permitting for dams.	Protects public health, safety, and welfare through inspections and permitting for dams.
OCGA 12-5-170 *Safe Drinking Water*	The Proposed Action would not impact the quality of drinking water in the state.	Addresses the state's policy concerning water resources.
OCGA 27-3-130 *Endangered Wildlife*	The Proposed Action would not adversely affect terrestrial or marine species; the Navy concluded informal consultation with USFWS. Effects to marine wildlife resources (including ESA-listed sea turtles and marine mammals) would be addressed through the federal consultation processes (Biological Evaluation and Letter of Authorization) with the National Marine Fisheries Service. Mitigation measures for protection of North Atlantic right whales would be implemented from November through April, including the Early Warning System, safe vessel speeds, restrictions for ordnance detonation, and stranding response plan.	Provides for protection of species that are rare, unusual, or in danger of extinction. Extends only to species on public lands.
OCGA 12-16-1 *Environmental Policy*	The Proposed Action is a federal agency activity.	Requires state agencies to prepare environmental impact reports.
OCGA 12-7-1 *Erosion and Sedimentation Control*	The Proposed Action does not include any construction activities and would not take place on land.	Requires counties and municipalities to establish procedures for land-disturbance activities. Identifies permit requirements, exemptions, and best management practices.
OCGA 27-1-3	The Proposed Action would not impact terrestrial wildlife or	Provides regulations for protection,

Statute (Georgia Statute)	Consistency	Scope
Game and Fish Code	freshwater wildlife resources, or marine game and fish within the coastal zone. No activities would take place on land or in any freshwater rivers, creek, streams, or lakes.	management and conservation of terrestrial and fresh water wildlife resources. Identifies responsible agencies for licensing and permitting recreational and commercial fish and wildlife activities.
OCGA 12-5-90 *Groundwater Use*	The Proposed Action would not require a permit related to the Groundwater Use Act. There would be no effect to water quality or in particular, to groundwater.	Establishes regulations for development and implementation of water conservation plans. Includes coastal groundwater management plan for water conservation, protection from saltwater encroachment, reasonable uses, future development and economic development.
OCGA 12-8-60 *Hazardous Waste Management*	The Proposed Action would not result in significant quantities of hazardous materials or wastes. Hazardous material and waste would be managed in accordance with applicable federal and state regulations and DoD service guidelines.	Regulates all aspects of hazardous waste including generation, transport, storage, treatment, and disposal.
OCGA 12-3-70 *Heritage Trust*	The Proposed Action would not impact historical resources of the state and would avoid significant natural areas.	Preserves certain property with unique characteristics, historical significance, or recreational value.
OCGA 12-3-50 *Historic Areas*	The Proposed Action would not impact historical resources of the state. Most of the approximately 900 shipwrecks in the JAX Study Area are along the coastline, with approximately 200 shipwrecks scattered in off-shore waters. 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	Addresses management and preservation of the state's archaeological and historical resources.

Statute (Georgia Statute)	Consistency	Scope
	be initiated in accordance with Section 106 of the National Historic Preservation Act and in accordance with OGCA 12-3-50.	
OCGA 12-3-90 *Natural Areas*	The Proposed Action would not have a significant impact to natural areas including estuarine research reserves, and aquatic preserves. There would be no effect to the Gray's Reef National Marine Sanctuary as a result of the Proposed Action.	Identifies and preserves areas with unusual ecological significance. The goals of the act are to preserve natural plant or animal communities, rare or valuable members, and other natural features of significant scientific, educational, geologic, ecological, or scenic value.
OCGA 12-4-40 *Oil and Gas and Deep Drilling*	The Proposed Action would not affect oil or gas drilling activities or involve any deep-water drilling.	Protects underground freshwater supplies and certain environmentally sensitive areas. Sets forth standards to prevent pollution, waste, fire, and spillage related to oil, gas, or mineral exploration.
OCGA 12-4-100 *Phosphate Mining*	The Proposed Action would not take place on land in Georgia; therefore, no effects would occur to phosphate mining.	Oversees licenses for mining phosphate deposits.
OCGA 50-16-61 *Revocable License Program*	The Proposed Action does not involve construction or land activities in Georgia.	Allows for the issuance of revocable licenses for recreational docks on state-owned tidal water bottoms.
OCGA 52-1-30 *Right of Passage*	The Proposed Action would not result in the closure of public access areas in state waters. A NOTAM and NOTMAR would be provided as required prior to exercises. Temporary disruptions to recreational and commercial fisheries could occur, but would be localized and for a short duration. No long-term	Provides for the use of all waterways by citizens.

Statute (Georgia Statute)	Consistency	Scope
	effects to these resources would occur.	
OCGA 12-2-1 *River Corridor Protection*	The Proposed Action would not affect river corridors, mountains, watersheds, or wetlands. No activities associated with the Proposed Action would create sedimentation or erosion in Georgia.	Protects river corridors, mountains, watersheds, and wetlands. Provides protective measures for erosion and sedimentation and inclusion in management plans.
OCGA 12-5-350 *Scenic Rivers*	The Proposed Action would not impact any scenic rivers.	Designates rivers with valuable scenic, recreational, or natural characteristics for present and future generations.
OCGA 12-3-110 *Scenic Trails*	The Proposed Action would not impact any scenic trails.	Establishes a scenic trails program.
OCGA 31-2-7 and OCGA 31-3-5.1 *Septic Tank Law*	The Proposed Action would not impact shoreline sanitation and does not include any construction or installation activities.	Regulates septic tanks including safe placement, installation, and maintenance.
OCGA 27-4-190 *Shellfish*	The Proposed Action would not impact shellfish harvesting areas and would not affect the management of shellfish resources.	Provides the regulations to harvest shellfish including licensing, approving areas for commercial harvest, and water quality monitoring.
OCGA 2-5-230 *Shore Protection*	The Proposed Action would not adversely affect the shoreline or access to the beach as no land activities would occur in Georgia.	Provides for protection and management of sand dunes, beaches, sandbars, and shoals. Identifies limitations and permitting requirements related to construction, storage, parking, vehicle operation and related activities. Provides for public access and recreation at or near the beach.

Statute (Georgia Statute)	Consistency	Scope
OCGA 12-8-21 *Solid Waste Management*	The Proposed Action would not involve the generation of solid waste within the state's coastal zone. All solid waste disposals would be conducted in accordance with U.S. Navy policies and procedures.	Sets forth the rules for solid waste handling facilities and processes to site new facilities.
O.G.C. 12-4-70 *Surface Mining*	The Proposed Action would not impact surface mining.	Regulates surface mining in the state and coastal zone.
O.G.C. 52-1-1 *Protection of Tidewaters*	The Proposed Action would not result in the closure of areas within state tidewaters. No removal of structures or construction activities would occur.	Provides for the use of all tidewaters by citizens. Allows for removal of structures.
O.G.C. 12-13-1 *Underground Storage Tank*	The Proposed Action does not include any construction or operation of landside facilities. There would be no landside activities in Georgia.	Provides regulations to operate, detect releases, take corrective actions, and enforce the use of underground storage tanks. Ensures the protection of human health and safety and protection and maintenance of groundwater quality and surface water resources from contamination.
OCGA 12-5-20 *Water Quality Control*	The Proposed Action would not result in significant impact to water quality from expended components.	Ensures that water uses are prudent, maintains or restores purity, and provides an adequate supply. Regulates the use of rivers, streams, lakes, and subsurface waters for public and private water supply; and agricultural, industrial, and recreational uses is provided. Requires compliance with the Georgia Water Quality Control Act for activities in the coastal zone including tourism and recreation,

Statute (Georgia Statute)	Consistency	Scope
		manufacturing and transportation, and other activities.
OCGA 12-5-120 *Water Wells Standards*	The Proposed Action would not include the construction, operation, or maintenance of water wells.	Requires compliance with the Water Wells Standards Act and regulates the siting, construction operation, maintenance, and abandon of wells and boreholes. Authorizes a council to adopt and amend rules to govern the licensing of well contractors.
OCGA 12-6-170 *Wildflower Preservation*	The Proposed Action would not occur on land in Georgia.	Designates and protects plant species that are rare, unusual, or in danger of extinction on public lands.

February 17, 2009

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
COASTAL RESOURCES DIVISION

Naval Facilities Engineering Command, Atlantic
Attn: Code EV22 (JAX EIS/OEIS Project Manager)
6506 Hampton Blvd.
Norfolk, Virginia 23508-1278

VIA FACSIMILE: 757.322.4805

RE: Georgia Coastal Management Program Negative Determination Conditional Concurrence – Department of the Navy's DEIS/OEIS for JAX Range Complex

Dear Commander:

The Georgia Coastal Management Program (GCMP) objected to your June 27, 2008 federal consistency determination in an August 8, 2008 letter. Our primary concerns with the proposal related to potential impacts of ordnance detonations and vessel collisions on endangered North Atlantic right whales that inhabit state and federal waters off Georgia and Florida between November 15 and April 15 each year. The Navy then submitted a Negative Determination letter December 19, 2008. The Georgia Department of Natural Resouces' (GDNR) Wildlife Resources Division Nonagme Conservation Section and GCMP requested additional information via email on January 12, 2009, which was provided by fleet project manager John Van Name via email on January 30, 2009.

While this additional information has alleviated most of our concerns regarding ordnance detonations, the vessel mitigation measures as currently outlined are insufficient to protect right whales from vessel collisions and coastal effects are reasonably foreseeable from the proposed project. As such, the GCMP is compelled to object with the Navy's Negative Determination unless these concerns (outlined below) are addressed in the Final EIS or in consultation with the National Marine Fisheries Service (NMFS).

The Georgia Endangered Wildlife Act (O.C.G.A. 27-3-130 et seq.) and its attendant rules, enforceable policies of the GCMP, list North Atlantic right whales as endangered species and afford them protection under the Act, whether they are within State waters or transiting Federal waters. Georgia has had a Cooperative Agreement with the National Marine Fisheries Service (NMFS) under Section 6 of the Endangered Species Act (ESA) since 1990, which is one of the oldest in existence with NMFS. This agreement includes state and federal waters offshore of Georgia and Florida. The agreement mandates Georgia to review federal actions that have the potential to impact right whales and provide comments and/or recommendations aimed at minimizing or eliminating impacts to right whales. The agreement further tasks Georgia with taking management steps to reduce or eliminate injury or mortality to right whales caused by ship collisions and to protect habitats essential to the survival of right whales.

One Conservation Way • Brunswick, Georgia 31520
(912) 264-7218 • Fax: (912) 262-3143 • CoastalGaDNR.org

Vessel collisions are the greatest human-related cause of right whale mortality. The mitigation measures outlined in the JAX Range proposal rely on lookouts and the Early Warning System aerial surveys as the primary means of mitigating vessel collisions. While these measures are certainly prudent, and likely reduce the probability of vessel collisions somewhat, they do not by themselves constitute a practical mitigation strategy. Right whales spend the majority of their time below the surface and are therefore difficult to detect visually. The probability of detecting right whales is further reduced during periods of poor weather, rough seas, and darkness.

The best available science indicates that probability of large whale mortality and serious injury is lowest at vessel speeds of 10 knots or less. NMFS recently established seasonal speed restrictions for non-sovereign vessels 65ft or greater at ports along the Atlantic coast in order to reduce the likelihood of right whale mortality and serious injury from vessel collisions. While the Navy and other federal agencies were intentionally exempted from the ship speed rule, it is clear that NMFS recognized the risk that federal vessel operations may pose to right whales—and that these risks could be mitigated through reductions in vessel speed:

> "This exemption would not relieve Federal agencies of their obligations under the ESA, including Section 7. NMFS will be reviewing the federal actions involving vessel operations to determine where ESA Section 7 consultations would be appropriate. NMFS also requests all Federal agencies to voluntarily observe the conditions of the proposed regulations when and where their missions are not compromised" (NMFS, Final Environmental Impact Statement To Implement Vessel Operational Measures to Reduce Ship Strikes to North Atlantic Right Whales, ES-11).

The GCMP is prepared to withdraw our August 8, 2008 objection to the JAX Range proposal with the condition that the Navy adopts the following mitigation measures in the Final EIS and/or in consultation with NMFS (in addition to those already outlined in the JAX Range DEIS):

- All Navy vessels 65 feet or longer will operate at speeds of 10 knots or less when transiting through, or conducting RDT&E activities within, 30 NM of shore from Morehead City, NC to Port Canaveral, FL during November 15-April 15 annually, except as provided below.
- Vessels may operate at speeds greater than 10 knots as necessary to maintain safe steerage and navigation.
- Vessels may operate at speeds greater than 10 knots when engaged in combat, activities in support of combat, or other defense activities requiring greater vessel speeds.

Final approval of this activity may not be granted until 90 days from our receipt of your Negative Determination, which was on December 29, 2008 [15 CFR § 930.35(c)]. You

are urged to modify the proposed project or submit a Consistency Determination prior to March 30, 2009 in accordance with federal regulations.

If the proposed project is not modified to incorporate these mitigation measures or a Consistency Determination is not submitted, all parties shall treat this conditional concurrence letter as an objection letter pursuant to 15 C.F.R. §930.43. The Navy must notify us immediately if these conditions are not acceptable [15 C.F.R. §930.4(a)(2)]. The Navy has the opportunity to appeal this objection with the Secretary of Commerce within 30 days after receipt of this letter or the State has the opportunity to appeal to the Secretary of Commerce within 30 days after receiving notice from the Navy that the action will not be modified by these three conditions, pursuant to 15 C.F.R. §930.63 (e).

If you have any technical questions regarding our comments, please contact Brad Winn or Clay George at (912) 264-7355. If you have any questions regarding this federal consistency determination conditional concurrence, please contact Kelie Moore at (912) 264-7218.

Sincerely,

Susan Shipman
Director

SS/km

Cc: David Kaiser, NOAA OCRM
Barb Zoodsma, NMFS SERO
Michael Payne, NMFS OPR
Dan Forster, GDNR WRD
Leslie Ward, FWC FWRI

DEPARTMENT OF THE NAVY
COMMANDER
U.S. FLEET FORCES COMMAND
1562 MITSCHER AVENUE SUITE 250
NORFOLK, VA 23551-2487

5090
Ser N4/7/1099
December 19, 2008

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 in the Virginia Capes (VACAPES) and Jacksonville (JAX) Range Complexes. The purpose of the Proposed Action in each range complex is to: 1) Achieve and maintain Fleet readiness using the range complexes to support and conduct current, emerging, and future training operations and RDT&E operations; 2) Expand warfare missions supported by each 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 Actions in the VACAPES and JAX Range Complexes will: (1) be conducted in a manner consistent with the enforceable policies of North Carolina's approved coastal management program, and (2) not impact natural or cultural resources of the State's coastal zone. The basis for this "Negative 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 VACAPES Draft Environmental Impact Statement (EIS)/Overseas EIS (OEIS) and JAX Draft EIS/OEIS and appendices which were published and released to the public for comment on June 27, 2008[2], in compliance with the National

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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 plant. 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] See Federal Register, Vol. 73. No. 125, Friday, June 27, 2008, pages 36495 to 36501

Environmental Policy Act and Executive Order 12114. Further information regarding these DEIS/OEIS documents may be obtained by visiting the project's websites: www.vacapesrangecomplexeis.com www.jacksonvillerangecomplexeis.com.

Since the publication of the VACAPES and JAX DEIS/OEIS in the Summer of 2008, the U.S. Navy recently completed an informal consultation with the U.S. Fish and Wildlife Service (USFWS) on October 7, 2008, to address the proposed activities and its potential impact upon certain endangered and threatened species. The informal consultation with USFWS is documented in Enclosure (3).

In accordance with 15 Code of Federal Regulations (CFR) Section 930.35, the Department of the Navy has reviewed North Carolina's coastal management program and associated enforceable policies and has determined that the Proposed Actions would have no reasonably foreseeable effects to the State's coastal zone or its resources.

In accordance with 15 CFR Section 930.35(c), the State of North Carolina has 60 days from the receipt of this document in which to concur with or object to this Negative Determination, or to request an extension under 15 CFR Section 930.41(b). Our point of contact is Ms. Kelly Knight, 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 (Atlantic Fleet) within 60 days from receipt of this Determination. North Carolina's response or other inquiries should be sent to: Naval Facilities Engineering Command, Atlantic, Attn: Code EV22 (NEPA Project Manager), 6506 Hampton Blvd., Norfolk, Virginia 23508-1278; or Facsimile (757) 322-4805. If additional information should be required, requests for such information should be requested within ten days of receipt of this Negative Determination.

Sincerely,

J. W. MURPHY
Deputy Chief of Staff
for Operational Readiness
and Training

Enclosures:
1. Federal Agency CZMA Negative Determination for North Carolina
2. VACAPES and JAX DEIS/OEIS CD-Rom
3. USFWS Informal Consultation

FEDERAL AGENCY COASTAL ZONE MANAGEMENT ACT (CZMA) NEGATIVE DETERMINATION FOR NORTH CAROLINA

INTRODUCTION

This document provides the State of North Carolina with the Department of the Navy's (U.S. Navy) Negative Determination under the Coastal Zone Management Act (CZMA) 16 U.S.C. § 1456 Section 307 (c) (1) [or (2)] and 15 Code of Federal Regulations (CFR) § 930 (c), for training and testing activities in the Virginia Capes (VACAPES) and Jacksonville (JAX) Range Complexes. The information in this CZMA Negative Determination is provided pursuant to 15 CFR § 930.39.

This CZMA Negative Determination addresses the Proposed Action of the VACAPES Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) and JAX EIS/OEIS.

NEGATIVE DETERMINATION

In accordance with 15 CFR § 930.35, the Department of the Navy has reviewed 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 U.S. Navy has determined that the Proposed Actions in the VACAPES and JAX range complexes will have no effects on any coastal use or resource. State permits are not required to implement the Proposed Actions.

