

## **DEPARTMENT OF DEFENSE**

### **Department of the Navy**

#### **Record of Decision for Mariana Islands Range Complex Training**

**AGENCY:** Department of Defense Representative Guam, Commonwealth of the Northern Mariana Islands, Federated States of Micronesia and the Republic of Palau

**ACTION:** Notice of Record of Decision

**SUMMARY:** After carefully weighing the operational and environmental consequences of the Proposed Action, the Department of Defense (DoD) Representative Guam, Commonwealth of the Northern Mariana Islands (CNMI), Federated States of Micronesia and Republic of Palau (DoD REP), announces his decision to support and conduct current, emerging, and future military training and Research, Development, Test, and Evaluation (RDT&E) activities in the Mariana Islands Range Complex (MIRC), while enhancing training resources through investment in the MIRC. These training and RDT&E activities are conducted by the Department of the Navy (Navy), the United States Marine Corps (USMC), the United States Air Force (USAF), Guam National Guard, the United States Coast Guard (USCG) and other users based and deployed in the Western Pacific. The Navy is the Executive Agent for management of the MIRC. The senior Navy Commander in the Mariana Islands has three overlapping roles: Commander, Joint Region Marianas; Commander, U.S. Naval Forces Marianas; and DoD REP. The DoD REP functions include providing liaison to the governments of Guam, the CNMI, the Federated States of Micronesia and the Republic of Palau, and coordinating multi-service (Joint) Service planning and use, including environmental planning, of the MIRC.

The DoD REP has decided to implement the Preferred Alternative (Alternative 1) which is a proposal designed to meet the Military Services' (the Services') current and foreseeable training requirements. In addition to accommodating the No Action Alternative (current training activities), Alternative 1 would include increased training as a result of upgrades and modernization of existing capabilities, training associated with Intelligence, Surveillance, and Reconnaissance and Strike (ISR/Strike), and increased training associated with multi-national and/or joint exercises.

The actions proposed are incremental increases over the current activities that would result in relatively small-scale, but critical, enhancements that are necessary if the United States Armed Forces are to maintain a state of military readiness commensurate with its national defense mission. The Proposed Action does not include proposals for major additions or changes to facilities, training, or RDT&E capacities.

**FOR FURTHER INFORMATION:** Mariana Islands Range Complex Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS), Project Manager, Code EV21, Naval Facilities Engineering Command, Pacific, 258 Makalapa Drive, Suite 100, Pearl Harbor, HI 96869-3134, telephone number (808) 472-1402.

**INTRODUCTORY STATEMENT:** Pursuant to section 4321 et seq. of Title 42 of the U.S. Code (section 101 et seq. of the National Environmental Policy Act of 1969 [NEPA]); the regulations of the President's Council on Environmental Quality (CEQ) that implement NEPA procedures (40 Code of Federal Regulations [CFR] Parts 1500-1508); DoD Instruction 4715.9, *Environmental Planning and Analysis*; and the applicable Service environmental regulations that implement these laws and regulations, the DoD REP announces his decision to support and conduct current, emerging, and future training and RDT&E activities in the MIRC, as necessary to achieve and sustain Service readiness, including the Services' training; DoD or other federal agency RDT&E activities; and investment in range resources and range infrastructure, all in furtherance of the Services' statutory obligations under Title 10 of the U.S. Code governing the roles and responsibilities of the Services. The National Marine Fisheries Service (NMFS), the U.S. Department of the Interior (DOI), the U.S. Department of Agriculture Wildlife Services (USDA-WS), the Federal Aviation Administration (FAA), the United States Army (Army), the USMC, the USAF and the USCG were invited as cooperating agencies. The NMFS, DOI (Office of Insular Affairs), FAA, USMC and USAF are cooperating agencies.

The Proposed Action focuses on critical enhancements of the MIRC to increase training capabilities (especially in the undersea and air warfare areas) that are necessary if the Services are to maintain a state of military readiness commensurate with the national defense mission. The Proposed Action does not involve an expansion of the existing MIRC boundaries. The Proposed Action does not involve relocations of Army, Navy, USMC, USAF, or USCG personnel or assets, carrier berthing capability, or deployment of strategic missile defense assets to the MIRC. The Proposed Action concentrates on the sustainable development and improvement of existing training capabilities in the MIRC and will not include any new or permanent military construction projects. The Services considered applicable Executive Orders, including an analysis of the environmental effects of its actions outside the United States or its territories under the provisions of Executive Order 12114 (*Environmental Effects Abroad of Major Federal Actions*) and the requirements of Executive Order 12898 (*Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*).

Actions analyzed in the Final Environmental Impact Statement/Overseas Environmental Impact Statement are required to enable the Services to meet their statutory responsibilities under sections 5013 and 5062 of Title 10 of the U.S. Code to organize, train, equip, and maintain combat-ready forces and to successfully fulfill its current and future global mission of winning wars, deterring aggression, and maintaining freedom of the seas.

The Proposed Action will be accomplished as set out in Alternative 1, described in the Final EIS/OEIS as the Preferred Alternative. Alternative 1 (Preferred Alternative) is a proposal designed to meet the Services' current and foreseeable training requirements. In addition to accommodating the No Action Alternative (current training activities), Alternative 1 would support and conduct current, emerging, and future training and RDT&E activities in the MIRC, while enhancing training resources through investment in the ranges. Alternative 1 includes increased training as a result of upgrades and modernization of existing capabilities; training associated with ISR/Strike; and increased levels of multi-national and/or joint exercises.

Range modifications and upgrades resulting in increased training include development and deployment of new Portable Underwater Tracking Range capabilities, development of a laser

certified range area in Warning Area 517 (W-517), small arms range capability improvements, and Military Operations in Urban Terrain training facility improvements. The establishment of a Danger Zone and restricted area around Farallon de Medinilla is required to restrict all private and commercial vessels from entering the area during the conduct of hazardous training activity. This safety zone provides an additional measure of safety for the public during hazardous training activities involving the island. A ten nautical mile (16 kilometer) zone around Farallon de Medinilla will be established in accordance with 33 CFR § 334.1. The creation of the Danger Zone does not affect the continued implementation of the current restricted access as indicated in the lease agreement; therefore, no trespassing is permitted on the island or nearshore waters and reef at any time. Public access to Farallon de Medinilla will remain strictly prohibited and there are no commercial or recreational activities on or near the island. In addition to increasing training levels, these increased capabilities will allow increased multi-national and/or joint exercises. Alternative 1 (Preferred Alternative) also includes the training associated with the establishment of the ISR/Strike program at Andersen Air Force Base (AFB). The ISR/Strike program initiative will host rotationally deployed F-22 aircraft, permanently deployed air lift and refueling aircraft, and the RQ-4 Global Hawk Unmanned Aerial Vehicle.

Implementation of the Preferred Alternative could begin immediately. Because of the Services' Title 10 requirements to organize, train, equip, and maintain combat-ready forces, ongoing training and RDT&E activities within the MIRC will continue at current levels in the event that the Preferred Alternative is not implemented.

## **OVERVIEW OF THE FINAL EIS/OEIS FOR THE MARIANA ISLANDS RANGE COMPLEX:**

**1. Today's Services:** The DoD is in charge of the USAF, Army, Navy, and USMC. The Department of Homeland Security is in charge of the USCG. The mission of the DoD is to provide the military forces needed to deter war and to protect the security of our country. They engage in war-fighting, humanitarian aid, peacekeeping, disaster relief, and homeland security.

**2. Why the Military Trains:** The U.S. military is maintained to ensure the freedom and safety of all Americans, both at home and abroad. In order to do so, Title 10 of the U.S Code requires the Services to maintain, train, and equip combat-ready forces capable of winning wars, deterring aggression, and maintaining freedom of the seas. Modern war and security operations are complex. Modern weaponry has brought both unprecedented opportunity and innumerable challenges to the Services. Smart weapons, used properly, are very accurate and actually allow the Services to accomplish their mission with greater precision and far less destruction than in past conflicts. But these modern smart weapons are very complex to use. U.S. military personnel must train regularly with them to understand their capabilities, limitations, and operation. Modern military actions require teamwork between hundreds or thousands of people, and their various equipment, vehicles, ships, and aircraft, all working individually and as a coordinated unit to achieve success. Military training addresses all aspects of the team, from the individual to joint and coalition teamwork. To do this, the Services employ a building block approach to training. Training doctrine and procedures are based on operational requirements for deployment of forces. Training proceeds on a continuum, from teaching basic and specialized individual military skills, to intermediate skills or small unit training, to advanced, integrated training events, culminating in Joint exercises or pre-deployment certification events.

In order to provide the experience so important to success and survival, training must be as realistic as possible. The military often employs simulators and synthetic training to provide early skill repetition and enhance teamwork, but live training in a realistic environment is vital to success. This requires sufficient land, sea, and airspace to maneuver tactically; realistic targets and objectives; simulated opposition that creates a realistic enemy; and instrumentation to objectively monitor the events and learn to correct errors.

One of the Navy's critical training requirements to support its mission involves the ability of the Navy to move Strike Groups (a combination of ships, submarines, and aircraft) into areas from which they may carry out sustained operations while simultaneously protecting themselves from many threats, including those posed by submarines and mines. In recent decades, many nations have increased their submarine warfare capabilities in an effort to thwart surface ships and their ability to carry out strike missions. Accordingly, one of the Navy's key training objectives involves holding adversary submarines at risk by maintaining the ability to destroy them, if and when required, at a time and place of the Navy's choosing. Fundamental to this objective is the knowledge at all times of where such submarines are operating and an understanding of their intentions and capabilities as evidenced by their actions. A critical component of anti-submarine warfare training is the Portable Underwater Tracking Range. This is an instrumented range that allows near real-time tracking and feedback to all participants. The tracking range provides for both a shallow water and deep water operating environment, with a variety of bottom slope and sound velocity profiles similar to potential contingency operating areas.

In addition to training for anti-submarine warfare, Strike Groups train to defend themselves from air threats and surface threats. Long-range weapons of increasing precision and lethality pose a threat to Strike Group personnel. The threat situation is evolving rapidly which requires flexibility during training cycles to train Strike Groups on how to counter them. Simultaneously, research and development of new weapons and sensors is required prior to deploying them with Strike Groups. These systems may either be defensive or offensive in nature.

The time period leading up to actual hostilities is one of the most difficult and strenuous periods for Strike Groups to prepare for during training. During training, Strike Groups must develop a proficiency in reducing the risk to themselves should an adversary submarine engage in an unexpected hostile act. Strike Groups counter this challenge by using active sonar to detect, identify, and classify a submarine and its actions to gain an understanding of its intentions. The Strike Group must also maintain contact and ensure that the movements of the Strike Group vessels do not place them in a position where the adversary submarine could harm them. As modern diesel-electric submarines of potential adversaries have become exceedingly quiet and increasingly difficult to detect by passive means, realistic and repetitive anti-submarine warfare training with active sonar is necessary for U.S. forces to be confident and knowledgeable in the Navy's plans, tactics, and procedures to perform and survive in situations leading up to hostilities as well as actual combat.

Today's active sonar systems are generally categorized into three areas: low-, mid-, and high-frequency. Active sonar training as analyzed in the MIRC Final EIS/OEIS employs two frequency ranges: mid- and high- frequency. Mid- and high-frequency systems are integrated into Strike Groups as part of the ships, submarines, and aircraft comprising each Strike Group. The analysis of mid-frequency and high-frequency active sonar is a critical component of the

MIRC Final EIS/OEIS. The Navy's Surveillance Towed Array Sensor System (SURTASS) low-frequency active sonar was developed and is deployed separately from the Strike Group because of physical limits on its mobility and the limited number of available units. The Navy has analyzed SURTASS low-frequency active sonar in a Final and Supplemental EIS/OEIS(s) and its operation is covered by associated environmental documentation.

Range complexes provide a controlled and safe environment with threat-representative targets that enable military forces to conduct realistic combat-like training as they undergo all phases of the graduated buildup needed for combat-ready deployment. Ranges and operating areas provide the space necessary to conduct controlled and safe training scenarios representative of those that the military would have to face in actual combat. The range complexes are designed to provide the most realistic training in the most relevant environments, replicating to the best extent possible the operational stresses of warfare. The integration of undersea ranges, with land training areas, safety landing fields, and amphibious landing sites are critical to this realism, allowing execution of multidimensional exercises in complex scenarios. They also provide instrumentation that captures the performance of tactics and equipment in order to provide the feedback and assessment that is essential for constructive criticism of personnel and equipment. The live-fire phase of training facilitates assessment of the military's ability to place weapons on target with the required level of precision while under a stressful environment. Realistic live training will remain the cornerstone of readiness.

### **3. The Strategic Importance of the Existing MIRC**

The MIRC is characterized by a unique combination of attributes that make it a strategically important range complex for the Services. These attributes include location within U.S. territory, live-fire ranges on the islands of Guam, Tinian, and Farallon de Medinilla, expansive airspace, surface sea space, and underwater sea space, authorized use of multiple types of live and inert ordnance on Farallon de Medinilla, support for all Navy warfare areas (Primary Mission Areas) and numerous other Service roles, missions, and tactical tasks, support to homeported Navy, Army, USCG, and USAF units based at military installations on Guam and CNMI, training support for deployed forces, Western Pacific (WestPac) Theater training venue for Special Warfare forces, ability to conduct Joint and combined force exercises, and rehearsal area for WestPac contingencies. Due to Guam and CNMI's strategic location and DoD's ongoing reassessment of the WestPac military alignment, there has been a dramatic increase in the importance of the MIRC as a training venue and its capabilities to support required military training.

### **4. Structuring the Analysis in the MIRC Final EIS/OEIS of Service Training Activities**

**a. Geographic Scope:** The Final EIS/OEIS analyzes the training of U.S. military forces in the onshore, nearshore, and offshore areas in and adjacent to the islands of Guam and the CNMI. The MIRC consists of existing multiple training areas of land, sea space (nearshore and offshore), undersea space, and airspace. For the purposes of this EIS/OEIS, the MIRC and the Study Area are the same geographical areas.



Guam and the CNMI are political subdivisions of the United States. Guam was annexed to the United States as a result of the Treaty of Paris of 1898. Since that time, Guam has been administered as a territory of the United States. The CNMI, also a fully integrated political subdivision of the United States, was integrated into the United States as a result of *The Covenant to Establish a Commonwealth of the Northern Mariana Islands in Political Union with the United States of America*, approved and effective March 24, 1976. Though no territory within the sovereign states of the Federated States of Micronesia is included within the MIRC Study Area and range complex, the range complex includes waters outside the territorial seas surrounding the Federated States of Micronesia.

The MIRC consists of three primary components: ocean surface and undersea areas, airspace, and training land areas.

**(1) Surface/Undersea Areas.** Within the MIRC Study Area are surface and undersea areas routinely used by the military for a variety of activities; these areas include the following:

**i. W-517.** This 14,000 square nautical mile (48,019 square kilometer) area is a polygon-shaped area of water space under W-517 used by Navy ships for unit-level training; it begins approximately 50 nautical miles (93 kilometers) south-southwest of Guam. Warning Area 517 is contained within the following coordinates: 13° 10'N/144° 30'E, 13° 10'N/144° 42'E, 12° 50'N/144° 45'E, 11° 00'N/144° 45'E, 11° 00'N/143° 00'E, 11° 45'N/143° 00'E, 12° 50'N/144° 30'E.

**ii. Offshore.** Agat Bay, Tupalao Cove, Dadi Beach, and Piti Mine Neutralization Area are nearshore training areas off of Naval Base Guam-Main Base, and are located within federally owned coastal waters on Guam. Agat Bay, Tupalao Cove, and Dadi Beach are to the east of Main Base. Piti Mine Neutralization Area is just north of the Apra Harbor Glass Breakwater. These areas are utilized for military littoral and unit-level training activities.

**iii. Outer Apra Harbor.** Outer Apra Harbor supports commercial operations as well as Navy activities and unit-level training. Outer Apra Harbor is a deep-water port that can accommodate the Navy's largest vessels. Outer Apra Harbor provides access to areas which support Navy activities and training within the harbor, including Kilo Wharf, Gab Gab Beach, Reserve Craft Beach, Sumay Cove Channel and Basin, San Luis Beach, and Inner Apra Harbor.

**iv. Inner Apra Harbor.** Inner Apra Harbor is part of Naval Base Guam-Main Base. Wharves and mooring buoys support Navy shipping, and the basin supports small craft and diver training.

**(2) Airspace.** The MIRC Study Area includes airspace used either exclusively by the military, or shared with civilian and commercial aircraft. Some of this airspace is Special Use Airspace, which is military airspace designated by the FAA as Warning Areas, Restricted Areas, and Air Traffic Control Assigned Airspace (ATCAA). Airspace in the MIRC Study Area includes:

**i. W-517.** W-517 is an irregular-shaped polygon comprising 14,000 square nautical miles (48,019 square kilometers) of airspace that begins south of Guam and extends south-southwest in waters and airspace for a distance of approximately 80 to 100 nautical miles (148 to 185 kilometers), from the ocean surface up to unlimited altitude.

**ii. Restricted Area 7201 (R-7201).** R-7201 is a 28 square nautical mile (96 square kilometer) circular area over Farallon de Medinilla that extends out in a 3 nautical mile (10 kilometer) radius from Farallon de Medinilla from the surface to unlimited altitude.

**iii. ATCAA.** Open-ocean ATCAAs within the MIRC Study Area are utilized for military training, from unit-level training to major joint exercises. ATCAAs 1 through 3 (3A, 3B, 3C), and 5 and 6 have been preassigned in agreements with the FAA and 36<sup>th</sup> Operational Group. The seven ATCAAs encompass 63,000 square nautical miles (216,084 square kilometers) of area from south of Guam to north-northeast of Farallon de Medinilla, from the surface to flight level (FL) 300, FL390 to FL430, or surface to unlimited. ATCAAs are activated for short periods to cover the period of training activities. Commander, Joint Region Marianas coordinates all ATCAA requests with the FAA and 36<sup>th</sup> Operational Group. Other ATCAAs may be configured and requested contingent on agreement with the FAA and coordination with COMNAVMAR and 36<sup>th</sup> Operational Group.

Airspace associated with military airfields and landing areas, such as Andersen tower and landing patterns, are not included in this analysis.

**(3) Land Ranges.** The land areas of the MIRC include DoD training areas and facilities located on Farallon de Medinilla, Tinian, Saipan, and Guam, and non-DoD training venues (areas where the military trains, but does not control or administer the land use) on Rota and Saipan.

**i. Farallon de Medinilla.** Farallon de Medinilla is an island comprising approximately 182 acres (74 hectares) of land leased by DoD from CNMI. Farallon de Medinilla is an uninstrumented range and supports live and inert bombing, shore bombardment, missile strikes, and strafing.

**ii. Tinian Military Lease Area.** The Tinian Military Lease Area encompasses 15,400 acres (6,232 hectares) on the island of Tinian, leased by DoD from CNMI. Training on Tinian is conducted on two parcels within the Military Lease Area: the Exclusive Military Use Area encompassing 7,600 acres (3,076 hectares) on the northern third of Tinian, and the Lease Back Area encompassing 7,800 acres (3,157 hectares) and the middle third of Tinian. The Military Lease Area supports small unit-level training through large field exercises and expeditionary warfare training.

**iii. Saipan.** The Saipan Army Reserve Center contains an armory and administrative and maintenance facilities. Land navigation training is conducted on non-DoD lands with coordination between the Army Reserve Unit, Saipan and the CNMI government. The Army Reserve Unit has access to the CNMI Public Safety Small Arms Range Complex on non-DoD lands. The Navy has access to approximately 100 acres (40 hectares) of

Port Authority area including wharf space which supports Visit, Board, Search and Seizure, Anti-Terrorism/Force Protection, and Naval Special Warfare training activities.

**iv. Rota.** Rota is the southernmost island of CNMI and provides non-DoD training facilities supporting special warfare training.

**v. Guam.** Land-based ranges and training facilities support unit-level training, special warfare training, small arms qualifications, field exercises, and expeditionary warfare activities including Training in Urban Environment Exercise.

**b. Procedural History and Public Involvement:** The MIRC EIS/OEIS public involvement process began with the publishing of a Notice of Intent to prepare an EIS. The Notice of Intent initiated a public scoping period, and was published in the *Federal Register* on June 1, 2007. The Notice of Intent was published in two local newspapers: the *Pacific Daily News* (Guam) on June 4, 16, 17, and 18, 2007 and the *Saipan Tribune* (Saipan/Tinian) on June 4, 19, 20, and 21, 2007. The scoping period lasted 45 days, concluding on July 16, 2007. Three scoping meetings were held on June 20, 21, and 22, 2007, one on each of the islands of Guam, Saipan, and Tinian.

The Notice of Availability/Notice of Public Hearing for the MIRC Draft EIS/OEIS was published in the *Federal Register* on Friday, January 30, 2009. The DoD REP also placed a combined Notice of Availability/Notice of Public Hearing in both the *Pacific Daily News* and the *Saipan Tribune*, and in an additional newspaper, the *Daily Marianas Variety* (Guam, Saipan, Tinian, Rota, the Federated States of Micronesia). On March 23, 2009, the DoD REP published a Notice of Public Hearing in the *Federal Register* to extend the initial public comment period from 45 days to 60 days, until March 31, 2009. The *Federal Register* notice included supplemental information, including the original and extended comment periods, ways to comment, and locations of the information repositories. On March 20, 2009, an ad announcing the extension of the MIRC Draft EIS/OEIS comment period was placed in the previously mentioned three newspapers.

