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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648-XE926

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the U.S. Air Force Conducting Maritime Weapon Systems Evaluation Program Operational Testing within the Eglin Gulf Test and Training Range

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; proposed incidental harassment authorization; request for comments.

SUMMARY: NMFS (hereinafter, “we”) received an application from the U.S. Department of the Air Force, Headquarters 96th Air Base Wing (Air Force), Eglin Air Force Base (Eglin AFB), requesting an Incidental Harassment Authorization (IHA or Authorization) to take marine mammals, by harassment, incidental to a Maritime Weapon Systems Evaluation Program (Maritime WSEP) within a section of the Eglin Gulf Test and Training Range in the northern Gulf of Mexico.

Eglin AFB’s Maritime WSEP activities are military readiness activities per the Marine Mammal Protection Act (MMPA), as amended by the National Defense Authorization Act of 2004 (NDAA). Per the MMPA, NMFS requests comments on its proposal to issue an Authorization to Eglin AFB to incidentally take, by Level B and Level A harassment, two species of marine mammals, the Atlantic bottlenose dolphin

(*Tursiops truncatus*) and Atlantic spotted dolphin (*Stenella frontalis*), during the specified activity.

DATES: NMFS must receive comments and information no later than [*insert date 30 calendar days after the date of publication in the FEDERAL REGISTER*].

ADDRESSES: Address comments on the application to Jolie Harrison, Chief, Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910. The mailbox address for providing email comments is *ITP.Youngkin@noaa.gov*. Please include RIN 0648-XE926 in the subject line. Comments sent via email to *ITP.Youngkin@noaa.gov*, including all attachments, must not exceed a 25-megabyte file size. NMFS is not responsible for e-mail comments sent to addresses other than the one provided in this notice.

Instructions: All submitted comments are a part of the public record, and generally we will post them to <http://www.nmfs.noaa.gov/pr/permits/incidental/military.htm> without change. All personal identifying information (for example, name, address, *etc.*) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information.

To obtain an electronic copy of Eglin AFB's application, a list of the references used in this document, and Eglin AFB's Environmental Assessment (EA) titled, "Maritime Weapons System Evaluation Program," write to the previously mentioned address, telephone the contact listed here (see **FOR FURTHER INFORMATION CONTACT**), or visit the internet at:

<http://www.nmfs.noaa.gov/pr/permits/incidental/military.htm>.

FOR FURTHER INFORMATION CONTACT: Dale Youngkin, Office of Protected Resources, NMFS, (301) 427-8401.

SUPPLEMENTARY INFORMATION:

Background

Sections 101(a)(5)(A) and (D) of the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals of a species or population stock, by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if, after NMFS provides a notice of a proposed authorization to the public for review and comment: (1) NMFS makes certain findings; and (2) the taking is limited to harassment.

An Authorization for incidental takings for marine mammals shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant), and if the permissible methods of taking and requirements pertaining to the mitigation, monitoring, and reporting of such taking are set forth. NMFS has defined “negligible impact” in 50 CFR 216.103 as “an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.”

The NDAA (Public Law 108–136) removed the “small numbers” and “specified geographical region” limitations indicated earlier and amended the definition of harassment as it applies to a “military readiness activity” to read as follows (section

3(18)(B) of the MMPA): (i) any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild (Level A Harassment); or (ii) 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 (Level B Harassment).

Summary of Request

On February 4, 2016, we issued an Authorization to Eglin AFB to take marine mammals, by harassment, incidental to a Maritime Weapon Systems Evaluation Program (Maritime WSEP) within the Eglin Gulf Test and Training Range (EGTTR) in the Gulf of Mexico from February 4, 2016 through February 3, 2017 (see 81 FR 7307; February 11, 2016). These proposed missions were very similar to previous Maritime WSEP mission activities for which incidental harassment authorizations were issued the previous year (80 FR 17394). On September 19, 2016, we received a renewal request for an Authorization from Eglin AFB to continue the missions authorized in 2016. We considered the revised renewal request as adequate and complete on September 27, 2016.

Due to the ongoing nature of these activities, as well as the fact that other mission activities are conducted within the EGTTR, we have discussed developing a rulemaking to encompass all mission activities in the EGTTR, and anticipate that the Maritime WSEP activities will be part of that future rulemaking. However, this IHA is being proposed due to timing constraints to ensure that these activities are in compliance with the Marine Mammal Protection Act (MMPA) while the future rulemaking is in process.

Eglin AFB proposes to conduct Maritime WSEP missions within the EGTTR airspace over the Gulf of Mexico within Warning Area 151 (W-151), specifically within sub-area W-151A (see Figure 2-1 of Eglin AFB's application and Figure 1 below). The proposed Maritime WSEP training activities are planned to occur during daylight hours in February and March 2017, however, the activities could occur between February 4, 2017, and February 3, 2018.

Eglin AFB proposes to use multiple types of live munitions (*e.g.*, gunnery rounds, rockets, missiles, and bombs) against small boat targets in the EGTTR. These activities qualify as military readiness activities.

The following aspects of the proposed Maritime WSEP training activities have the potential to take marine mammals: exposure to impulsive noise and pressure waves generated by live ordnance detonation at or near the surface of the water. Take, by Level B harassment, of individuals of common bottlenose dolphin or Atlantic spotted dolphin could potentially result from the specified activity. Additionally, although NMFS does not expect it to occur, Eglin AFB has also requested authorization for Level A Harassment of up to three individuals of either common bottlenose dolphins or Atlantic spotted dolphins. Therefore, Eglin AFB has requested authorization to take individuals of two cetacean species by Level A and Level B harassment.