PROPOSED FEDERAL AGENCY ACTION

The U.S. Navy has prepared an EIS/OEIS for each range complex to assess potential environmental impacts for the Proposed Actions in VACAPES and JAX range complexes over a 10-year planning horizon. These EIS/OEISs are expected to be completed in the Spring of 2009. The proposed activities evaluated in these EIS/OEISs are associated with U.S. Navy training; research, development, testing, and evaluation (RDT&E) activities; and associated range capabilities enhancements (CD files in PDF format are enclosed).

VACAPES Range Complex. The components of the VACAPES Range Complex include 28,672 square nautical miles (nm^2) of special use area (SUA) warning area; 27,661 nm^2 of offshore surface and subsurface OPAREA; and 18,092 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 VACAPES Range Complex. This area is referred to as the VACAPES Study Area. The VACAPES Study Area does not include any dry land. However, it does include the area from the mean high tide line east (seaward) to the 3 nm boundary of the states of Delaware, Maryland, Virginia, and North Carolina. This 3-nm state boundary also serves as the western boundary of the VACAPES OPAREA (refer to the study area figure in the enclosed CD). The VACAPES Study Area also includes 420 nm^2 of the lower Chesapeake Bay.

JAX Range Complex. The JAX Range Complex geographically encompasses offshore, near-shore, and onshore OPAREA, ranges, and SUA. Components of the JAX Range Complex encompass 50,090 nm^2 of sea space and 62,596 nm^2 of SUA off the coasts of North Carolina, South Carolina, Georgia, and Florida, as well as 20 square miles of inland range area in north-central Florida. The geographic scope of the EIS/OEIS includes the airspace; seaspace; and undersea space of the JAX Range Complex, including the area from the mean high tide line, up to

and extending seaward from the 3 nm western boundary of the Jacksonville and Charleston OPAREAs, hereafter referred to as the JAX Study Area. Also included are the inland ranges and associated restricted airspace of the Rodman Range and Lake George Range (refer to the study area figure in the enclosed CD).

These EIS/OEISs were 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 (CEQ) 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); Executive Order (E.O.)12114, Environmental Effects Abroad of Major Federal Actions; and Department of Defense (DoD) regulations implementing E.O. 12114 (32 CFR Part 187). The Proposed Actions require analysis of potential impacts within and outside U.S. territory. Therefore, these documents were written to satisfy the requirements of both the 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 for the three range complexes 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 the National Marine Fisheries Service (NMFS) under the Endangered Species Act (ESA). In accordance with the Marine Mammal Protection Act (MMPA) (16 U.S.C. Section 1371[a][5]), the U.S. Navy has submitted a request for a letter of authorization for the three range complexes to NMFS for the incidental taking of marine mammals by the Proposed Action. 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). The USFWS provided in their concurrence letter dated October 7, 2008 that the Proposed Actions may affect but would not adversely affect listed species. These documents are provided electronically in PDF format on the enclosed CD**.**

Proposed Actions

The Proposed Actions are to support and conduct current and emerging training and RDT&E operations in the three range complexes. 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 for each range complex is Alternative 2, which includes implementation of Alternative 1 with additional increases in some operations, a reduction of bombing exercises, and designation of additional mine warfare training areas to provide additional support during training 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 a Negative 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. 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. These EIS/OEISs address 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 Actions is therefore to:

- Achieve and maintain Fleet readiness using the three range complexes to support and conduct current, emerging, and future training operations and RDT&E operations;
- Expand warfare missions supported by the three range complexes; and
- Upgrade and modernize existing range capabilities to enhance and sustain U.S. Navy training and RDT&E.

The need for the Proposed Actions is to provide range capabilities for training and equipping combat-capable naval forces ready to deploy worldwide. In this regard, these range complexes further 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 three range complexes;
- Accommodate future increases in operational training tempo in the three range complexes 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 three range complexes must adequately support the testing and training needed for new platforms (aircraft and weapons systems); and
- Maintain the long-term viability of the three range complexes 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 actions evaluated in these EIS/OEISs. These potentially include:

- Increase use of contractor-operated small 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, and Multi-Mission Maritime Aircraft (MMA) training operations; and
- Conduct mine warfare training using a temporary mine training area.

FEDERAL REVIEW

Statutes addressed as part of the federal review and considered in the analysis of the Proposed Actions are discussed in Table 1. The Proposed Actions 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 in each range complex will have no effects on any coastal use or policies of North Carolina's CMP based on the following information, data, and analysis (given as a summary in the table and presented as comprehensive analysis in Chapter 3 of the EIS/OEIS for each range complex).

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 (Atlantic Fleet) 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 (NEPA Project Manager), 6506 Hampton Blvd., Norfolk, Virginia 23508-1278. The DEIS may be downloaded by visiting the project's websites: "www.vacapesrangecomplexeis.com" and "www.jacksonvillerangecomplexeis.com".

Table 1. North Carolina Coastal Management Program Consistency Review

Section (North Carolina Statute)	Consistency	Scope
Activities in Public Trust Areas (DCM 15A North Carolina Administrative Code 07H) State Guidelines for Areas of Environmental Concern (AEC)		
0205 Coastal Wetlands	The Proposed Actions do not include testing and training activities in coastal wetlands; therefore, no impacts would occur.	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.
0206 Estuarine Waters	The Proposed Actions do not include testing and training activities in estuarine waters; therefore, no impacts would occur.	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.
0207 Public Trust Areas	The Proposed Actions do not include testing and training activities in public trust areas that would restrict public rights for navigation and recreation; therefore, no impacts would occur.	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.
0209 Estuarine Shorelines	The Proposed Actions do not include testing and training activities in estuarine shorelines; therefore, no impacts would occur.	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.

Section (North Carolina Statute)	Consistency	Scope
0303 Ocean Hazard Areas	The Proposed Actions do not include testing and training activities in ocean hazard areas; therefore, no impacts would occur.	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.
0403 Public Water Supplies	The Proposed Actions do not include testing and training activities in small surface water supply watersheds and public water supply well fields; therefore, no impacts to public water supplies would occur.	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.
0505 Coastal Areas that Sustain Remnant Species	The Proposed Actions do not include testing and training activities in fragile coastal natural resource areas that sustain remnant species; therefore, no impacts would occur.	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.
0506 Coastal Complex Natural Area	The Proposed Actions do not include testing and training activities in significant components of coastal systems or especially notable habitat areas of scientific, educational, or aesthetic value; therefore, no impacts would occur.	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 have remained essentially unchanged by human activity.

Section (North Carolina Statute)	Consistency	Scope
0507 Unique Coastal Geologic Formations	The Proposed Actions do not include testing and training activities in unique coastal geologic formations; therefore, no impacts would occur.	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.
0509 Significant Coastal Archaeological 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.	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.
0510 Significant Coastal Historic Architectural Resources	The Proposed Actions do not include testing and training activities in districts, structures, buildings, sites or objects that have more than local significance to history or architecture; therefore, no impacts would occur.	Conserve coastal historic architectural resources of more than local significance which are valuable educational, scientific, associative or aesthetic resources.
0602 Pollution of Water	The Proposed Actions do not include testing and training activities in or adjacent to shell fish waters; therefore, no impacts would occur.	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.

Section (North Carolina Statute)	Consistency	Scope
0603 Minimum Altitudes	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 Proposed Actions would not impact FAA minimum altitude standards.	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.
0604 Noise Pollution	The Proposed Actions do not include airspace activity associated with coastal development; therefore, no impacts would occur.	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.
Activities outside Areas of Environmental Concern (DCM 15A North Carolina Administrative Code 07M)		
General Policy Guidelines for the Coastal Area		
0200 Shoreline Erosion	The Proposed Actions do not include development along the ocean or estuarine shoreline; therefore, would not result in shoreline erosion impacts.	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.
0300 Shorefront Access	The Proposed Actions do not restrict public access to public trust waters; therefore, would not impact 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.

Section (North Carolina Statute)	Consistency	Scope
0400 Coastal Energy	The Proposed Actions do not include the development of energy facilities or exploration of offshore or OCS energy resources; therefore, would not impact coastal energy.	Addresses development of energy facilities and energy resources in the state and in offshore waters, and exploration for the development of offshore and outer continental shelf (OCS) energy resources such as oil and gas.
0500 Post-disaster	The Proposed Actions do not include any efforts to assist with post-disaster activities; therefore, would not impact plans for post-disaster reconstruction.	Intended to provide guidance on and mitigate for the effects of a coastal natural disaster by providing adequate plans for post-disaster reconstruction.
0600 Floating Structures	Navy ships are excluded from the definition of floating structures; therefore, the Proposed Actions would not impact public trust waters.	Addresses prohibition of floating structures in public trust waters of the coastal area except in permitted marinas.
0700 Mitigation	The Proposed Actions do not include construction or other activities that could result in adverse impacts.	Addresses mitigation for adverse impacts to coastal lands and waters from development.
0800 Coastal Water Quality	The Proposed Actions would not result in releases of constituents in violation of state or federal water quality standards; therefore, no significant impacts on water quality from expended components would occur.	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.
1100 Beneficial Use and Availability of Materials Resulting from the Excavation or Maintenance of Navigation Channels	The Proposed Actions do not include any excavation or maintenance activities or disposal of material from these activities; therefore, no impacts would occur.	Regulates disposal of materials resulting from excavation or maintenance of navigation channels and promotes its beneficial use whenever practicable.
1200 Ocean Mining	The Proposed Actions do not include any mining activities or construction of mining-related structures; therefore, no impacts would occur.	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.

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Coastal Management

Beverly Eaves Perdue
Governor

James H. Gregson
Director

Dee Freeman
Secretary

February 9, 2009

J. W. Murphy (ATTN Code EV22 (NEPA Project Manager))
Deputy Chief of Staff for Operational Readiness and Training
Naval Facilities Engineering Command
6506 Hampton Blvd.
Norfolk, VA 23508-1278

SUBJECT: **CD09-008** – Consistency Concurrence for Proposed Atlantic Fleet Training Within the Jacksonville/Charleston Range Complexes (JAX) (DCM#20080169)

Dear Mr. Murphy:

We received your Negative Determination on December 29, 2008 for the proposed Atlantic Fleet Training within the Navy's Jacksonville/Charleston Range Complexes (JAX). The Navy proposes, over the next ten years, continued Atlantic Fleet training that includes: research, development, testing, and evaluation; and associated range capabilities enhancements, including infrastructure improvements. The JAX Range Complex geographically encompasses offshore, nearshore, and onshore operating areas, ranges, and special use airspace. Components of the JAX Range Complex encompass 50,090 square nautical miles (nm^2) of sea space and 62,596 nm^2 of special use airspace off the coasts of North Carolina, South Carolina, Georgia, and Florida, as well as 20 square miles of inland range area in north-central Florida. The portion of the JAX Range located off of North Carolina, is off the coasts of Pender, New Hanover, and Brunswick Counties from the mean high tide line oceanward.

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. Nonetheless, several State agencies expressed concerns related to the proposed activity. The North Carolina Division of Parks and Recreations noted that there are coastal parks that could be affected by the proposed activity. The North Carolina Division of Marine Fisheries expressed concerns about the accumulation of debris. Likewise the Division of Coastal Management continues to be concerned over the long-term cumulative effects of the sonar and the

400 Commerce Ave., Morehead City, NC 28557-3421
Phone: 252-808-2808 \ FAX: 252-247-3330 Internet: www.nccoastalmanagement.net

NCDENR

North Carolina Department of Environment and Natural Resources
Division of Parks and Recreation

Beverly Eaves Perdue, Governor | Dee Freeman, Secretary | Lewis Ledford, Director

January 27, 2009

Stephen Rynas, Federal Consistency Coordinator
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557-3421

Reference: DCM#20080168, Proposed Atlantic Fleet Training (VACAPES)
DCM#20080169, Proposed Atlantic Fleet Training (JAX)

Dear Mr. Rynas,

The North Carolina State Division of Parks and Recreation (NCDPR) reviewed the U.S. Navy's Negative Determination under the Coastal Zone Management Act for training and testing activities in the Virginia Capes (VACAPES) and Jacksonville (JAX) Range Complexes.

Based on the information provided to us, we are unable to conclude that the proposed actions will have no impacts on coastal use or resources. The proposed actions appear to potentially impact recreation and natural resources at NCDPR holdings as well as other ecologically important state lands and waters. We would like to see these potential impacts considered in the EIS and recommend that all state agencies' comments be addressed. If indeed all training will occur outside of state waters and airspace, this should be clarified. NCDPR's main concerns are as followed:

A. VACAPES Proposed Action

According to the Negative Determination documents, the VACAPES Range Complex includes the restricted airspace in mainland Dare County. The VACAPES Study Area also includes air, sea, and undersea space on the ocean side of the barrier islands from the mean high tide line east to the 3 nm state limit in North Carolina. Between these two areas lie Jockey's Ridge State Park and Run Hill State Natural Area. Pettigrew State Park and Lake Phelps, also NCDPR holdings, fall within Restricted Airspace R-5314 A-J. A map is attached.

Jockey's Ridge is the tallest active dune system on the east coast and is a unique coastal geologic formation. It is also a designated National Natural Landmark. Jockey's Ridge, Run Hill, and Pettigrew State Park are held by the state because they include exceptional natural, recreational,

1615 Mail Service Center, Raleigh, North Carolina 27699-1615
Phone: 919-733-4181 \ FAX: 919-715-3085 \ Internet: www.ncparks.gov

NORTH CAROLINA STATE PARKS

TRAINING AREAS WEST OF THE 3 NM STATE WATERS BOUNDARY

As a conservation agency, NCDPR is also concerned with impacts to marine and migratory wildlife in the naval OPAREAs seaward of the 3 nm state boundaries. Any such impacts potentially have repercussions for North Carolina's ecosystems and North Carolina residents' enjoyment of these natural resources. However, since these areas fall outside of state waters and most of these species are covered by federal law and international treaties, we defer to the National Marine Fisheries Service and the U.S. Fish and Wildlife Service on appropriate protection measures.

Thank you for the opportunity to review this proposal. We will look forward to more information so that we can better assess potential impacts to NCDPR holdings and state resources.

Sincerely,

Jean Lynch
Coastal Region Biologist
North Carolina Division of Parks and Recreation
P.O. Box 475
Carolina Beach, NC 28428-0475
Office: (910) 458-8206
Fax: (910) 409-5755

Rich/Anne

NCDENR

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

(E)

MEMORANDUM

December 31, 2008

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 Atlantic Fleet Training (JAX) (DCM#20080169)

LOCATION: Jacksonville/Charleston Range Complexes (JAX), Offshore, North Carolina

This document is being circulated for **consistency** review and comment by **January 23, 2009**. This is one of two very similar projects the other being Virginia Capes Range Complex. The State Clearinghouse previously sent both of these projects out for NEPA review. A copy of the DEIS is on the "T" drive which is accessible if you are within DCM, please see the next page for their location. If you need copies of the DEIS on CD, I can send one. (Steve, Tere, Terry, and Frank please respond directly or delegate.) 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: Anne Deaton Date: 2/3/09

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

NCDENR

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

MEMORANDUM

December 31, 2008

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 Atlantic Fleet Training (JAX) (DCM#20080169)

LOCATION: Jacksonville/Charleston Range Complexes (JAX), Offshore, North Carolina

This document is being circulated for **consistency** review and comment by **January 23, 2009**. This is one of two very similar projects the other being Virginia Capes Range Complex. The State Clearinghouse previously sent both of these projects out for NEPA review. A copy of the DEIS is on the "T" drive which is accessible if you are within DCM, please see the next page for their location. If you need copies of the DEIS on CD, I can send one. (Steve, Tere, Terry, and Frank please respond directly or delegate.) 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: 1/23/09

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

NCDENR

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

MEMORANDUM

December 31, 2008

TO: John Fear
Coastal Reserve Program - Beaufort
101 Pivers Island Road
Beaufort, NC 28516-9701

FROM: Stephen Rynas, AICP; Federal Consistency Coordinator

SUBJECT: Proposed Atlantic Fleet Training (JAX) (DCM#20080169)

LOCATION: Jacksonville/Charleston Range Complexes (JAX), Offshore, North Carolina

This document is being circulated for **consistency** review and comment by **January 23, 2009**. This is one of two very similar projects the other being Virginia Capes Range Complex. The State Clearinghouse previously sent both of these projects out for NEPA review. A copy of the DEIS is on the "T" drive which is accessible if you are within DCM, please see the next page for their location. If you need copies of the DEIS on CD, I can send one. (Steve, Tere, Terry, and Frank please respond directly or delegate.) 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: John Fear Date: 1-7-09

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
Michael F. Easley, Governor
James H. Gregson, Director
William G. Ross Jr., Secretary

MEMORANDUM

December 31, 2008

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 Atlantic Fleet Training (JAX) (DCM#20080169)

LOCATION: Jacksonville/Charleston Range Complexes (JAX), Offshore, North Carolina

This document is being circulated for **consistency** review and comment by **January 23, 2009**. This is one of two very similar projects the other being Virginia Capes Range Complex. The State Clearinghouse previously sent both of these projects out for NEPA review. A copy of the DEIS is on the "T" drive which is accessible if you are within DCM, please see the next page for their location. If you need copies of the DEIS on CD, I can send one. (Steve, Tere, Terry, and Frank please respond directly or delegate.) 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: Chuck for Patti Fowler Date: 1/5/09

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

Michael F. Easley, Governor | **James H. Gregson, Director** | William G. Ross Jr., Secretary

MEMORANDUM

December 31, 2008

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 Atlantic Fleet Training (JAX) (DCM#20080169)

LOCATION: Jacksonville/Charleston Range Complexes (JAX), Offshore, North Carolina

This document is being circulated for **consistency** review and comment by **January 23, 2009**. This is one of two very similar projects the other being Virginia Capes Range Complex. The State Clearinghouse previously sent both of these projects out for NEPA review. A copy of the DEIS is on the "T" drive which is accessible if you are within DCM, please see the next page for their location. If you need copies of the DEIS on CD, I can send one. (Steve, Tere, Terry, and Frank please respond directly or delegate.) 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: Steve Everhart Date: 1/7/09

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

Michael F. Easley, Governor | **James H. Gregson, Director** | William G. Ross Jr., Secretary

MEMORANDUM

December 31, 2008

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 Atlantic Fleet Training (JAX) (DCM#20080169)

LOCATION: Jacksonville/Charleston Range Complexes (JAX), Offshore, North Carolina

This document is being circulated for **consistency** review and comment by **January 23, 2009**. This is one of two very similar projects the other being Virginia Capes Range Complex. The State Clearinghouse previously sent both of these projects out for NEPA review. A copy of the DEIS is on the "T" drive which is accessible if you are within DCM, please see the next page for their location. If you need copies of the DEIS on CD, I can send one. (Steve, Tere, Terry, and Frank please respond directly or delegate.) 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: 1-30-9

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

APPENDIX H

OVERVIEW OF AIRBORNE AND UNDERWATER ACOUSTICS

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APPENDIX H
OVERVIEW OF AIRBORNE AND UNDERWATER ACOUSTICS

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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 JAX 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 JAX 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 JAX 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 JAX 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).