The Final EIS/OEIS addressed all public comments received on the Draft EIS/OEIS. Where appropriate, the analysis incorporates issues identified by public comments. During the public review process for the Draft EIS/OEIS, 762 comments were received; 101 from federal agencies, 420 from state agencies, 80 from non-government organizations, and 161 from individuals.

Responses included corrections of data inaccuracies, clarifications regarding analytical approaches, inclusion of additional data or analyses, and modification of the way in which the Proposed Action and Alternatives were presented. No comments received on the Draft EIS/OEIS required significant revisions to be made in the Final EIS/OEIS; however, revisions were made to amplify information previously provided. These changes included expanded descriptions of the proposed Farallon de Medinilla Surface Danger Zone and Restricted Area, additional detail added to resource sections, additional analysis of greenhouse gas emissions and the related cumulative effects discussion, and revision of mitigation measures. Inclusion of the additional analyses and details did not result in an increase of any harassment estimates, nor did they change the conclusions in any of the resource areas analyzed. The Notice of Availability of the Final EIS/OEIS was published in the *Federal Register* on June 4, 2010 (*Federal Register*, Vol.



75, No. 107), and in three newspapers. The MIRC Final EIS/OEIS was made available for general review at five public libraries in the Study Area and at the project website [www.MarianasRangeComplexEIS.com](http://www.MarianasRangeComplexEIS.com). Finally, the Final EIS/OEIS was distributed to those individuals, agencies, and organizations who asked to be notified during the public comment period, as well as members of Congress, state and territorial governors and officials from the region encompassed in the MIRC Study Area.

**ADDITIONAL BACKGROUND AND ISSUES:** Understanding the relationship between this EIS/OEIS and other DoD environmental planning efforts is important for understanding what is analyzed in the MIRC EIS/OEIS.

**1. The Tactical Training Theater Assessment Planning Program (TAP):** In 2002, the Navy initiated the Tactical Training Theater Assessment Program to serve as the overarching training area sustainment program. TAP focuses specifically on the sustainability of range complexes, operating areas, and special use airspace that support the Fleet Response Training Plan. TAP represents the first time the Navy has managed its training areas on a range complex-wide basis. TAP provides environmental planning documentation that assesses the potential for environmental effects associated with certain activities and actions conducted within a range complex. The MIRC EIS/OEIS is a TAP document.

**2. The Final Overseas EIS/OEIS for Surveillance Towed Array Sensor System (SURTASS) Low Frequency Active Sonar and Final Supplemental EIS for SURTASS Low Frequency Active Sonar:** The Final EIS/OEIS for the MIRC incorporates by reference the Final Overseas EIS/OEIS and Final Supplemental EIS/OEIS for SURTASS low-frequency active sonar. Analysis of the SURTASS low-frequency active sonar system was previously presented in a series of documents and addressed by National Oceanic and Atmospheric Administration and NMFS (NOAA/NMFS) in consideration of applicable regulations including the potential for synergistic and cumulative effects. The MIRC Final EIS/OEIS does not include an analysis for the use of low-frequency active, but does recognize the potential for a cumulative effect with the use of a combination of SURTASS low-frequency active sonar and high-frequency active and mid-frequency active sonar for training. The MIRC is within the SURTASS low-frequency active operating areas covered by the current SURTASS low-frequency active Final Rule western Pacific mission site area number 4, and excludes nearshore waters around shorelines. The website for SURTASS low-frequency active and the associated Environmental Impact Analysis is located at <http://www.surtass-lfa-eis.com>

**3. Final EIS, Establishment and Operation of an Intelligence, Surveillance, and Reconnaissance and Strike Capability, Andersen AFB, Guam:** The USAF has established the *ISR/Strike program* at Andersen AFB, Guam. ISR/Strike will be implemented in phases over a planning horizon of Fiscal Years 2007–2016. Aircraft operations and training out of Andersen AFB ultimately will increase by 45 percent over the current level. Environmental impacts associated with ISR/Strike have been analyzed in the *2006 Establishment and Operation of an Intelligence, Surveillance and Reconnaissance/Strike, Andersen Air Force Base, EIS*. There will be increased activity on all the current training areas supporting USAF training activities: W-517, ATCAAs, and Farallon de Medinilla/R-7201. The ISR/Strike EIS analyzed environmental impacts related to the infrastructure improvements required. The MIRC EIS/OEIS analyzes the impacts of the increased training resulting from the ISR/Strike implementation.

**4. Draft EIS/OEIS Guam and CNMI Military Relocation, Relocating Marines from Okinawa, Visiting Aircraft Carrier Berthing, and Army Air and Missile Defense Task Force:** The Proposed Action for the Relocation EIS/OEIS is a multi-Service project involving components of the USMC, Navy, and Army. Facilities construction and improvements would be necessary to accommodate the three major elements of the Proposed Action. The three main components of the Proposed Action are (1) USMC: develop and construct facilities and infrastructure to support approximately 8,600 Marines and their 9,000 dependents relocated from Okinawa to Guam and develop and construct facilities and infrastructure to support training and operations on Guam and Tinian (CNMI) for the relocated Marines; (2) Navy: construct a new deep-draft wharf with shoreside infrastructure improvements creating the capability in Apra Harbor, Guam to support a transient nuclear powered aircraft carrier; (3) Army: develop facilities and infrastructure on Guam to support relocating approximately 600 military personnel and their 900 dependents to establish and operate an Army Air and Missile Defense Task Force. The MIRC EIS/OEIS focuses on the achievement of service readiness activities while the analyses of the Guam and CNMI Military Relocation EIS/OEIS actions focus on the relocation of forces to the Marianas with its associated infrastructure and military construction requirements. This EIS is available at the website [www.guambuildupeis.us](http://www.guambuildupeis.us)

**5. Andersen Air Force Base Cargo Parachute Drop Zone, Environmental Assessment, December 2000:** The Air Force proposed to develop a cargo drop zone at Northwest Field, Andersen Air Force Base, Guam. The dimensions of the drop zone were proposed to be 4,500 by 2,400 feet (1,372 by 732 meters) or 248 acres (100 hectares). The proposed development site consisted of paved surfaces (aviation runways and taxiways) and secondary limestone forest consisting of trees, brush and open weedy areas. Developing the proposed drop zone would require clearing about 150 to 180 acres (61 to 73 hectares) so that dropped cargo and the parachutes are not damaged by trees and high brush. Andersen Air Force Base is within the MIRC EIS/OEIS Study Area.

**6. Military Operations in Urban Terrain Training at Andersen South, AAFB GUAM Environmental Assessment January 2003.** The Marine Corps required realistic urban training areas in Asia and the Western Pacific, where there was not currently any large Military Operations in Urban Terrain facility. The proposed facility would provide a site for use by Marine units of various sizes and types with the Marine Expeditionary Force based on Okinawa as the primary user. The Proposed Action was to develop parts of Andersen South as a facility for conducting Military Operations in Urban Terrain training, along with basic infantry skills training, maneuver exercises, and aviation and related training. Basic Urban Skills Training would be the primary focus but would include continuation of ongoing training activities which include bivouacs, land navigation, field maneuvers, offensive and defensive tactics, platoon size training in an urban environment, helicopter operations, logistical operations and night vision goggle training.

**7. Beddown of Training and Support Initiatives at Northwest Field, Environmental Assessment, Andersen Air Force Base, Guam, June 2006:** The Proposed Action for the Beddown of Training and Support Initiatives at Northwest Field Environmental Assessment was to remove deployment restrictions for one of the Rapid Engineer Deployable Heavy Operations Repair Squadron Engineer Squadrons at Andersen Air Force Base, Guam by relocation of the engineering squadron, its Silver Flag training program, its Commando Warrior

training program and a Combat Communications Squadron (and associated training program) to the Northwest Field area of Andersen AFB, Guam from other installations in the Pacific region. Andersen Air Force Base is within the MIRC EIS/OEIS Study Area.

**PURPOSE AND NEED:** The purpose of the Proposed Action is to achieve and maintain Service readiness using the MIRC to support and conduct current, emerging, and future training and RDT&E activities, while enhancing training resources through investment in the ranges.

The need for the Proposed Action is to enable the Services to meet their statutory responsibility to organize, train, equip, and maintain combat-ready forces and to successfully fulfill their current and future global mission of winning wars, deterring aggression, and maintaining freedom of the seas. Activities involving RDT&E are an integral part of this readiness mandate.

**ALTERNATIVES CONSIDERED:** The Services identified a reasonable range of alternatives, based on criteria set out in the Final EIS/OEIS, which would satisfy its purpose and need. Three alternatives were analyzed in the Final EIS/OEIS: (1) The No Action Alternative, (2) Alternative 1, which is current activities in the No Action Alternative plus increased training supported by modernization and upgrade/modification to existing capabilities, training associated with ISR/Strike capabilities, and multi-national and/or joint exercises; and (3) Alternative 2, which includes Alternative 1 activities plus additional naval exercises. Alternative 1 is identified in the Final EIS/OEIS as the Preferred Alternative. Based on the analysis in the Final EIS/OEIS, the No-Action Alternative and Alternative 1 (with implementation of the associated mitigation measures) are considered the Environmentally Preferred Alternatives due to implemented and proposed mitigation measures which provide environmental protections despite the additional training activity.

**1. Alternatives Eliminated From Further Consideration:** In developing a reasonable range of alternatives, the Services eliminated five alternatives from further consideration: (a) alternative range complex locations; (b) conduct simulated training exclusively; (c) concentrating the level of current training in the MIRC to fewer sites; (d) reduction in activity types and activity levels; and (e) maintaining the level of current training in the MIRC with implementation of spatial and temporal mitigation.

**a. Alternative Range Complex Locations:** Consideration of alternative locations for training presently conducted in the MIRC was rejected from further analysis because it does not meet the criteria set forth for the purpose and need of the Proposed Action. The MIRC is the only capable and efficient training location within the territory of the United States in the Western Pacific for Services homeported, deployed to, or returning from regions in the Western Pacific and the Indian Ocean. It is neither reasonable, practicable, or appropriate to seek alternative locations for training conducted in the MIRC. This alternative, therefore, was eliminated from further consideration in the EIS/OEIS.

**b. Conduct Simulated Training Exclusively:** Training by the Services includes extensive use of computer-simulated virtual training environments, and conducting command and control exercises with assigned role play and modeling versus actual operational forces (constructive training) where possible. These training methods have substantial value in

achieving limited training objectives. Computer technologies provide excellent tools for implementing a successful, integrated training program while reducing the risk and expense typically associated with live military training. However, virtual and constructive training are an adjunct to, not a substitute for, live training, including live-fire training. Unlike live training, these methods do not provide the requisite level of realism necessary to attain combat readiness, and cannot replicate the high-stress environment encountered during an actual combat situation.

The Services continue to research new ways to provide realistic training through simulation, but simulation cannot replicate the dynamics of the natural environment, especially the unanticipated. This alternative substitution of simulation for live training fails to meet the purpose and need for the Proposed Action and was therefore eliminated from detailed study.

**c. Concentrating the Level of Current Training in the MIRC to Fewer Sites:** During scoping, an alternative to decrease the training venues within the MIRC and increase the level of training activities in those venues was suggested. A concentration of training at fewer locations would not support the same amount of training, would jeopardize the quality of training, and would raise significant safety concerns. For these reasons, this alternative has been eliminated from further consideration in the EIS/OEIS.

**d. Reduction in Activity Types and Activity Levels:** As part of the Public Hearing Process, comments were received asking for consideration of an additional alternative that involved a reduction in activity types and levels to ensure that decision-makers are fully informed and are presented with a full range of alternatives. Activity levels were analyzed for the three alternatives analyzed in the EIS. The alternatives presented in the Final EIS analyzed different activity types (No Action with the fewest and Alternative 2 with the most). The Final EIS/OEIS appropriately limited its analysis to reasonable alternatives that meet the purpose of and need for the Proposed Action. A reduction in activities could lead to the purpose and need not being met. For these reasons, this alternative was eliminated from further consideration in the EIS/OEIS.

**e. Maintaining the Level of Current Training in the MIRC With Implementation of Spatial and Temporal Mitigation:** An alternative with mitigations based on geographical or temporal restrictions could severely limit the flexibility required for meeting training requirements and is not consistent with the purpose of and need for the Proposed Action. For these reasons, this alternative was eliminated from further consideration in the EIS/OEIS.

**2. No Action Alternative – Current Training within the MIRC:** For proposals involving changes to on-going activities, CEQ guidance describes “no action” as “‘no change’ from management direction or level of intensity” and “continuing with the present course of action until the action is changed.” Consequently, the No Action Alternative is a baseline against which the impacts of the Proposed Action are compared. The purpose of including a No Action Alternative in environmental impact analyses is to ensure that agencies compare the potential impacts of the proposed federal action to the known impacts of maintaining the status quo. The No Action Alternative is representative of baseline conditions, where the action presented represents a regular and historical level of activity on the MIRC to support training activities and exercises.

**3. Alternative 1, The Preferred Alternative – Current Training, Increased Training Supported by Modernization and Upgrades/Modifications to Existing Capabilities, Training Associated with ISR/Strike, and Increased Training Associated with Multi-National and/or Joint Exercises:** Alternative 1 (Preferred Alternative) is a proposal designed to meet the Services’ current and foreseeable training requirements. In addition to accommodating the No Action Alternative (current training activities), Alternative 1 would include increased training as a result of upgrades and modernization of existing capabilities, training associated with ISR/Strike, and increased training associated with multi-national and/or joint exercises.

Range modifications and upgrades resulting in increased training include development and deployment of new Portable Underwater Tracking Range capabilities, development of a laser certified range area in W-517, small arms range capability improvements, and Military Operations in Urban Terrain training facility improvements. The establishment of a Danger Zone and restricted area around Farallon de Medinilla is required to restrict all private and commercial vessels from entering the area during the conduct of hazardous training activity. This safety zone provides an additional measure of safety for the public during hazardous training activities involving the island. A ten nautical mile (16 kilometers) zone around Farallon de Medinilla will be established in accordance with 33 CFR § 334.1. The creation of the Danger Zone does not affect the continued implementation of the current restricted access as indicated in the lease agreement; and therefore no trespassing is permitted on the island or nearshore waters and reef at any time. Public access to Farallon de Medinilla will remain strictly prohibited and there are no commercial or recreational activities on or near the island. In addition to increasing training levels, these increased capabilities will result in increased multi-national and/or joint exercises.

**a. Actions Associated with the Preferred Alternative:**

**(1) Modernization and Upgrades of Training Areas:**

**i. Anti-Submarine Warfare Portable Underwater Tracking Range Pingers and Transponders:** Anti-submarine warfare describes the entire spectrum of platforms, tactics, and weapon systems used to identify, track and neutralize submarine threats to combatant and non-combatant maritime forces. A critical component of anti-submarine warfare training is the Portable Underwater Tracking Range. This is an instrumented range that allows near real-time tracking and feedback to all participants. The tracking range should provide for both a shallow water and deep water operating environment, with a variety of bottom slope and sound velocity profiles similar to potential contingency operating areas. Guam homeported submarine crews, as well as crews of transient submarines, require anti-submarine warfare training events to maintain qualifications and proficiency. A MIRC instrumented anti-submarine warfare Portable Underwater Tracking Range, target support services, and assigned torpedo retriever craft would meet support requirements for Torpedo Exercise and Tracking Exercise activities in the MIRC in support of submarines and other deployed anti-submarine warfare forces.

MK-84 range pingers are used in association with the Portable Underwater Tracking Range. Portable Underwater Tracking Range transponders are anchored to the seafloor and track up to four MK-84 range pingers. Portable Underwater Tracking Range Baseline 1 consists of 10



transponders with three held in reserve, and is deployable from 400 meters to 3,500 meters depth. Signals from the transponders are uplinked to range control for processing.

**ii. Military Operations in Urban Terrain:** Military Operations in Urban Terrain training is conducted within a facility that replicates an urban area, to the extent practicable. The urban area includes a central urban infrastructure of buildings, blocks, and streets; an outlying suburban residential area; and outlying facilities. Suburban area structures should represent a local noncombatant populace and infrastructure. The existing Military Operations in Urban Terrain facilities will be maintained and remodeled as necessary to support training requirements of units stationed at or deployed to the MIRC. In addition, modular and temporary facilities may be assembled to support Military Operations in Urban Terrain exercises.

**iii. Air-to-Surface Missile Exercise and Bombing Exercise in W-517:** Missile Exercises are authorized in W-517; however, in support of HSC-25, a permanent Laser Hazard Area and Missile Hazard Area is required to support Missile Exercise unit level training requirements. The laser range location and schedule will be established and coordinated with the Joint Region Marianas Area Training Office and Guam FAA. Bombing Exercises are authorized in W-517; however, in support of USAF requirements for live fire Bombing Exercise, Area Training and USAF have developed range safety and mitigation procedures for support of Joint Direct Attack Munitions in W-517.

**(2) Farallon de Medinilla:** Under implementation of Alternative 1, a 10 nautical mile (19 kilometer) surface Danger Zone would be established to restrict all private and commercial vessels from entering the area during the conduct of hazardous training activity. The proposed Danger Zone would designate a surface safety zone of 10 nautical mile (19 kilometer) radius surrounding Farallon de Medinilla. This safety zone provides an additional measure of safety for the public during hazardous training activities involving the island. The surface Danger Zone is proposed as a surface safety exclusion area to be established in accordance with 33 CFR § 334.1. The U.S. Army Corps of Engineers may promulgate regulations restricting commercial, public, and private vessels from entering the restricted safety zone to minimize danger from the hazardous activity in the area.

**(3) ISR/Strike:** The MIRC EIS/OEIS analyzes the impacts of the increased training resulting from the establishment of the ISR/Strike program implementation.

**(4) Major Exercises:** Training would increase to include additional major exercises involving multiple strike groups and expeditionary task forces. Major exercises provide multi-Service and multi-national participation in realistic maritime and expeditionary training that is designed to replicate the types of operations and challenges that could be faced during real-world contingency operations.

**4. Alternative 2 – Current Training; Increased Training Supported By Modernization and Upgrades/Modifications to Existing Capabilities, Training Associated with ISR/Strike, Increased Multi-National and/or Joint Exercises, and Additional Naval Exercises:** Alternative 2 includes all the actions proposed for MIRC in Alternative 1 and increased training activity associated with major at-sea exercises as described in the Final

EIS/OEIS. Additional major at-sea exercises would provide additional ships and personnel maritime training including additional use of active sonar that would improve the level of joint operating skill and teamwork between the Navy, Joint Forces, and Partner Nations.

**ENVIRONMENTAL IMPACTS OF THE PREFERRED ALTERNATIVE:** The Navy analyzed the potential impacts of the Proposed Action in terms of the following resource areas: (1) geology, soils, and bathymetry, (2) hazardous materials, (3) water quality, (4) air quality, (5) airborne noise, (6) marine communities, (7) marine mammals, (8) sea turtles, (9) fish and essential fish habitat (EFH), (10) seabirds and shorebirds, (11) terrestrial biological resources within the land training areas within the MIRC, (12) land use, (13) cultural resources, (14) transportation, (15) demographics, (16) regional economy, (17) recreation, (18) environmental justice and protection of children, and (19) public health and safety.

The Navy used a screening process to identify aspects of the Proposed Action that could act as stressors to resources. Navy subject matter experts deconstructed the warfare areas and training exercises included in the Proposed Action 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. This process was used to focus the information presented and analyzed in the affected environment and environmental consequences sections of the Final EIS/OEIS. Examples of potential stressors identified through the screening process include: vessel movements, aircraft overflights, explosives, non-explosive practice munitions, high explosive ordnance, sonar, hazardous materials, sonobuoys, weapons firing, vehicle and troop movements, land-based movements, and building modification.

The potential for environmental impacts throughout the MIRC Study Area associated with each alternative were analyzed and documented in the Final EIS/OEIS. This Record of Decision summarizes the potential impacts associated with implementation of the Preferred Alternative. Implementation of the Preferred Alternative would have no significant impact on geologic resources, bathymetry, sediments, or soil, water quality, air quality, hazardous materials, airborne noise, marine communities, land use, transportation, regional economy, demographics, environmental justice, or public health and safety in territorial waters as a result of the analyzed stressors. Furthermore, the proposed activities would not cause significant harm in non-territorial waters as a result of the analyzed stressors. These resource areas would continue to be managed in accordance with applicable federal, territorial and commonwealth regulations, and DoD service guidelines. Mitigation measures are not necessary for these resource areas.

**1. Marine Mammals:** Thirty-two marine mammal species, stocks or populations have been confirmed or may have the potential to occur in the marine waters of the MIRC, including 29 cetaceans (whales, dolphins, and porpoises), two pinnipeds (Hawaiian monk seal and northern elephant seal), and one sirenian (dugong). Of these 32, there are approximately 22 that are regularly found in the area, four that are rare and six that are extralimital. The north Pacific right whale, Indo Pacific bottlenose dolphin, Hubbs beaked whale, dugong, Hawaiian monk seal and the northern elephant seal were designated as extralimital (a species that has occurred rarely in the past or may have only one or several documented sightings), therefore, those species were excluded from the analyses in the Final EIS/OEIS.