Eglin AFB's Maritime WSEP training activities may potentially impact marine mammals at or near the water surface in the absence of mitigation. Marine mammals could potentially be harassed, injured, or killed by exploding and non-exploding projectiles, and falling debris. However, based on analyses provided in Eglin AFB's 2016 application, Eglin AFB's previous applications and Authorizations Eglin AFB's 2015

Environmental Assessment (EA), and past monitoring reports for the authorized activities conducted in February and March 2016 and 2015, and for reasons discussed later in this document, we do not anticipate that Eglin AFB's Maritime WSEP activities would result in any serious injury or mortality to marine mammals.

For Eglin AFB, this would be the third such Authorization, if issued, following the Authorization issued effective from February 4, 2016, through February 3, 2017 (see 81 FR 7307; February 11, 2016). This IHA would be effective from February 4, 2017, through February 3, 2018, if issued. The monitoring report associated with the 2016 Authorization is available at www.nmfs.noaa.gov/pr/permits/incidental/military.htm and provides additional environmental information related to proposed issuance of this Authorization for public review and comment.

Description of the Specified Activity

Overview

Eglin AFB proposes to conduct live ordnance testing and training in the Gulf of Mexico as part of the Maritime WSEP operational testing missions. The Maritime WSEP test objectives are to evaluate maritime deployment data, evaluate tactics, techniques and procedures, and to determine the impact of techniques and procedures on combat Air Force training. The need to conduct this type of testing has developed in response to increasing threats at sea posed by operations conducted from small boats, which can carry a variety of weapons, can form in large or small numbers, and may be difficult to locate, track, and engage in the marine environment. Because of limited Air Force aircraft and munitions testing on engaging and defeating small boat threats, Eglin AFB proposes to employ live munitions against boat targets in the EGTTR in order to continue

development of techniques and procedures to train Air Force strike aircraft to counter small maneuvering surface vessels.

Dates and Duration

Eglin AFB proposes to schedule up to eight Maritime WSEP training missions occurring during a one-week period in February 2017 and a one-week period in March 2017. The proposed missions would occur for up to four hours each day during the morning hours, with multiple live munitions being released per day. However, the proposed Authorization, would be effective to cover those activities anytime during the period from February 4, 2017 through February 3, 2018.

Specified Geographic Region

The specific planned mission location is approximately 17 miles (mi) (27.3 kilometers (km)) offshore from Santa Rosa Island, Florida, in nearshore waters of the continental shelf in the Gulf of Mexico. All activities would take place within the EGTTR, defined as the airspace over the Gulf of Mexico controlled by Eglin AFB, beginning at a point three nautical miles (nmi) (3.5 mi; 5.5 km) from shore. The EGTTR consists of subdivided blocks including Warning Area 151 (W-151) where the proposed activities would occur, specifically in sub-area W-151A (shown in Figure 1).

W-151: The inshore and offshore boundaries of W-151 are roughly parallel to the shoreline contour. The shoreward boundary is three nmi (3.5 mi; 5.5 km) from shore, while the seaward boundary extends approximately 85 to 100 nmi (97.8 mi; 157.4 km to 115 mi; 185.2 km) offshore, depending on the specific location. W-151 covers a surface area of approximately 10,247 square nmi (nmi²) (13,570 square mi (mi²); 35,145 square km (km²)), and includes water depths ranging from about 20 to 700 meters (m) (65.6 to

2296.6 feet (ft)). This range of depth includes continental shelf and slope waters.

Approximately half of W-151 lies over the shelf.

W-151A: W-151A extends approximately 60 nmi (69.0 mi; 111.1 km) offshore and has a surface area of 2,565 nmi² (3,396.8 mi²; 8,797 km²). Water depths range from about 30 to 350 m (98.4 to 1148.2 ft) and include continental shelf and slope zones.

However, most of W-151A occurs over the continental shelf, in water depths less than 250 m (820.2 ft). Maritime WSEP training missions will occur in the shallower, northern inshore portion of the sub-area, in a water depth of about 35 meters (114.8 ft).