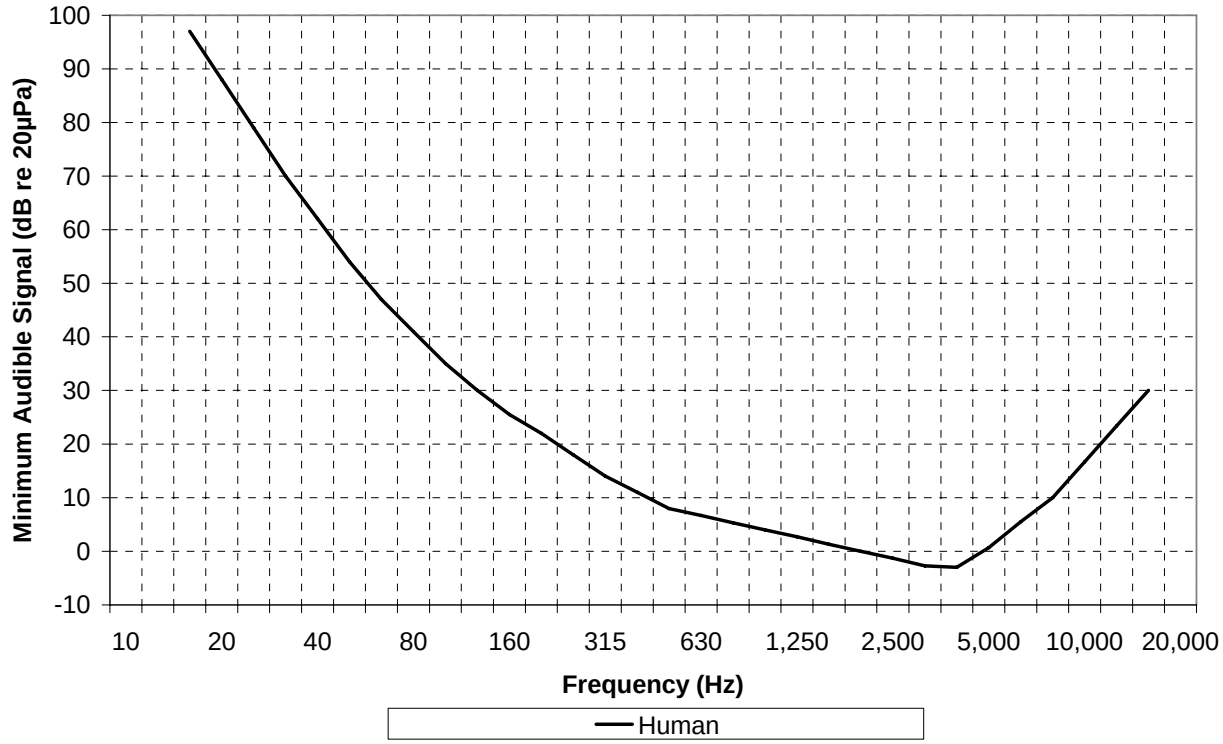


Figure H.1 Human In-Air Hearing Threshold

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.

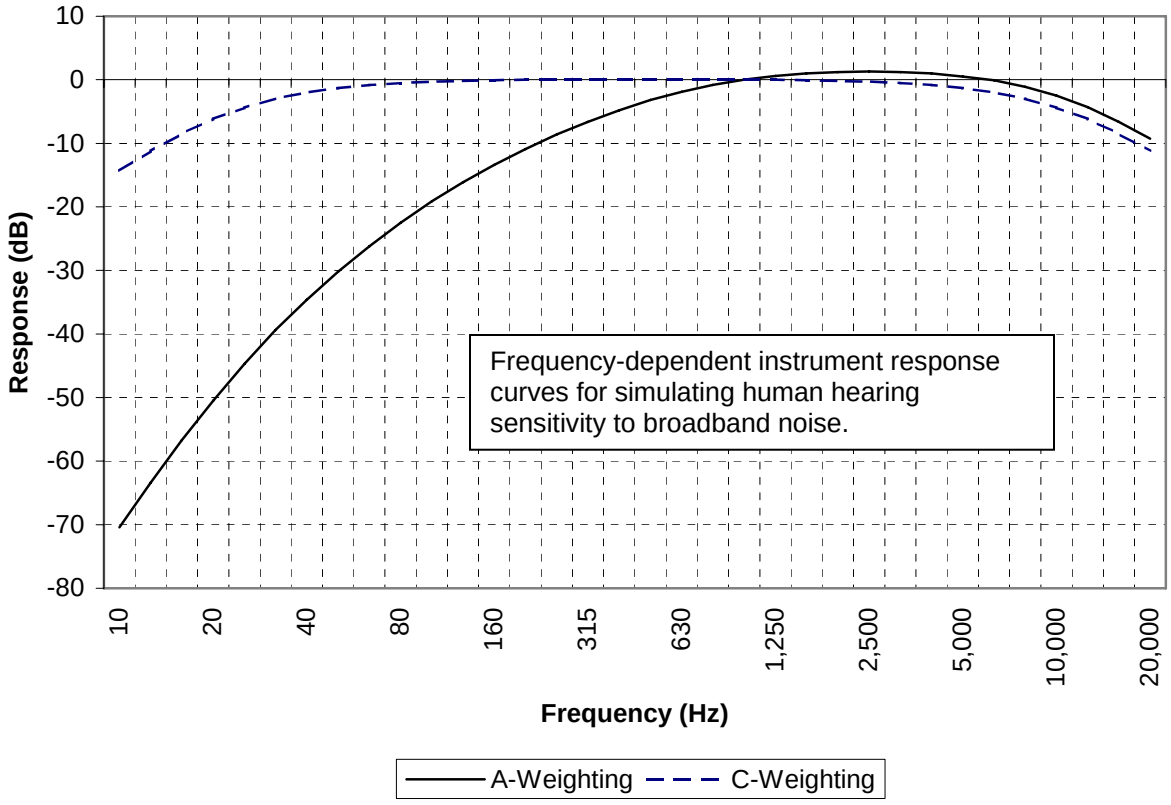


Figure H.2 Noise Weighting Characteristics

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

[1] L_{dn} is the formula version of the Day-Night Average Sound Level metric and DNL is normally used in text.

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).

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 JAX 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 JAX 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 JAX 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.

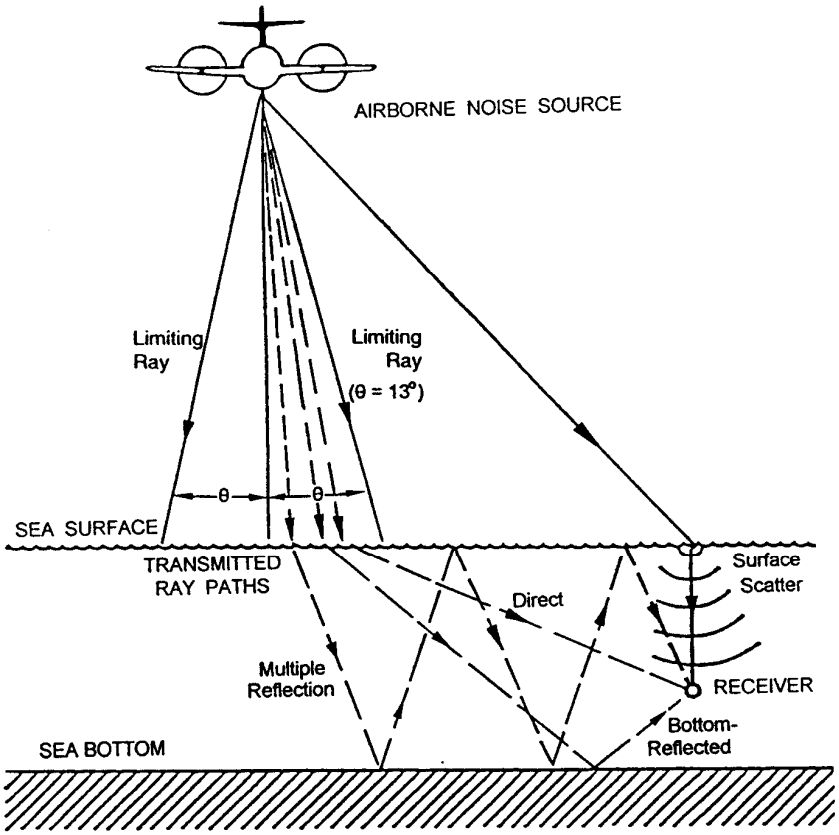


Figure H.3 Characteristics of Sound Transmission through Air-Water Interface

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.

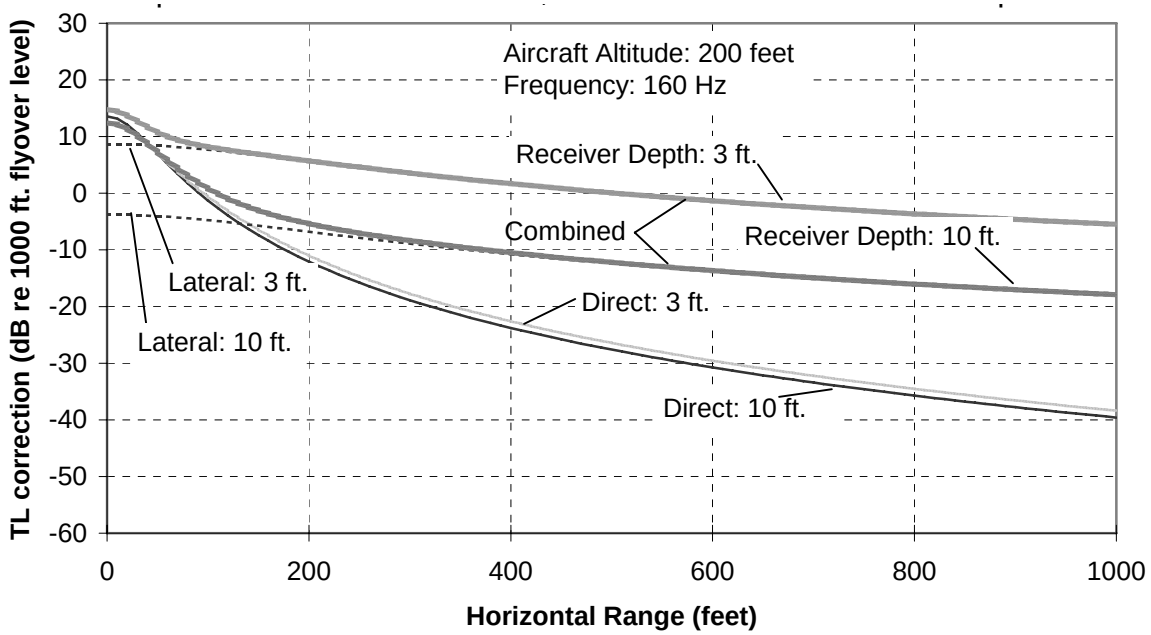


Figure H.4 Transmission of Loss of Noise through Air-Water Interface, Comparison of Direct-Refracted, Lateral and Combined TL Component

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.

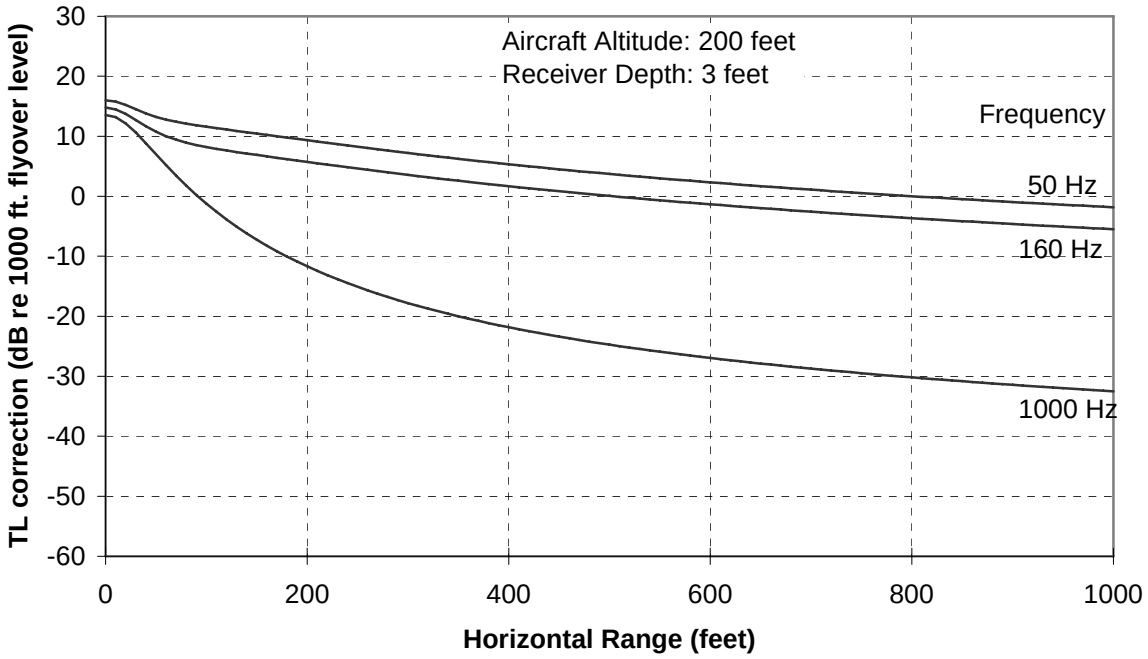


Figure H.5A Air-Water Transmission Loss vs. Frequency

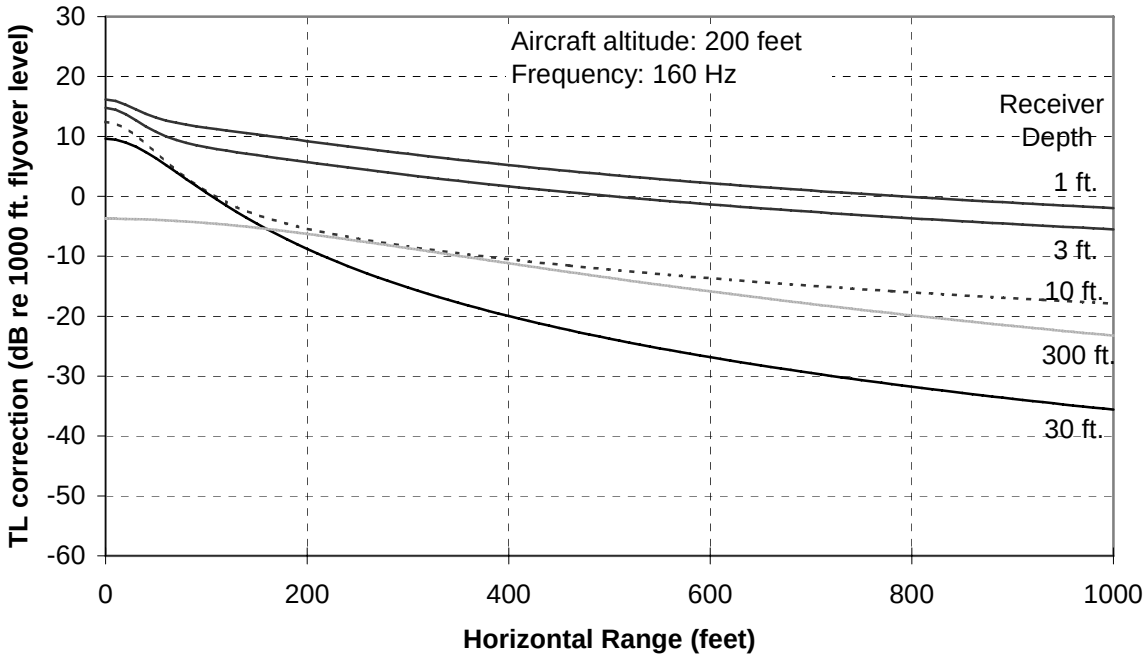


Figure H.5B Air-Water Transmission Loss vs. Receiver Depth

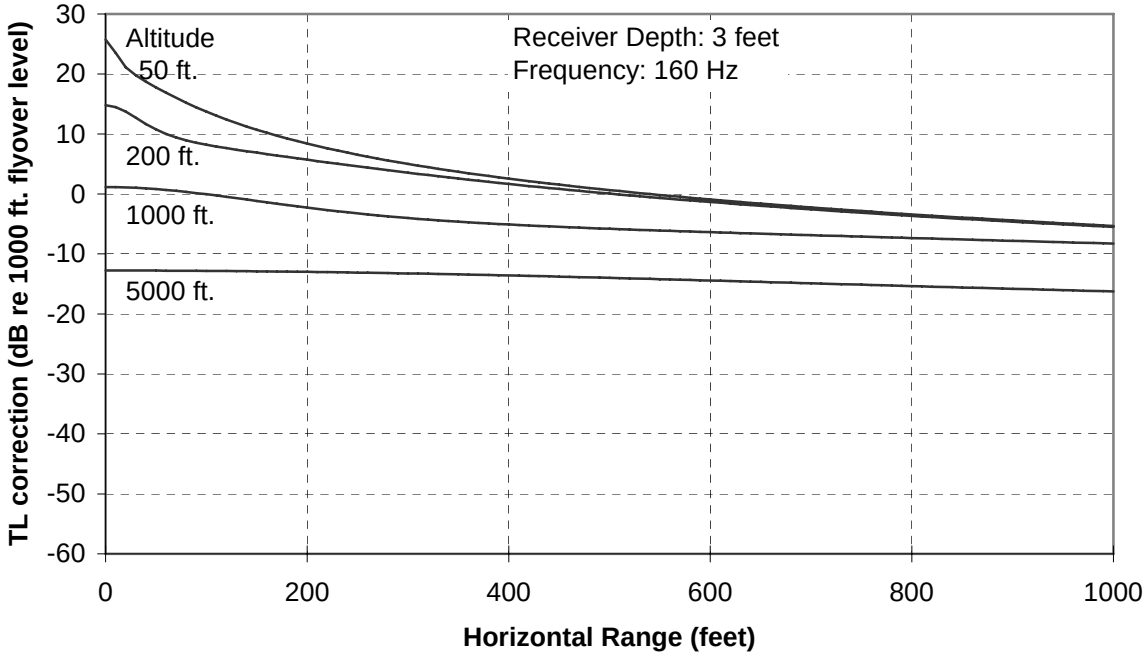


Figure H.5C Air-Water Transmission Loss vs. Aircraft Altitude

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 JAX 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 JAX 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.