**a. Framework for Assessing Marine Mammal Response to**

**Anthropogenic Sound:** The Final EIS/OEIS employed separate criteria to assess physiological and behavioral effects on marine mammals from exposure to mid-frequency active and high-frequency active sonar. The approach to estimating potential physiological effects from anti-submarine warfare training within the MIRC on marine mammals used methods that were developed in cooperation with NMFS for the Navy's Undersea Warfare Training Range Draft EIS/OEIS, Undersea Warfare Exercise Programmatic Environmental Assessment/Overseas Environmental Assessment, the 2006 Supplement to the 2002 Rim of the Pacific Programmatic Environmental Assessment/Overseas Environmental Assessment, Composite Training Unit Exercise/Joint Task Force Exercise Environmental Assessment/Overseas Environmental Assessment, the Southern California Range Complex Final EIS/OEIS, and the Hawaii Range Complex Final EIS/OEIS. The approach to estimating potential behavioral effects of anti-submarine warfare training within the MIRC on marine mammals was adopted as a result of comments and recommendations received on these previous documents, as well as comments on the MIRC Draft EIS/OEIS.

In the Final EIS/OEIS, the criteria employed in the MIRC Final EIS/OEIS was used to assist in ordering and evaluating the potential responses of marine mammals to sound. The framework includes the physics of sound propagation (physics component), the potential physiological responses associated with sound exposure (physiology component), the behavioral processes that might be affected (behavior component), and the life functions that may be immediately affected by changes in behavior at the time of exposure (Fig 3.7-1 in the Final EIS/OEIS). These are extended to longer term life functions and into population and species effects.

**(1) Mid-Frequency Active/High-Frequency Active Sonar**

**Physiological Effects Analysis:** The impact analysis in the Final EIS/OEIS used auditory tissues as indicators of both injurious and non-injurious physiological effects and supported the determination that permanent threshold shift (PTS) and temporary threshold shift (TTS) were the most appropriate biological indicators, respectively, of physiological effects that equate to the onset of injury (Level A harassment under the Marine Mammal Protection Act [MMPA]) and non-injurious behavioral disturbance (Level B harassment under the MMPA). Alternative views have challenged this determination, arguing that it is inconsistent with other types of observed or reported injury. Such observed or reported injuries, however, have not been linked directly to sound exposure and may result from other processes related to the behavior of the animal. The impact analysis as presented in the Final EIS/OEIS is consistent with the scientific literature. No scientific literature exists that demonstrates a direct mechanism by which injury will occur as a result of sound exposure levels less than those predicted to cause a PTS in a marine mammal.

The Final EIS/OEIS expressed the physiological effects thresholds in terms of the total received sound energy level (SEL), which is a measure of the flow of sound energy through an area, because marine and terrestrial mammal data show that, for continuous-type sounds of interest (e.g., mid-frequency active sonar pings), TTS and PTS are more closely related to the energy in the sound exposure than to the exposure sound pressure level (SPL). The SEL includes both the ping SPL and duration. Longer-duration mid-frequency active and high-frequency active sonar pings and/or higher-SPL pings will have a higher SEL. If an animal is exposed to

multiple pings, the SEL in each individual ping is summed to calculate the total energy level. Therefore, the total received SEL depends on the SPL, duration, and number of pings received.

Because mammalian auditory threshold shift data show less effect from intermittent exposures than from continuous exposures with the same energy (Ward, 1997), basing the physiological effect thresholds on the total received SEL is a conservative approach for treating multiple pings that will likely overestimate any adverse effects; in reality, some recovery will occur between pings and lessen the effect of a particular exposure. In the Final EIS/OEIS, the sound exposure thresholds for TTS and PTS in cetacea are 195 dB re 1  $\mu\text{Pa}^2$ -s received SEL for TTS and 215 dB re 1  $\mu\text{Pa}^2$ -s received SEL for PTS.

The Navy considered criticism of its reliance on Navy studies of TTS in highly trained captive animals in the Navy's marine mammal program for its primary source of data for physiological effects. Contrary to this criticism, the Navy, with the full support of NMFS, relied on these studies because they are the most controlled studies of behavioral reactions to sound exposure available and provide the greatest amount of data. These studies recorded baseline behavior of the test subjects over many sessions so that behavioral alterations could be defined as a deviation from normal behavior. The sound exposure level received by each animal was recorded and quantified. The exposure signals used were close to the frequencies typically employed by mid-frequency active sonar. No other study provided the same degree of control or relevance to mid-frequency signal types as the TTS studies from which many of the behavioral response thresholds were derived.

The data from these studies are the best available scientific data both with respect to quality and quantity. Data from animals in the wild were utilized when sufficient information on animal behavior (both baseline and reactionary) and sound exposure levels existed. This is unfortunately a sparse amount of data. Utilization of other studies with inadequate control, observational periods, or ability to determine exposure levels of the animals would introduce a large amount of guesswork and estimation that weakens any numerical association between behavioral reactions and sound exposure. Furthermore, the limitations of the TTS studies referred to in the criticism were acknowledged in the original behavioral analysis. Please see Finneran, J.J. and Schlundt, C.E. (2004), "Effects of intense pure tones on the behavior of trained odontocetes" (Space and Warfare Naval Systems Center, San Diego, CA), in particular Final EIS/OEIS Section 3.7.3.1.1, which details the limitations of the data collection and analysis. NMFS is aware of these limitations yet still approves, as discussed below, the usage of the data at this time because of the quality and quantity of the data. As quality data continue to be collected on animals in the wild, the relevance of the behavioral data collected during the TTS studies will decrease and will eventually be replaced. However, at this time, they provide the best available data for assessing the relationship between behavioral reactions and sound exposure.

## **(2) Mid-Frequency Active/High-Frequency Active Sonar**

**Behavioral Effects Analysis:** The Final EIS/OEIS concluded that the necessary information (i.e., variable and context specific behavioral responses as well as causal factors of marine mammal stranding events associated with mid-frequency active sonar) to assess behavioral effects on each species from exposure to mid-frequency active and high-frequency active sonar is not yet complete due to the lack of empirical data, although ongoing research efforts will continue to develop the available body of data. The Final EIS/OEIS noted that the Navy has

funded, and will continue to fund, research efforts to develop these data, but such an undertaking will require years to complete. The present unavailability of such information is relevant to the ability to develop species-specific behavioral effects criteria. The science of understanding the effects of sound on marine mammals is dynamic. The analysis in the Final EIS/OEIS employed the best available science. The Navy is fully committed to the use of the best available science for evaluating the potential effects of training and testing activities.

In the Hawaii Range Complex Draft EIS/OEIS (U.S. Department of the Navy, 2007e), the Navy presented a dose methodology to assess the probability of Level B non-injurious, behavioral harassment from the effects of mid-frequency active and high-frequency active sonar on marine mammals. Following publication of the Draft EIS/OEIS, the Navy continued working with NMFS to refine the mathematically representative curve previously used, along with applicable input parameters, for the purpose of increasing the accuracy of the Navy's assessment. As the regulating and cooperating agency, NMFS presented two methods to six scientists (marine mammalogists and acousticians from within and outside the federal government) for an independent review (National Marine Fisheries Service, 2008). One of the methods was a normal curve fit to a "mean of means" calculated from the mean of: (1) the estimated mean received level produced by the reconstruction of the USS SHOUP event of May 2003, in which killer whales were exposed to mid-frequency active sonar (U.S. Department of the Navy, 2004b); (2) the mean of the five maximum received levels at which Nowacek et al. (2004) observed significantly different responses of right whales to an alert stimuli; and (3) the mean of the lowest received levels from the 3-kHz data that the Space and Naval Warfare Systems Center classified as altered behavior from Finneran and Schlundt (2004).

The second method was a derivation of a mathematical function used for assessing the percentage of a marine mammal<sup>1</sup> population experiencing the risk of harassment under the MMPA associated with the Navy's use of SURTASS low-frequency active sonar (U.S. Department of the Navy, 2001c). This function is appropriate for application in a number of contexts, including instances where there are limited data (Feller, 1968). This method is identified as "the risk function" in this document.

Two NMFS scientists, one from the NMFS Office of Science and Technology and one from the Office of Protected Resources, summarized the reviews of the six scientists, and developed a recommendation. The NMFS Office of Protected Resources decided to use two risk functions, one for odontocetes and pinnipeds and one for mysticetes, with applicable input parameters to estimate the risk of behavioral harassment from exposure to mid-frequency active and high-frequency active sonar. The particular acoustic risk functions specified by NMFS estimate the probability of behavioral responses that NMFS would classify as Level B harassment under the MMPA given exposure to specific received levels of mid-frequency active and high-frequency active sonar. The mathematical function was derived from a solution in Feller (1968), as defined in the SURTASS Low Frequency Active Sonar Final OEIS/EIS (U.S. Department of the Navy, 2001c) and relied on in the Supplemental SURTASS Low Frequency Active Sonar EIS/OEIS

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<sup>1</sup> The definition of Level B Harassment used in the Final EIS/OEIS for military readiness activities is "any act that disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering, to a point where such behavioral patterns are abandoned or significantly altered."



(U.S. Department of the Navy, 2007d) with respect to potential impact from the SURTASS low-frequency active sonar, for the probability of mid-frequency active and high-frequency active sonar risk for MMPA Level B behavioral harassment with input parameters modified by NMFS for mid-frequency active and high-frequency active sonar for mysticetes, odontocetes, and pinnipeds. This determination was based on the recommendation of the two NMFS scientists, consideration of the independent reviews from six scientists, and NMFS MMPA regulations affecting the Navy's use of SURTASS low-frequency active sonar (U.S. Department of the Navy, 2002b; National Oceanic and Atmospheric Administration, 2007b).

The Navy applied the acoustic risk function in the Hawaii Range Complex Final EIS/OEIS (U.S. Department of the Navy, 2008) in its assessment of the potential behavioral effects of mid-frequency active and high-frequency active sonar on marine mammals, and risk functions are not new concepts for risk assessments. The Final EIS/OEIS noted that common elements are contained in the process used for developing criteria for air, water, radiation, and ambient noise, and for assessing the effects of sources of air, water, and noise pollution. The Final EIS/OEIS also acknowledged a widespread consensus that cetacean response to mid-frequency active sound signals needs to be better defined using controlled experiments (Cox et al., 2006; Southall et al., 2007). The Navy is contributing to an ongoing behavioral response study in the Bahamas that is anticipated to provide some initial information on beaked whales, the species identified as the most sensitive to mid-frequency active sonar. NMFS is leading this international effort with scientists from various academic institutions and research organizations to conduct studies on how marine mammals respond to underwater sound exposures. Until additional data are available, NMFS and the Navy have determined that the three data sets detailed in the Section 3.7.3.1.1 of the Final EIS/OEIS are most applicable for the direct use in developing risk function parameters for mid-frequency active and high-frequency active sonar. Accordingly, both risk functions specified by NMFS were developed using these data sets.

NMFS determined that these data sets represent the only known data that specifically relate to altered behavioral responses to exposure to mid-frequency sound sources. Until applicable data sets are evaluated to better quantify harassment from high-frequency active sources, the Final EIS/OEIS concluded that the risk functions derived for mid-frequency active sources will apply to high-frequency active sources.

**(3) Critique of the Two Risk Function Curves as Presented in the Hawaii Range Complex Final EIS/OEIS:** As discussed above, the risk functions used in the Final EIS/OEIS to assess non-injurious temporary behavioral effects to marine mammals were first set forth in the Navy's Final EIS/OEIS for the Hawaii Range Complex. The Navy received several comments on the Hawaii Range Complex Final EIS/OEIS critical of the risk function curves specified by NMFS. In reviewing whether the parameters employed were based upon the best available science, the implications in the uncertainty in the values, and biases and limitations in the risk function criteria, such critique asserted that data were incorrectly interpreted by NMFS when calculating parameter values, resulting in a model that underestimates takes. Of primary importance to these commenters was the point that the risk function curves specified by NMFS do not account for a wide range of frequencies from a variety of sources (e.g., motor boats, seismic survey activities, banging on a pipe). In fact, all of the critique concerning "data sets not considered" by NMFS relate to sound sources that are either higher or lower in frequency than mid-frequency active sonar, are contextually different (such as those presented in

whale watch vessel disturbances or oil and gas exploration activities), or are relatively continuous in nature as compared to intermittent sonar pings. These sounds from data sets not considered have no relation to the frequency or duration of a typical Navy mid-frequency active sonar as described in the Final EIS/OEIS.

As discussed above and in the Final EIS/OEIS, NMFS selected data sets that were relevant to mid-frequency active sonar sources and selected parameters accordingly. In order to satisfy the concern reflected in that a risk function must be inherently precautionary, NMFS could have selected data sets and developed parameters derived from a wide variety of sources across the entire spectrum of sound frequencies in addition to or as substitutes for those that best represent the Navy's mid-frequency active sonar. The net result, however, would have been a risk function that captures a host of behavioral responses beyond those that are biologically significant as contemplated by the definition of Level B harassment under the MMPA as applicable to military readiness activities. Given the results of the modeling and the marine mammal densities in the MIRC Study Area, having a lower basement value would not result in any significant number of additional takes. This is demonstrated in Table 3.7-5 *Percent of Harassments at Each Received Level Band* and Figure 3.7-6, *The Percentage of Behavioral Harassments Resulting from the Risk Function for Every 5dB of Received Level* of the Final EIS/OEIS which shows that less than 1 percent of the predicted number of takes resulted from exposures below 140 dB. Accordingly, while lowering the basement value from 120 dB to something "far lower than 110 dB" would change the risk function curve, it is not likely to result in any appreciable increase in the number of takes. In addition, lowering the basement value below the present 120 dB received level would involve modeling for impacts occurring below the naturally occurring ambient background noise present in the MIRC Study Area.

Such critique suggests that the criteria used to establish the risk function parameters should reflect the biological basement value where any reaction from any source is detectable. The MMPA, particularly as it applies to military readiness activities and certain federally-funded scientific research activities, does not intend to regulate any and all marine mammal behavioral reactions as suggested by the comment.

Various comments recommending that the B parameter and the data used should be revised given that, ". . . 120 dB re 1 $\mu$ Pa has broadly been found as the value at which 50 percent of individuals respond to noise . . .;" that ". . . 50 percent of migrating whales changed course to remain outside the 120 dB re 1 $\mu$ Pa contour (citing to Malme et al. 1983, 1984);" and that ". . . mysticetes exposed to a variety of sounds associated with the oil industry, typically 50 percent exhibited responses at 120 dB re 1 $\mu$ Pa" are factually inaccurate. All of these comments provided a single citation to Malme et al. (1983, 1984) for the repeated assertion that 50 percent of marine mammals will react to 120 db re 1 $\mu$ Pa. Malme et al. (1983, 1984) in fact indicated that for migrating whales, a 50-percent probability of response occurred at 170 dB for a continuous, low frequency sound source that is very different from mid-frequency active sonar.

Regarding critique that the model underestimates takes because of uncertainty arising from "inter-specific variation" or from "broad confidence intervals," the risk function methodology assumes variations in responses within the species and was chosen specifically to account for uncertainties and the limitations in available data. NMFS considered all available data sets and, as discussed above, made a determination as to the best data currently available. While the data

sets have limitations, they constitute the best available science. Critique that the model has limitations in that it does not account for social factors, and is likely to underestimate takes, reflects a concern that if one animal is “taken” and leaves an area then the whole pod would likely follow. As explained in Appendix F, *Marine Mammal Modeling*, of the Final EIS/OEIS, the model does not operate on the basis of an individual animal but quantifies the exposures NMFS may classify as takes based on the summation of fractional marine mammal densities. Because the model does not consider the many mitigation measures that the Navy utilizes when it is using mid-frequency active sonar, to include mid-frequency active sonar power down and power off requirements should mammals be spotted within certain distances of the ship, if anything, it overestimates the amount of takes.

Lastly, regarding critique that there are additional datasets, including datasets not considered by NMFS and the Navy, that should have been considered and not having done so resulted in the model underestimating takes, the various data sources suggested by the commenters involve contexts that are neither applicable to the proposed action nor the sound exposures resulting from those actions. For instance, Lusseau et al. (2006) involved disturbance to a small pod of dolphins exposed to 8,500 whale-watching opportunities annually. This is nothing like the type or frequency of action that is proposed by the Navy for the MIRC Study Area. In a similar manner, the example from noise used in drive fisheries is not applicable to Navy training. Navy training involving the use of active sonar typically occurs in situations where the ships are located miles apart, the sound is intermittent, and the training does not involve surrounding the marine mammals at close proximity. Furthermore, suggestions that effects from acoustic harassment devices and acoustic deterrent devices, which are relatively continuous, high-frequency sound sources (unlike mid-frequency active sonar) and are specifically designed to exclude marine mammals from habitat, are also fundamentally different from the use of mid-frequency active sonar. Finally, reactions to airguns used in seismic research or other activities associated with the oil industry are also not applicable to mid-frequency active sonar, since the sound or noise source, its frequency, source level, and manner of use is fundamentally different.

#### **b. Mid-Frequency Active/High-Frequency Active Sonar Effects**

**Estimates:** Using the criteria specified by NMFS and the application of the Navy’s post-modeling analysis, the Navy does not estimate any mortalities or injurious effects on marine mammals as a result of exposure to mid-frequency active and high-frequency active sonar as set forth under Alternative 1. The Navy estimates 79,562 non-injurious effects on marine mammals annually as a result of exposure to mid-frequency active and high-frequency active sonar that NMFS would classify as Level B harassment under the MMPA. Of this total, 1,243 exposures represent temporary, non-injurious physiological effects resulting from the onset of TTS in the animals from exposure to mid-frequency active and high-frequency active sonar, and the remaining 78,319 exposures represent temporary, non-injurious behavioral effects. The Navy estimates that two marine mammals would be exposed to sound levels that could cause PTS. Regarding use of mid-frequency active and high-frequency active sonar under the selected alternative, Navy is seeking authorization from NMFS for 79,562 annual MMPA Level B incidental harassment takes and two annual MMPA Level A takes.

While the Navy’s modeling of mid-frequency active and high-frequency active sonar estimated two Level A takes tied to the onset of PTS, no mid-frequency active sonar exposures are expected to result in any marine mammal mortalities. It is highly unlikely that a marine

mammal would experience any longterm effects because the large Mariana Islands Range Complex training areas makes individual marine mammals' repeated or prolonged exposures to high-level sonar signals unlikely. The number of exposures that exceed the PTS threshold and result in Level A harassment from sonar is two for two species, one sperm whale and one pantropical spotted dolphin. However, these estimates do not take into consideration either the mitigation measures or the likely avoidance behaviors of some of the animals exposed. Under the MMPA rulemaking, NMFS recognized that many marine mammals would deliberately avoid exposing themselves to the received levels necessary to induce injury (i.e., approaching to within approximately 10 meters of the source) by moving away from or at least modifying their path to avoid a close approach. Additionally, in the unlikely event that an animal approaches the sonar vessel at a close distance, NMFS believes that the mitigation measures (i.e., shutdown/powerdown zones for mid-frequency active sonar and high-frequency active sonar) further ensure that animals would not be exposed to injurious levels of sound. As discussed below, the Navy utilizes both aerial (when available) and passive acoustic monitoring (during all anti-submarine warfare exercises) in addition to watchstanders on vessels to detect marine mammals for mitigation implementation. With the mitigation, NMFS does not believe that any marine mammals will incur PTS from exposure to mid-frequency active sonar and high-frequency active sonar.

Therefore, long-term effects on individuals, populations or stocks are unlikely. However, to allow for scientific uncertainty regarding the strandings of beaked whales, including the causal effects, the Navy requested authorization for take, by mortality, of the beaked whale species present in the Mariana Islands Range Complex notwithstanding the decades-long history of these same training and RDT&E activities with the same basic equipment having never been associated with a marine mammal stranding event in the range complex. As a conservative approach, the Navy requested a take by mortality for any ten beaked whales of the Ziphiidae family. In addition to the Navy's request for an incidental take authorization under the MMPA for the proposed action, the Navy completed consultation with NMFS under Section 7 of the Endangered Species Act (ESA). NMFS issued a Biological Opinion on June 28, 2010. In that Biological Opinion, NMFS concluded that the Navy's proposed activities are not likely to jeopardize the continued existence of the listed marine mammals in the Mariana Islands Range Complex.

**c. Explosive Effects Analysis:** The approach to risk assessment for impulsive sound in the water was derived from the analysis of effects associated with the USS WINSTON S. CHURCHILL (DDG 81) and USS SEAWOLF (SSN 21) ship shock trials. The CHURCHILL ship shock trial used three criteria for analysis of potential exposure effects: eardrum rupture (i.e., tympanic-membrane [TM] rupture), onset of extensive lung injury, and onset of slight lung injury. The threshold for TM rupture corresponds to a 50-percent rate of rupture (i.e., 50 percent of the animals exposed to the level are expected to suffer TM); this is stated in terms of a SEL value of 1.17 inch pounds per square inch (in-lb/in<sup>2</sup> or about 205 decibel referenced to 1 micropascal squared-second [dB re 1  $\mu$ Pa<sup>2</sup>-s]). This recognizes that TM rupture is not necessarily a serious or life-threatening injury, but it is a useful index of possible injury that is well correlated with measures of permanent hearing impairment.