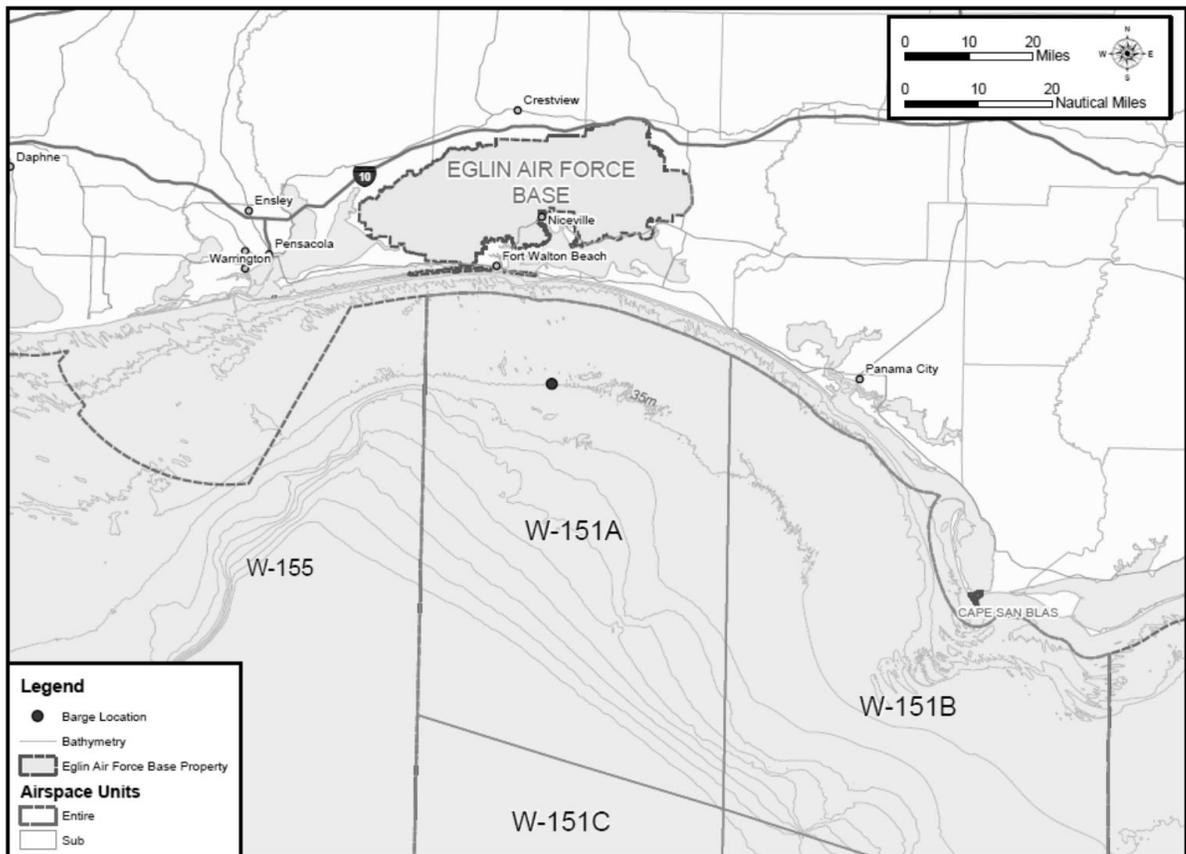


Figure 1 – Proposed Maritime WSEP operational testing location in block W-151A in the EGTRR.

Detailed Description of Activities

The Maritime WSEP training missions include the release of multiple types of inert and live munitions from fighter and bomber aircraft, unmanned aerial vehicles, and gunships against small, static, towed, and remotely-controlled boat targets. Munition types include bombs, missiles, rockets, and gunnery rounds (Table 1).

Table 1 - Live Munitions and Aircraft

Munitions	Aircraft (not associated with specific munitions)
GBU-10/-24/-31	F-16C fighter aircraft
GBU-49	F-16C+ fighter aircraft
JASSM	F-15E fighter aircraft
GBU-12 (PWII)/-54 (LJDAM)/-38/-32 (JDAM)	A-10 fighter aircraft
AGM-65 (Maverick)	B-1B bomber aircraft
CBU-105 (WCMD)	B-52H bomber aircraft
GBU-39 (Small Diameter Bomb)	MQ-1/9 unmanned aerial vehicle
AGM-114 (Hellfire)	AC-130 gunship
AGM-176 (Griffin)	
2.75 Rockets/ AGR-20A/B	
AIM-9X	
PGU-12/B high explosive incendiary 30 mm rounds	

Key: AGM = air-to-ground missile; CBU = Cluster Bomb Unit; GBU = Guided Bomb Unit; LJDAM = Laser Joint Direct Attack Munition; Laser SDB = Laser Small Diameter Bomb; mm = millimeters; PGU = Projectile Gun Unit; WCMD = wind corrected munition dispenser.

The proposed Maritime WSEP training activities involve detonations above the water, near the water surface, and under water within the EGTTR. However, because the tests will focus on weapons/target interaction, Eglin AFB will not specify a particular aircraft for a given test as long as it meets the delivery parameters.

Eglin AFB would deploy the munitions against static, towed, and remotely-controlled boat targets within the W-151A. Eglin AFB would operate the remote-controlled boats from an instrumentation barge (*i.e.*, the Gulf Range Armament Test

Vessel; GRATV) anchored on site within the test area. The GRATV would provide a platform for video cameras and weapons-tracking equipment.

Table 2 lists the number, height, or depth of detonation, explosive material, and net explosive weight (NEW) in pounds (lbs) of each munition proposed for use during the Maritime WSEP activities.

Table 2 - Maritime WSEP munitions proposed for use in the W-151A test area.

Type of Munition	Total # of Live Munitions	Detonation Type	Net Explosive Weight per Munition
GBU-10/-24/-31	2	Subsurface (10-ft depth)	945 lbs
GBU-49	4	Surface	500 lbs
JASSM	4	Surface	255 lbs
GBU-12 (PWII)/-54 (LJDAM)/-38/-32 (JDAM)	6	Subsurface (10-ft depth)	192 lbs
AGM-65 (Maverick)	8	Surface	86 lbs
CBU-105 (WCMD)	4	Airburst	83 lbs
GBU-39 (Small Diameter Bomb)	4	Surface	37 lbs
AGM-114 (Hellfire)	20	Subsurface (10-ft depth)	20 lbs
AGM-176 (Griffin)	10	Surface	13 lbs
2.75 Rockets/ AGR-20A/B	100	Surface	12 lbs
AIM-9X	1	Surface	7.9 lbs
PGU-12/B high explosive incendiary 30 mm rounds	1,000	Surface	0.1 lbs

Key: AGL = above ground level; AGM = air-to-ground missile; CBU = Cluster Bomb Unit; GBU = Guided Bomb Unit; JDAM = Joint Direct Attack Munition; LJDAM = Laser Joint Direct Attack Munition; mm = millimeters; msec = millisecond; lbs = pounds; PGU = Projectile Gun Unit; HEI = high explosive incendiary.

At least two ordnance delivery aircraft will participate in each live weapons release training mission, which lasts approximately four hours. Before delivering the ordnance, mission aircraft would make a dry run over the target area to ensure that it is clear of commercial and recreational boats. Jets will fly at a minimum air speed of 300 knots (approximately 345 miles per hour, depending on atmospheric conditions) and at a minimum altitude of 305 m (1,000 ft). Due to the limited flyover duration and potentially

high speed and altitude, the pilots would not participate in visual surveys for protected species. Eglin AFB’s 2016 and 2015 Authorization renewal request, 2014 application for the same activities, and 2015 EA and Finding of No Significant Impact (FONSI) contain additional detailed information on the Maritime WSEP training activities and are all available online

(http://www.nmfs.noaa.gov/pr/permits/incidental/military.htm#af_eglinwsep2016).