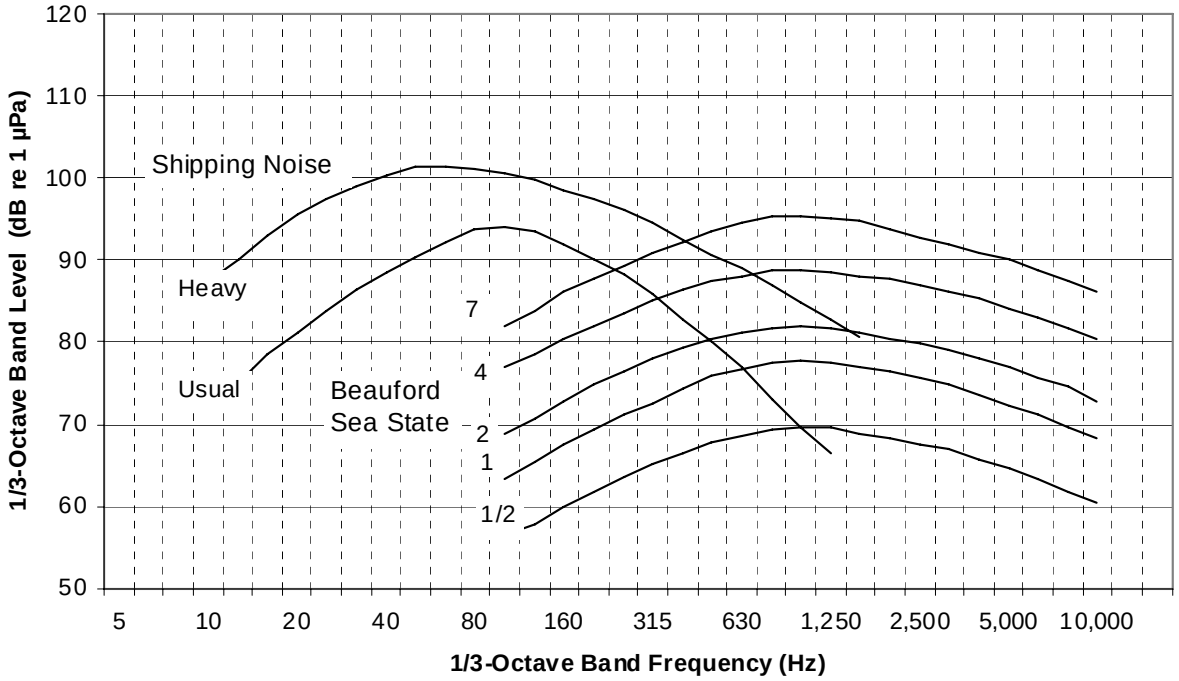


Figure H.6 Underwater Ambient Noise

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 JAX 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.

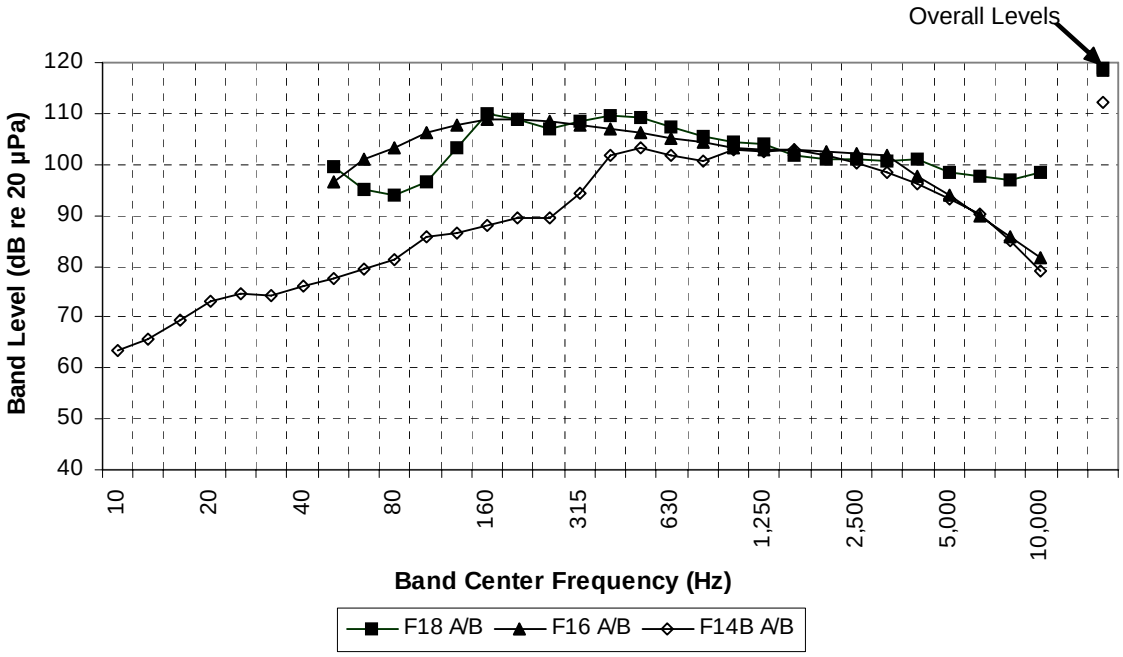
Figure H.6 also provides two curves that approximate the upper bounds of distant ship traffic noise. The upper curve represents noise at sites exposed to heavily used shipping lanes. The lower curve represents moderate or distant shipping noise as measured in shallow water. As shown, highest observed 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

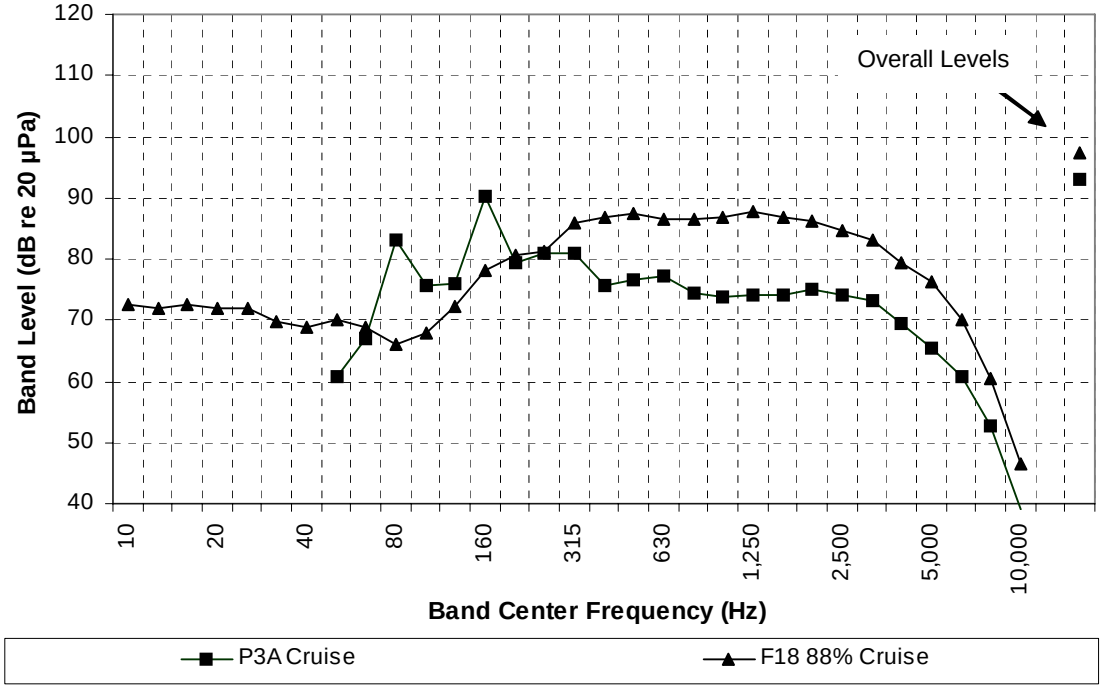
Noise received at and below the sea surface is relevant to marine mammals and some other marine animals at sea. The spectral composition and overall level of each airborne noise source must both be considered in assessing potential impacts on marine mammals present at sea in the JAX Range Complex. As 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 JAX 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 JAX 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 JAX 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 JAX Range Complex, and thus sound levels are representative of JAX 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 JAX 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 JAX 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 JAX 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 (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 27,661; 50,090; and 18,617 square nautical miles (nm^2), respectively. Only VACAPES OPAREA is included in the tables below.

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**: 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; 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.

Exposure estimates could not be calculated for several species (West Indian manatee, blue whale, sei whale, Bryde's whale, killer whale, pygmy killer whale, false killer whale, melon-headed whale, spinner dolphin, and Fraser's dolphin) because density data are limited for these species. However, the likelihood of exposure should be even lower than that estimated for other species with given densities since they are less likely to occur in the Study Area.

The results of the modeling are presented in the following tables. Model output data are presented in Tables I-1 to I-18 for the No Action Alternative, Tables I-19 to I-36 for Alternative 1, and Tables I-37 to I-54 for Alternative 2 (Preferred Alternative).

Table I-1 for No Action Alternative
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-157A in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	0.00055	0.00055	0.00055	0.00055
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	0.00034	0.00034	0.00025	0.00034
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	0.00027	0.00027	0.00027	0.00027
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	0.00021	0.00021	0.00057	0.00021
Loggerhead Turtle	0.00038	0.00038	0.00041	0.00038
Hardshell Turtle[2]	0.00016	0.00016	0.00019	0.00016
Kemps Ridley Turtle	<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 consist of greens, hawksbills, and all other identified hardshell turtles.*

Table I-2 for No Action Alternative
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-157B in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	0.00000	0.00000	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	N/A	N/A	N/A	N/A
Loggerhead Turtle	N/A	N/A	N/A	N/A
Hardshell Turtle[2]	N/A	N/A	N/A	N/A
Kemps Ridley Turtle	N/A	N/A	N/A	N/A

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-3 for No Action Alternative
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-157C in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	0.00000	0.00000	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	N/A	N/A	N/A	N/A
Loggerhead Turtle	N/A	N/A	N/A	N/A
Hardshell Turtle[2]	N/A	N/A	N/A	N/A
Kemps Ridley Turtle	N/A	N/A	N/A	N/A

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-4 for No Action Alternative
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-158A in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	N/A	N/A	N/A	N/A
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	N/A	N/A	N/A	N/A
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	0.00015	0.00015	0.00016	0.00015
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	N/A	N/A	N/A	N/A
Pantropical Spotted Dolphin	N/A	N/A	N/A	N/A
Pilot Whale	N/A	N/A	N/A	N/A
Rissos Dolphin	N/A	N/A	N/A	N/A
Rough-Toothed Dolphin	N/A	N/A	N/A	N/A
Striped Dolphin	N/A	N/A	N/A	N/A
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	N/A	N/A
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<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 consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-5 for No Action Alternative
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-158B in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	0.00000	0.00000	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	N/A	N/A	N/A	N/A
Loggerhead Turtle	N/A	N/A	N/A	N/A
Hardshell Turtle[2]	N/A	N/A	N/A	N/A
Kemps Ridley Turtle	N/A	N/A	N/A	N/A

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-6 for No Action Alternative
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-158E in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	0.00000	0.00000	0.00000	0.00000
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	0.00000	0.00000	0.00000	0.00000
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	0.00000	0.00000	0.00000	0.00000
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
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

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-7 for No Action Alternative
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-158F in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	0.00000	0.00000	0.00000	0.00000
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	0.00000	0.00000	0.00000	0.00000
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
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

[1]*Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)*
[2]*Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles*

Table I-8 for No Action Alternative
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-159A in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
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

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-9 for No Action Alternative
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-159B in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	N/A	N/A	N/A	N/A
Humpback Whale	N/A	N/A	N/A	N/A
Fin Whale	N/A	N/A	N/A	N/A
Sperm Whale	N/A	N/A	N/A	N/A
Atlantic Spotted Dolphin	N/A	N/A	N/A	N/A
Beaked Whale	N/A	N/A	N/A	N/A
Bottlenose Dolphin	N/A	N/A	N/A	N/A
Clymene Dolphin	N/A	N/A	N/A	N/A
Common Dolphin	N/A	N/A	N/A	N/A
Minke Whale	N/A	N/A	N/A	N/A
Pantropical Spotted Dolphin	N/A	N/A	N/A	N/A
Pilot Whale	N/A	N/A	N/A	N/A
Rissos Dolphin	N/A	N/A	N/A	N/A
Rough-Toothed Dolphin	N/A	N/A	N/A	N/A
Striped Dolphin	N/A	N/A	N/A	N/A
Kogia spp.	N/A	N/A	N/A	N/A
Leatherback Turtle	N/A	N/A	N/A	N/A
Loggerhead Turtle	N/A	N/A	N/A	N/A
Hardshell Turtle[2]	N/A	N/A	N/A	N/A
Kemps Ridley Turtle	N/A	N/A	N/A	N/A

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-10 for No Action Alternative
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-132A in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	<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	0.00000	<0.0001
Bottlenose Dolphin	0.00023	0.00023	0.00027	0.00023
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos 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
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
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

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-11 for No Action Alternative
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-132B in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	0.00000	0.00000	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	0.00017	0.00017	0.00018	0.00017
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	0.00018	0.00018	0.00021	0.00018
Rissos 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
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	N/A	N/A	N/A	N/A
Loggerhead Turtle	N/A	N/A	N/A	N/A
Hardshell Turtle[2]	N/A	N/A	N/A	N/A
Kemps Ridley Turtle	N/A	N/A	N/A	N/A

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-12 for No Action Alternative
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-133 in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	0.00000	0.00000	<0.0001	0.00000
Atlantic Spotted Dolphin	0.00024	0.00024	0.00024	0.00024
Beaked Whale	<0.0001	<0.0001	0.00000	<0.0001
Bottlenose Dolphin	0.00054	0.00054	0.00054	0.00054
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos 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
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	0.00014	0.00014	0.00015	0.00014
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<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 consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-13 for No Action Alternative
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-134 in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	0.00000	0.00000	<0.0001	0.00000
Atlantic Spotted Dolphin	0.00024	0.00024	0.00024	0.00024
Beaked Whale	<0.0001	<0.0001	0.00000	<0.0001
Bottlenose Dolphin	0.00054	0.00054	0.00054	0.00054
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos 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
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	0.00014	0.00014	0.00015	0.00014
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<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 consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-14 for No Action Alternative
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in AA in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	0.00000	0.00000	0.00000	0.00000
Atlantic Spotted Dolphin	0.00011	0.00011	0.00011	0.00011
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
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

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-15 for No Action Alternative
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in BB in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	0.00000	0.00000	0.00000	0.00000
Atlantic Spotted Dolphin	0.00011	0.00011	0.00011	0.00011
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
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

[1]*Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)*
[2]*Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles.*

Table I-16 for No Action Alternative
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in CC in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	0.00000	0.00000	0.00000	0.00000
Atlantic Spotted Dolphin	0.00011	0.00011	0.00011	0.00011
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
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

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-17 for No Action Alternative
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in CHAS-UNDET-NORTH in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	0.00000	0.00000	<0.0001	0.00000
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos 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
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
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

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-18 for No Action Alternative
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in CHAS-UNDET-SOUTH in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	0.00000	0.00000	0.00000	0.00000
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos 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
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
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

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-19 for Alternative 1
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-157A in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	0.00060	0.00060	0.00060	0.00060
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	0.00037	0.00037	0.00028	0.00037
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	0.00029	0.00029	0.00029	0.00029
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	0.00023	0.00023	0.00062	0.00023
Loggerhead Turtle	0.00042	0.00042	0.00045	0.00042
Hardshell Turtle[2]	0.00017	0.00017	0.00020	0.00017
Kemps Ridley Turtle	<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 consist of greens, hawksbills, and all other identified hardshell turtles.*

Table I-20 for Alternative 1
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-157B in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	0.00000	0.00000	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	N/A	N/A	N/A	N/A
Loggerhead Turtle	N/A	N/A	N/A	N/A
Hardshell Turtle[2]	N/A	N/A	N/A	N/A
Kemps Ridley Turtle	N/A	N/A	N/A	N/A