The criterion for mortality is the onset of extensive lung injury. For small mammals, the threshold is given in terms of the Goertner modified positive impulse indexed to 30.5 pounds per



square inch-millisecond (psi-ms). For medium and large mammals, the threshold is 73.9 psi-ms and 111.7 psi-ms, respectively.

The effects of an underwater explosion on marine mammals are dependent on several factors, including the size, type, and depth of both the animal and the explosive charge; the depth of the water column; and the standoff distance between the explosive charge and the animal, as well as the sound propagation properties of the environment. Impacts to marine species are a result of physiological responses (generally the destruction of tissues at air-fluid interfaces) to both the type and strength of the acoustic signature and shock wave generated by an underwater explosion. Behavioral impacts are also expected, though the type and severity of these effects are more difficult to define due to limited studies addressing the behavioral effects of explosives on marine mammals and other aquatic species. Potential effects can range from brief acoustic effects (such as behavioral disturbance), tactile perception, physical discomfort, slight injury of the internal organs and the auditory system, to death of the animal. Nonlethal injury includes slight injury to internal organs and the auditory system; however, delayed lethality may be a result of individual or cumulative sublethal injuries. Immediate lethal injury would be a result of massive combined trauma to internal organs as a direct result of close proximity to the point of detonation.

#### **(1) Summary of 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 USS SEAWOLF Submarine Shock Test Final EIS, and subsequently used in the USS WINSTON S. CHURCHILL Ship Shock Final EIS and the Atlantic Fleet Active Sonar Training Final EIS/OEIS. NMFS adopted these criteria and thresholds in its final rule on unintentional taking of marine animals occurring incidental to the shock testing. 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. Navy policy is to use a 23 psi criterion for explosive charges less than 2,000 pounds (909 kilograms) and the 12 psi criterion for explosive charges larger than 2,000 pounds (909 kilograms). All explosives modeled for the MIRC EIS/OEIS are less than 1,500 pounds (682 kilograms).

#### **(2) Thresholds and Criteria for Injurious Explosive Physiological**

**Effects:** For injury, the analysis uses dual criteria: eardrum rupture (i.e., 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% rate of rupture (i.e., fifty percent [50%] of animals exposed to the level are expected to suffer TM rupture); this is stated in terms of an SEL value of 1.17 inch pounds per square inch (about 205 dB re 1  $\mu\text{Pa}^2\text{-s}$ ).

The threshold for onset of slight lung injury is calculated for a small animal (a dolphin calf weighing 26.9 pounds [12.2 kilograms]) and is given in terms of the “Goertner modified positive impulse,” indexed to 13 psi-millisecond (ms). The criterion with the largest potential exposure range (most conservative), either TM rupture (energy threshold) or onset of slight lung injury (peak pressure threshold), was used in the analysis to determine injurious physiological exposures.



For mortality, the analysis uses the criterion corresponding to the onset of extensive lung injury. For small animals, the threshold is given in terms of the Goertner modified positive impulse, indexed to 30.5 psi-ms.

### **(3) Thresholds and Criteria for Non-Injurious Explosive**

**Physiological Effects:** The criterion for non-injurious harassment is Temporary Threshold Shift (TTS) (a slight, recoverable loss of hearing sensitivity). For this assessment, there are dual thresholds for TTS, an energy threshold and a peak pressure threshold. The first threshold is a 182 dB re 1  $\mu\text{Pa}^2\text{-s}$  maximum SEL in any 1/3 octave band at frequencies above 100 Hertz (Hz) for toothed whales/sea turtles and in any 1/3-octave band above 10 Hz for baleen whales. The second threshold is stated in terms of peak pressure at 23 psi (about 225 dB referenced to 1 microPascal [dB re 1  $\mu\text{Pa}$ ]). The criterion with the largest potential exposure range (most conservative), either the energy threshold or peak pressure threshold, was used in the analysis to determine noninjurious physiological (i.e., TTS) exposures.

### **(4) Thresholds and Criteria for Behavioral Effects – Multiple**

**Explosions:** Because multiple explosions would occur within a discrete time period, an 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 behavioral disturbance threshold for tones is derived from the Space and Naval Warfare Systems Center pure-tone tests for TTS and is found to be 5 decibels (dB) below the threshold for TTS, or 177 dB re 1  $\mu\text{Pa}^2\text{-s}$  maximum SEL 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.

## **d. Summary of Impacts for Marine Mammals:**

**(1) Endangered Species Act (ESA) Conclusions:** The Navy analyzed the potential effects of vessel movements, aircraft overflights, active sonar, weapons firing/ordnance use, use of explosive ordnance, and expended materials and determined that these activities may affect the five ESA-listed marine mammals (blue whale [*Balaenoptera musculus*], fin whale [*Balaenoptera physalus*], humpback whale [*Megaptera novaeangliae*], sei whale [*Balaenoptera borealis*], and sperm whale [*Physeter macrocephalus*]) considered in the Final EIS/OEIS. There are no designated critical habitats for marine mammals in the MIRC; therefore, critical habitat designations for ESA-listed marine mammals will not be affected.

NMFS has determined that the issuance of 5-year regulations and subsequent Letters of Authorization for Navy training exercises in the MIRC would not have an unmitigable adverse impact on the availability of the affected species or stocks for subsistence use.

Pursuant to Section 7 of the ESA, the Navy has consulted with NMFS on this action. NMFS has also consulted internally on the issuance of regulations under section 101(a)(5)(A) of the MMPA for this activity. In a Biological Opinion, NMFS concluded that the Navy's activities in the MIRC and NMFS' issuance of these regulations are not likely to jeopardize the continued existence of threatened or endangered species or destroy or adversely modify any designated critical habitat.

NMFS will also issue Biological Opinions and associated Incidental Take Statements to exempt the take (under the ESA) that NMFS authorizes in the Letters of Authorization under the MMPA. The Incidental Take Statements issued for each Letter of Authorization will contain implementing terms and conditions to minimize the effect of the marine mammal take authorized through the 2010 Letter of Authorization (and subsequent Letters of Authorization in 2011, 2012, 2013, and 2014). With respect to listed marine mammals, the terms and conditions of the Incidental Take Statements will be incorporated into the Letters of Authorization.

**i. Marine Mammal Protection Act Conclusions:** The analyses conducted by the Navy indicate non-ESA listed marine mammals could be exposed to impacts associated with active sonar, underwater detonations, and explosive ordnance use under the Preferred Alternative that could result in Level A or Level B harassment as defined by MMPA provisions that are applicable to the Navy. Two potential Level A exposures resulted from the summation of mid-frequency active modeling, which includes analysis of Portable Underwater Tracking Range and seasonal occurrence of humpback whales within the MIRC. One Level A exposure is estimated for the pantropical spotted dolphin and one for the sperm whale (ESA-listed species). Modeling results for all waters (territorial and non-territorial) indicate potentially 79,562 Level B harassments (78,319 from non-TTS and 1,243 from TTS). Other nonacoustic stressors associated with the Preferred Alternative are not expected to result in Level A or Level B harassment. For underwater detonations and explosive ordnance, modeling results for all waters (territorial and non-territorial) indicate potentially 151 Level B harassments (109 from sub-TTS and 42 from TTS), which includes analyses for Joint Direct Attack Munitions and HELLFIRE use within the MIRC. No Level A exposures are anticipated.

Evidence from five beaked whale strandings, all of which have taken place outside the MIRC Study Area, and have occurred over approximately a decade, suggests that the exposure of beaked whales to mid-frequency active sonar in the presence of five conditions in the aggregate (e.g., multiple units using active sonar, steep bathymetry, constricted channels, strong surface ducts, etc.) may result in strandings, potentially leading to mortality. Although these physical factors believed to have contributed to the likelihood of beaked whale strandings are not present, in their aggregate, in the MIRC Study Area, scientific uncertainty exists regarding what other factors, or combination of factors, may contribute to beaked whale strandings. Accordingly, to allow for scientific uncertainty regarding contributing causes of beaked whale strandings and the exact behavioral or physiological mechanisms that can lead to the ultimate physical effects (stranding and/or death), NMFS is authorizing take, by injury or mortality, of ten beaked whales over the course of the 5-yr regulations.

Overall, the conclusions in this analysis find that impacts to marine mammal species and stocks would be negligible for the following reasons:

Most acoustic harassments are within the noninjurious TTS or behavioral effects zones (Level B harassment). Two exposures to sound levels causing PTS/injury (Level A harassment) resulted from the summation of the modeling under the Preferred Alternative and consideration of Portable Underwater Tracking Range placement scenarios; however, these exposures are not expected to occur.

Although modeling results contained in the Final EIS/OEIS represent estimated harassment under the MMPA for the Preferred Alternative, they are conservative estimates of harassment, primarily by behavioral disturbance. In addition, the model calculates harassment without taking into consideration standard mitigation measures, and is not indicative of a likelihood of either injury or harm.

To allow for more flexibility in training exercises, NMFS has added language bounding the flexibility in annual variation of potential take of individual marine mammal species into the regulatory text. The new language indicates that modeled annual takes (which must be provided with the annual Letter of Authorization application) of any individual species may vary but will not ultimately exceed the indicated 5-year total for that species by more than 10% and will not exceed the indicated annual total by more than 25% in any given year; and that modeled total yearly take of all species combined may vary but will not exceed the combined amount indicated in any given year by more than 10%. NMFS has considered these limitations in their negligible impact determination and the findings described in the proposed rule remain applicable.

**2. Sea Turtles:** The five sea turtle species included in this analysis include the green (*Chelonia myardas*), hawksbill (*Eretmochelys imbricata*), leatherback (*Dermochelys coriacea*), olive ridley (*Lepidochelys olivacea*), and loggerhead turtle (*Caretta caretta*). There is a potential for increased short-term behavioral reactions under the Preferred Alternative. The Navy concluded that additional aircraft overflights, active sonar use, weapons firing, Extended Echo Ranging/Improved Extended Echo Ranging (EER/IEER) buoys, and increased amphibious landing activities may affect ESA-listed sea turtles in the nearshore marine environment and nesting habitats under the Preferred Alternative. Therefore, the Navy completed Section 7 ESA consultation with NMFS and U.S. Fish and Wildlife Service (USFWS).

Based on the analyses included in the Final EIS/OEIS, potential impacts associated with the Preferred Alternative may affect ESA-listed sea turtles within the MIRC. Administration of ESA obligations associated with sea turtles are shared between NMFS and USFWS, depending on life stage and specific location of the sea turtle. NMFS generally has jurisdiction over sea turtles in the marine environment and USFWS jurisdiction is generally applied over nesting activities. The Navy has consulted with NMFS and USFWS regarding its determination of effect for federally listed sea turtles associated with potential impacts of Alternative 1 (Preferred Alternative).

NMFS has determined that the issuance of 5-year regulations and subsequent Letter of Authorization for Navy training exercises in the MIRC would not have an unmitigable adverse impact on the availability of the affected species or stocks for subsistence use. There are two sea turtle species that are listed as endangered under the ESA with confirmed or possible occurrence in the study area: hawksbill sea turtle and leatherback sea turtle. An additional three species of sea turtles are also listed as threatened under the ESA: green sea turtle, loggerhead sea turtle, and olive ridley sea turtle.

In a Biological Opinion, NMFS concluded that the Navy's activities in the MIRC and NMFS' issuance of these regulations are not likely to jeopardize the continued existence of threatened or endangered species or destroy or adversely modify any designated critical habitat.

Through formal consultation, the USFWS concurred with the Navy's determination that the Preferred Alternative is likely to affect, but not likely to adversely affect, the green sea turtle or the hawksbill sea turtle based upon the conservation measures that will be implemented to avoid adults, nests, and hatchlings and to prevent impacts to their nesting habitats.

**3. Fish and Essential Fish Habitat:** Potential impacts from training and RDT&E activities on fish have been analyzed, and no significant short- or long-term impacts are expected. There are no ESA-listed fish, marine invertebrate, or marine plant species within the MIRC. The potential effects on fish from mid-frequency active and high-frequency active sonar used during anti-submarine warfare exercises will be negligible. It is reasonable to conclude that there will be few, and more likely no, impacts on the behavior of fish. Potential impacts on fish from underwater detonations would be negligible. A small number of fish are expected to be injured by detonation of explosives, and some fish located in proximity to the initial detonations can be expected to die. However, the overall impacts on water column habitat would be localized and transient. Potential impacts on fish and EFH from training and RDT&E activities have been analyzed and it was concluded that those effects would be minimal and temporary. The Navy determined there would be no adverse effects on essential fish habitat because potential impacts to essential fish habitat and fish/managed species would be temporary and/or minimal and would not reduce the quality and/or quantity of essential fish habitat in the Study Area. NOAA Fisheries (Hawaii Office) provided six EFH conservation recommendations for the MIRC. Per Section 305(b)(4)(B) of the Magnuson-Steven Fishery Conservation and Management Act, the Navy provided a written response to NOAA's letter within 30 days of receipt indicating that the conservation measures would be implemented to the fullest extent practicable.

**4. Seabirds and Shorebirds:** All seabird and shorebird species found within the Mariana Islands are protected under the Migratory Bird Treaty Act. At least 18 seabird and shorebird species are known to breed within the MIRC Study Area; of these, 11 seabird and shorebird species are known to breed on military owned or leased lands. Farallon de Medinilla is one of two locations where breeding occurs for the great frigatebird within the Mariana Islands, and the largest nesting location for the masked booby in the Mariana and Caroline Islands. Some of the seabird and shorebird species within the MIRC are further protected by the ESA. The short-tailed albatross (*Phoebastria albatrus*) and Hawaiian petrel (*Pterodroma sandwichensis*) are listed as endangered under the ESA, and the Newell's shearwater (*Puffinus auricularis newellii*) is listed as threatened under the ESA. The Navy analyzed various potential environmental stressors for seabirds, which included analyses for vessel movements, aircraft overflights, amphibious landings and over-the-beach training, explosive ordnance use at sea and on Farallon de Medinilla, and activities resulting in expending materials into the environment.

In accordance with the ESA, the Navy has concluded that the implementation of the Proposed Action would not affect ESA-listed seabird species.

In accordance with the Migratory Bird Treaty Act and the final rule authorizing the DoD to take migratory birds during military readiness activities (50 CFR Part 21 effective on February 28, 2007), the Navy has concluded that the proposed activities will not adversely affect any 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 migratory bird species to maintain genetic diversity, to reproduce, and to function effectively in its native ecosystem. The

Navy reached this conclusion based on seabird monitoring studies at Farallon de Medinilla showing population fluctuations but no discernable decline. The rookery locations on Farallon de Medinilla for the great frigatebird and masked booby are not targeted areas and these species have not shown declines in nesting activity despite intensive use of Farallon de Medinilla as a live fire range.

**5. Terrestrial Species and Habitats:** The Navy analyzed various potential environmental stressors for terrestrial biological resources that may potentially degrade habitats or affect biodiversity. Individual species considered in the analysis included three plant species (*Serianthes nelsonii*, *Osmoxylon mariannense*, and *Nesogenes rotensis*), two sea turtle species (green sea turtle and hawksbill turtle), eight bird species (Nightingale reed warbler, Mariana swiftlet, Mariana crow, Mariana common moorhen, Guam Micronesian kingfisher, Guam rail, Micronesian megapode, and Rota bridled white-eye), and one mammalian species (Mariana fruit bat).

The Navy completed Section 7 ESA consultation with USFWS, resulting in a conclusion that the proposed training within land-based areas of the MIRC would likely adversely affect but not likely jeopardize the continued existence of the Mariana Crow, Mariana Fruit Bat, and Micronesian megapode. As stated in the Biological Opinion (BO), USFWS believes that no more than 5 pairs or 10 individuals over 5 years will be killed as a result of the proposed action and no more than 46 individuals over five years will be harmed and harassed from the use of rodenticide for conservation measures. The incidental take statement from the ISR Strike BO for the Mariana crow and Mariana fruit bat is incorporated into the MIRC BO by reference; therefore, no additional take of the Mariana crow or the Mariana fruit bat is authorized under the MIRC. All other ESA-listed species considered in the analyses would either have “No Effect” or “May Affect, Not Likely to Adversely Affect” if the Preferred Alternative is implemented. Critical habitat has been designated on Guam for the Mariana fruit bat, Mariana crow, and the Guam Micronesian kingfisher; and on Rota for the Mariana crow and Rota bridled-white-eye. None of the designated critical habitats would be affected by the Preferred Alternative.

**6. Cultural Resources:** Based on consultations with the Guam State Historic Preservation Officer, CNMI Historic Preservation Officer, Advisory Council on Historic Preservation, and the National Park Service, a new Programmatic Agreement was negotiated for all military training activities proposed under the Preferred Alternative. Upgrades of training facilities could affect cultural resources; however, per the negotiated Programmatic Agreement they will be conducted in such a manner as to avoid or minimize harm to cultural resources. If avoidance is not possible, consultation with the appropriate Historic Preservation Officer would be initiated and any adverse effect to cultural resources would be resolved prior to upgrading existing training facilities.

A new Programmatic Agreement that stipulates avoidance strategies and protective measures to reduce and minimize significant effects on sensitive areas has been signed and executed. The execution of the Programmatic Agreement concluded the Section 106 process under the National Historic Preservation Act.



**MITIGATION MEASURES:** The Navy will implement the mitigation measures required as described in the Final EIS/OEIS, the MMPA 5-year Rule and yearly Letters of Authorization, and the ESA Biological Opinions. Those mitigations are summarized below. As discussed below in the section addressing compliance with environmental laws, NMFS has provided for an adaptive management regime under the MMPA and ESA authorizations for these activities. Should any mitigation measure(s) be modified through this adaptive management process, the Navy will apply the modified measure(s) consistent with the requirements in the relevant annual MMPA Letters of Authorization and/or ESA Incidental Take Statements.

**1. Standard Operating Procedures (General Maritime Measures):** The mitigation measures presented below are implemented by Navy personnel on a regular and routine basis. These are routine measures and are considered “Standard Operating Procedures.” The use of shipboard lookouts is a critical component of all Navy Standard Operating Procedures. Navy shipboard lookouts (also referred to as “watchstanders”) are highly qualified and experienced observers of the marine environment. Their duties require that they report all objects sighted in the water to the Officer of the Deck (e.g., trash, a periscope, marine mammals, sea turtles) and all disturbances (e.g., surface disturbance, discoloration) that may be indicative of a threat to the vessel and its crew. There are personnel serving as lookouts on station at all times (day and night) when a ship or surfaced submarine is moving through the water.

All Commanding Officers, Executive Officers, lookouts, Officers of the Deck, Junior Officers of the Deck, maritime patrol aircraft aircrews, and anti-submarine warfare helicopter crews complete the NMFS-approved Marine Species Awareness Training by viewing the U.S. Navy Marine Species Awareness Training digital versatile disk (DVD). Marine Species Awareness Training may also be viewed on-line by naval personnel. Navy lookouts will undertake extensive training in order to qualify as a watchstander in accordance with the Lookout Training Handbook (Naval Education and Training Command 12968-D).

Lookout training will include on-the-job instruction under the supervision of a qualified, experienced lookout. Following successful completion of this supervised training period, lookouts will complete the Personal Qualification Standard Program, certifying that they have demonstrated the necessary skills (such as detection and reporting of partially submerged objects). Personnel being trained as lookouts can be counted among the number of lookouts required by a particular mitigation measures as long as supervisors monitor their progress and performance.

Lookouts will be trained in the most effective means to ensure quick and effective communication within the command structure in order to facilitate implementation of mitigation measures if marine species are spotted. All lookouts onboard platforms involved in anti-submarine warfare training events will review the NMFS-approved Marine Species Awareness Training material prior to use of mid-frequency active sonar. All Commanding Officers, Executive Officers and officers standing watch on the bridge will have reviewed the Marine Species Awareness Training material prior to a training event employing the use of mid-frequency active/high-frequency active sonar.

## **2. Operating Procedures & Collision Avoidance (For All Training Types):**

As indicated in Chapter 5 of the FEIS, Navy biologists monitor beaches during landing exercises. Beach masters ensure the safety of both the craft and marine/terrestrial animals.

Prior to major exercises, a Letter of Instruction, Mitigation Measures Message or Environmental Annex to the Operational Order will be issued prior to the exercise to further disseminate the personnel training requirement and general marine mammal mitigation measures.

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

While underway, surface vessels will have at least two lookouts with binoculars; surfaced submarines will have at least one lookout with binoculars. Lookouts already posted for safety of navigation and man-overboard precautions may be used to fill this requirement. As part of their regular duties, lookouts will watch for and report to the Officer of the Deck the presence of marine mammals and sea turtles.

On surface vessels equipped with a multi-function active sensor, pedestal mounted “Big Eye” (20x110) binoculars will be properly installed and in good working order to assist in the detection of marine mammals and sea turtles in the vicinity of the vessel.

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

While in transit, naval vessels will be alert at all times, use extreme caution, and proceed at a “safe speed”, which means the speed at which Commanding Officer can maintain crew safety and effectiveness of current operational directives, so that the vessel can take action to avoid a collision with any marine mammal.

When marine mammals have been sighted in the area, Navy vessels will increase vigilance and take reasonable and practicable actions to avoid collisions and activities that might result in close interaction of naval assets and marine mammals. Actions may include changing speed and/or direction and are dictated by environmental and other conditions (e.g., safety, weather).