Description of Marine Mammals in the Area of the Specified Activity

Table 3 lists marine mammal species with potential or confirmed occurrence in the proposed activity area during the project timeframe and summarizes key information regarding stock status and abundance. Please see NMFS’ 2015 and 2014 Stock Assessment Reports (SAR), available at www.nmfs.noaa.gov/pr/sars and Garrison *et al.*, 2008; Navy, 2007; Davis *et al.*, 2000 for more detailed accounts of these stocks’ status and abundance.

Table 3 – Marine mammals that may occur in the proposed activity area.

Species	Stock Name	Regulatory Status ^{1, 2}	Estimated Abundance	Relative Occurrence in W-151
Common bottlenose dolphin	Choctawatchee Bay	MMPA - S ESA – NL	179 CV = 0.04 ³	Uncommon
	Pensacola/East Bay	MMPA - S ESA – NL	33 CV = 0.80 ⁴	Uncommon
	St. Andrew Bay	MMPA - S ESA – NL	124 CV = 0.57 ⁴	Uncommon
	Gulf of Mexico Northern Coastal	MMPA - S ESA – NL	7,185 CV = 0.21 ³	Common
	Northern Gulf of Mexico Continental Shelf	MMPA - NC ESA – NL	51,192 CV = 0.10 ³	Uncommon
	Northern Gulf of Mexico Oceanic	MMPA - NC ESA – NL	5,806 CV = 0.39 ⁴	Uncommon
Atlantic spotted dolphin	Northern Gulf of Mexico	MMPA - NC ESA – NL	37,611 ⁴ CV = 0.28	Common

¹ MMPA: D = Depleted, S = Strategic, NC = Not Classified.

² ESA: EN = Endangered, T = Threatened, DL = Delisted, NL = Not listed.

³ NMFS Draft 2015 SAR (Waring *et al.*, 2015)

⁴ NMFS 2014 SAR (Waring *et al.*, 2014)

An additional 19 cetacean species could occur within the northeastern Gulf of Mexico, mainly occurring at or beyond the shelf break (*i.e.*, water depth of approximately 200 m (656.2 ft)) located beyond the W-151A test area. NMFS and Eglin AFB consider these 19 species to be rare or extralimital within the W-151A test location area. These species are the Bryde's whale (*Balaenoptera edeni*), sperm whale (*Physeter macrocephalus*), dwarf sperm whale (*Kogia sima*), pygmy sperm whale (*K. breviceps*), pantropical spotted dolphin (*Stenella attenuata*), Clymene dolphin (*S. clymene*), spinner dolphin (*S. longirostris*), striped dolphin (*S. coeruleoalba*), Blainville's beaked whale (*Mesoplodon densirostris*), Gervais' beaked whale (*M. europaeus*), Cuvier's beaked whale (*Ziphius cavirostris*), killer whale (*Orcinus orca*), false killer whale (*Pseudorca crassidens*), pygmy killer whale (*Feresa attenuata*), Risso's dolphin (*Grampus griseus*), Fraser's dolphin (*Lagenodelphis hosei*), melon-headed whale (*Peponocephala electra*), rough-toothed dolphin (*Steno bredanensis*), and short-finned pilot whale (*Globicephala macrorhynchus*).

Of these species, only the sperm whale is listed as endangered under the Endangered Species Act (ESA) and as depleted throughout its range under the MMPA. Sperm whale occurrence within W-151A is unlikely because almost all reported sightings have occurred in water depths greater than 200 m (656.2 ft).

Because these species are unlikely to occur within the W-151A area, Eglin AFB has not requested and we are not proposing to authorize take for them. Thus, we do not consider these species further in this notice.

We have reviewed Eglin AFB's species descriptions, including life history information, distribution, regional distribution, diving behavior, and acoustics and

hearing, for accuracy and completeness. That information is contained in sections 3 and 4 of Eglin AFB's 2016 Authorization application and to Chapter 3 in Eglin AFB's EA rather than reprinting the information here.

Other Marine Mammals in the Proposed Action Area

The endangered West Indian manatee (*Trichechus manatus*) rarely occurs in the area (USAF 2014). The U.S. Fish and Wildlife Service has jurisdiction over the manatee; therefore, we would not include a proposed Authorization to harass manatees and do not discuss this species further in this notice.

Potential Effects of the Specified Activity on Marine Mammals and Their Habitat

This section includes a summary and discussion of the ways that components (e.g., exposure to impulsive noise and pressure waves generated by live ordnance detonation at or near the surface of the water) of the specified activity, including mitigation may impact marine mammals and their habitat. The "Estimated Take by Incidental Harassment" section later in this document will include a quantitative analysis of the number of individuals that we expect Eglin AFB to take during this activity. The "Negligible Impact Analysis" section will include the analysis of how this specific activity would impact marine mammals. We will consider the content of the following sections: "Estimated Take by Incidental Harassment" and "Proposed Mitigation" to draw conclusions regarding the likely impacts of these activities on the reproductive success or survivorship of individuals—and from that consideration—the likely impacts of this activity on the affected marine mammal populations or stocks.

In the following discussion, we provide general background information on sound and marine mammal hearing before considering potential effects to marine mammals from sound produced by underwater detonations.