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-21 for Alternative 1
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-157C in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	0.00000	0.00000	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	N/A	N/A	N/A	N/A
Loggerhead Turtle	N/A	N/A	N/A	N/A
Hardshell Turtle[2]	N/A	N/A	N/A	N/A
Kemps Ridley Turtle	N/A	N/A	N/A	N/A

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-22 for Alternative 1
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-158A in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	N/A	N/A	N/A	N/A
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	N/A	N/A	N/A	N/A
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	0.00015	0.00015	0.00016	0.00015
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	N/A	N/A	N/A	N/A
Pantropical Spotted Dolphin	N/A	N/A	N/A	N/A
Pilot Whale	N/A	N/A	N/A	N/A
Rissos Dolphin	N/A	N/A	N/A	N/A
Rough-Toothed Dolphin	N/A	N/A	N/A	N/A
Striped Dolphin	N/A	N/A	N/A	N/A
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	N/A	N/A
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<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 consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-23 for Alternative 1
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-158B in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	0.00000	0.00000	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	N/A	N/A	N/A	N/A
Loggerhead Turtle	N/A	N/A	N/A	N/A
Hardshell Turtle[2]	N/A	N/A	N/A	N/A
Kemps Ridley Turtle	N/A	N/A	N/A	N/A

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-24 for Alternative 1
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-158E in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	0.00000	0.00000	0.00000	0.00000
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	0.00000	0.00000	0.00000	0.00000
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	0.00000	0.00000	0.00000	0.00000
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
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

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-25 for Alternative 1
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-158F in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	0.00000	0.00000	0.00000	0.00000
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	0.00000	0.00000	0.00000	0.00000
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
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

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-26 for Alternative 1
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-159A in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
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

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-27 for Alternative 1
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-159B in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	N/A	N/A	N/A	N/A
Humpback Whale	N/A	N/A	N/A	N/A
Fin Whale	N/A	N/A	N/A	N/A
Sperm Whale	N/A	N/A	N/A	N/A
Atlantic Spotted Dolphin	N/A	N/A	N/A	N/A
Beaked Whale	N/A	N/A	N/A	N/A
Bottlenose Dolphin	N/A	N/A	N/A	N/A
Clymene Dolphin	N/A	N/A	N/A	N/A
Common Dolphin	N/A	N/A	N/A	N/A
Minke Whale	N/A	N/A	N/A	N/A
Pantropical Spotted Dolphin	N/A	N/A	N/A	N/A
Pilot Whale	N/A	N/A	N/A	N/A
Rissos Dolphin	N/A	N/A	N/A	N/A
Rough-Toothed Dolphin	N/A	N/A	N/A	N/A
Striped Dolphin	N/A	N/A	N/A	N/A
Kogia spp.	N/A	N/A	N/A	N/A
Leatherback Turtle	N/A	N/A	N/A	N/A
Loggerhead Turtle	N/A	N/A	N/A	N/A
Hardshell Turtle[2]	N/A	N/A	N/A	N/A
Kemps Ridley Turtle	N/A	N/A	N/A	N/A

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-28 for Alternative 1
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-132A in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	<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	0.00000	<0.0001
Bottlenose Dolphin	0.00023	0.00023	0.00027	0.00023
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos 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
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
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

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-29 for Alternative 1
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-132B in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	0.00000	0.00000	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	0.00017	0.00017	0.00018	0.00017
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	0.00018	0.00018	0.00021	0.00018
Rissos 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
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	N/A	N/A	N/A	N/A
Loggerhead Turtle	N/A	N/A	N/A	N/A
Hardshell Turtle[2]	N/A	N/A	N/A	N/A
Kemps Ridley Turtle	N/A	N/A	N/A	N/A

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-30 for Alternative 1
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-133 in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	0.00000	0.00000	<0.0001	0.00000
Atlantic Spotted Dolphin	0.00024	0.00024	0.00024	0.00024
Beaked Whale	<0.0001	<0.0001	0.00000	<0.0001
Bottlenose Dolphin	0.00054	0.00054	0.00054	0.00054
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos 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
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	0.00014	0.00014	0.00015	0.00014
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<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 consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-31 for Alternative 1
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-134 in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	0.00000	0.00000	<0.0001	0.00000
Atlantic Spotted Dolphin	0.00024	0.00024	0.00024	0.00024
Beaked Whale	<0.0001	<0.0001	0.00000	<0.0001
Bottlenose Dolphin	0.00054	0.00054	0.00054	0.00054
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos 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
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	0.00014	0.00014	0.00015	0.00014
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<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 consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-32 for Alternative 1
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in AA in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	0.00000	0.00000	0.00000	0.00000
Atlantic Spotted Dolphin	0.00012	0.00012	0.00012	0.00012
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
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

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-33 for Alternative 1
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in BB in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	0.00000	0.00000	0.00000	0.00000
Atlantic Spotted Dolphin	0.00012	0.00012	0.00012	0.00012
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
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

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-34 for Alternative 1
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in CC in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	0.00000	0.00000	0.00000	0.00000
Atlantic Spotted Dolphin	0.00012	0.00012	0.00012	0.00012
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
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

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-35 for Alternative 1
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in CHAS-UNDET-NORTH in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	0.00000	0.00000	<0.0001	0.00000
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos 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
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
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

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-36 for Alternative 1
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in CHAS-UNDET-SOUTH in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	0.00000	0.00000	0.00000	0.00000
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos 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
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
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

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-37 for Alternative 2
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-157A in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	0.00061	0.00061	0.00061	0.00061
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	0.00037	0.00037	0.00028	0.00037
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	0.00029	0.00029	0.00029	0.00029
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	0.00023	0.00023	0.00062	0.00023
Loggerhead Turtle	0.00042	0.00042	0.00045	0.00042
Hardshell Turtle[2]	0.00017	0.00017	0.00020	0.00017
Kemps Ridley Turtle	<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 consist of greens, hawksbills, and all other identified hardshell turtles

Table I-38 for Alternative 2
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-157B in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	0.00000	0.00000	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	N/A	N/A	N/A	N/A
Loggerhead Turtle	N/A	N/A	N/A	N/A
Hardshell Turtle[2]	N/A	N/A	N/A	N/A
Kemps Ridley Turtle	N/A	N/A	N/A	N/A

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-39 for Alternative 2
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-157C in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	0.00000	0.00000	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	N/A	N/A	N/A	N/A
Loggerhead Turtle	N/A	N/A	N/A	N/A
Hardshell Turtle[2]	N/A	N/A	N/A	N/A
Kemps Ridley Turtle	N/A	N/A	N/A	N/A

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-40 for Alternative 2
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-158A in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	N/A	N/A	N/A	N/A
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	N/A	N/A	N/A	N/A
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	0.00012	0.00012	0.00013	0.00012
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	N/A	N/A	N/A	N/A
Pantropical Spotted Dolphin	N/A	N/A	N/A	N/A
Pilot Whale	N/A	N/A	N/A	N/A
Rissos Dolphin	N/A	N/A	N/A	N/A
Rough-Toothed Dolphin	N/A	N/A	N/A	N/A
Striped Dolphin	N/A	N/A	N/A	N/A
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	N/A	N/A
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<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 consist of greens, hawksbills, and all other identified hardshell turtles

Table I-41 for Alternative 2
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-158B in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	0.00000	0.00000	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	N/A	N/A	N/A	N/A
Loggerhead Turtle	N/A	N/A	N/A	N/A
Hardshell Turtle[2]	N/A	N/A	N/A	N/A
Kemps Ridley Turtle	N/A	N/A	N/A	N/A

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-42 for Alternative 2
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-158E in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	0.00000	0.00000	0.00000	0.00000
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	0.00000	0.00000	0.00000	0.00000
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	0.00000	0.00000	0.00000	0.00000
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
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

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-43 for Alternative 2
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-158F in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	0.00000	0.00000	0.00000	0.00000
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	0.00000	0.00000	0.00000	0.00000
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
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

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-44 for Alternative 2
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-159A in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
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

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-45 for Alternative 2
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-159B in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	N/A	N/A	N/A	N/A
Humpback Whale	N/A	N/A	N/A	N/A
Fin Whale	N/A	N/A	N/A	N/A
Sperm Whale	N/A	N/A	N/A	N/A
Atlantic Spotted Dolphin	N/A	N/A	N/A	N/A
Beaked Whale	N/A	N/A	N/A	N/A
Bottlenose Dolphin	N/A	N/A	N/A	N/A
Clymene Dolphin	N/A	N/A	N/A	N/A
Common Dolphin	N/A	N/A	N/A	N/A
Minke Whale	N/A	N/A	N/A	N/A
Pantropical Spotted Dolphin	N/A	N/A	N/A	N/A
Pilot Whale	N/A	N/A	N/A	N/A
Rissos Dolphin	N/A	N/A	N/A	N/A
Rough-Toothed Dolphin	N/A	N/A	N/A	N/A
Striped Dolphin	N/A	N/A	N/A	N/A
Kogia spp.	N/A	N/A	N/A	N/A
Leatherback Turtle	N/A	N/A	N/A	N/A
Loggerhead Turtle	N/A	N/A	N/A	N/A
Hardshell Turtle[2]	N/A	N/A	N/A	N/A
Kemps Ridley Turtle	N/A	N/A	N/A	N/A

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-46 for Alternative 2
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-132A in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	<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	0.00000	<0.0001
Bottlenose Dolphin	0.00023	0.00023	0.00027	0.00023
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos 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
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
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

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-47 for Alternative 2
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-132B in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	0.00000	0.00000	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	0.00017	0.00017	0.00018	0.00017
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	0.00018	0.00018	0.00021	0.00018
Rissos 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
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	N/A	N/A	N/A	N/A
Loggerhead Turtle	N/A	N/A	N/A	N/A
Hardshell Turtle[2]	N/A	N/A	N/A	N/A
Kemps Ridley Turtle	N/A	N/A	N/A	N/A

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-48 for Alternative 2
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-133 in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	0.00000	0.00000	<0.0001	0.00000
Atlantic Spotted Dolphin	0.00024	0.00024	0.00024	0.00024
Beaked Whale	<0.0001	<0.0001	0.00000	<0.0001
Bottlenose Dolphin	0.00054	0.00054	0.00054	0.00054
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos 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
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	0.00014	0.00014	0.00015	0.00014
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<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 consist of greens, hawksbills, and all other identified hardshell turtles

Table I-49 for Alternative 2
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-134 in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	0.00000	0.00000	<0.0001	0.00000
Atlantic Spotted Dolphin	0.00024	0.00024	0.00024	0.00024
Beaked Whale	<0.0001	<0.0001	0.00000	<0.0001
Bottlenose Dolphin	0.00054	0.00054	0.00054	0.00054
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos 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
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	0.00014	0.00014	0.00015	0.00014
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<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 consist of greens, hawksbills, and all other identified hardshell turtles

Table I-50 for Alternative 2
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in AA in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	0.00000	0.00000	0.00000	0.00000
Atlantic Spotted Dolphin	0.00012	0.00012	0.00012	0.00012
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
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

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-51 for Alternative 2
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in BB in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	0.00000	0.00000	0.00000	0.00000
Atlantic Spotted Dolphin	0.00012	0.00012	0.00012	0.00012
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
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

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-52 for Alternative 2
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in CC in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	0.00000	0.00000	0.00000	0.00000
Atlantic Spotted Dolphin	0.00012	0.00012	0.00012	0.00012
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00000	0.00000	0.00000	0.00000
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
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

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-53 for Alternative 2
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in CHAS-UNDET-NORTH in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	0.00000	0.00000	<0.0001	0.00000
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos 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
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
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

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-54 for Alternative 2
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in CHAS-UNDET-SOUTH in the JAX Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	0.00000	0.00000	0.00000	0.00000
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00000	0.00000	0.00000	0.00000
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos 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
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
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

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)

[2]Hardshell Turtles consist of greens, and all other identified hardshell turtles

Appendix J

Technical Risk Assessment
for the
Use of Underwater Explosives in the Jacksonville Range Complex

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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, Mine Neutralization Exercises (MINEX), Bombing Exercises (BOMBEX), small arms training (MK3A2 grenades), and Missile Exercises (MISSILEX) in the Jacksonville Range Complex. The Jacksonville Range Complex encompasses both the Charleston (CHASN) and Jacksonville (JAX) OPAREAs.

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.

Figure J.1-1 shows the areas where explosive ordnance is used in the Jacksonville Range Complex.

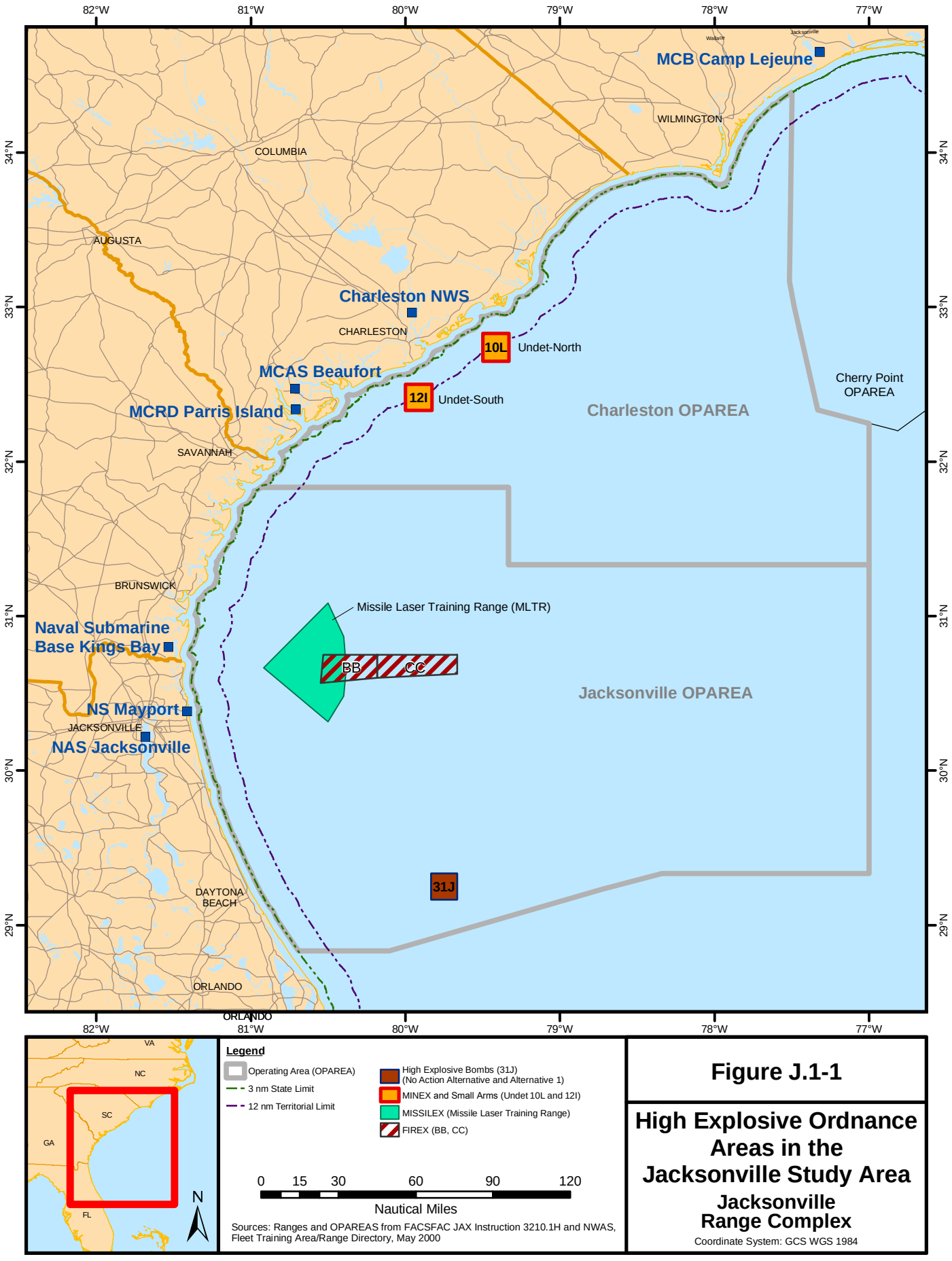


Figure J.1-1

High Explosive Ordnance Areas in the Jacksonville Study Area

Jacksonville Range Complex

Coordinate System: GCS WGS 1984

Table J.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 J.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. Due to the very low NEW (0.5 lb) associated with grenades, and the small expected ZOI, the full modeling process explained in this Appendix was not completed. For a description of the analysis that was completed for grenades, please see page 3-231. Table J.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 70 Hellfire events per year that can take place in MLTR during any season, so there are 17.5 events modeled for each season.