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

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

### **3. Measures for Specific Training Events**

#### **a. Mid-Frequency Active Sonar Operations/Operating Procedures (for all Submarine Warfare Operations)**

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

All surface ships participating in anti-submarine warfare training events will, in addition to the three personnel on watch noted previously, have at all times during the exercise at least two additional personnel on watch as marine mammal lookouts.

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

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

During mid-frequency active sonar operations, personnel will utilize all available sensor and optical systems (such as night vision goggles) to aid in the detection of marine mammals.

Aircraft with deployed sonobuoys will use only the passive capability of sonobuoys when marine mammals are detected within 200 yards (183 meters) of the sonobuoy.

Helicopters shall observe/survey the vicinity of an anti-submarine warfare exercise for minutes before the first deployment of active (dipping) sonar in the water.

Helicopters shall not dip their sonar within 200 yards (183 meters) of a marine mammal and shall cease pinging if a marine mammal closes within 200 yards (183 meters) after pinging has begun.

**Safety Zones** — When marine mammals are detected by any means (aircraft, shipboard lookout, or acoustically) within 1,000 yards (914 meters) of the sonar dome (the bow), the ship or submarine will limit active transmission levels to at least 6 decibels (dB) below normal operating levels

Ships and submarines will continue to limit maximum mid-frequency active transmission levels by this 6-dB factor until the marine mammal has been seen to leave the 1,000 yard (914 meter) safety zone, has not been detected for 30 minutes, or the vessel has transited more than 2,000 yards (1,829 meters) beyond the location of the last detection.

Should a marine mammal be detected within 500 yards (457 meters) of the sonar dome, active transmissions will be limited to at least 10 dB below the equipment's normal operating level (i.e., limit to at most 225 dB for AN/SQS-53 and 215 for AN/SQS-56, etc.). Ships and submarines will continue to limit maximum ping levels by this 10-dB factor until the marine

mammal has been seen to leave the 500 yard (457 meter) safety zone, has not been detected for 30 minutes, or the vessel has transited more than 2,000 yards (1,829 meters) beyond the location of the last detection.

Should the marine mammal be detected within 200 yards (183 meters) of the sonar dome, active sonar transmissions will cease. Active sonar will not resume until the animal has been seen to leave the 200 yard (183 meter) safety zone, has not been detected for 30 minutes, or the vessel has transited more than 2,000 yards (1,829 meters) beyond the location of the last detection.

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

If the need for power-down should arise (as detailed in "Safety Zones" above), when operating a hull-mounted or sub-mounted source above 235 dB (infrequent), the Navy shall follow the requirements as though they were operating at 235 dB (i.e., the first power-down will be to 229 dB).

Active sonar levels (generally) — Navy shall operate active sonar at the lowest practicable level, not to exceed 235 dB, except as required to meet tactical training objectives.

Submarine sonar operators will review detection indicators of close-aboard marine mammals prior to the commencement of anti-submarine warfare events involving mid-frequency active sonar.

**b. Surface-to-Surface Gunnery (up to 5-inch explosive rounds)**

For exercises using targets towed by a vessel, target-towing vessels shall maintain a trained lookout for marine mammals and sea turtles when feasible. If a marine mammal or sea turtle is sighted in the vicinity, the tow vessel will immediately notify the firing vessel, which will suspend the exercise until the area is clear.

A 600 yard (549 meter) radius buffer zone will be established around the intended target.

From the intended firing position, trained lookouts will survey the buffer zone for marine mammals and sea turtles prior to commencement and during the exercise as long as practicable. Due to the distance between the firing position and the buffer zone, lookouts are only expected to visually detect breaching whales, whale blows, and large pods of dolphins and porpoises.

The exercise will be conducted only when the buffer zone is visible and marine mammals and sea turtles are not detected within it.

**c. Surface-to-Surface Gunnery (non-explosive rounds)**

A 200 yard (183 meter) radius buffer zone will be established around the intended target.

From the intended firing position, trained lookouts will survey the buffer zone for marine mammals and sea turtles prior to commencement and during the exercise as long as practicable.

If available, target towing vessels will maintain a lookout (unmanned towing vessels will not have a lookout available). If a marine mammal or sea turtle is sighted in the vicinity of the exercise, the tow vessel will immediately notify the firing vessel in order to secure gunnery firing until the area is clear.

The exercise will be conducted only when the buffer zone is visible and marine mammals and sea turtles are not detected within it.

**d. Surface-to-Air Gunnery (explosive and non-explosive rounds)**

Vessels will orient the geometry of gunnery exercises in order to prevent debris from falling in the area of sighted marine mammals.

Vessels will attempt to recover any parachute deploying aerial targets to the extent practicable (and their parachutes if feasible) to reduce the potential for entanglement of marine mammals and sea turtles.

Target towing vessels shall maintain a lookout if feasible. If a marine mammal or sea turtle is sighted in the vicinity of the exercise, the tow vessel will immediately notify the firing vessel in order to secure gunnery firing until the area is clear.

**e. Air-to-Surface Gunnery (explosive and non-explosive rounds)**

A 200 yard (183 meter) radius buffer zone will be established around the intended target.

If surface vessels are involved, lookout(s) will visually survey the buffer zone for marine mammals and sea turtles prior to and during the exercise.

Aerial surveillance of the buffer zone for marine mammals and sea turtles will be conducted prior to commencement of the exercise. Aerial surveillance altitude of 500 to 1,500 feet (152 to 457 meters) is optimum. Aircraft crew/pilot will maintain visual watch during exercises. Release of ordnance through cloud cover is prohibited; aircraft must be able to actually see ordnance impact areas.

The exercise will be conducted only if marine mammals and sea turtles are not visible within the buffer zone.

**f. Air-to-Surface At-Sea Bombing Exercises (explosive and non-explosive bombs and rockets)**

If surface vessels are involved, trained lookouts shall survey for marine mammals. Ordnance shall not be targeted to impact within 1,000 yards (914 meters) of known or observed marine mammals or sea turtles.



A buffer zone of 1,000 yard (914 meter) radius will be established around the intended target.

Aircraft shall visually survey the target and buffer zone for marine mammals prior to and during the exercise. The survey of the impact area will be made by flying at 1,500 feet (457 meters) or lower, if safe to do so, and at the slowest safe speed. When safety or other considerations require the release of weapons without the releasing pilot having visual sight of the target area, a second aircraft, the “wingman,” will clear the target area and perform the clearance and observation functions required before the dropping plane may release its weapons. Both planes must have direct communication to assure immediate notification to the dropping plane that the target area may have been fouled by encroaching animals or people. The clearing aircraft will assure it has visual site of the target area at a maximum height of 1,500 feet. The clearing plane will remain within visual sight of the target until required to clear the area for safety reasons. Survey aircraft should employ most effective search tactics and capabilities.

The exercise will be conducted only if marine mammals and sea turtles are not visible within the buffer zone.

**g. Small Arms Training (grenades, explosive and non-explosive rounds)**

Lookouts will visually survey for marine mammals and sea turtles. Weapons will not be fired in the direction of known or observed marine mammals or sea turtles.

**h. Air-to-Surface Missile Exercises (explosive and non-explosive)**

Aircraft will visually survey the target area for marine mammals and sea turtles. Visual inspection of the target area will be made by flying at 1,500 feet (457 meters) or lower, if safe to do so, and at slowest safe speed. Firing or range clearance aircraft must be able to actually see ordnance impact areas.

Explosive ordnance shall not be targeted to impact within 1,800 yards (1,646 meters) of sighted marine mammals or sea turtles.

**i. Underwater Detonations (up to 10 lb [5 kilogram] charges)**

**(1) Exclusion Zones:** all demolitions and ship mine countermeasures training activities involving the use of explosive charges must include exclusion zone for marine mammals and sea turtles to prevent physical and/or acoustic effects to those species. These exclusion zones for demolitions and ship mine countermeasures shall extend in a 700 yard (640 meter) arc radius around the detonation site. Should a marine mammal or sea turtles be present within the surveillance area, the explosive event shall not be started until the animal leaves the area.

**(2) Pre-exercise Survey:** for demolition and ship mine countermeasures operations, pre-exercise surveys shall be conducted within 30 minutes prior to the commencement of the scheduled explosive event. The survey may be conducted from the surface, by divers, and/or from the air, and personnel shall be alert to the presence of any marine mammal or sea turtle. Should such an animal be present within the exclusion area, the explosive

event shall be paused until the animal voluntarily leaves the area. The Navy will ensure the exclusion area is clear of marine mammals and sea turtles for a full 30 minutes prior to initiating the explosive event. Personnel will record any marine mammal observations during the exercise as well as measures taken if species are detected within the exclusion zone.

**(3) Post-Exercise Surveys and Reporting:** Surveys within the same radius shall also be conducted within 30 minutes after the completion of the explosive event. If there is evidence that a marine mammal may have been stranded, injured or killed by the action, Navy training activities shall be immediately suspended and the situation immediately reported by the participating unit to the Officer in Charge of the Exercise, who will follow Navy procedures for reporting the incident to Commander, Pacific Fleet, the Environmental Director, and the chain-of-command. The situation shall also be reported to NMFS. The Stranding Plan contains details for reporting to NMFS.

**j. Aircraft Training Activities Involving Non-Explosive Devices:** Non-explosive devices such as some sonobuoys, inert bombs, and mining training activities involve aerial drops of devices that have the potential to hit marine mammals and sea turtles if they are in the immediate vicinity of a floating target. The exclusion zone, as established above for each non-explosive exercise type and if not-defined above, the minimum exclusion zone is 200 yards (183 meters), shall be clear of marine mammals and sea turtles around the target location. Pre- and post- surveillance and reporting requirements outline for underwater detonations shall be implemented during mining training activities.

**k. Sinking Exercise:** The Marine Protection, Research and Sanctuaries Act authorization for Sinking Exercise targets (40 CFR § 229.2), requires that the targets be sunk in waters which are at least 2,000 yards (1,829 meters) deep and at least 50 nautical miles (93 kilometers) from land.

The Navy has developed range clearance procedures to maximize the probability of sighting any ships or protected species in the vicinity of an exercise.

All weapons firing would be conducted during the period one hour after official sunrise to 30 minutes before official sunset.

Extensive range clearance operations would be conducted in the hours prior to commencement of the exercise, ensuring that no shipping is located within the hazard range of the longest-range weapon being fired for that event.

An exclusion zone with a radius of 1.0 nautical mile (1.9 kilometers) would be established around each target. An additional buffer of 0.5 nautical miles (0.9 kilometers), would be added to account for errors, target drift, and animal movements. Additionally, a safety zone, which would extend beyond the buffer zone by an additional 0.5 nautical miles (0.9 kilometers), would be surveyed. Together the zones extend out 2.0 nautical miles (3.7 kilometers) from the target.

A series of surveillance over-flights would be conducted within the exclusion and the safety zones, prior to and during the exercise, when feasible. Survey protocol would be as follows:

Overflights within the exclusion zone would be conducted in a manner that optimizes the surface area of the water observed. This may be accomplished through the use of the Navy's Search and Rescue Tactical Aid, which provides the best search altitude, ground speed, and track spacing for the discovery of small, possibly dark objects in the water based on the environmental conditions of the day. These environmental conditions include the angle of sun inclination, amount of daylight, cloud cover, visibility, and sea state.

All visual surveillance activities shall be conducted by Navy personnel trained in visual surveillance. At least one member of the mitigation team will have completed the Navy's marine mammal training program for lookouts.

In addition to the overflights, the exclusion zone would be monitored by passive acoustic means, when assets are available. This passive acoustic monitoring would be maintained throughout the exercise. Additionally, passive sonar onboard submarines may be utilized to detect any vocalizing marine mammals in the area. The Officer Conducting the Exercise (Officer in Charge of the Exercise) would be informed of any aural detection of marine mammals and would include this information in the determination of when it is safe to commence the exercise.

On each day of the exercise, aerial surveillance of the exclusion and safety zones would commence two hours prior to the first firing.

The results of all visual, aerial, and acoustic searches would be reported immediately to the Officer in Charge of the Exercise. No weapons launches or firing would commence until the Officer in Charge of the Exercise declares the safety and exclusion zones free of marine mammals and sea turtles.

Aerial surveillance would be conducted using helicopters or other aircraft based on necessity and availability. The Navy has several types of aircraft capable of performing this task; however, not all types are available for every exercise. For each exercise, the available asset best suited for identifying objects on and near the surface of the ocean would be used. These aircraft would be capable of flying at the slow safe speeds necessary to enable viewing of marine vertebrates with unobstructed, or minimally obstructed, downward and outward visibility. The exclusion and safety zone surveys may be cancelled in the event that a mechanical problem, emergency search and rescue, or other similar and unexpected event preempts the use of one of the aircraft onsite for the exercise.

Every attempt would be made to conduct the exercise in sea states that are ideal for marine mammal sighting, Beaufort Sea State three or less. In the event of a four or above, survey efforts would be increased within the zones. This would be accomplished through the use of an additional aircraft, if available, and conducting tight search patterns.

The exercise would not be conducted unless the exclusion zone could be adequately monitored visually. Should low cloud cover or surface visibility prevent adequate visual monitoring as described previously, the exercise would be delayed until conditions improved, and all of the above monitoring criteria could be met.

In the unlikely event that any listed species are observed to be harmed in the area, a detailed description of the animal would be taken, the location noted, and if possible, photos taken. This

information would be provided to NOAA Fisheries via the Navy's regional environmental coordinator for purposes of identification.

An after action report detailing the exercise's time line, the time the surveys commenced and terminated, amount, and types of all ordnance expended, and the results of survey efforts for each event would be submitted to NMFS.

**I. Mitigation Measures Related to Explosive Source Sonobuoys (AN/SSQ-110A)**

**(1) AN/SSQ-110A Pattern Deployment**

Crews will conduct visual reconnaissance of the drop area prior to laying their intended sonobuoy pattern. This search should be conducted below 500 yards (457 meters) at a slow speed, if operationally feasible and weather conditions permit. In dual aircraft operations, crews are allowed to conduct coordinated area clearances.

Crews shall conduct a minimum of 30 minutes of visual and aural monitoring of the search area prior to commanding the first post detonation. This 30-minute observation period may include pattern deployment time.

For any part of the briefed pattern where a post (source/receiver sonobuoy pair) will be deployed within 1,000 yards (914 meters) of observed marine mammal activity, crews will deploy the receiver ONLY and monitor while conducting a visual search. When marine mammals are no longer detected within 1,000 yards (914 meters) of the intended post position, crews will co-locate the explosive source sonobuoy (AN/SSQ-110A) with the receiver.

When operationally feasible, crews will conduct continuous visual and aural monitoring of marine mammal activity. This is to include monitoring of own-aircraft sensors from first sensor placement to checking off station and out of radio frequency (RF) of these sensors.

**(2) AN/SSQ-110A Pattern Deployment (Aural and Visual Detection)**

**i. Aural Detection:**

Aural detection of marine mammals cues the aircrew to increase the diligence of their visual surveillance.

If, following aural detection, no marine mammals are visually detected, then the crew may continue multi-static active search.

**ii. Visual Detection:**

If marine mammals are visually detected within 1,000 yards (914 meters) of the explosive source sonobuoy (AN/SSQ-110A) intended for use, then that payload shall not be detonated. Aircrews may utilize this post once the marine mammals have not been re-sighted for 30

minutes, or are observed to have moved outside the 1,000 yard (914 meter) safety buffer, whichever occurs first.

Aircrews may shift their multi-static active search to another post, where marine mammals are outside the 1,000 yard (914 meter) safety buffer.

### **(3) AN/SSQ-110A Scuttling Sonobuoys**

Aircrews shall make every attempt to manually detonate the unexploded charges at each post in the pattern prior to departing the training area by using the “Payload 1 Release” command followed by the “Payload 2 Release” command. Aircrews shall refrain from using the “Scuttle” command when two payloads remain at a given post. Aircrews will ensure that a 1,000 yard (914 meter) safety buffer, visually clear of marine mammals, is maintained around each post as is done during active search training activities.

Aircrews shall only leave posts with unexploded charges in the event of a sonobuoy malfunction, an aircraft system malfunction, or when an aircraft must immediately depart the area due to issues such as fuel constraints, inclement weather, and in-flight emergencies. In these cases, the sonobuoy will self-scuttle using the secondary or tertiary method.

Aircrews shall ensure all payloads are accounted for. Explosive source sonobuoys (AN/SSQ-110A) that cannot be scuttled shall be reported as unexploded ordnance via voice communications while airborne, then upon landing via naval message.

Mammal monitoring shall continue until out of their aircraft sensor range.

## **4. Mitigation Measures Specific to Resources (Other Than Marine Mammals and Sea Turtles)**

**a. Geology, Soils, and Bathymetry:** the following measures are current mitigation measures for activities that could impact geology and soils in the Study Area:

Locate ground-disturbing training activities on previously disturbed sites whenever possible.

Ensure that all training areas, including transit routes necessary to reach training areas, are clearly identified or marked. Restrict vehicular activities to designated/previously identified areas.

Continue to control erosion through the Site Approval Process, whereby the Navy reviews each proposed project for its erosion potential, and involves the designated installation Natural Resource Specialist in the process.

Continue to manage erosion in accordance with the applicable storm water pollution prevention plan (SWPPP) at each training location.

Prohibit off-road vehicle use except in designated off-road areas or on established trails.



Comply with existing policies and management activities to conserve soils, including requirements and restrictions outlined in the Marianas Training Handbook.

**b. Hazardous Materials:** General requirements and restrictions relating to hazardous materials and hazardous waste include:

No aircraft washing activity will occur on Tinian.

The Navy will reduce hazardous materials usage where possible. The Navy will establish hazardous materials storage facilities away from catch basins, storm drains, waterways, and forested habitats used by listed species. Liquid hazardous materials will be stored in containers or facilities with an impervious lining.

The Navy will use hazardous chemical warning labels on all hazardous materials. Material Safety Data Sheets for each hazardous material will be carried by all deploying units. The Navy will establish and use designated collection points for segregation, packaging, and labeling of hazardous wastes for disposal. This will include the segregation of hazardous waste from general refuse. No hazardous materials or substances will be allowed in trash containers or dumpsters on shore. The Navy will dispose of oily waste and bilge water at disposal facilities on Guam or Saipan.

The Navy will report spills in water and in terrestrial habitats immediately. The Navy will have available spill containment and cleanup equipment, trained spill response teams, packaging materials for hazardous materials and hazardous wastes, wherever hazardous wastes may be spilled or exposed to habitats.

Emergency fuel release may only be conducted in designated aircraft emergency fuel release areas. If designated emergency fuel release areas are unavailable, fuel may be released as directed at locations at least 12 nautical miles (22 kilometers) from any land, sea mound or island, in depths greater than or equal to 1,000 fathoms (6,000 feet) of water and at an altitude safe for flight or as directed to ensure complete evaporation of the fuel.

Ordnance may be jettisoned in designated emergency jettison areas only. If designated emergency areas are unavailable, ordnance may be jettisoned at locations at least 12 nautical miles (22 kilometers) from any land, sea mound or island, in depths greater than or equal to 1,000 fathoms (6,000 feet) of water and at an altitude safe for flight or as directed.

Collect and haul away all expended brass and lead rounds.

**c. Terrestrial Species and Habitats, Including Seabirds, Shorebirds, and Nesting Sea Turtles**

**(1) Mitigation, Conservation, and Other Standard Mitigation Measures Relating to Terrestrial Species and Habitats:** The Navy proposes to include conservation measures to minimize, avoid, or offset adverse effects associated with the proposed increase in training activities as part of the Proposed Action. The Final EIS/OEIS details the conservation measures from prior consultations within the MIRC. The mitigation measures and

conservation measures detailed in this Record of Decision are the result of the Biological Opinion issued by the USFWS.

**(2) Conservation Measures for Predators, Pests, and Plants:  
Invasive Species Management Associated with MIRC Training Activities**

*Brown Treesnake Interdiction and Control:* Per Public Law 110-417, [Division A], title III, Section 316, October 14, 2008, 122 Statute 4410 and per DoD Defense Transportation Regulations, Chapter 505 protocols, the Navy will commit to implementing 100 percent inspection of all outgoing cargo vessels and aircraft with trained quarantine officers and dog detection teams, which could be supplemented by other pest control expertise (with appropriate U.S. Department of Agriculture Wildlife Services brown treesnake detection training and oversight) to meet 100 percent inspection goals for large scale training activities. As a stakeholder, the USFWS would have input on the Navy protocols for implementing brown treesnake interdiction and control strategies. The Navy will work cooperatively with USFWS and U.S. Department of Agriculture to seek information in development of protocols for implementation of interdiction and control methods aimed at controlling brown treesnake as related to training activities within the MIRC action area. On an as needed basis, the USFWS, U.S. Department of Agriculture, and Navy may request meetings to discuss interdiction and control method protocols as related to military training in the MIRC.

In the event military units, vehicles, and equipment accidentally leave Guam without inspection, as soon as possible, the DoD will notify their inspection contractor and the point of destination port or airport authorities and work with the destination port to resolve the issue.

In addition, the Navy will route inbound personnel and cargo for tactical approach exercises (that require an uninterrupted flow of events) directly to CNMI training locations to avoid Guam seaports and airfields. If Guam cannot be avoided, the Navy in cooperation with the U.S. Department of Agriculture and USFWS will identify and implement appropriate interdiction methods that may include redundant inspections or other interdiction methods as agreed to by the USFWS, U.S. Department of Agriculture, and the Navy. Additionally, tactical approach exercises will involve only cargo equipment that has not originated from areas containing a brown treesnake population or will be 100 percent inspected by certified brown treesnake canine programs. If the U.S. Department of Agriculture develops performance standards for this activity, the Navy will adopt those standards, provided they are compatible with military mission.