Brief Background on Sound and WSEP Sound Types

Sound travels in waves, the basic components of which are frequency, wavelength, velocity, and amplitude. Frequency is the number of pressure waves that pass by a reference point per unit of time and is measured in hertz (Hz) or cycles per second. Wavelength is the distance between two peaks of a sound wave; lower frequency sounds have longer wavelengths than higher frequency sounds and attenuate (decrease) more rapidly in shallower water. Amplitude is the height of the sound pressure wave or the “loudness” of a sound and is typically measured using the decibel (dB) scale. A dB is the ratio between a measured pressure (with sound) and a reference pressure (sound at a constant pressure, established by scientific standards). It is a logarithmic unit that accounts for large variations in amplitude; therefore, relatively small changes in dB ratings correspond to large changes in sound pressure. When referring to sound pressure levels (SPLs; the sound force per unit area), sound is referenced in the context of underwater sound pressure to 1 microPascal (μPa). One pascal is the pressure resulting from a force of one newton exerted over an area of one square meter. The source level (SL) represents the sound level at a distance of 1 m from the source (referenced to 1 μPa). The received level is the sound level at the listener’s position. Note that we reference all underwater sound levels in this document to a pressure of 1 μPa .

Root mean square (rms) is the quadratic mean sound pressure over the duration of an impulse. Acousticians calculate rms by squaring all of the sound amplitudes,

averaging the squares, and then taking the square root of the average (Urlick 1983). Rms accounts for both positive and negative values; squaring the pressures makes all values positive so that one can account for the values in the summation of pressure levels (Hastings and Popper 2005). Researchers often use this measurement in the context of discussing behavioral effects, in part because behavioral effects, which often result from auditory cues, may be better expressed through averaged units than by peak pressures.

When underwater objects vibrate, or activity occurs, sound-pressure waves are created that alternately compress and decompress the water as the sound wave travels. These underwater sound waves radiate in all directions away from the source similar to ripples on the surface of a pond except in cases where the sound is directional. Aquatic life and underwater receptors such as hydrophones detect the changes in pressure associated with the compressions and decompressions of underwater sound waves as underwater sound or noise. Even in the absence of sound from the specified activity, the underwater environment has noise, or ambient sound, which is the environmental background sound levels lacking a single source or point (Richardson *et. al.*, 1995). The sound level of a region is defined by the total acoustic energy being generated by known and unknown sources. These sources can be physical (*e.g.*, waves, earthquakes, ice, or atmospheric sound); biological (*e.g.*, sounds produced by marine mammals, fish, and invertebrates); and anthropogenic (*e.g.*, vessels, dredging, aircraft, or construction).

The sum of the various natural and anthropogenic sound sources at any given location and time comprising the ambient, or background, sound depends on the source levels (as determined by weather conditions and levels of biological and anthropogenic activities) and the ability of sounds to propagate through the environment. In turn, sound

propagation is dependent on the spatially and temporally varying properties of the water column and sea floor, and is frequency-dependent. As a result of the dependence on a large number of varying factors, ambient sound levels can be expected to vary widely over both coarse and fine spatial and temporal scales. Sound levels at a given frequency and location can vary by 10-20 dB from day to day (Richardson *et. al.*, 1995). The result is that, depending on the source type and its intensity, sound from the specified activity may be a negligible addition to the local environment or could form a distinctive signal that may affect marine mammals.

Sounds fall into one of two general sound types: impulsive (defined in the following paragraphs) and non-pulsed. The distinction between these two sound types is important because they have differing potential to cause physical effects, particularly with regard to hearing (*e.g.*, Ward, 1997 in Southall *et al.*, 2007). Please see Southall *et al.*, (2007) for an in-depth discussion of these concepts. The sounds produced by the proposed WSEP activities are impulsive. Impulsive sound sources (*e.g.*, explosions, gunshots, sonic booms, impact pile driving) produce signals that are brief (typically considered to be less than one second), broadband, atonal transients (ANSI, 1986; Harris, 1998; NIOSH, 1998; ISO, 2003; ANSI, 2005) and occur either as isolated events or repeated in some succession. These sounds have a relatively rapid rise from ambient pressure to a maximal pressure value followed by a rapid decay period that may include a period of diminishing, oscillating maximal and minimal pressures, and generally have an increased capacity to induce physical injury as compared with sounds that lack these features.

Marine Mammal Hearing

When considering the influence of various kinds of sound on the marine environment, it is necessary to understand that different kinds of marine life are sensitive to different frequencies of sound. Current data indicate that not all marine mammal species have equal hearing capabilities (Richardson *et al.*, 1995; Southall *et al.*, 1997; Wartzok and Ketten 1999; Au and Hastings 2008).

Animals are less sensitive to sounds at the outer edges of their functional hearing range and are more sensitive to a range of frequencies within the middle of their functional hearing range. For mid-frequency cetaceans, such the common bottlenose dolphin and the Atlantic spotted dolphin (the two marine mammal species with expected occurrence in the EGTTR WSEP mission area), functional hearing estimates occur between approximately 150 Hz and 160 kHz with best hearing estimated to occur between approximately 10 to less than 100 kHz (Finneran *et al.*, 2005 and 2009; Natchtigall *et al.*, 2005 and 2008; Yuen *et al.*, 2005; Popov *et al.*, 2010 and 2011; and Schlundt *et al.*, 2011).

On August 4, 2016, NMFS released its Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Technical Guidance)(NMFS 2016; 81 FR 51694). This new guidance established new thresholds for predicting onset of temporary (TTS) and permanent (PTS) threshold shifts for impulsive (*e.g.*, explosives and impact pile drivers) and non-impulsive (*e.g.*, vibratory pile drivers) sound sources. These acoustic thresholds are presented using dual metrics of cumulative sound exposure level (SEL_{cum}) and peak sound level (PK) for impulsive sounds and SEL_{cum} for non-impulsive sounds. Eglin AFB used the new acoustic Technical Guidance

to evaluate potential effects to marine mammals (more detailed information on PTS and TTS is provided below).