TABLE J.1-1
NUMBER OF EXPLOSIVE EVENTS WITHIN THE JACKSONVILLE RANGE COMPLEX FOR NO ACTION ALTERNATIVE

Sub-Area	Ordnance	Winter	Spring	Summer	Fall	Annual Totals
	MISSILEX					33
MLTR	**Hellfire**	**7.5**	**7.5**	**7.5**	**7.5**	
MLTR	**Maverick**	**0.75**	**0.75**	**0.75**	**0.75**	
	FIREX with IMPASS					10
BB,CC	**5" rounds**	**0**	**0**	**5**	**5**	
	Small Arms Training					8
UNDET North	**MK3A2 grenades***	**1**	**1**	**1**	**1**	
UNDET South	**MK3A2 grenades***	**1**	**1**	**1**	**1**	
	MINEX					18
UNDET North	**20 LB**	**1.75**	**1.75**	**3.75**	**1.75**	
UNDET South	**20 LB**	**1.75**	**1.75**	**3.75**	**1.75**	
	BOMBEX					23
Area 31J	**MK-82****	**3.75**	**3.75**	**3.75**	**3.75**	
Area 31J	**MK-83****	**0.75**	**0.75**	**0.75**	**0.75**	
Area 31J	**MK-84**	**0.25**	**0.25**	**0.25**	**0.25**	
Area 31J	**MK-20**	**1**	**1**	**1**	**1**	

**One event using the MK3A2 grenades consists of 10 grenades being thrown. Therefore, there are a total of 80 grenades being used over the course of 1 year.*

*** One event using the MK-82 or MK-83 bombs consists of four bombs being dropped in succession. For example, in Area 31J there are 15 events for the MK-82, which means that a total of 60 bombs will be dropped per year. In accordance with the current biological opinion for the Southeast, no live FIREX is conducted during North Atlantic right whale calving season (Dec 1 – Mar 31) and therefore no modeling was completed for the winter and spring seasons*

TABLE J.1-2
NUMBER OF EXPLOSIVE EVENTS WITHIN THE JACKSONVILLE RANGE COMPLEX FOR ALTERNATIVE 1

Sub-Area	Ordnance	Winter	Spring	Summer	Fall	Annual Totals
	MISSILEX					73
MLTR	**Hellfire**	**17.5**	**17.5**	**17.5**	**17.5**	
MLTR	**Maverick**	**0.75**	**0.75**	**0.75**	**0.75**	
	FIREX with IMPASS					10
BB,CC	**5" rounds**	**0**	**0**	**5**	**5**	
	Small Arms Training					8
UNDET North	**MK3A2 grenades***	**1**	**1**	**1**	**1**	
UNDET South	**MK3A2 grenades***	**1**	**1**	**1**	**1**	
	MINEX					12
UNDET North	**20 LB**	**1.25**	**1.25**	**2.25**	**1.25**	
UNDET South	**20 LB**	**1.25**	**1.25**	**2.25**	**1.25**	
	BOMBEX					23
Area 31J	**MK-82****	**3.75**	**3.75**	**3.75**	**3.75**	
Area 31J	**MK-83****	**0.75**	**0.75**	**0.75**	**0.75**	
Area 31J	**MK-84**	**0.25**	**0.25**	**0.25**	**0.25**	
Area 31J	**MK-20**	**1**	**1**	**1**	**1**	

**One event using the MK3A2 grenades consists of 10 grenades being thrown. Therefore, there are a total of 80 grenades being used over the course of 1 year.*

*** One event using the MK-82 or MK-83 bombs consists of four bombs being dropped in succession. For example, in Area 31J there are 15 events for the MK-82, which means that a total of 60 bombs will be dropped per year. In accordance with the current biological opinion for the Southeast, no live FIREX is conducted during North Atlantic right whale calving season (Dec 1 – Mar 31) and therefore no modeling was completed for the winter and spring seasons.*

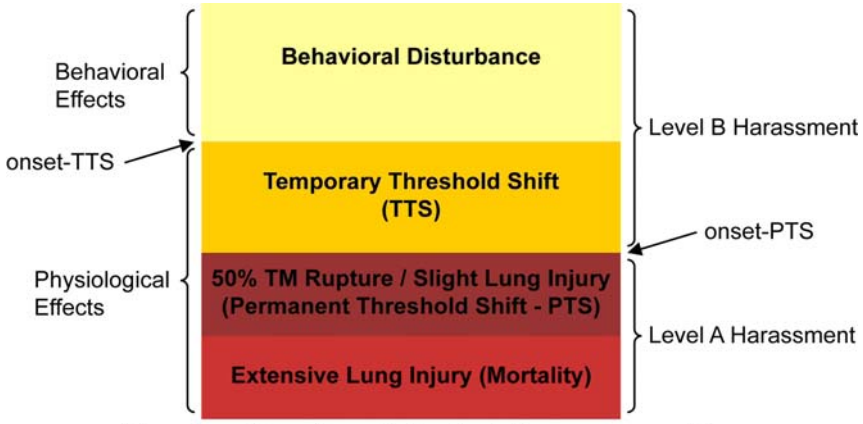
TABLE J.1-3
NUMBER OF EXPLOSIVE EVENTS WITHIN THE JACKSONVILLE RANGE COMPLEX FOR ALTERNATIVE 2

Sub-Area	Ordnance	Winter	Spring	Summer	Fall	Annual Totals
	MISSILEX					73
MLTR	**Hellfire**	**17.5**	**17.5**	**17.5**	**17.5**	
MLTR	**Maverick**	**0.75**	**0.75**	**0.75**	**0.75**	
	FIREX with IMPASS					10
BB,CC	**5" rounds**	**0**	**0**	**5**	**5**	
	Small Arms Training					8
UNDET North	**MK3A2 grenades***	**1**	**1**	**1**	**1**	
UNDET South	**MK3A2 grenades***	**1**	**1**	**1**	**1**	
	MINEX					12
UNDET North	**20 LB**	**1.25**	**1.25**	**2.25**	**1.25**	
UNDET South	**20 LB**	**1.25**	**1.25**	**2.25**	**1.25**	

**One event using the MK3A2 grenades consists of 10 grenades being thrown. Therefore, there are a total of 80 grenades being used over the course of 1 year. In accordance with the current biological opinion for the Southeast, no live FIREX is conducted during North Atlantic right whale calving season (Dec 1 – Mar 31) and therefore no modeling was completed for the winter and spring seasons*

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. In addition, this section reflects a revised acoustic criterion for small underwater explosions (< 1500-lbs NEW) (i.e., 23 pounds per square inch [psi] instead of previous acoustic criteria of 12 psi for peak pressure over all exposures), 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.1-2 depicts the acoustic impact framework used in this assessment.



(Figure is not to scale and is for illustrative purposes only)

Figure J.1-2 Physiological and Behavioral Acoustic Effects Framework for Explosives

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 25% 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 exposure 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 applies to BOMBEX, FIREX with IMPASS, and MK-83 and MK-83 bombs used in BOMBEX. Since FIREX with IMPASS 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 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. For large explosives, as in the case of the Churchill FEIS, frequency range cutoffs at 10 and 100 Hz produce different results in the impact range estimates. For small explosives (< 1500-lbs 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 resulting from the 10 and 100 Hz frequency range cutoffs 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 μPa2-s in any 1/3-octave band. The energy threshold usually dominates over the peak pressure threshold and is used in the analysis to determine potential non-injurious physiological 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 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 non-injurious effects. 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 (without TTS) are not considered for single explosions.

Multiple Explosions

For this analysis, the use of multiple explosions applies to BOMBEX, FIREX with IMPASS, and 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-lbs 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 J.1-4 summarizes the effects, criteria, and thresholds used in the assessment for impulsive sounds. Non-injurious effects are determined by either the dual physiological criteria for single detonations or the behavioral criteria for multiple detonations. 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 and Mk-83 bombs.

Table J.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	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

Effect	Criteria	Metric	Threshold
			lbs)
Non-injurious Physiological	TTS	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
Non-injurious Behavioral	Behavioral Disturbance	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
TTS = Temporary Threshold Shift			

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 10 events per year in the Jacksonville Range Complex. 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:

$$P(t) = P_o \exp(-t/t_o), \text{ for } t > 0, \text{ and}$$

$$P(t) = 0, \; t < 0,$$

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. For an 8-lb RDX charge, a 9.2-lbs NEW would be used in the formulas.

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-lbs 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-lbs 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-lbs 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 J.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 J.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

$= 0.126 + 2*(0.126) + 1*(0.105) + 4*(0.083) – 0.038 – 1.223 = – 0.446 \text{ nm}^2$.

The negative total area derived for behavioral disturbance 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 eight-point 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 the east coast OPAREAs. 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 J.2-2** for the Jacksonville Range Complex 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 J.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-ms	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)
JAX/CHASN	50 m – 100 m	0.048-0.048	1.10-1.23	0.43-2.20
JAX/CHASN	100 m – 1000 m	0.048-0.048	1.10-1.23	0.00-0.00
JAX/CHASN	> 1000 m	0.048-0.048	1.10-1.10	0.00-0.00

In these areas, which occur in deep water, the 23 psi criterion dominates over the 177 dB re 1 Pa^2-sec behavioral criterion and therefore was used in the analysis .

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, MISSILEX, AND SMALL ARMS TRAINING

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, MISSILEX, and Small Arms 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 (31J). Under Alternative 2, no BOMBEX training will occur. MISSILEX training occurs in one location (MLTR) under all Alternatives. Small Arms training involving the use of MK3A2 grenades occurs in two locations (UNDET North and South) 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, MISSILEX, and Small Arms Training were identified as JAX 31J, JAX MLTR, and UNDET North and South, 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.

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 (40m) of the JAX MLTR 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 J.3-1 presents the MISSILEX modeling results of the impact ranges for the Jacksonville Range Complex. Table J.3-2 and J.3-3 present the BOMBEX modeling results of the impact ranges for the Jacksonville Range Complex. Table J.3-4 presents the Small Arms Training modeling results of the impact ranges for the Jacksonville Range Complex.

TABLE J.3-1
ESTIMATED ZOIS (KM^2) USED IN EXPOSURE CALCULATIONS FOR SMALL ARMS TRAINING (ANTI-SWIMMER GRENADES) INVOLVING MULTIPLE EXPLOSIVES

Area	Ordnance	Estimated ZOI @ 177 dB re 1 μPa^2-sec (multiple detonations only)				Estimated ZOI @ 205 dB re 1 μPa^2-sec or 13 psi				Mortality ZOI @ 30.5 psi			
		Win	Spr	Sum	Fall	Win	Spr	Sum	Fall	Win	Spr	Sum	Fall
JAX													
UNDET North	**MK3A2 grenade**	**4.25**	**4.30**	**3.97**	**3.97**	**0.09**	**0.09**	**0.09**	**0.09**	**<0.01**	**<0.01**	**<0.01**	**<0.01**
UNDET South	**MK3A2 grenade**	**4.67**	**4.72**	**4.24**	**4.59**	**0.09**	**0.09**	**0.09**	**0.09**	**<0.01**	**<0.01**	**<0.01**	**<0.01**

Note: ZOIs for the MK3A2 grenades are modeled as multiple detonations (10 grenades being used during each event).

TABLE J.3-2
ESTIMATED ZOIS (KM^2) USED IN EXPOSURE CALCULATIONS FOR BOMBEX INVOLVING SINGLE EXPLOSIVES

Area	Ordnance	Estimated ZOI @ 182 dB Re 1 μPa2-sec or 23 psi (peak)				Estimated ZOI @ 205 dB Re 1 μPa2-sec or 13 psi-ms				Estimated ZOI @ 30.5 psi-ms			
		Win	Spr	Sum	Fall	Win	Spr	Sum	Fall	Win	Spr	Sum	Fall
Area 31J	**MK-84**	**12.80**	**14.25**	**13.28**	**16.04**	**0.57**	**0.57**	**0.57**	**0.57**	**<0.01**	**<0.01**	**<0.01**	**<0.01**
	MK-20	**2.69**	**2.69**	**2.69**	**2.69**	**0.07**	**0.07**	**0.07**	**0.07**	**<0.01**	**<0.01**	**<0.01**	**<0.01**

Note: ZOIs for MK-84 and MK-20 bombs are modeled as single detonations.

TABLE J.3-3
ESTIMATED ZOIS (KM^2) USED IN EXPOSURE CALCULATIONS FOR BOMBEX INVOLVING MULTIPLE EXPLOSIVES

Area	Ordnance	Estimated ZOI @ 177 dB re 1 μPa2-sec (multiple explosives only)				Estimated ZOI @ 205 dB Re 1 μPa2-sec or 13 psi-ms				Estimated ZOI @ 30.5 psi-ms			
		Win	Spr	Sum	Fall	Win	Spr	Sum	Fall	Win	Spr	Sum	Fall
Area 31J	**MK-82**	**62.07**	**76.24**	**102.22**	**84.48**	**2.09**	**2.09**	**2.18**	**2.09**	**<0.01**	**<0.01**	**<0.01**	**<0.01**
	MK-83	**108.97**	**148.32**	**138.88**	**128.26**	**4.98**	**5.13**	**5.28**	**5.28**	**<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).

TABLE J.3-4 ESTIMATED ZOIS (KM^2) FOR MISSILEX

Area	**Ordnance**	**Estimated ZOI @ 182 dB re 1 μPa2-s or 23 psi**				**Estimated ZOI @ 205 dB re 1 μPa2-s or 13 psi**				**Estimated ZOI @ 30.5 psi**			
		Win	Spr	Sum	Fall	Win	Spr	Sum	Fall	Win	Spr	Sum	Fall
JAX													
MLTR	Hellfire	0.89	0.73	0.64	0.73	0.02	0.02	0.02	0.02	<0.01	<0.01	<0.01	<0.01
MLTR	Maverick	0.91	0.91	0.79	0.91	0.11	0.07	0.07	0.11	<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 Jacksonville Range Complex 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 J.4-1 shows the results of the model estimation.

Table J.4-1. Estimated Impact Areas

Threshold	Impact Area for 5-lbs NEW	Impact Area for 20-lbs NEW
Estimated Impact Area @ 13 psi-msec	0.03 sq km ± 10%	0.13 sq km ± 10%
Estimated Impact Area @ 182 dB re 1 μPa^2-sec	0.2 sq km ± 25%	0.8 sq km ± 25%

Injurious physiological impact areas are dominated by the onset slight lung injury criterion (13 psi-msec). TTS is the applicable criteria to determine non-injurious effects, and the impact areas are dominated by the energy threshold (182 dB re 1 μPa^2-sec). The results for the injurious physiological 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 DESCRIPTIONS INCLUDING LAWS AND REGULATIONS CONSIDERED

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 Jacksonville (JAX) 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.

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 JAX 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 three 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 Materials (Hazardous Materials and Hazardous Waste)

Resource Conservation and Recovery Act (RCRA): 42 USC § 6901 *et seq*. regulates management of solid waste and hazardous waste. Under RCRA, hazardous materials are considered solid wastes – and thus fall under the definition of hazardous wastes – if they are used in a manner constituting disposal rather than for their intended purpose. Military munitions become subject to RCRA when transported off-range for storage, reclamation, treatment, disposal; if buried or land filled on- or off-range; or if they land off-range and are not immediately rendered safe or retrieved. Transportation, storage, and disposal of these items are governed by RCRA.

The Military Munitions Rule clarifies when conventional and chemical military munitions become a hazardous waste under RCRA. 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). These conditions cover virtually all the uses of missiles, munitions, and targets at the JAX Range Complex. 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.

RCRA provides that the United States Environmental Protection Agency (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. Statutory hazardous waste authorities for the four states within the JAX Range Complex are contained in the following agencies and regulations.

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 treatment, storage, and disposal facilities 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.

Regulations for hazardous waste in **South Carolina** can be found in the S.C. Code Regs. 61-79, South Carolina Hazardous Waste Management Act, South Carolina Code Annotated (S.C. Code Ann.) 44-56-10 *et seq.*, R. 61-79.264.1030 to 61-79.264.1090 and S.C. Code Regs. 61-79.265.1030 to 61-79.265.1090 (interim status) (organic air emissions standards). The lead agencies are the South Carolina Department of Health and Environmental Control (DHEC) and the Bureau of Land and Waste Management, Division of Compliance and Enforcement, Hazardous Waste Section.

South Carolina's hazardous waste management rules include RCRA rules and additional state requirements. South Carolina's rules apply to hazardous waste generators; transporters; owners and operators of hazardous waste treatment, storage, and disposal facilities; handlers of universal wastes; and handlers of used oil. South Carolina has the State Hazardous Waste Contingency Fund for the cleanup of contaminated sites in the state. The program incorporates the federal Superfund program and includes a funding mechanism and a liability system for site cleanup.

Regulations for hazardous waste in **Georgia** can be found at Ga. Code Ann. 12-8-60 to 12-8-83 (Georgia Hazardous Waste Management Act), Ga. Code Ann. 12-8-90 to 12-8-97 (Georgia Hazardous Site Response Act), Ga. Code Ann. 12-8-100 to 12-8-113 (Georgia Hazardous Waste Management Authority Act), and the Ga. R. & Regs. 391-3-11-.01 to 391-3-11-.18. The lead agency is the Georgia Department of Natural Resources (DNR) Environmental Protection Division (EPD) Hazardous Waste Management Branch. Georgia adopted the federal RCRA rules and several more stringent state requirements. Georgia's hazardous waste program applies to hazardous waste generators; transporters; owners and operators of hazardous waste TSDF; handlers of universal wastes, and handlers of used oil.

The Georgia Pollution Prevention Assistance Division (GA P^2AD) works with military bases and installations to develop partnerships between state government and DoD facilities as a result of a DoD proclamation that advances pollution prevention as the main tool to achieve environmental compliance. The goal of the partnership is to enhance military mission readiness, promote effective utilization of resources, and to strengthen environmental stewardship in the state of Georgia. The partnership is comprised of a DoD Regional Environmental Coordinator (REC), a REC from each base, EPA Region 4, and GA P^2AD. The partnership aids in developing methods for reviewing hazardous materials currently in use; providing recommendations regarding hazmat elimination, substitution, disposal, and consolidation; inspecting shops and contractor work sites for compliance; and assisting base personnel in all aspects of hazardous material management.

Regulations for **Florida** hazardous waste can be found in Fla. Stat. 403.01 *et seq.* and Florida Administrative Code (F.A.C.) 62-730.001 to 62-730.900, F.A.C. 62-737.100 to 62-737.400, and F.A.C. 62-710.210 to 62-710.901. Hazardous waste is regulated by the Florida Department of Environmental Protection (DEP) Division of Waste Management's Bureau of Solid and Hazardous Waste. Florida's DEP hazardous waste management program covers hazardous waste generators; transporters; TSDF owners and operators; used oil management; and universal waste. Florida has its own Superfund program, which is not as extensive as the federal Superfund program. Florida DEP responds to hazardous substance spills and controls the funding for the cleanup of hazardous substance sites.