The Navy is committed to implementing redundant inspections, where and when appropriate after discussions with appropriate stakeholders. Redundant inspections include inspections on Guam and at the receiving jurisdiction for administrative and logistical movements that do not require a tactical approach to complete the training requirements. It is anticipated that redundant inspections would utilize existing quarantine and inspection protocols at receiving ports. Appropriate stakeholders include, but are not limited to: the USFWS to ensure the inspections are adequate to reduce risks to trust resources, U.S. Department of Agriculture Wildlife Services, receiving jurisdictions and their supporting agencies with expertise in invasive species control, and other inspection authorities as needed to ensure inspection methods are current and revised as new techniques, technology, or data become available.

The Navy will also establish snake-free quarantine areas for cargo traveling from Guam to CNMI and locations outside of the MIRC. These brown treesnake sterile areas will be subject to: (1) multiple day and night searches with appropriately trained interdiction canine teams that meet performance standards, (2) snake trapping, and (3) visual inspection for snakes. Temporary barriers may be preferable to permanent enclosures because of the variable sizes needed for various training activities. The Navy will produce standard operating procedures for temporary barrier construction and use. Standard operating procedures will ensure that temporary barriers will be constructed and maintained in a manner that assures the efficacy of the barrier tool and that staff maintaining and constructing the temporary barriers will receive training related to this activity prior to construction. Standard operating procedures will be developed in cooperation with the USFWS, U.S. Geological Survey Biological Resources Discipline, and the U.S. Department of Agriculture Wildlife Services to ensure risk to trust resources is adequately minimized. If risks are not adequately minimized, recommendations will be provided for incorporation into the protocols until the Navy and USFWS mutually agree the risk has been minimized. The USFWS, Navy, and other appropriate parties will meet, if necessary, to resolve concerns such that the protocols ensure risk is adequately minimized.

The Navy will support rapid response actions to brown treesnake sightings within the CNMI and locations outside of the MIRC (specifically Hawaii) by working with U.S. Geological Survey Biological Resources Discipline to develop procedures and protocols that will support rapid action for a brown treesnake sighting. For example, Navy personnel (civilian and uniform) could be trained to augment response teams on Guam and Hawaii or the Navy may retain an agreement with trained, local pest control contractors that meet applicable performance standards.

*DoD Participation in the Brown Treesnake Control Plan:* The Navy, working in collaboration with the USFWS and U.S. Department of Agriculture Wildlife Services and Animal and Plant Health Inspection Service will decide how best to implement the Brown Treesnake Control Plan relevant to MIRC activities. The Navy provides an environmental education program for new arrival and the current environmental education program may be updated to provide more recent information to ensure each individual has the most up-to-date training.

All new service personnel will receive the "Area Training Welcome Aboard Brief."

Mandatory viewing of a brown treesnake educational video.

Pocket guides with brown tree snake information and personal inspection guidelines will be carried at all times.

Assurance that brown treesnake awareness extends from the chain of command to the individual military service member.

*Prevention of Invasive Species Introduction and Spread:* All personnel involved in MIRC training will adhere to Commander, Naval Forces Marianas Instruction 5090.7, which calls for individual troops to be responsible for conducting self inspections to avoid potential introductions of invasive species to Guam and the CNMI. Troops will inspect all gear and

clothing (e.g., boots, bags, weapons, pants) for soil accumulations, seeds, invertebrates, and possible inconspicuous stowaway brown treesnakes). The intent of this measure is to minimize the potential effects associated with transport of troops and personnel to Guam and to CNMI from areas that contain species not native to terrestrial habitats within the MIRC (extra-MIRC travel). In addition, Commander, Naval Forces Marianas Instruction 5090.7 will be adhered to for travel to and from training sites within the MIRC (inter-MIRC travel). In addition to self inspections, each action will undergo a pathway risk analysis as a tool to improve programmatic efficiency while preventing the spread or introduction of invasive species. Actions at risk of transporting invasive species will have prevention tasks identified and implemented to reduce risk. Methods such as Hazard Analysis and Critical Control Point (HACCP) planning (see <http://www.haccp-nrm.org>) may be utilized to conduct pathway analysis.

The Navy is a participating agency in the development of the Regional Biosecurity Plan. Once completed, the Regional Biosecurity Plan will be applicable to MIRC training activities when such procedures do not unduly interfere with military training. The Navy will continue to work cooperatively with USFWS and U.S. Department of Agriculture in the development of protocols for implementation of interdiction and control methods in accordance with recommendations contained in the Regional Biosecurity Plan aimed at controlling brown tree snake and other invasive species as related to training activities within the MIRC action area. The Regional Biosecurity Plan will coordinate and integrate inter-agency invasive species management efforts such as control, interdiction, eradication, and research. This plan is currently in development and draft components of the plan will be completed in March 2010. The final plan is anticipated to be completed in January 2011.

*Cooperative Development of Regional Training and Standard Operating Procedures and Exercise Planning:* The Navy will invite USFWS Pacific Islands Field Office to participate in the development of regional standard operating procedures and exercise planning to better meet invasive species management needs associated with MIRC training.

*Coordination of Training Events:* The DoD REP will assure that Area Training coordinates meetings for brown treesnake interdiction on all training activities for the training execution phase and an after action review phase. If a snake is found during training, Navy policy is to kill the snake and reported to the Joint Region Environmental Staff for recordkeeping purposes.

### **(3) Overall Management of Migratory Birds within the MIRC:**

Migratory bird conservation relative to non-military readiness activities is addressed separately in a Memorandum of Understanding developed in accordance with Executive Order 13186, signed January 10, 2001, "Responsibilities of Federal Agencies to Protect Migratory Birds." The Memorandum of Understanding between DoD and USFWS was signed on July 31, 2006. DoD responsibilities discussed in the Memorandum of Understanding include, but are not limited to:

Obtaining permits for import and export, banding, scientific collection, taxidermy, special purposes, falconry, raptor propagation, and depredation activities;

Encouraging incorporation of comprehensive migratory bird management objectives in the planning of DoD planning documents;

Incorporating conservation measures addressed in Regional or State Bird Conservation Plans in Integrated Natural Resource Management Plans;

Managing military lands and activities other than military readiness in a manner that supports migratory bird conservation;

Avoiding or minimizing impacts to migratory birds, including incidental take and the pollution or detrimental alteration of the environments used by migratory birds; and,

Developing, striving to implement, and periodically evaluating conservation measures for management actions to avoid or minimize incidental take of migratory birds, and, if necessary, conferring with the Service on revisions to these conservation measures.

#### **(4) Conservation Measures for Amphibious Landings and Land-Based Training**

**i. Guam and Tinian:** To reduce the effects to sea turtles associated with amphibious landing activities, the Navy implements the following training measures, which were minimization measures included in previous consultations with USFWS:

Monitoring on Guam is in accordance with Naval Facilities Engineering Command Marianas Environmental sea turtle monitoring protocol, which includes periodic beach monitoring throughout the year.

The Navy began a monitoring program for sea turtles on Tinian in 1998, which involves surveys of all sandy areas within military lease lands on Tinian on a monthly basis (approximate). During the monthly surveys, crawls, nests, potential nests, body pits, and hatchling tracks are noted. Monitoring occurs at Unai Dankulo (Long Beach), Unai Chulu, Unai Masalok, and Unai Lamlam. Lepresarium Beach was once part of the monitoring program, however, monitoring at this location ceased when the Military Lease Area boundary was updated to not include this beach. Monitoring data is shared with both CNMI Division of Fish and Wildlife and USFWS.

The Navy maintains “No Wildlife Disturbance” and No Training areas at Tarague Beach, Unai Chulu, Unai Chiget, and Unai Dankulo (Long Beach). Cross-country off-road vehicle travel, pyrotechnics, demolition, digging/excavation (without prior approval of Joint Region Marianas environmental monitors), open fires, mechanical vegetation clearing, live ammunition, firing blanks, flights below 1,000 feet (305 meters), and helicopter landings (except for designated landing zones) are prohibited in “No Wildlife Disturbance” areas. All entry or training, except specifically authorized administrative troop and vehicle movement on designated roads or trails, are prohibited in “No Training” areas, in addition to prohibitions in “No Wildlife Disturbance” areas. The Navy evaluates “No Wildlife Disturbance” and “No Training” boundaries based on additional survey information obtained during monthly monitoring surveys for sea turtle nesting activity on Tinian.

Navy biologists monitor beaches during night-time landing exercises. If sea turtles are observed or known to be within the area, training activities are halted until all nests have been



located and sea turtles have left the area. Identified nests are avoided during the night-time landing exercise.

Prior to beach landings by amphibious vehicles, known sea turtle nesting beaches are surveyed by Navy biologists for the presence of sea turtle nests no more than six hours prior to a landing exercise. Areas free of nests are flagged, and vehicles are directed to remain within these areas. Further, each landing activity has a “beach master” that would “wave off” vehicle approaches if sea turtles or sea turtle nests were observed in the water or on the land.

The Navy recognizes that surge waves generated by slow moving Landing Crafts Air Cushion could break off coral heads and cause beach scour, degrading foraging and nesting habitat for sea turtles. To minimize the surge effect, Landing Craft Air Cushion landings on Tinian are scheduled for high-tide. Landing Crafts Air Cushion stay on-cushion until clear of the water and within a designated Craft Landing Zone. Amphibious Assault Vehicle landings at Unai Babui are restricted to an established approach lane and land at high tide one vehicle at a time. Within the Craft Landing Zone, Landing Craft Air Cushion come off-cushion with the Landing Craft Air Cushion oriented to permit expeditious vehicle and cargo offload onto a cleared offload and vehicle traffic area. The Navy recognizes ruts resulting from vehicle traffic on beaches may prevent sea turtle hatchlings from reaching the water and expose them to predation or desiccation. Although Landing Craft Air Cushion and expeditionary vehicle traffic typically do not leave ruts, some compaction of sand in vehicle tracks is possible. If restoration of beach topography is required, it is conducted using non-mechanized methods.

#### **ii. Conservation Measures Specific to Farallon de**

**Medinilla:** In recognition that Farallon de Medinilla is an important nesting location for seabird species and the ESA-listed Micronesian megapode, the Navy has designed the following measures to avoid and minimize impacts associated with the EIS/OEIS alternatives. Use restrictions are in place to minimize adverse effects such as decreasing wildfire potential, decrease direct strike potential of ESA listed species (specifically, Micronesian megapodes), and to limit degradation of the interior mesic flats found outside of the impact zones, and minimize impacts to seabirds.

Use constraints include targeting restrictions on Missile Exercise Air-to-Ground, Gunnery Exercise Air-to-Ground Fire Support (Land), and other amphibious assault exercises involving Rigid Hull Inflatable Boat or other vessels. Targeting from vessels and aircraft observe the following restrictions: (1) no targeting of cliffs on the eastern coast of the island, (2) firing direction is from the west only towards the island, and (3) no firing south of a designated “No Fire Line.” Bombing Exercise (Land) and Missile Exercise Air-to-Ground restrictions include: (1) only targeting two impact areas located on the interior plateau of the island and the southern peninsula (the impact areas total approximately 34 acres [14 hectares], which accounts for 20 percent of the island’s area), (2) prohibiting cluster bombs and fuel-air explosives or incendiary devices, and (3) designated placement of targets to avoid sensitive areas (e.g., seabird nests, megapode habitats, potential roosting sites for transient Mariana fruit bats).

Range maintenance will use both herbicide and prescribed burn treatments on Farallon de Medinilla. A visual survey for megapodes will be conducted in the area by a qualified biologist,

prior to each vegetation removal event that may include: herbicide application, fire retardant application, or prescribed burning.

Precautions will be taken to help prevent the accidental introduction of invasive species including plant seeds during range maintenance. All equipment will be washed prior to shipment and personnel will clean all personal gear of soils and seeds prior to embarking from Saipan.

Personnel will not stay overnight on Farallon de Medinilla but will fly back to Saipan each evening by helicopter. If food is brought to Farallon de Medinilla, then all trash and any uneaten food will be removed from the island daily or stored in rodent-proof containers.

Edges of the prescribed treatment area will be marked using GPS or flagging tape. Aerial or manual application of a registered herbicide will begin on the windward side of treatment area and all label restrictions will be followed. A dye marker solution will be used to ensure only the targeted area is covered and excess herbicide is not applied.

Prior to implementing the prescribed burn, personnel will ensure ground conditions conducive to conducting the prescribed burn so that a burn would most likely result in a low intensity ground fire. Methods will follow all precautions outlined in the range maintenance plan.

Fire retardant powder, foam or gel will be applied aurally, south of the “No Drop Zone” before the prescribed burn to prevent escape.

After the completion of the controlled burn, erosion control may be necessary until ground conditions stabilize. If erosion control is necessary, a straw wattle sediment control system will be installed. The straw wattle will be free of invasive pests.

Personnel will be advised of the presence of the Micronesian megapode and be cautioned to not interact with any individual birds. However, because the personnel applying the herbicide may not be wildlife experts; personnel will be instructed to avoid any birds, nests, or eggs.

**a) *Quarterly Seabird Monitoring:*** The Navy will conduct quarterly surveys using the same protocols as the monthly monitoring surveys for seabirds and other resources at Farallon de Medinilla (aerial surveys). Naval Facilities Engineering Command Pacific and Marianas biologists have over 10 years of monitoring data for seabird populations on Farallon de Medinilla, which show no significant changes in the population indices. Therefore, the Navy concludes that quarterly monitoring of seabird populations would be sufficient to meet monitoring goals at Farallon de Medinilla.

**b) *Five-Year Interval Megapode Surveys on Farallon de Medinilla:*** The Navy will conduct density and abundance surveys for the Farallon de Medinilla megapode population every five years. These surveys will follow existing transects and methods established during prior surveys on Farallon de Medinilla. Surveys will be conducted in coordination with other range management activities.

**c) *Conduct Rat Eradication on Farallon de Medinilla:*** The rodenticide diphacinone has recently been approved for field use by USEPA for rat eradications (EPA Registration Number 56228-35). Successful rat eradications on Pacific

Islands have been accomplished on Mokapu (off Molokai), Campbell Island (New Zealand), and San Jorge (Solomon Islands), as well as successful application within portions of Hawaii Volcanoes National Park. Given the small size of Farallon de Medinilla, island wide eradication is possible. This action will provide direct benefits to nesting birds (eggs and nesting substrate) and indirect benefits to Micronesian megapodes by increasing vegetation on certain portions of the island.

**iii. Conservation Measures Specific to Saipan:** Training events as described under the MIRC EIS/OEIS will be conducted within areas of Saipan that are not near known occupied Mariana swiftlet caves, the two major wetland areas that support Mariana common moorhen, or beaches that could be used by sea turtles.

Training in the Marpi Maneuver Area is expected to be infrequent and limited to pedestrian land navigation training.

Training will be limited to pen areas to minimize impacts to nightingale reed-warblers, Mariana fruit bat, and Micronesian megapodes.

The individual Commanding Officer conducting training under guidance of the DoD REP will restrict training in the Marpi Maneuver Area to the nightingale reed-warbler non-peak breeding seasons (April through June; and October through December). If these training restrictions cannot be accommodated, the Navy will contact the CNMI government, including Division of Fish and Wildlife regarding avoidance measures.

There will be no digging in the soil or cutting of vegetation along the southern border of the Marpi Maneuver Area in the mixed limestone forest. No ground disturbance or vegetation removal of any kind is permitted in this area to avoid impacts to the Micronesian megapode and Mariana fruit bat. No habitat will be removed for any training activity on Saipan.

Smoking is not permitted during training activities and fire-safe portable receptacles for cigarette butts are used during periods of rest between training activities. No fires are permitted during bivouac activities.

If other areas are needed for training, the Navy will contact the USFWS regarding the need for reinitiation of the Biological Opinion.

**iv. Conservation Measures Specific to Tinian:** Existing conservation measures for MIRC training are associated with limiting the potential effects to special status species (ESA-listed species and birds listed under the Migratory Bird Treaty Act) from aircraft training, amphibious landings, and vehicle and pedestrian land navigation within the Exclusive Military Use Area and bivouac training.

Aircraft Training Restrictions over Wetlands – The Navy restricts helicopter training over Tinian wetland areas. Helicopters must maintain a minimum altitude of 1,000 feet (305 meters) above ground level during training exercises that require flights over Hagoi. In addition, the Navy avoids overflights over Mahalang wetland and Bateha wetland. No aviation live-fire activities are conducted.

Hagoi Management and Training Restrictions – Hagoi and adjacent areas are designated as a “No Training Area”. No ground disturbance or vegetation removal of any kind is permitted in this area. The current Integrated Natural Resources Management Plan (INRMP) for DoD lands on Tinian and Farallon de Medinilla includes a Hagoi Moorhen Management Plan and this will be carried forward when the INRMP is updated. The updated INRMP will also include management plans for other wetlands within the Military Lease Area.

Vehicle and Pedestrian Land Navigation and Bivouac Training – Unrestricted use of off-road vehicles and pedestrian land navigation within the Tinian Military Lease Area could produce unexpected noise, vegetation trampling, or unintentional ignition of fires. Therefore, the Navy avoids intrusive training activities within limestone forest areas (delineated on maps distributed to operators and marked in the field) with restrictions on cross country off-road vehicle travel and other activities that may disturb ESA listed species or degrade habitats. Bivouac training restrictions prohibit the clearing of additional vegetation to establish new bivouac areas. Maneuver units remain tactical with no support camps.

*Fire Management within the Exclusive Military Use Area:* Grass fires are regular occurrences on Tinian, and there is greater danger during the dry season (February through April) than in the wet season (July through October). Some fires have been caused by campfires and cigarettes. Fire spreads rapidly through light fuels (such as grasslands); and depending on weather conditions, fires may or may not burn out when fires reach heavier fuels (such as tangantangan thickets). The alteration of habitats by fire can result in direct effects to ESA listed species and other species through mortality from smoke inhalation or burning individuals and by removing their habitat which could prevent or inhibit breeding during the year, and create competition for feeding and sheltering, particularly for species that establish discrete territories. The area authorized for open fires and pyrotechnics is restricted to the North Field only (except for actual emergency signaling). Cooking is not authorized in outdoor training areas (except for heating tabs and mechanisms in “meals ready to eat”). North Field’s existing runways and taxiways act as fire breaks and fire access roads, and the vegetation is primarily characterized by tangantangan thickets. Standard operating procedures for all exercises include fire response measures that must be adhered to. To augment military fire response efforts, the Tinian Fire Department maintains a 300-gallon pump truck and fire crew to respond to wildland fires. The Tinian Fire Department also maintains a 750-gallon pumper truck and crew in San Jose to respond to and provide fire service for the southern, more developed portion of the island, and backup Crash, Fire, and Rescue support to West Field. Request for the use of these assets will be made through the West Field command post during major exercises. To date, no wildland fire has been sourced from MIRC training activities on Tinian (or on other DoD lands in the Mariana Islands).

**v. Conservation Measures Specific to Rota:** The Navy will not initiate any action requiring the removal, trimming, or pruning of any tree known to support nesting, roosting, or foraging habitat for the Mariana crow, Mariana fruit bat or Rota bridled white-eye. No training activities will occur near or within critical habitat or habitat occupied by ESA listed species. If such activities are planned in the future, the Navy will consult with USFWS pursuant to section 7 of the ESA.

**vi. Conservation Measures Specific to Guam:** The Proposed Action will not conflict with conservation measures developed in agreement between the Navy and USAF action proponents and the USFWS Pacific Islands Field Office for prior ESA consultations. These ongoing conservation measures are described below, and are not additional mitigations proposed as part of this EIS/OEIS.

**d) Andersen Air Force Base Training Restrictions:**

*Aircraft Training Restrictions* – The USAF maintains helicopter and fixed wing flight restrictions associated with MIRC training over portions of Northwest Field, and Pati Point. At Northwest Field, helicopter overflights north of the South Runway below 1,000 feet (305 meters) above ground level are prohibited. Overflights of the Munitions Storage Area (MSA) are prohibited below 1,000 feet (305 meters) above ground level. Overflights within 3,000 feet (914 meters) of Pati Point are prohibited below 1,600 feet (488 meters) mean sea level, except for flights from the end of the Andersen Main runways.

*Habitat Enhancement Activities At Northwest Field*  
– To offset the loss of potential breeding and foraging habitat from the Proposed Action, the USAF proposed to construct three ungulate enclosure units totaling approximately 255 hectares (630 acres) north of the Northwest Field, Field Training Exercise area on the upper plateau above Ritidian Point. In addition, the USAF proposed completing a pig, deer, and brown treesnake barrier around a 55 hectare (136 acre) habitat management unit located near Potts Junction. The USAF is also developing an ungulate management plan. Implementation of the plan will reduce ungulates in non-fenced areas, with eradication as the objective within ungulate enclosures. Within these areas, the USAF proposed to develop and implement an ungulate eradication program and reduce ungulate numbers in non-enclosure areas. Further, the USAF proposed to establish five 50x50 square meter foraging plots in the ungulate control enclosure for out planting native tree species utilized by foraging Mariana fruit bats and Mariana crows.