Common Bottlenose Dolphin Vocalization and Hearing

Bottlenose dolphins can typically hear within a broad frequency range of 0.04 to 160 kHz (Au 1993; Turl 1993). Electrophysiological experiments suggest that the bottlenose dolphin brain has a dual analysis system: one specialized for ultrasonic clicks and another for lower-frequency sounds, such as whistles (Ridgway 2000). Scientists have reported a range of highest sensitivity between 25 and 70 kHz, with peaks in sensitivity at 25 and 50 kHz (Nachtigall *et al.*, 2000). Research on the same individuals indicates that auditory thresholds obtained by electrophysiological methods correlate well with those obtained in behavior studies, except at lower (10 kHz) and higher (80 and 100 kHz) frequencies (Finneran and Houser 2006).

Sounds emitted by common bottlenose dolphins fall into two broad categories: pulsed sounds (including clicks and burst-pulses) and narrow-band continuous sounds (whistles), which usually are frequency modulated. Clicks have a dominant frequency range of 110 to 130 kHz and a source level of 218 to 228 dB re: 1 μ Pa (peak-to-peak) (Au 1993) and 3.4 to 14.5 kHz at 125 to 173 dB re 1 μ Pa (peak-to-peak) (Ketten 1998). Whistles are primarily associated with communication and can serve to identify specific individuals (*i.e.*, signature whistles) (Caldwell and Caldwell 1965; Janik *et al.*, 2006). Cook *et al.* (2004) classified up to 52 percent of whistles produced by bottlenose dolphin groups with mother-calf pairs as signature whistles. Sound production is also influenced by group type (single or multiple individuals), habitat, and behavior (Nowacek 2005). Bray calls (low-frequency vocalizations; majority of energy below 4 kHz), for example,

are used when capturing fish, specifically sea trout (*Salmo trutta*) and Atlantic salmon (*Salmo salar*), in some regions (*i.e.*, Moray Firth, Scotland) (Janik 2000). Additionally, whistle production has been observed to increase while feeding (Acevedo-Gutiérrez and Stienessen 2004; Cook *et al.*, 2004).

Atlantic Spotted Dolphin Vocalization and Hearing

Researchers have recorded a variety of sounds including whistles, echolocation clicks, squawks, barks, growls, and chirps for the Atlantic spotted dolphin. Whistles have dominant frequencies below 20 kHz (range: 7.1 to 14.5 kHz) but multiple harmonics extend above 100 kHz, while burst pulses consist of frequencies above 20 kHz (dominant frequency of approximately 40 kHz) (Lammers *et al.*, 2003). Other sounds, such as squawks, barks, growls, and chirps, typically range in frequency from 0.1 to 8 kHz (Thomson and Richardson 1995). Recorded echolocation clicks had two dominant frequency ranges at 40 to 50 kHz and 110 to 130 kHz, depending on source level (*i.e.*, lower source levels typically correspond to lower frequencies and higher frequencies to higher source levels (Au and Herzing 2003). Echolocation click source levels as high as 210 dB re 1 μ Pa-m peak-to-peak have been recorded (Au and Herzing 2003). Spotted dolphins in the Bahamas were frequently recorded during agonistic/aggressive interactions with bottlenose dolphins (and their own species) to produce squawks (0.2 to 12 kHz broad band burst pulses; males and females), screams (5.8 to 9.4 kHz whistles; males only), barks (0.2 to 20 kHz burst pulses; males only), and synchronized squawks (0.1-15 kHz burst pulses; males only in a coordinated group) (Herzing 1996). The hearing ability for the Atlantic spotted dolphin is unknown; however, odontocetes are generally adapted to hear high-frequencies (Ketten 1997).

The Maritime WSEP training exercises proposed for the incidental take of marine mammals have the potential to take marine mammals by exposing them to impulsive noise and pressure waves generated by live ordnance detonation at or near the surface of the water. Exposure to energy, pressure, or direct strike by ordnance has the potential to result in non-lethal injury (Level A harassment), disturbance (Level B harassment), serious injury, and/or mortality. In addition, NMFS also considered the potential for harassment from vessel and aircraft operations.

Acoustic Effects, Underwater Detonations

Underwater explosive detonations send a shock wave and sound energy through the water and can release gaseous by-products, create an oscillating bubble, or cause a plume of water to shoot up from the water surface. The shock wave and accompanying noise are of most concern to marine animals. Depending on the intensity of the shock wave and size, location, and depth of the animal, an animal can be injured, killed, suffer non-lethal physical effects, experience hearing related effects with or without behavioral responses, or exhibit temporary behavioral responses or tolerance from hearing the blast sound. Generally, exposures to higher levels of impulse and pressure levels would result in greater impacts to an individual animal.

The effects of underwater detonations on marine mammals are dependent on several factors, including the size, type, and depth of the animal; the depth, intensity, and duration of the sound; the depth of the water column; the substrate of the habitat; the standoff distance between activities and the animal; and the sound propagation properties of the environment. Thus, we expect impacts to marine mammals from MaritimeWSEP activities to result primarily from acoustic pathways. As such, the degree of the effect

relates to the received level and duration of the sound exposure, as influenced by the distance between the animal and the source. The further away from the source, the less intense the exposure should be.

The potential effects of underwater detonations from the proposed Maritime WSEP training activities may include one or more of the following: temporary or permanent hearing impairment; non-auditory physical or physiological effects; behavioral disturbance; and masking (Richardson *et al.*, 1995; Gordon *et al.*, 2004; Nowacek *et al.*, 2007; Southall *et al.*, 2007). However, the effects of noise on marine mammals are highly variable, often depending on species and contextual factors (based on Richardson *et al.*, 1995).

In the absence of mitigation, impacts to marine species could result from physiological and behavioral responses to both the type and strength of the acoustic signature (Viada *et al.*, 2008). The type and severity of behavioral impacts are more difficult to define due to limited studies addressing the behavioral effects of impulsive sounds on marine mammals. Potential effects from impulsive sound sources can range in severity from effects such as behavioral disturbance or tactile perception to physical discomfort, slight injury of the internal organs and the auditory system, or mortality (Yelverton *et al.*, 1973).