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. DoD facilities, including Navy facilities, are subject to state and local facility prevention and response planning requirements. However, Navy Shipboard Spill

Contingency Plans (SCP) 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 the four states within the JAX Range Complex 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.

Regulations for POL in **South Carolina** can be found at 48-1-90 of the Pollution Control Act; Chapter 1 of Title 48 Environmental Protection and Conservation, Code of Laws of South Carolina, 1976; 48-43-520 (4) of the 1977 South Carolina Oil and Gas Act; South Carolina Hazardous Waste Management Regulations 61-79.265 Subpart D; South Carolina Air Pollution Control Regulations (S.C. Code Regs. 61-62.4); the South Carolina State Underground Petroleum Environmental Response Bank Act, and the South Carolina Hazardous Waste Management Act. Under the Federal CWA, the DHEC serves as a member of the Federal Regional Response Team and coordinates the implementation of the USEPA and South Carolina DHEC Contingency Plans. In the coastal area, the DHEC ensures state interests are addressed and cooperates with the U.S. Coast Guard (designated federal on-scene coordinator) in implementing contingency plans.

Oil or hazardous material releases must be reported to the DHEC Emergency Response Section (ERS) 24-hour reporting number (888-481-0125). The South Carolina Contingency Plan for Spills and Releases of Oil and Hazardous Materials discusses agency responsibilities during spills and releases. The Contingency Plan should be referenced when extra labor and equipment is required during an incident and the State On-Scene Coordinator must be the one to request such labor and equipment.

Regulations for POL in **Georgia** can be found at Ga. Code Ann. 391-3-15 (underground storage tank management), Ga. Code Ann. 391-3-23 (petroleum pipeline eminent domain permit procedures), Official Code of Georgia Annotated (O.C.G.A.) 22-3-84 (Georgia petroleum pipeline and facilities), and O.C.G.A. 12-14-1 (oil or hazardous spills or releases).

The Georgia DNR EPD is the lead agency. Anyone with knowledge of any spill or release should immediately notify the DNR EPD Emergency Operations Center at 800-241-4113 or 404-656-4863.

For any reportable spill (a hazardous substance above the reportable quantity listed in 40 CFR 302.4 or a petroleum product, which reaches the waters of the state and causes a sheen), up to three notifications may be required. First, according to O.C.G.A. 12-14-1 et seq. reportable spills must be immediately reported to the DNR Emergency Operations Center at 800-241-4113 or 404-656-4863. Second, any spill that is reportable in Georgia must also be reported to the federal National Response Center (NRC) at 1-800-424-8802. Finally, a release of chemicals listed in 40 CFR 350, Appendix A, must be reported to the National Response Center, the State Emergency Response Commission, and the Local Emergency Planning Committee of any area affected by the release. In Georgia, reports to the State Emergency Response Commission (SERC) are filed through EPD's Emergency Operations Center.

Regulations for **Florida** POL management can be found at Title 28 Fla. Stat. Chapters 376 and 403, 62-710 F.A.C. (used oil), 62-761 F.A.C. (UST), and 62-762 F.A.C. (Above Ground Storage Tanks [AST]). It is the mission of the Local Emergency Planning Committees and the SERC to plan for effects of a release or spill of hazardous materials. The State Warning Point handles hazardous materials spills or releases in Florida by coordinating with other sections in the Department of Community Affairs, state agencies, and federal agencies for response and handling.

Florida law requires reporting of oil and hazardous substances spills to SERC at the State Warning Point or the National Response Center. Public Laws 96-510 and 92-500 (CERCLA) require immediate notification of the appropriate federal agency of a discharge of oil or hazardous substances. Fla. Stat. Chapters 376 and 403 indicate reporting procedures for pollutant discharges. Florida Marine Patrol or the United States Coast Guard must be notified within one hour of a pollutant discharge by the pilot or the master of a vessel, or person in charge of any terminal facility. The State Warning Point has to be notified within one working day of a release of a hazardous substance from a facility in a quantity equal to or exceeding the reportable quantity in a 24-hour period. The DEP or the State Warning Point must be notified of a discharge of petroleum or petroleum products exceeding 25 gallons on a pervious surface.

The Florida Petroleum Cleanup Program is managed within the Bureau of Petroleum Storage Systems (BPSS). It provides technical oversight, management, and administrative activities necessary to prioritize, assess, and cleanup sites contaminated by discharges of petroleum and petroleum products from stationary petroleum storage systems. The Storage Tank Regulation Section, also part of the BPSS, ensures all new and replacement storage tank systems have secondary containment, and all remaining single-wall systems replace their systems with secondary containment by 2010. Florida DEP contracts with counties to perform annual compliance inspections.

K.3 Water Resources

Federal Regulations

Water resource regulations focus on the right to use water and protection of water quality. The principal federal laws protecting water quality are the Federal Water Pollution Control Act or Clean Water Act (CWA) (33 USC §1251, *et seq*.) as amended in 1977, 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. NOAA 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 Navy identified which discharges 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 an MPCD, or to review a federal performance standard for an 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 Navy guidance, as required by EO 12088, *Federal Compliance with Pollution Control Standards*, and the CWA, Navy facilities will comply with all substantive and procedural requirements applicable to point and nonpoint 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.

Statutory water quality authorities for the three states within the JAX Range Complex are contained in the following agencies and regulations.

Statutory Regulations

North Carolina

According to North Carolina General Statute 130A Article 10, the Public Water Supply Section of the North Carolina Department of Environment and Natural Resources (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, 2007a):

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** – 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 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** – 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 strengthens enforcement and heightens 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 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, 2007d).

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, 2007d).

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, 2007d).

South Carolina

The federal CWA provides the statutory basis for state water quality standards programs. The regulatory requirements governing these programs (Water Quality Standards Regulations) are published in 40 CFR 131. States are responsible for reviewing, establishing, and revising water quality standards. South Carolina's surface water quality standards system is published in South Carolina Regulation 61-68, Water Classifications and Standards. The components of this system include: classifications, criteria, an anti-degradation policy, and special protection of certain waters (Outstanding National Resource Waters and Outstanding Resource Waters). Regulations for South Carolina water quality can be found in the Water Use Reporting and Coordination Act, South Carolina Code Annotated (S.C. Code Ann.) Title 49 – Water, Water Resources and Drainage. Title 49-3 addresses the Water Resources Planning and Coordination Act and addresses water quality, watershed protection and management measures, water supply, and water resources for recreational purposes. The lead agency is the South Carolina Department of Health and Environmental Control (DHEC) Bureau of Water (DoN, 2006).

South Carolina follows federal regulations for its water pollution permitting program and has its own storm water requirements. South Carolina's rules for permit requirements of wastewater discharges from industrial sources parallel the federal regulations governing the NPDES. The permit standards are broad and cover facilities not subject to federal storm water requirements (DoN, 2006).

The South Carolina DHEC developed state regulations 61-68 and 61-69 to protect the water quality of the state (SCDHEC, 2001b). The water quality standards include numeric and narrative criteria used for setting permit limits on discharges to waters of the state, with the intent of maintaining and improving surface waters "…to a level to provide for the survival and propagation of a balanced indigenous aquatic community of flora and fauna and to provide for recreation in and on the water." Occasional short-term departures from these conditions do not automatically result in adverse effects to the biological community. The standards also recognize that deviations from these criteria may occur due solely to natural conditions and that the aquatic community adapts to such conditions. In such circumstances, the variations do not represent standards violations, and critical conditions of the natural situation, *e.g.*, low flow, high temperature, minimum dissolved oxygen, *etc*., are used as the basis of permit limits (SCDHEC, 2001b).

The DHEC Office of Ocean and Coastal Resource Management (OCRM) protects and enhances the State's coastal resources by preserving sensitive and fragile areas while promoting responsible development in the eight coastal counties of South Carolina (SCDHEC, 2007). OCRM Program Goals and Objectives include implementing the Coastal Zone Management Plan to manage wetlands alterations, storm water and land disturbance activities; certifying all federal and state permits; directing federal actions and all alterations of tidally influenced critical area lands, waters and beaches; preserving sensitive natural, historic, and cultural resources through regulatory oversight and guidance; providing technical expertise to resolve complex coastal management issues; and encouraging low impact and alternative development to preserve water quality and environmental integrity. The Coastal Zone is composed of coastal waters and submerged bottoms seaward to the state's jurisdictional line (3 nm) as well as the lands and waters of the eight coastal counties. The Critical Area is defined as all tidelands, coastal waters, beaches and oceanfront, and sand dune systems (SCDHEC, 2007).

South Carolina has seven classes with associated designated uses, arranged in order of degree of protection required (South Carolina Regulation 61-68 – Water Classifications and Standards):

- **Outstanding National Resource Waters (ONRW)** are freshwaters or saltwaters that constitute an outstanding national recreational or ecological resource.
- **Outstanding Resource Waters (ORW)** are freshwaters or saltwaters that constitute an outstanding recreational or ecological resource, or those freshwaters suitable as a source for drinking water supply purposes with treatment levels specified by the DEHC.
- **Trout Waters**. The State recognizes three types of trout waters: Natural; Put, Grow, and Take; and Put and Take.
    - **Natural (TN)** are freshwaters suitable for supporting reproducing trout populations and a cold water balanced indigenous aquatic community of fauna and flora. Also suitable for primary and secondary contact recreation and as a source for drinking water supply after conventional treatment in accordance with the requirements of the DHEC. Suitable for fishing and the survival and propagation of a balanced indigenous aquatic community of fauna and flora. Suitable also for industrial and agricultural uses.
    - **Put, Grow, and Take (TPGT)** are freshwaters suitable for supporting growth of stocked trout populations and a balanced indigenous aquatic community of fauna and flora. Also suitable for primary and secondary contact recreation and as a source for drinking water supply after conventional treatment in accordance with the requirements of the DHEC. Suitable for fishing

and the survival and propagation of a balanced indigenous aquatic community of fauna and flora. Suitable also for industrial and agricultural uses.

  - **Put and Take (TPT)** are freshwaters suitable for primary and secondary contact recreation and as a source for drinking water supply after conventional treatment in accordance with the requirements of the DHEC. Suitable for fishing and the survival and propagation of a balanced indigenous aquatic community of fauna and flora. Suitable also for industrial and agricultural uses. The standards of freshwaters classification protect these uses.

- **Freshwaters (FW)** are freshwaters suitable for primary and secondary contact recreation and as a source for drinking water supply after conventional treatment in accordance with the requirements of the DHEC. Suitable for fishing and the survival and propagation of a balanced indigenous aquatic community of fauna and flora. Suitable also for industrial and agricultural uses.
- **Shellfish Harvesting Waters (SFH)** are tidal saltwaters protected for shellfish harvesting and uses listed in Class SA and Class SB. Suitable for primary and secondary contact recreation, crabbing, and fishing. Also suitable for the survival and propagation of a balanced indigenous aquatic community of marine fauna and flora.
- **Class SA** are tidal saltwaters suitable for primary and secondary contact recreation, crabbing, and fishing, except harvesting of clams, mussels, or oysters for market purposes or human consumption and uses listed in Class SB. Also suitable for the survival and propagation of a balanced indigenous aquatic community of marine fauna and flora.
- **Class SB** are tidal saltwaters suitable for primary and secondary contact recreation, crabbing, and fishing, except harvesting of clams, mussels, or oysters for market purposes or human consumption. Also suitable for the survival and propagation of a balanced indigenous aquatic community of marine fauna and flora.

Georgia

Regulations for Georgia water quality can be found at Code of Georgia Annotated (Ga. Code Ann.) 12-5-22 (surface water), Ga. Code Ann. 12-5-280 to 12-5-297 (Coastal Marshlands Protection Act), Ga. Code Ann. 12-5-52(a) (enforcement), and Ga. Code Ann. 12-5-170 to 12-5-213 (Georgia Safe Drinking Water Act (SDWA)). The lead agency in Georgia is the Georgia Department of Natural Resources (DNR) Environmental Protection Department (EPD). Georgia uses federal effluent guidelines and EPD uses its best professional judgment to determine permit limits when no guidelines exist. In contrast to federal rules, Georgia defines "waters" to include groundwater. Georgia's River Basin Management Program controls water pollution in the 14 river basins or watersheds by monitoring surface/groundwater quality. The program implements plans for each of the river basins by a local advisory committee (DoN, 2006).

Georgia's DNR EPD has a program to involve local governments in managing and protecting the state's water resources. Under the program, water management programs are developed to help local governments identify, analyze, and implement a water management plan of action for local officials to follow (DoN, 2006).

Georgia has seven classes with associated designated uses, which are arranged in order of degree of protection required (GA 391-3-6-.03 – Water Use Classifications and Water Quality Standards):

- **Outstanding National Resource Waters** – This designation will be considered for an outstanding national resource waters, such as waters of national or State parks and wildlife refuges and waters of exceptional recreational or ecological significance. For waters designated ONRW, existing water quality shall be maintained and protected.

- **Drinking Water Supplies** - Those waters approved as a source for public drinking water systems permitted or to be permitted by the EPD. Waters classified for drinking water supplies will also support the fishing use and any other use requiring water of a lower quality.
- **Recreation** – General recreational activities such as water skiing, boating, and swimming, or for any other use requiring water of a lower quality, such as recreational fishing.
- **Fishing, Propagation of Fish, Shellfish, Game and Other Aquatic Life** – Secondary contact recreation in and on the water; or for any other use requiring water of a lower quality.
- **Wild River** – For all waters designated in 391-3-6-.03(13) as "Wild River," there shall be no alteration of natural water quality from any source.
- **Scenic River** – For all waters designated in 391-3-6-.03(13) as "Scenic Rivers," there shall be no alteration of natural water quality from any source.
- **Coastal Fishing** – This classification will be applicable to specific sites when so designated by the EPD. For waters designated as "Coastal Fishing", site specific criteria for dissolved oxygen will be assigned and detailed by footnote in Section 391-3-6-.03(13), "Specific Water Use Classifications." All other criteria and uses for the fishing use classification will apply for coastal fishing.

Florida

Regulations for Florida water quality can be found in the Florida Air and Water Pollution Control Act, Florida Statutes (Fla. Stat.) 403.011 to 403.067), Florida Safe Drinking Water Act (Fla. Stat. 403.850 to 403.88), Fla. Stat. 373 (storm water), and Florida Administrative Code (F.A.C.) Ch. 62-65 (storm water). The regulatory agencies are the Florida Department of Environmental Protection (FDEP), FDEP Division of Water Resource Management, and five regional Florida Water Management Districts (WMD), including the Northwest Florida WMD, Suwanee River WMD, St. Johns River WMD, Southwest Florida WMD, and the South Florida WMD (DoN, 2006).

Florida's surface water quality standards system is published in F.A.C. 62-302 (and 62-302.530). The components of this system include: classifications, criteria, an anti-degradation policy, and special protection of certain waters (Outstanding Florida Waters).

Florida has five classes with associated designated uses, arranged in order of degree of protection required (62-302.400 F.A.C.):

- **Class I - Potable Water Supplies –** Fourteen general areas throughout the state, including impoundments and associated tributaries, certain lakes, rivers, or portions of rivers, used as a drinking water supply.
- **Class II - Shellfish Propagation or Harvesting –** Generally coastal waters where shellfish harvesting occurs.
- **Class III - Recreation, Propagation and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife –** The surface waters of the state are Class III unless described in rule 62-302.400 F.A.C.
- **Class IV - Agricultural Water Supplies –** Generally located in agriculture areas around Lake Okeechobee.
- **Class V - Navigation, Utility and Industrial Use –** Currently, there are not any designated Class V bodies of water. The Fenholloway River was reclassified as Class III in 1998.

An Outstanding Florida Water (OFW) is a waterbody designated worthy of special protection because of its natural attributes. This special designation is applied to certain waters, and is intended to protect existing good water quality. Most OFWs are areas managed by the state or federal government as parks, including wildlife refuges, preserves, marine sanctuaries, estuarine research reserves, certain waters

within state or national forests, scenic and wild rivers, or state aquatic preserves. Generally, waters within these managed areas are OFWs because the managing agency has requested this special protection. Waters not already in a state or federal managed area, may be designated as "special water" OFWs if certain requirements are met, including a public process of designation (FDEP, 2006).

K.4 Air Quality

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, classify areas as to their attainment status relative to the NAAQS, develop schedules and strategies to meet the NAAQS, and 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 Clean Air Act Amendments (CAAA) (1990) established new deadlines for achievement of the NAAQS, dependent upon the severity of the nonattainment.

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:

- NAAQS; 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, these agencies include: South Carolina (South Carolina Department of Health and Environmental Control (SC DHEC)); Georgia (Georgia Department of Natural Resources (GA DNR); and Florida (Florida Department of Environment Protection (FDEP).

NAAQS

The CAA requires USEPA to set NAAQS (40 CFR Part 50) for pollutants considered harmful to public health and the environment (Table 3.3.1). 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.

As previously mentioned, the USEPA set NAAQS for six pollutants ("criteria pollutants"). Areas within a particular state that do not meet the NAAQS for a criteria pollutant are designated as being in "nonattainment" for that pollutant. Nonattainment status is further defined by the extent to which the standard is exceeded. Ozone nonattainment status is categorized by five classifications: marginal, moderate, serious, severe, and extreme; CO and PM_{10} nonattainment status is categorized by two classifications: moderate and serious. The remaining criteria pollutants have designations of either "attainment," "nonattainment," or "unclassifiable." Areas that achieve the air quality standard after being designated in nonattainment are redesignated as in attainment following USEPA approval of a maintenance plan. These areas are commonly known as "maintenance areas," signifying that they are

attainment areas with a maintenance plan approved by USEPA. The maintenance plan must include emissions budgets demonstrating measures to be taken to ensure the area continues to meet the NAAQS.

General Conformity Rule

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. 40 CFR 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. 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.

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, 2007a, 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.