*Post-typhoon Training Schedule* – After a typhoon event, food resources for the Mariana crow and Mariana fruit bat may be severely reduced, and in response to typhoon events, the USAF implements the following modifications to training schedules: (1) If crows are nesting within an (approximate) 1,800 meter (1,969 yard) radius of cratering exercises and within 500 meters (547 yards) of small arms firing, no crater charges will be detonated within two to three months of a typhoon event; (2) If Mariana crows are nesting within these buffer areas within one to two months of a typhoon event, no cratering charges will be detonated, and no M2, M115A, and M116A munitions will be used; and (3) If crows are nesting within these buffer areas within one month of a typhoon event, no training events will occur in the Northwest Field training areas. The USAF agreed to coordinate with Government of Guam Division of Aquatic and Wildlife Resources (DAWR) to alter training schedules to minimize effects to solitary roosting bats or foraging bats after typhoon events.

*Avoidance and Minimization Measures* – The USAF has developed an Adaptive Management Strategy and implements various measures to avoid, minimize, and/or offset potential impacts to listed species associated with both the Northwest Field Beddown and the establishment of the ISR/Strike capability at Andersen AFB. Potential management measures included in the Adaptive Management Strategy are: (1) aircraft



noise reduction by modifying ground track location and flight profile of aircraft, (2) threat removal through brown treesnake control around fruit bat colony roosts and crow nest locations and poaching enforcement activities, (3) population enhancement through reinstruction support, and (4) efforts to establish and maintain Mariana fruit bat, Mariana crow, Guam Micronesian kingfisher, and Guam rail on Guam. The USAF has completed in 2008 a noise monitoring study to assist in the adaptive management effort. To better understand the habitat components and conservation management needs for ESA listed species in northern Guam habitats and ESA listed species' recovery efforts, the USAF also completed in 2008 quantitative vegetation sampling throughout Andersen AFB.

**e) Navy Lands Training Restrictions:**

*Aircraft Training Restrictions* - The Navy maintains helicopter and fixed wing flight restrictions associated with MIRC training over portions of the Naval Munitions Site. Helicopter bucket training at Fena Reservoir only occurs near the spillway, away from emergent vegetation areas in the shallower portions of the reservoir. Except at designated landing and drop zones, the Navy prohibits flights over the Naval Munitions Site below 1,000 feet (305 meters) above ground level for fixed wing aircraft and 500 feet (152 meters) above ground level for helicopters.

*Amphibious Landing Restrictions at Sumay Cove*- The Navy maintains restrictions on landings and launches such as the use of the concrete boat ramp at Sumay Cove (across from potential turtle nest sites). Coupled with speed restrictions to avoid creating wakes, the use of the Sumay Cove ramp avoids and minimizes effects to sea turtle nesting sites.

*Fire Bucket Training Exercise Monitoring at Fena Reservoir*- Fire bucket training, which occurs near the spillway at Fena Reservoir, continues to follow the Biological Opinion, "95I0012 Fire Bucket Training" of February 16, 1995, but assumed that activity near the spillway would not occur in areas overlapping Mariana common moorhen foraging areas. In April 2009, two Mariana common moorhens were observed near the spillway at Fena Reservoir. This kind of training may affect moorhens using this area through harassment, therefore, for the first three exercise, qualified Navy biologists will monitor moorhens for behavioral changes associated with training near the spillway. If significant behavioral changes are noted, training activities will stop pending Section 7 ESA consultation between the Navy and USFWS.

*Ungulate Management Planning on Navy Lands*- An ungulate management plan and an Environmental Assessment are currently in development that will provide a long-term program and methods for a sustained reduction of ungulates on Navy lands.

*Establishment of No Training Areas Around the Three Known Mariana Swiftlet Caves within the Naval Munitions Site*- The Navy will establish No Training Areas around the three known Mariana swiftlet caves within the Naval Munitions Site. Training will be restricted to occur outside of the 100 meter (328 feet) radius buffers around these caves. The largest cave, Mahlac, has been monitored since 1984 by the Government of

Guam, Department of Agriculture, Division of Aquatic and Wildlife Resources and Naval Facilities Engineering Command Pacific and Marianas biologists. Two smaller caves, Fachi Cave and Maemong Cave, have been monitored since 1992 and 2004, respectively. A recent survey of the three known swiftlet caves suggests an overall increase in swiftlet numbers in Mahlac Cave and Maemong Cave, and Fachi Cave may have reached a maximum capacity to support swiftlets (due to limited size of roosting sites). The Navy has contracted USDA-WS to trap brown treesnakes in areas surrounding the caves since 2005, which has resulted in the removal of 488 snakes.

The Navy believes that 100 meter (328 feet) buffers to exclude training activities are sufficient to meet conservation goals for the swiftlet because (1) populations have increased under similar training restrictions and (2) the Navy will continue trapping efforts in swiftlet cave areas, which is likely to have factored into the population increases within the Naval Munitions Site. Some normal day-to-day operations of the Naval Munitions Site may occur within the buffers (such as driving on roads), but no training will occur within the buffers during exercises.

*Wetland Buffers Around Naval Munitions Site*

*Wetland Areas-* Potential nesting habitats (palustrine emergent wetlands) are dispersed throughout the Southern Land Navigation Area and the Northern Land Navigation Area. No maneuver and navigation training occur in areas with known Mariana common moorhen nesting activity or migratory birds that may utilize these wetlands.

*Fire Management Planning Within the Naval*

*Munitions Site-* The U.S. Forest Service has developed a fire management plan for the Naval Munitions Site and other Navy lands on Guam. The plan includes fire danger modeling of different fuel loadings within the Naval Munitions Site and determines if new fuel breaks are needed to protect personnel, infrastructure, and sensitive ecological areas.

**d. Cultural Resources:** Based on consultations with the Guam State Historic Preservation Office, CNMI Historic Preservation Officer, Advisory Council on Historic Preservation, and the National Park Service, a new Programmatic Agreement to resolve any potential adverse effects was negotiated for all military training activities proposed under the Preferred Alternative and included additional mitigation measures and procedures. Previous training constraints maps have been revisited and refined as needed; No Training and Limited Training areas are identified. Limited Training areas are defined as pedestrian traffic areas with vehicular access limited to designated roadways and/or the use of rubber-tired vehicles. No pyrotechnics, demolition, or digging is allowed without prior consultation with the appropriate historic preservation office. The Programmatic Agreement also stipulates multiple site checks and studies to assess the impact of training on the Tinian National Historic Landmark. Up to four times a year, field checks will be conducted with the CNMI Historic Preservation Officer and/or National Park Service representative. An annual report will be submitted to the CNMI Historic Preservation Officer and to the National Park Service on any training activities and any subsequent impacts. Currently, a Cultural Landscape Report is being prepared on the Tinian National Historic Landmark to establish a baseline for existing conditions. A copy of the signed Programmatic Agreement is included in the Final EIS/OEIS.

e. **Transportation:** The existing 3 nautical miles (5 kilometers) surface safety zone around Farallon de Medinilla is an informal clear zone based upon the existing FAA approved warning area R-7210 which restricts air space from an altitude of "Zero" feet to "infinity"; however, no corresponding surface Danger Zone has been designated for navigable waters nor have any restrictions been approved by the U.S. Army Corps of Engineers. The proposed surface Danger Zone extends to a 10 nautical miles (19 kilometers) radius around Farallon de Medinilla. It provides for enhanced public safety and improved military readiness and provides for the required surface Danger Zone around the live impact area of the range.

Joint Region Marianas has instituted and will continue its current rigorous routine for notifying mariners of time, date and extent of intended use of Farallon de Medinilla, using Notices to Mariners, government agencies including local mayors offices and emergency management agencies, and local media including NOAA marine weather channel. Notices shall include the dates, times and extent (distance from land) the hazard area extends. To accommodate competing uses of the seaspace, the proposed regulatory action will provide that when the range is not in use, the waters will be open to mariners who can legally be in the area. This new process will allow flexibility to schedule only the space needed, and only the times needed for effective training, leaving the area open for the fishermen who depend upon the area around Farallon de Medinilla as a fishing ground to the maximum extent compatible with military requirements.

#### **ALTERNATIVE MITIGATION MEASURES FOR MARINE MAMMALS**

**CONSIDERED BUT ELIMINATED:** As described in the Final EIS/OEIS, the vast majority of estimated sound exposures of marine mammals during proposed active sonar activities would not cause injury. Potential acoustic effects on marine mammals would be further reduced by the mitigation measures described above. Therefore, through the MIRC Final EIS/OEIS and associated regulatory documents, NMFS has concluded the Proposed Action and mitigation measures would achieve the least practicable adverse impact on species or stocks of marine mammals.

Based on NMFS' preliminary determinations reached in the development of the proposed rule associated with the MIRC as well as NMFS' analysis of the comments received during the public comment period on the proposed rule, NMFS has determined that the Navy's Final EIS/OEIS adequately analyzes the training activities in the Mariana Islands Range Complex. NMFS has adopted the MIRC Final EIS/OEIS to support the proposed issuance of the MMPA incidental take regulations, the 2010 Letter of Authorization, and future Letters of Authorization as appropriate. As mentioned above, NMFS must also prescribe regulations that set forth the means of affecting the least practicable adverse impact on affected species or stocks and their habitat (i.e., mitigation measures). The Navy's Final EIS/OEIS includes a suite of proposed mitigation measures, a discussion of mitigation measures that were considered by the Navy and NMFS, but eliminated, and an indication that additional mitigation measures (either not discussed in the Final EIS/OEIS or measures considered but eliminated in the Final EIS/OEIS) may be required by NMFS/Navy Final Rule adaptive management process. As indicated in the Final EIS/OEIS, all alternatives include implementation of mitigation measures.

In making a determination of "least practicable adverse impact", NMFS considered the following factors relative to one another: (1) the manner in which, and the degree to which, the

successful implementation of the measure is expected to minimize adverse impacts to marine mammals; (2) the proven or likely efficacy of the specific measure to minimize adverse impacts as planned; and (3) the practicability of the measure for Navy implementation, which includes consideration of personnel safety, practicality of implementation, and the impact on the effectiveness of the military readiness activity. Accordingly, the following additional mitigation measures were analyzed and eliminated from further consideration.

**1. Seasonal and/or Geographic Limitations:** NMFS has indicated that seasonal or geographic limitations in areas where there is robust evidence that animals are predictably gathering in higher densities, or known to specifically go to conduct important behaviors that could potentially be disrupted by the proximity of mid-frequency active sonar activities (such as breeding/calving areas) can be one of the more effective means of reducing adverse impacts to marine mammals. By reducing the overlap in time and space of the known concentrations of marine mammals and the acoustic footprint associated with the thresholds for the different types of take (either at all times and places where animals are concentrated, or times and places where they are concentrated for specifically important behaviors, the amount of take can be reduced. However, the concept of geographical and seasonal (or temporal) limitations must be balanced with the Title 10 responsibilities of DoD and consideration of personnel safety, practicality of implementation, and impact upon the effectiveness of military readiness activities to assure a fully trained and ready military force. NMFS has also acknowledged that it is not a foregone conclusion that large training areas must contain smaller areas within which sonar activity must be limited. In order to come to both the correct scientific conclusions, as well as to effect the means of “least practicable adverse impact,” one cannot assume that every region contains areas within it that are of a level of importance that warrants excluding the activity. If there is not enough data for an area, it cannot be known which areas are most important and it is not appropriate (and potentially dangerous) to use data that is not robust enough to support the designation of important habitat. The risk of the latter is not only protecting an unimportant area, but potentially causing an increase of activity in an important area which has been misidentified.

Some of the specific reasons that specific types of seasonal and geographic restrictions or limitations are impracticable for the Navy include:

Coastal restrictions (such as 25 nautical miles [37 kilometers] from the 200 meter isobath) - Littoral waterspace is where potential enemies will operate. The littoral waterspace is also the most challenging area to operate due to a diverse acoustic environment. In real world situations, it is highly likely the Navy would be working in these types of areas. It is not realistic to refrain from training in the areas that are the most challenging and operationally important. Areas where anti-submarine warfare events are scheduled to occur are carefully chosen to provide for the safety of events and to allow for the realistic development of the training scenario including the ability of the exercise participants to develop, maintain, and demonstrate proficiency in all areas of warfare simultaneously. Limiting the training event to a few areas would have an adverse impact on the effectiveness of the training by limiting the ability to conduct other critical warfare areas including, but not limited to, the ability of the Strike Group to defend itself from threats on the surface and in the air while carrying out air strikes and/or amphibious assaults. In those locations where amphibious landing events occur, coastal restrictions would decouple anti-submarine warfare training and Amphibious training, which are critically important to be conducted together due to the high risk to forces during actual Amphibious operations.

Furthermore, major exercises using integrated warfare components require large areas of the littorals and open ocean for realistic and safe training.

Sea Mounts and Canyons-Submarine tracking is a long and complicated tactical procedure. Seamounts are often used by submarines to hide or mask their presence, requiring the need to train in this complex ocean environment. This is precisely the type of area needed by the Navy to train. Sea mounts and canyons impact the way sound travels in water as well as the Navy's ability to search and track submarines. If the Navy does not train near sea mounts and canyons and understand how these features affect their ability to search and track a submarine, they will be unable to do so when faced with an actual threat. Exercise locations are carefully chosen based on training requirements and the ability of ships, aircraft, and submarines to operate safely. Given the strategic training needs, restricting active sonar operation around seamounts and canyons in the MIRC study area is not practicable. This discussion considers the impracticability of avoiding all seamounts and canyons. While it may be somewhat less impracticable to avoid a subset of specific seamounts or canyons, marine mammal use of these areas is ephemeral and varies based on many changing factors, which would make it difficult to justify requiring the avoidance of any particular features since doing so may or may not benefit marine mammals at any particular time.

Fronts and other Major Oceanographic Features – NMFS has determined that the impracticability to the Navy of avoiding these features outweighs the potential conservation gain. Though many species may congregate near fronts and other major oceanographic features, these areas may be both large and transitory, and, so restricting access to these features to avoid animals that may congregate in a small subset of the total areas is not practicable. Additionally, limiting sonar use in the vicinity of these types of features would disrupt training for the reasons described above for sea mounts and canyons.

**2. Use of Dedicated or Independent Marine Mammal Observers to Implement Mitigation:** Navy lookouts are specifically trained to detect anything (living or inanimate) that is in the vicinity of, visible from, or approaching the vessel. The safety of the personnel on board and of the vessel depends on their performance. While they receive training that is intended to expose them to the different species of marine mammals they might see and the behaviors they might potentially observe, they would certainly not be expected to differentiate between species or identify the significance of a behavior as effectively as an independent MMO. However, identification to species and understanding of marine mammal behavior is not necessary for mitigation implementation – for that, a lookout must simply detect a marine mammal and estimate its distance (e.g., within 1,000 yards, 500 yards, or 200 yards [914, 457, 183 meters]) to the vessel. Though dedicated and independent marine mammal observers are critical to implement a Monitoring Plan, Navy lookouts performing their normal duties are expected to be effective at detecting marine mammals for mitigation implementation.

Several reasons for why using third-party observers from air or surface platforms, in addition to or instead of the existing Navy-trained lookouts is not practicable include the security clearance requirements and possible security compromise of training events, availability of third-party observers, limited berthing availability, safety and scheduling issues related to aerial survey, and the geographic distances between simultaneous events.



**3. Use of Additional Detection Methods to Implement Mitigation (Shutdown Zones):** In order for additional marine mammal detection methods to assist in the implementation of mitigation (shutdown and powerdown), they must be able to localize, or identify where the marine mammal is in relation to the sound source of concern (since shutdown and powerdown mitigation is triggered by the distance from the sound source), and transmit the applicable data to the commanding officer in real time (i.e., quickly so that the sonar source can be turned down or shut off right away or the explosive detonation can be delayed). A limited number of techniques based on the real time participation of additional observers (such as additional aerial platforms) can achieve this, while many passive acoustic methods cannot. The section below contains information that speaks both to the practicality of implementation of some methods as well as the effectiveness.

While Navy radars are used to detect objects at or near the water surface, radars are not specifically designed to search for and identify marine mammals.

The number of aerial and unmanned aerial vehicle systems currently integrated into fleet training is extremely low and their availability for use in most training events is rare; therefore, shifting their use and focus from hunting submarines to locating marine mammals would be costly and negatively impact the training objectives related to these systems.

Airborne assets when available already monitor for the presence of marine mammals with no reported incidents where marine mammals were overlooked during an exercise or where aerial assets were unable to perform their duties while watching for marine mammals; therefore, the allocation of additional airborne assets is not well justified.

Unmanned aerial vehicle detection is currently and in the foreseeable 5-year period of the requested authorization, extremely limited because unmanned aerial vehicles are rarely if ever available, therefore their use is impractical and expensive.

Gliders are not currently capable of providing real time data, and therefore, are not an effective detection method for use in mitigation implementation.

The Navy is actively engaged in acoustic monitoring research involving a variety of methodologies; however, none of the methodologies have been developed to the point where they could be used as a mitigation tool for mid-frequency active or high-frequency active sonar. At this time, the active sonar and adjunct systems listed below proved to be impracticable for the following reasons.

Use of multiple systems (meaning the mid-frequency active sonar used for the exercise plus any additional active system used for marine mammal detection) operating simultaneously increases the likelihood that a submarine may be detected under conditions where it is attempting to mask its presence before activating sonar, resulting in an impact to the effectiveness of the military readiness activity. Additionally, interference may occur when certain active sonar systems (such as HFM3) are activated concurrently with mid-frequency active sonar.

HFM3 is an adjunct system used by low-frequency active sonar because the hulls of those platforms can be modified and travel can occur at slow speeds. Mid-frequency active sonar

combatants are not equipped with HFM3 systems and it is impractical to install such a system on mid-frequency active sonar combatants.

To provide a specialized localization capability (distance, direction, etc.) most of the systems (Sonobuoys, SQQ-89, Bottom-Mounted Sensors) would require significant modifications.

Prior to implementation of real-time passive acoustic monitoring for use in mitigation, the species present and their distribution should be established. A system must be implemented on range and Detection, Classification, and Localization (DCL) algorithms specific to these species must be developed and tests with visual observers must be conducted to verify their performance. The Navy continues to work on this, and such systems are not yet available for consideration as required mitigation.

**4. Avoidance of Federal Marine National Monuments, including the Marianas Trench Marine National Monument:** Pursuant to the MMPA, NMFS makes decisions regarding required mitigation based on biological information pertaining to the potential impacts of an activity on marine mammals and their habitat (and the practicability of the measure), not management designations intended for the broad protection of various other marine resources.

The Marianas Trench Marine National Monument (MTNM) was established to protect the submerged lands and waters of the Mariana Archipelago and was designated with the purpose of protecting the submerged volcanic areas of the Mariana Ridge, the coral reef ecosystem of the waters of surrounding islands, and the Marianas Trench. The Monument includes the submerged lands of the “Volcano Unit” and the water column and submerged lands within the “Island Unit”. There are no specifically designated marine mammal protection areas in the MTNM.

A portion of the MTNM overlaps with the MIRC Study Area. When training occurs in this area or any of the other Monument areas, the Navy would follow the general mitigation protocols established in the final rule and Letter of Authorization. NMFS expects that the mitigation measures employed in the MTNM and other Monuments will reduce the number of marine mammals exposed to levels of sound expected to result in TTS in these areas.

No known areas of specific importance to marine mammals (that would benefit from a training restriction, i.e., not counting pinniped haulouts where the animals are not in the water the majority of the time) are present within these designated areas. Therefore, limiting activity in these areas would be of questionable value to marine mammals.

These measures would not offer any additional benefit to marine mammals. Additionally, the impracticability of seasonal and geographic restrictions and limitations, which applies to this measure, is discussed above.

**5. Suspension of Mid-Frequency Active Sonar Training at Night, or During Low Visibility or Surface Duct:** The Navy is capable of effectively monitoring a 1,000 yard (914 meter) safety zone using night vision goggles and passive acoustic monitoring (infrared cameras are sometimes used as an extra tool for detection, when available, but have not been shown to show a significant enhancement of current capabilities). Night vision goggles are always available to all vessel and aircrews as needed and passive acoustic monitoring is always

in use. As mentioned previously, the estimated zone in which TTS may be incurred is within about 140 meters (153 yards) of the sound source (830 meters [908 yards] for harbor seals), and the estimated zone for injury is within 10 meters (11 yards) of the sonar dome. The power-down and shut-down zones are at 1,000, 500, and 200 yards (914, 457, and 183 meters). The Navy is expected to be able to effectively implement the necessary mitigation measures during nighttime and times of lower visibility.

Regarding surface ducts, their presence is based on water conditions in the exercise areas, is not uniform, and can change over a period of a few hours as the effects of environmental conditions such as wind, sunlight, cloud cover, and tide changes alter surface duct conditions. Across a typical exercise area, the determination of “significant surface ducting” is continually changing, and Navy cannot accurately implement this mitigation measure. Furthermore, surface ducting alone does not necessarily increase the risk of mid-frequency active sonar impacts to marine mammals. While surface ducting causes sound to travel farther before losing intensity, simple spherical and cylindrical spreading losses result in a received level of no more than 175 dB root mean square (rms) at approximately 1,100 yards (1,006 meters) (assuming the nominal source of 235 dB rms), even in significant surface ducting conditions.