Hearing Impairment and Other Physical Effects

Marine mammals exposed to high intensity sound repeatedly or for prolonged periods can experience hearing threshold shift (TS), which is the loss of hearing sensitivity at certain frequency ranges (Kastak *et al.*, 1999; Schlundt *et al.*, 2000; Finneran *et al.*, 2002, 2005). TS can be permanent (PTS), in which case the loss of

hearing sensitivity is not recoverable, or temporary (TTS), in which case the animal's hearing threshold would recover over time (Southall *et al.*, 2007). Marine mammals depend on acoustic cues for vital biological functions, (*e.g.*, orientation, communication, finding prey, avoiding predators) thus, TTS may result in reduced fitness in survival and reproduction. However, this depends on the frequency and duration of TTS, as well as the biological context in which it occurs. TTS of limited duration, occurring in a frequency range that does not coincide with that used for recognition of important acoustic cues, would have little to no effect on an animal's fitness. Repeated sound exposure that leads to TTS could cause PTS. PTS constitutes injury, but TTS does not (Southall *et al.*, 2007). The following subsections provide a summary on the possibilities of TTS, PTS, and non-auditory physical effects.

Temporary Threshold Shift

TTS is the mildest form of hearing impairment that can occur during exposure to a strong sound (Kryter 1985). While experiencing TTS, the hearing threshold rises, and a sound must be stronger in order to be heard. In terrestrial mammals, TTS can last from minutes or hours to days (in cases of strong TTS). For sound exposures at or somewhat above the TTS threshold, hearing sensitivity in both terrestrial and marine mammals recovers rapidly after exposure to the sound ends. Few data on sound levels and durations necessary to elicit mild TTS have been obtained for marine mammals. According to Finneran and Jenkins (2012) the TTS onset thresholds for mid-frequency cetaceans are based on TTS data from a beluga whale exposed to an underwater impulse produced from a seismic watergun. TTS thresholds also use a dual criterion, and in a given analysis the more conservative of the two criteria is applied. The TTS thresholds for bottlenose and

Atlantic spotted dolphins consist of the SEL of an underwater blast weighted to the hearing sensitivity of mid-frequency cetaceans and a peak SPL measure of the same. The dual thresholds for TTS in mid-frequency cetaceans are:

- SEP (mid-frequency weighted) of 170 dB re 1 $\mu\text{Pa}^2\text{s}$
- Peak SPL (unweighted) of 224 dB re 1 μPa

Permanent Threshold Shift

When PTS occurs, there is physical damage to the sound receptors in the ear. In severe cases, there can be total or partial deafness, while in other cases the animal has an impaired ability to hear sounds in specific frequency ranges (Kryter 1985). There is no specific evidence that exposure to pulses of sound can cause PTS in any marine mammal. However, given the possibility that mammals close to a sound source might incur TTS, there has been further speculation about the possibility that some individuals might incur PTS. Single or occasional occurrences of mild TTS are not indicative of permanent auditory damage, but repeated or (in some cases) single exposures to a level well above that causing TTS onset might elicit PTS.

Relationships between TTS and PTS thresholds have not been studied in marine mammals, but they are assumed to be similar to those in humans and other terrestrial mammals. PTS might occur at a received sound level at least several dB above that inducing mild TTS if the animal were exposed to strong sound pulses with rapid rise time. There is no empirical data for onset of PTS in any marine mammal for ethical reasons and researchers must extrapolate PTS-onset based on hearing loss growth rates (*i.e.*, rate of how quickly threshold shifts grow in relation to increases in decibel level; expressed in dB of TTS/dB of noise) from limited marine mammal TTS studies and more

numerous terrestrial mammal TTS/PTS experiments. Typically, the magnitude of a threshold shift increases with increasing duration or level of exposure, until it becomes asymptotic (growth rate begins to level or the upper limit of TTS; Mills *et al.*, 1979; Clark *et al.*, 1987; Laroche *et al.*, 1989; Yost 2007). Based on data from terrestrial mammals, a precautionary assumption is that the PTS threshold for impulse sounds is at least six dB higher than the TTS threshold on a peak-pressure basis and probably greater than six dB (Southall *et al.*, 2007). Jenkins and Finneran (2012) define PTS thresholds differently for three groups of cetaceans based on their hearing sensitivity: low-frequency, mid-frequency; and high frequency. Bottlenose and Atlantic spotted dolphins (the subject of the Maritime WSEP acoustic impact analysis) both fall within the mid-frequency hearing category. The PTS thresholds use a dual criterion, one based on SEL and one based on SPL of an underwater blast. For a given analysis, the more conservative of the two is applied to afford the most protection to marine mammals. The mid-frequency cetacean criteria for PTS are:

- SEL(mid-frequency weighted) of 185 dB re 1 $\mu\text{Pa}^2\text{s}$
- Peak SPL (unweighted) of 230 dB re 1 μPa

Non-auditory Physiological Effects

Non-auditory physiological effects or injuries that theoretically might occur in marine mammals exposed to strong underwater sound include stress and other types of organ or tissue damage (Cox *et al.*, 2006; Southall *et al.*, 2007). While Eglin AFB's activities involve the use of explosives that are associated with these types of effects, severe injury to marine mammals is not anticipated from these activities.