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 (or its precursors) that is emitted is one for which the area is in attainment. If NEPA documentation is prepared for the action, the determination shall be described in that documentation; otherwise, no documentation is required.

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 Part 51 and 40 CFR Parts 52.1770 through 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) 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 ≤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 the NAAQS, plus a standard for TSP.

South Carolina

The lead agency for air quality in South Carolina is the Department of Health and Environmental Control (DHEC) Office of Environmental Quality Control, Bureau of Air Quality. Regulations can be found at South Carolina Code of Regulations (S.C. Code Regs.) as follows:

- 61-62.1(II) and 61-62.70 (air permits);
- 61-62.5 - 61-62.63.40 (hazardous air pollutants (HAP);
- 61-62.60 (new source performance standards (NSPS);

- 61-62.68.1 to 61-62.68.220 (accidental release and risk management program); and
- 61-62.96 and 61-62.99 (ozone transport).

South Carolina's SIP was submitted to the USEPA in 1972 and is frequently amended to comply with the CAA amendments.

Georgia

The Georgia Department of Natural Resources (DNR) Environmental Protection Division (EPD), Air Protection Branch is responsible for air quality in Georgia. Regulations can be found at Rules and Regulations of the State of Georgia (Ga. R. & Regs.) as follows:

- 391-3-1-.03 and 391-3-1-.02 (7) (air permits);
- 391-3-1-.02(9) (HAP);
- 391- 3-1-.02(8) (NSPS); and
- 391-3-1-.02(10) (risk management program).

The Georgia SIP was submitted to the USEPA in 1972 and is frequently amended to comply with the CAA amendments.

Florida

Air quality in Florida is regulated by the Florida Department of Environmental Protection (FDEP), Division of Air Resource Management. Regulations for Florida air quality can be found in Florida Administrative Code (F.A.C.) sections as follows:

- 62-210.300, 62-212, and 62- 213 (air permits);
- 62-204.800 (hazardous air pollutants (HAP); and
- 62-204.800 (new source performance standards).

The Florida SIP focuses on permitting requirements, HAPs, source specific emission standards, and numerous other air-related requirements.

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). RAICUZ Program implementation includes developing current and future Range Compatibility Zones 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). According to Appendix C of OPNAVINST 3550.1A, the only air-to-ground ranges within the JAX Range Complex, wherein the RAICUZ Program requirements must be implemented are R-2906 Rodman Target, R-2907 Lake George Complex Targets, and R-2910 Pinecastle Complex Targets (DoN, 2008).

The JAX and Charleston OPAREAs are over water and distant from any noise receptors. The RAICUZ program is inapplicable to this vast area. On the other hand, RAICUZ studies have been developed for the Lake George Range and Rodman Range. These studies are discussed further in Section 3.5.6.2. The Pinecastle Complex Targets are not covered in this EIS/OEIS..

The Department of Defense (DoD) has a similar program for air stations, called the Air Installation Compatibility Use Zone (AICUZ) program (DoN, 2002c). 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:

1. 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.

2. 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.

3. Implement the AICUZ plan for the installation including coordination with federal, state and local officials to maintain public awareness of AICUZ.

4. 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.

Although not within the boundaries of the JAX Range Complex, NAS JAX and NS Mayport are mentioned due to their proximity to the Complex, and because the aircraft stationed there are the primary users of the range complex. On June 27, 1978, the Jacksonville City Council passed an Air Installation Compatible Use Zone ordinance that proved to be landmark legislation. The AICUZ ordinance ultimately limited building around the three Naval Air Stations (NS Mayport, NAS Cecil Field, and NAS Jacksonville) and the civilian airport (NAS JAX, 2007).

In February 2001, NS Mayport conducted noise studies in support of an update to its 1993 AICUZ. NS Mayport conducted this new noise study to assess current noise impacts of aircraft operations and establish new noise exposure contours. While helicopter operations make up the vast majority of the flight operations at NS Mayport, the extent of the noise contours is primarily influenced by fixed-wing transient aircraft to the installation. The main sources of noise at NS Mayport are aircraft operations, which include take-offs, landings, touch-and-go operations, and engine maintenance run-ups at the station. These noise sources impact land use on the installation as well as surrounding developed areas that are potentially incompatible with flight operations, such as residential developments, schools, and churches. Aircraft noise was the primary reason for the development of the AICUZ program.

Both DoD and Federal Aviation Administration AICUZ guidelines were incorporated into a City of Jacksonville Airport District Zoning Ordinance of which the Navy is in full compliance. Although NS Mayport complies with all federal and local regulations regarding noise and land use, it still receives intermittent complaints from area residents. Complaints are resolved through open communication with the Air Operations Department which responds to all noise complaints. It is worth noting that since 1988 air operations at NS Mayport have decreased by 48 percent, thus decreasing local noise levels.

K.6 Marine Communities

A community is an assemblage of plants and/or animal populations sharing a common environment and interacting with each other and with the physical environment. This section specifically addresses the following marine communities occurring within the Jacksonville Range Complex: plankton and macroalgae, benthic communities, and artificial habitats. Seagrasses/submerged aquatic vegetation are not addressed because they are limited to nearshore estuarine environments and do not occur in the marine environment of the study area. Marine mammals are addressed in Section 3.6, sea turtles are addressed in Section 3.7, fish and essential fish habitat (EFH) are addressed in Section 3.8, and seabirds and migratory birds are addressed in Section 3.9 of this EIS/OEIS. Marine species listed under the Endangered Species Act (ESA) are addressed in Sections 3.6 through 3.9, as applicable. Gray's Reef National Marine Sanctuary is protected under the National Marine Sanctuaries Act (16 U.S.C. §§ 1431, *et. seq.*). Executive Order 13089 established the interagency U.S. Coral Reef Task Force charged with developing and implementing a comprehensive program of research and mapping of coral reef ecosystems. National Marine Sanctuaries and other Marine Protected Areas are also addressed in Section 3.17, Recreation.

The various federal laws and regulations that afford protection and management of marine communities are primarily aimed at specific community components such as ESA-listed species and designated critical habitat, marine mammals, federally managed fish species and EFH, and seabirds and migratory birds. Regulatory frameworks for these marine community components are presented in Sections 3.6 through 3.9.

K.7 Marine Mammals

The Marine Mammal Protection Act (MMPA) of 1972 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 104(c)(3) [16 USC 1374 (c)(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 JAX 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.

Several species of marine mammals could potentially occur in the JAX Range Complex. Accordingly, the Navy initiated the MMPA compliance process by submitting a Letter of Authorization package to the NMFS on April 7, 2008.

Endangered Species Act

The Endangered Species Act (ESA) of 1973 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. Harm is further defined by FWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined by FWS as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. [50 CFR §17.3] Under Section 7 of the ESA, "jeopardize" 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.

Six species of whales that are listed as endangered under the ESA could potentially occur in the JAX Study Area. Accordingly, the Navy initiated the ESA Section 7 consultation process with NMFS on 21 December 2007 and has prepared a Biological Evaluation (BE) to support the consultation process. The Navy initiated informal consultation on 12 May 2008 with USFWS for species under their jurisdiction. Critical habitat for listed species has been designated under the ESA in the JAX Range Complex study area for the North Atlantic right whale and the West Indian manatee as described below.

- The calving ground of the North Atlantic right whale, located seaward of southern Georgia and northern Florida, is found in the JAX Study Area. The NMFS issued a biological opinion (BO) in May 1997 for Navy activities conducted in the vicinity of the critical habitat area in the JAX/CHASN OPAREA. The Navy will continue to operate in accordance with the BO.

- Lake George, located in the inland portion of the JAX Study Area, was designated as manatee critical habitat in 1976. The Navy will operate in accordance with all applicable regulations.

Copies of correspondence with NMFS and USFWS are provided in Appendix C of this EIS/OEIS.

K.8 Sea Turtles

Endangered Species Act

As discussed in Section 3.6.1.1, the Endangered Species Act (ESA) established protection over and conservation of threatened and endangered species. All five species of sea turtles that potentially occur in the JAX Range Complex are listed as threatened or endangered. Therefore, the ESA requirements discussed in Section 3.6.1.1 are applicable to the analysis of sea turtles.

The Navy initiated the ESA Section 7 consultation process with the NMFS on 21 December 2007 and prepared a Biological Evaluation (BE) to support the consultation process. Critical habitat for listed species has not been designated under the ESA in the JAX Range Complex study area. Copies of correspondence with the NMFS are provided in Appendix C of this EIS/OEIS.

K.9 Fish and Essential Fish Habitat

Magnuson-Stevens Fishery Conservation and Management Act

The Fishery Conservation and Management Act of 1976 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 U.S. Fish and Wildlife Service (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 essential fish habitat (EFH) provision, which provides the means to conserve fish habitat. The EFH mandate requires that 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 lifestages) 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/lifestage 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 National Marine Fisheries Service (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 JAX Range Complex. The Navy has determined that the preferred alternative would have no adverse effects on EFH. However, in a 17 February 2009 letter to Navy, NMFS initiated EFH consultation with Navy by providing conservation recommendations based on NMFS's separate determination that Navy's release of expended materials would adversely affect EFH. Pursuant to the Magnuson-Stevens Act, Navy will complete the consultation process by responding in writing to NMFS's EFH Conservation Recommendations within the 30-day statutory timeline. Impacts to EFH are addressed in Section 3.9 of this EIS/OEIS.

Endangered Species Act

As discussed in Section 3.9.1.1, the Endangered Species Act (ESA) established protection over and conservation of threatened and endangered species. Portions of the JAX Range Complex EIS study area are within the historic ranges of the shortnose sturgeon (*Acipenser brevirostrum*) and smalltooth sawfish (*Pristis pectinata*), which are federally listed as endangered. Therefore, the ESA requirements discussed in Section 3.6.1.1 are applicable to the analysis for the shortnose sturgeon and smalltooth sawfish.

The Navy initiated the ESA Section 7 consultation process with NMFS on 21 December 2007 and prepared a revised Biological Evaluation (BE) in September 2008 to support the consultation process. Critical habitat for listed fish species has not been designated under the ESA in the JAX Range Complex study area. Copies of correspondence with the NMFS are provided in Appendix C of this EIS/OEIS.

K.10 Sea Birds and Migratory Birds

This section focuses on seabirds and migratory birds that could seasonally migrate through open water areas of the Jacksonville Range Complex. The analysis for birds occurring at Rodman Range and Lake George Range is provided in Section 3.10, Terrestrial and Freshwater Biological Resources. Seabirds are birds whose normal habitat and food source is the sea, whether they utilize coastal waters (the nearshore), offshore waters (the continental shelf), or pelagic waters (the open sea) (Harrison, 1983). Migratory birds are any species or family of birds that live, reproduce, or migrate within or across international borders at some point during their annual life cycle. The seabirds addressed in this EIS/OEIS are migratory birds.

The Migratory Bird Treaty Act (MBTA) of 1918 is the primary legislation in the United States established to conserve migratory birds. It implements the U.S. 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. The species of birds protected by the MBTA appear in 50 CFR 10.13. 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). Training operations that would occur in the Jacksonville 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 U.S. Fish and Wildlife Service (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.

As discussed in Section 3.10.1.1, the Endangered Species Act (ESA) established protection over and conservation of threatened and endangered species, including bird species that are federally listed as threatened or endangered. One federally listed seabird species (roseate tern, *Sterna dougallii*) potentially occurs within the Jacksonville Range Complex. Therefore, the ESA requirements discussed in Section 3.6.1.1 are applicable to the analysis of the roseate tern.

K.11 Terrestrial and Freshwater Biological Resources

Federal Regulations

The following regulatory framework governs and protects terrestrial and freshwater aquatic biologic resources, especially special status plants and wildlife specific to the Rodman and Lake George Ranges.

The **Migratory Bird Treaty Act (MBTA)** of 1918 - 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 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 U.S. Fish and Wildlife Service (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 Bald Eagle Protection Act - (16 U.S.C. §§ 668-668d, June 8, 1940, as amended 1959, 1962, 1972, and 1978) prohibits the taking or possession of and commerce in bald and golden eagles, with limited exceptions. The Act imposes criminal and civil penalties on anyone (including associations, partnerships

and corporations) in the U.S. or within its jurisdiction who, unless excepted, takes, possesses, sells, purchases, barters, offers to sell or purchase or barter, transports, exports or imports at any time or in any manner a bald or golden eagle, alive or dead; or any part, nest or egg of these eagles; or violates any permit or regulations issued under the Act. "Take" is defined as to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb. 'Transport" includes convey or carry by any means; also deliver or receive for conveyance.

Persons or groups that violate the Bald Eagle Protection Act knowingly, or with wanton disregard, are subject to criminal penalties up to a maximum $5,000 fine or one-year imprisonment, or both. Sentencing penalties may be doubled for any subsequent convictions, maximum fines are increased significantly. Each prohibited act is a separate violation. One-half of the criminal fine, but not to exceed $2,500, must be paid to whoever gives information leading to conviction. The civil penalty is a maximum fine of $5,000 per violation, with each violation a separate offense. Any livestock grazing agreement on federal land held by a person convicted under this Act is subject to immediate cancellation.

Statutory Regulations

Florida Fish and Wildlife Conservation Commission

The Navy initiated the consultation process with Florida Fish and Wildlife Conservation Commission on 15 October 2007 for the Rodman and Lake George Ranges. The FFWCC indicated that listed species have the potential to occur within or adjacent to the study area(s). This conclusion was based on consultation of the Florida's Strategic Habitat Conservation Areas and Biodiversity Hotspots data sets (Endries *et al.* nd)).

The State of Florida maintains a system of three types of conservation areas that account for 6.95 million acres or 20% of the land area of the state. These include:

- The Strategic Habitat conservation Areas (statewide and county,
- Biodiversity Hotspots (statewide and county) and
- Priority Wetlands (statewide and county)

Florida's Strategic Habitat Conservation Areas are lands designated to meet the state's conservation and protection goals for 30 species of wildlife that are inadequately protected by the current system of conservation lands. Strategic Habitat Conservation Areas are comprised of high quality sandhill sites, scrub sites, pine rocklands, tropical hardwood hammocks, dry prairies, bat caves, and wetlands. In particular, wetlands important to eight native species of wading birds and 105 species of globally rare plant species, are designated as Strategic habitat Conservation Areas. Management of Strategic Habitat Conservation Areas ensures that a wide range of species, in addition to those above, will benefit. The SHCAs encompass 4.82 million acres, or approximately 13% of the land area of Florida.

Biodiversity Hotspots are areas where the potential habitats of three or more indicator species of biodiversity overlap and they are presumed to indicate those areas of the state that are most important to biodiversity conservation.

Priority Wetlands are upland or wetland habitats for wetland-dependent listed species. These habitats are categorized for analytical purposes under a classification of land cover called priority wetlands.

K.12 Land Use

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. Naval 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.13 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 the National Environmental Policy Act (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 inventory of cultural resources present in the Area of Potential Effect (APE), and Section 106 includes the mandate to assess the significance and integrity of those cultural resources to determine eligibility for listing on the National Register of Historic Places (NRHP).

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-470mm), which prohibits removal of items of archeological interest from federal lands without a permit; the Abandoned Shipwreck Act of 1987, and the Abandoned Shipwreck Act Guidelines (NPS)(55 FR 50116, 55 FR 51528, and 56 FR 7875). The Abandoned Shipwreck Act extends the jurisdiction of abandoned shipwrecks in U.S. waters, considering them U.S. property and then transfers management authority to the states. However, lost U.S. Naval vessels and downed aircraft remain the property of the U.S. regardless of where they were lost or the passage of time. These properties are administered by the U.S. Naval Historical Center, a facility that has begun an underwater archeological program to inventory shipwrecks under Navy jurisdiction, including those owned or managed by the U.S. Navy. Commissioned Confederate vessels are considered 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, Chief of Naval Operations Instruction 5090.IA, and Navy guidance, which describes protection of historic and cultural resources as an important part of the Navy's mission.

DoD Instruction 4715.3 requires installations to develop an ICRMP as an internal compliance and management tool that integrates the entirety of the cultural resources program with ongoing mission

activities. The goal of the ICRMP is to enable the installation to meet the legal compliance requirements of federal historic preservation laws and regulations in a manner consistent with sound principles of cultural resource stewardship and the installation's military mission. Assessment of cultural resources located by inadvertent discovery follow the established plan for an installation as recorded in the ICRMP, fulfilling stipulations in both 36 CFR 800 and Navy guidance.

The ICRMP does this by:

- Establishing priorities for the identification, and standards for the evaluation, of archeological resources, historic architectural resources, and traditional cultural properties such as locations or objects held to be sacred by indigenous peoples.

- Providing guidance for actions to be undertaken in the case of the inadvertent discovery of human remains or archeological artifacts on installation land in compliance with the Native American Graves Protection and Repatriation Act (NAGPRA).

An ICRMP was developed for the JAX Range Complex (Johnson, 2005 cited in Trocolli, *et al*., 2005). Under the NHPA, the APE is defined as the JAX Range Complex OPAREA. The APE includes areas within which land-based operations could potentially affect NRHP historic properties (including prehistoric and historic archeological resources). Also included in the APE are any at-sea locales where underwater trenching, demolition, placement of systems, infrastructure, or equipment might affect submerged ruins, sites, features or wrecks. 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, or one or more federal agencies, or may belong to other nations.

K.14 Transportation

Transportation 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 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.16 Regional Economy

The purpose of this section is to provide an economic backdrop to the discussion of the No Action Alternative, Alternative 1, and Alternative 2 in the JAX Range Complex. The regional economy is important to the analysis of the Alternatives due to the requirements imposed by Executive Order (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.17 Recreation

Recreation 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.18 Environmental Justice

The purpose of this section is to provide an evaluation of the potential for disproportionate impacts to minorities, low-income populations, or children in the region of influence as a result of implementation of the No Action Alternative, Alternative 1, or Alternative 2. 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.19 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.