Mid-frequency active sonar training at night is vital because differences between daytime and nighttime affect the detection capabilities of Mid-frequency active sonar systems. As a matter of safety and international law, Navy vessels are required to use all means available in restricted visibility, including Mid-frequency active sonar and positioning of additional lookouts, to provide heightened vigilance to avoid collision. To be effective, the complexity of anti-submarine warfare requires the most realistic training possible. Reducing power in significant surface ducting conditions undermines training realism, and is, therefore, impracticable.

**6. Delayed Restart of Mid-Frequency Active Sonar after Shutdown or Powerdown:** NMFS’ assessment indicates that expanding the delay (until sonar can be restarted after a shutdown due to a marine mammal sighting) for deep-diving species adds minimal protective value as the ability of an animal to dive longer than the required shutdown time does not mean that it will always do so. Therefore, the additional time would only potentially add value in instances when animals had remained under water for longer than the shutdown time required; an animal would need to be swimming near sustained maximum speed for an hour in the direction of the vessel’s course to stay within the safety zone of the vessel (i.e., to be in danger of being exposed to levels of sonar associated with injury or TTS); the times when marine mammals are deep-diving (i.e., the times when they are under the water for longer periods of time) are the same times that a large portion of their motion is in the vertical direction, which means that they are far less likely to keep pace with a horizontally moving vessel; it is unlikely that a single cetacean would remain in the safety zone of a Navy sound source for more than 30 minutes; and last, in many cases, the lookouts are not able to differentiate species to the degree that would be necessary to implement this measure.

When there is an artificial break in the exercise (such as a shutdown) the flow of the exercise is lost and several hours of training may be wasted, depending on where the Navy was in the exercise. An increase in the delay of mid-frequency active sonar use that occurs during an exercise will likely further negatively affect the effectiveness of the military readiness training because it will be harder to regain the flow of the exercise the longer the equipment and

personnel are on hold. Moreover, lengthening a delay in training necessitates a continuation of the expenditure of resources (operation of all of the equipment and personnel), while not making progress towards the accomplishment of the mission (training completion).

**7. Halting of Mid-Frequency Active Sonar Use in the Event of a Marine Mammal Injury or Death (and Stranding) Until Cause is Determined:** Only in a very small portion of incidents (such as when a ship strikes a whale and personnel realize it immediately) is the cause of marine mammal injury or death immediately known. The Navy will be required (by the MMPA authorization) to notify NMFS immediately if an injured, stranded, or dead marine mammal is found during or shortly after, and in the vicinity of, any Navy training exercise utilizing mid-frequency active sonar, high-frequency active sonar, or underwater explosive detonations taking place with the MIRC.

Investigations into the causes of stranding events often take months or years and the most probable outcome is that a definitive determination of cause is not made. NMFS and the Navy have concluded that only 5 strandings worldwide (and not in the areas mentioned) can be associated with mid-frequency active sonar use. It is impracticable to halt the use of mid-frequency active sonar while the cause of a stranding is determined.

**8. Ramp Up of Sonar Source Prior to Full Power Operation:** NMFS utilizes ramp-up as a cautious mitigation measure to reduce Level B harassment and help ensure that Level A harassment does not occur. However, ramp-up procedures are not a viable alternative for mid-frequency active sonar training events as the ramp-up would alert opponents to the participants' presence, thus undermining training realism and effectiveness of the military readiness activity. Ramp up would constitute additional unnecessary sound introduced into the marine environment, in and of itself constituting harassment and this measure does not account for the movement of the anti-submarine warfare participants over the period of time when ramp up would be implemented.

**9. Enlargement or Modification of Powerdown/Shutdown Zones of Hull-mounted Sonar:** The current power-down and shut-down zones are based on scientific investigations specific to mid-frequency active sonar for a representative group of marine mammals. They are based on the source level, frequency, and sound propagation characteristics of mid-frequency active sonar. The zones are designed to preclude direct physiological effect from exposure to mid-frequency active sonar. NMFS has determined that these current measures effectively accomplish this.

**10. Expansion of Exclusion Area Delineated for Use with Explosive Detonations:** As described previously, the current designated exclusion zones for three exercise types (Sinking Exercise, Bombing Exercise, and Missile Exercise) are not large enough to prevent TTS should one of the largest explosives (MK-82 or Harpoon) detonate while the animal is at some distance outside of the exclusion zone. If the exclusion zone were enlarged, the Navy could theoretically reduce the number of TTS takes that might occur – however, anticipated takes by TTS are already very low and the exclusion zones are more than large enough to avoid injury from all charges.

**11. Monitoring of Explosive Exclusion Area *During Exercises*:** The Navy's Sinking Exercise and Bombing Exercise measures currently require that the Navy survey a safety zone prior to an exercise, and then during the exercise when feasible. Additionally, passive acoustic means are used to detect marine mammals during the exercise. Continuous monitoring during an explosive exercise could potentially decrease the number of animals exposed to energy or pressure levels associated with take. There are potentially serious safety concerns associated with monitoring an area where explosions will occur and the Navy must take those into consideration when determining when monitoring during an exercise is feasible. While the Navy's measures allow for some monitoring during explosive exercises, it is not practicable to do all of the time.

**12. Using Mid-Frequency Active and High-Frequency Active Sonar with Output Levels as Low as Possible Consistent with Mission Requirements or Using Active Sonar Only When Necessary:** Operators of sonar equipment are trained to be aware of the environmental variables affecting sound propagation. In this regard, the sonar equipment power levels are always set consistent with mission requirements. Active sonar is only used when required by the mission since it has the potential to alert opposing forces to the sonar platform's presence. The Navy remains committed to using passive sonar and all other available sensors in concert with active sonar to the maximum extent practicable consistent with mission requirements.

**13. Scaling Down Training to Meet Core Aims:** As with each Navy range complex, the primary mission of the MIRC is to provide a realistic training environment for naval forces to ensure that they have the capabilities and high state of readiness required to accomplish assigned missions. Exercise planners and Commanding Officers are obligated to ensure they maximize the use of time, personnel and equipment during training. The level of training expressed in the Proposed Action and alternatives is essential to achieving the primary mission of the MIRC.

**14. Limiting the Active Sonar Event Locations:** Areas where events are scheduled to occur are carefully chosen to provide for the safety of events and to allow for the realistic development of the training scenario including the ability of the exercise participants to develop, maintain, and demonstrate proficiency in all areas of warfare simultaneously. Limiting the exercise areas would concentrate all active sonar use, resulting in unnecessarily prolonged and intensive sound levels rather than the more transient exposures predicted by the current planning that makes use of multiple exercise areas. Furthermore, exercises using integrated warfare components require large areas of the littorals and open ocean for realistic and safe training.

**15. Implementing Vessel Speed Reduction:** Vessels engaged in training use extreme caution and operate at a slow, safe speed consistent with mission and safety. Ships and submarines need to be able to react to changing tactical situations in training as they would in actual combat. Placing arbitrary speed restrictions would not allow them to properly react to these situations. Training differently than that which would be needed in an actual combat scenario would decrease training effectiveness and reduce the crew's abilities.

**16. Adopting Mitigation Measures of Foreign Nation Navies:** The Navy typically operates in a Strike Group configuration where the group focuses its efforts on conducting air strikes and/or amphibious operations ashore. This requires that the Navy train to what it calls



“integrated warfare” meaning that Strike Groups must conduct many different warfare areas simultaneously. These include the ability to defend itself from attacks from submarines, mines, ships, aircraft and missiles. Other nations do not possess the same integrated warfare capabilities as the United States. As a result, many foreign nations’ measures are focused solely on reducing what they perceive to be impacts involving anti-submarine warfare. They are not required to locate training areas and position naval forces for the simultaneous and integrated warfare elements that the Navy conducts. As a result, many nations are willing to move training to areas where they believe marine mammals may not exist and do not train in the same bathymetric and littoral environments.

**REPORTING, MONITORING, AND STRANDING RESPONSE:** The Navy will implement the reporting and monitoring requirements of the MMPA Final Rule and the ESA Biological Opinion, and any additional such requirements in the annual MMPA Letters of Authorization and ESA Incidental Take Statements. Reports required by the MMPA Final Rule and ESA Biological Opinion include an Annual MIRC Monitoring Plan Report, an Annual MIRC Exercise Report, Major Training Event Notification, MIRC Comprehensive 5-Year Report, and a Comprehensive National anti-submarine warfare Report.

As a part of the NMFS rule-making process, NMFS and the Navy coordinated on the development of a Marine Species Monitoring Plan and Marine Mammal Stranding Response Plan. The Monitoring Plan commits to collection of field data that will enable the Navy and NMFS to better understand the distribution and abundance of marine mammals and sea turtles in the Mariana Islands. Field methods will include passive acoustic monitoring and visual surveys. This data will be used to support the Navy’s future environmental compliance under MMPA and ESA. In the Stranding Response Plan, the Navy and NMFS have established a protocol to ensure a dialogue is developed and coordination maintained during any marine mammal stranding event as defined in the MMPA.

The MMPA regulations governing the take of marine mammals incidental to Navy activities in the Mariana Island Range Complex includes an adaptive management component. The use of adaptive management will give NMFS the ability to consider new data from different sources to determine (in coordination with the Navy) on an annual basis if mitigation or monitoring measures should be modified or added (or deleted) if new data suggests that such modifications are appropriate (or are not appropriate) for subsequent annual MMPA Letters of Authorization. Possible sources of data results from the Navy’s monitoring from the previous year (including other locations), monitoring workshop results, compiled results of Navy funded research and development (R&D) studies, results from stranding investigations (including those that may involve strandings within and outside the MIRC and those involving the coincident mid-frequency/high-frequency active sonar of explosives training or not involving their coincident use) and results from general marine mammal and sound research. Mitigation measures could be modified or added (or deleted) if new data suggests that such modifications would have (or do not have) a reasonable likelihood of accomplishing the goals of mitigation laid out in NMFS’ MMPA Final Rule and if the measures are practicable. NMFS would also coordinate with the Navy to modify or add to (or delete) the existing monitoring requirements if the new data suggest that the addition of (or deletion of) a particular measure would more effectively accomplish the goals of monitoring laid out in the Final Rule. The reporting requirements associated with the Final Rule are designed to provide NMFS with monitoring data from the previous year to allow

NMFS to consider the data and issue annual MMPA Letters of Authorization. NMFS and the Navy will meet annually (prior to Letters of Authorization issuance, except in the year of the Monitoring Workshop) to discuss the monitoring reports, Navy R&D developments, and current science and whether mitigation or monitoring modifications are appropriate. An adaptive management component will be included in the annual MMPA Letters of Authorization and may be included in the annual ESA Incidental Take Statements.

**CUMULATIVE IMPACTS:** The Final EIS/OEIS analyzed cumulative impacts of the Proposed Action in combination with other past, present, and reasonably foreseeable future actions taking place in the project area, regardless of the agency or person undertaking these actions. The Final EIS/OEIS analyzed cumulative impacts associated with implementation of Navy-sponsored activities and other non-Navy activities in the region. The cumulative project list for MIRC includes 30 projects ranging from minor construction to major infrastructure type projects, as well as various military-sponsored projects (including actions considered in the Guam and CNMI Military Relocation EIS/OEIS). Other activities included fishing, commercial and recreational marine traffic, oil extraction, liquid natural gas terminal proposals, ocean pollution, coastal development, scientific research, commercial and general aviation, and air quality factors. Potential cumulative impacts resulting from other relevant projects combined with the Proposed Action addressed in this EIS/OEIS were determined to be less than significant.

#### **AGENCY CONSULTATION AND COORDINATION:**

**1. Marine Mammal Protection Act:** In support of the Proposed Action, on August 11, 2008 the Navy applied for an authorization pursuant to Section 101(a)(5)(A) of the MMPA. On February 18, 2009 the Navy updated its request with revised information concerning acoustic modeling results. After the application was reviewed by NMFS, a Notice of Receipt of Application was published in the Federal Register. Publication of the Notice of Receipt of Application initiated the 30-day public comment period, during which anyone could obtain a copy of the application by contacting NMFS. On October 20, 2009 NMFS published a Proposed Rule in the Federal Register (Volume 74, No. 201, October 20, 2009). NMFS considered and addressed comments received during the public comment period on the Proposed Rule. NMFS issued the MMPA Final Rule on July 20, 2010, effective immediately upon filing with the Office of the Federal Register (Federal Register Docket Number 0907281180-0269-02).

#### **2. Endangered Species Act:**

**a. National Marine Fisheries Service:** As part of the environmental documentation for the Final EIS/OEIS, and as an MMPA permit applicant, the Navy entered into early consultation procedures with NMFS regarding the potential effects on ESA-listed species from the conduct of the activities outlined in the Final EIS/OEIS. In accordance with Section 7 of the ESA (50 CFR § 402.11), after reviewing the current status of the endangered blue whale, fin whale, humpback whale, sei whale, sperm whale, green sea turtle, hawksbill sea turtle, leatherback sea turtle, loggerhead sea turtle, and the olive ridley sea turtle, the environmental baseline for the MIRC Study Area, the effects of the proposed action, and the cumulative effects, prior to the issuance of this Record of Decision, NMFS issued on June 28, 2010, a Biological Opinion concluding that the Navy's proposal to conduct major training exercises, unit-level and intermediate-level training activities, and RDT&E activities in the MIRC are likely to adversely

affect but are not likely to jeopardize the continued existence of these threatened and endangered species under NMFS's jurisdiction. Critical habitat that has been designated for listed species is outside of the area of the proposed activities and would not be affected by those activities. The Biological Opinion is effective for the Proposed Action through June 28, 2015.

**b. U.S. Fish and Wildlife Service:** The Navy conducted consultation with the USFWS in accordance with Section 7 of the ESA (50 CFR § 402.11) for species under the jurisdiction of USFWS. Species considered in the consultation included three plant species (*Serianthes nelsonii*, *Osmoxylon mariannense*, and *Nesogenes rotensis*), two sea turtle species (green sea turtle and hawksbill turtle), 11 bird species (Nightingale reed warbler, Mariana swiftlet, Mariana crow, Mariana common moorhen, Guam Micronesian kingfisher, Guam rail, Micronesian megapode, short-tailed albatross, Hawaiian petrel, Newell's shearwater, and Rota bridled white-eye), and one mammalian species (Mariana fruit bat). The USFWS issued a Biological Opinion on February 22, 2010, concluding that the Navy's proposed training within land-based areas of the MIRC would likely adversely affect but not likely to jeopardize the continued existence of the Mariana Crow, Mariana Fruit Bat, and Micronesian megapode. All other ESA-listed species considered in the analyses would either not be affected or not likely adversely affected by the Proposed Action. Critical habitat has been designated on Guam for the Mariana fruit bat, Mariana crow, and the Guam Micronesian kingfisher and on Rota for the Mariana crow and Rota bridled-white-eye. The USFWS concluded that the critical habitat designations would not be affected by those activities. The Biological Opinion is effective for the Proposed Action through February 21, 2015.

**c. Coastal Zone Management Act:** In accordance with the Coastal Zone Management Act, the Navy has reviewed the enforceable policies of the Coastal Zone Management Plans for Guam and the CNMI. Based on the location of MIRC activities, the enforceable policies of the Guam Coastal Zone Management Plans, and pursuant to 15 CFR § 930.39, the Navy has determined that the Proposed Action is consistent to the maximum extent practicable with the Guam Coastal Zone Management Plan. A Consistency Determination for Guam was submitted on March 18 to Guam's Bureau of Statistics and Plans. Guam's Bureau of Statistics and Plans' response to the Consistency Determination was received on June 25, 2009. Pursuant to 15 C.F.R. § 930.41(a), Guam had 60 days to reply to the Navy's Consistency Determination. Although the Guam's Bureau of Statistics and Plans response was not received within the 60-day review period, the Navy replied to that letter on July 20. The Navy's reply addressed all the concerns raised by the Guam Coastal Zone Management Plan. No reply to the Navy's July 20 letter was received and the Navy assumed concurrence based on the statutory deadline for response. Based on the location of MIRC activities, the enforceable policies of the CNMI Coastal Zone Management Plan, and pursuant to 15 CFR § 930.35 a Negative Determination for CNMI was submitted on March 18, 2009. CNMI did not object to the Negative Determination.

**d. National Historic Preservation Act:** The Navy has consulted with the Advisory Council on Historic Preservation, Territory of Guam and the CNMI State Historical Preservation Officers, and the National Park Service. A new Programmatic Agreement that stipulates avoidance strategies and avoidance measures to reduce and minimize potential adverse effects on cultural resources from training activities proposed under the Preferred Alternative was signed on December 11, 2009.

e. **Magnuson Stevens Act:** An ecosystem-based assessment of EFH was prepared in the Final EIS/OIES. The Study Area covered a vast area encompassing more than 501,873 square nautical miles (1,721,308 square kilometers). The wide dispersion in time and space of Navy training activities superimposed on the variable temporal and seasonal distributions of the fish species present minimizes the potential for interaction with local populations. As described in the Final EIS/OEIS, for managed species and EFH an adverse effect is 1) more than minimal, 2) not temporary, 3) causes significant changes in ecological function, and 4) does not allow the environment to recover without measurable impact. Given the limited extent, duration, and magnitude of potential impacts of Navy training, adverse effects on managed species and EFH are not expected under the Preferred Alternative (Alternative 1). NOAA Fisheries (Hawaii Office) provided six EFH conservation recommendations for the MIRC. Per Section 305(b)(4)(B) of the Magnuson-Steven Fishery Conservation and Management Act, the Navy provided a written response to NOAA's letter within 30 days of receipt indicating that the conservation measures would be implemented to the fullest extent practicable. From an ecosystem-based management perspective, range training activities would not adversely contribute to cumulative impacts on present or future uses of the area. Additional details regarding effects to EFH are provided in the Final EIS/OEIS. NMFS provided EFH recommendations; copies of NMFS correspondence and Navy's response correspondence are provided in the Final EIS/OEIS.

**RESPONSES TO COMMENTS ON THE FINAL EIS/OEIS:** The Final EIS/OEIS incorporated, and formally responded to, all public comments received on the Draft EIS/OEIS. No comments received on the Draft EIS/OEIS required significant revisions in the Final EIS/OEIS. There were additional revisions, which are reflected in the Final EIS/OEIS, that were made to amplify information previously provided. These changes included a more detailed description of the Danger Zone around Farallon de Medinilla, the additional discussion of terrestrial mitigations, additional calculations of greenhouse gas emissions, and more detailed information and development of communications protocols. Inclusion of this additional information did not result in a change to the conclusions in any of the resource areas analyzed. The NOA of the Final EIS/OEIS was published in the *Federal Register*, in various newspapers, and on the project website.

The Notice Of Availability of the Final EIS/OEIS was published in the Federal Register on June 4, 2010 (Federal Register Vol. 75, No. 107, June 4, 2010), in various newspapers, and on the MIRC EIS/OEIS website. Release of the Final EIS/OEIS was accompanied by a 30-day wait period. The Navy reviewed and considered all comments received during the wait period following the issuance of the Notice of Availability. No new or substantive comments were received; however, the exact coordinates of the W-517 area were added to the Record of Decision as a result of a comment from the Guam Fishermen's Cooperative Association. An additional statement regarding Navy biologists' monitoring of beaches during landing exercises for the safety of marine mammals and vessel has been added to the mitigation section of the Record of Decision due to a comment from the Guam Department of Agriculture. Comment received from EPA Region IX, which is discussed in the next paragraph, reiterated comments submitted on the Draft EIS/OEIS.

EPA Region IX Comment: EPA Region IX reiterated concerns raised in its review of the Draft EIS/OEIS related to the need for site-specific assessments similar to those conducted for



the Hawaii Range Complex. The Region also reiterated their concerns regarding deficiencies in the cumulative impact assessment. The configuration of the MIRC is different than that for the HI Range Complex. For those activities that were localized, analysis is achieved through on-site monitoring activities which provide the ability to identify potential localized effects. Use of adaptive management and monitoring will initiate additional analysis on an as needed basis through monitoring plans and annual renewals of the Letter of Authorization. As a programmatic document, the FEIS considered the training that occurs at the multiple training venues including consideration of multiple training activities in the same location and the same activities in multiple locations at the time of the FEIS analysis. Best available information was utilized for current and anticipated activities at the time of the FEIS analysis. Future documents will continue to build upon the cumulative effects analysis of the FEIS as the information becomes available and Proposed Actions are developed and analyzed in the future.

**CONCLUSIONS:** In determining whether and how to enhance the capabilities of the MIRC Range Complex, the following factors were considered: the Congressional mandates in Section 5062 or Title 10 of the U.S. Code; existing assets and capabilities of the MIRC Range Complex; the DoD's operational, testing, and training requirements; environmental impacts; the training and maintenance of ships and aircraft and training of personnel; and comments received during the EIS/OEIS process.

After carefully weighing all of these factors and analyzing the data presented in the Final EIS/OEIS, I have determined that the Preferred Alternative best meets the requirements for the Services' training and RDT&E activities. In addition to the specific mitigation measures identified in this Record of Decision, the Services will continue to review operational procedures and coordinate with other federal, state, and local entities as necessary to determine if any additional mitigation measures are necessary, feasible, and practicable.

20 July 2010

Date

Paul J. Bushong

Rear Admiral Paul J. Bushong  
Department of Defense Representative Guam  
Commonwealth of the Northern Mariana Islands  
(CNMI),  
Federated States of Micronesia and  
Republic of Palau (DoD REP)