Adverse Stress Responses:

An acoustic source is considered a potential stressor if, by its action on the animal, via auditory or non-auditory means, it may produce a stress response in the animal. Here, the stress response will refer to an increase in energetic expenditure that results from exposure to the stressor and which is predominantly characterized by either the stimulation of the sympathetic nervous system (SNS) or the hypothalamic-pituitary-adrenal (HPA) axis (Reeder and Kramer 2005). The SNS response to a stressor is immediate and acute and occurs by the release of the catecholamine neurohormones norepinephrine and epinephrine (*i.e.*, adrenaline). These hormones produce elevations in the heart and respiration rate, increase awareness, and increase the availability of glucose and lipids for energy. The HPA response results in increases in the secretion of the glucocorticoid steroid hormones, predominantly cortisol in mammals. The presence and magnitude of a stress response in an animal depends on a number of factors. These include the animal's life history stage (*e.g.*, neonate, juvenile, adult), the environmental conditions, reproductive or developmental state, and experience with the stressor. Not only will these factors be subject to individual variation, but they will also vary within an individual over time. The stress response may or may not result in a behavioral change, depending on the characteristics of the exposed animal. However, provided that a stress response occurs, we assume that some contribution is made to the animal's allostatic load. One can assume that any immediate effect of exposure that produces an injury also produce a stress response and contribute to the allostatic load. Allostasis is the ability of an animal to maintain stability through change by adjusting its physiology in response to both predictable and unpredictable events (McEwen and Wingfield 2003). If the animal does not perceive the sound, the acoustic source would not produce tissue effects and

does not produce a stress response by any other means. Thus, we expect that the exposure does not contribute to the allostatic load.

Serious Injury/Mortality:

Elgin AFB proposes to use several types of explosive sources during its training exercises. Proposed detonations could be either in air, at the water surface, or underwater, depending on the mission and type of munition. Airburst detonations have little transfer of energy underwater, but surface and underwater detonations are of most concern regarding potential effects to marine mammals. The underwater explosions from these weapons would send a shock wave and blast noise through the water, release gaseous by-products, create an oscillating bubble, and cause a plume of water to shoot up from the water surface. The shock wave and blast noise are of most concern to marine animals. In general, potential impacts from explosive detonations can range from brief effects (such as short term behavioral disturbance), tactile perception, physical discomfort, slight injury of the internal organs, and death of the animal (Yelverton *et al.*, 1973; O’Keeffe and Young 1984; DoN 2001). The effects of an underwater explosion on a marine mammal depend on many 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 charge and the animal, as well as the sound propagation properties of the environment. Physical damage of tissues resulting from a shock wave (from an explosive detonation) constitutes an injury. Blast effects are greatest at the gas-liquid interface (Landsberg 2000) and gas containing organs, particularly the lungs and gastrointestinal tract, are especially susceptible to damage (Goertner 1982; Hill 1978; Yelverton *et al.*, 1973). Nasal sacs, larynx, pharynx, trachea, and lungs may be damaged by compression/

expansion caused by the oscillations of the blast gas bubble (Reidenberg and Laitman 2003). Severe damage (from the shock wave) to the ears can include tympanic membrane rupture, fracture of the ossicles, cochlear damage, hemorrhage, and cerebrospinal fluid leakage into the middle ear.

Non-lethal injury includes slight injury to internal organs and the auditory system, however, delayed lethality can be a result of individual or cumulative sublethal injuries (DoN, 2001). Immediate lethal injury would be a result of massive combined trauma to internal organs as a direct result of proximity to the point of detonation (DoN 2001).

Disturbance Reactions

Disturbance includes a variety of effects, including subtle changes in behavior, more conspicuous changes in activities, and displacement, or abandonment of habitat. Behavioral responses to sound are highly variable and context-specific and reactions, if any, depend on species, state of maturity, experience, current activity, reproductive state, auditory sensitivity, time of day, and many other factors (Richardson *et al.*, 1995; Wartzok *et al.*, 2003; Southall *et al.*, 2007). Behavioral reactions can vary among individuals as well as within an individual, depending on previous experience with a sound source, context, and numerous other factors (Ellison *et al.*, 2012). Behavioral reactions can also vary depending on the characteristics associated with the sound source (*e.g.*, whether it is moving or stationary, the number of sources, etc).

Tolerance

Studies on marine mammals' tolerance to sound in the natural environment are relatively rare. Richardson *et al.* (1995) defined tolerance as the occurrence of marine mammals in areas where they are exposed to human activities or manmade noise. In

many cases, tolerance develops by the animal habituating to the stimulus (*i.e.*, the gradual waning of responses to a repeated or ongoing stimulus) (Richardson, *et al.*, 1995; Wartzok *et al.*, 2003), but because of ecological or physiological requirements, many marine animals may need to remain in areas where they are exposed to chronic stimuli (Richardson, *et al.*, 1995). Animals are most likely to habituate to sounds that are predictable and unvarying.

The opposite process is sensitization, when an unpleasant experience leads to subsequent responses, often in the form of avoidance, at a lower level of exposure. Behavioral state may affect the type of response as well. For example, animals that are resting may show greater behavioral change in response to disturbing sound levels than animals that are highly motivated to remain in an area for feeding (Richardson *et al.*, 1995; NRC, 2003; Wartzok *et al.*, 2003).

Numerous studies have shown that underwater sounds are often readily detectable by marine mammals in the water at distances of many kilometers. However, other studies have shown that marine mammals at distances more than a few kilometers away often show no apparent response to activities of various types (Miller *et al.*, 2005). This is often true even in cases when the sounds must be readily audible to the animals based on measured received levels and the hearing sensitivity of that mammal group. Although various baleen whales, toothed whales, and (less frequently) pinnipeds have been shown to react behaviorally to underwater sound from impulsive sources such as airguns, at other times, mammals of all three types have shown no overt reactions (*e.g.*, Malme *et al.*, 1986; Richardson *et al.*, 1995; Madsen and Mohl, 2000; Croll *et al.*, 2001; Jacobs and

Terhune 2002; Madsen *et al.*, 2002; MacLean and Koski, 2005; Miller *et al.*, 2005; Bain and Williams 2006).

Controlled experiments with captive marine mammals showed pronounced behavioral reactions, including avoidance of loud sound sources (Ridgway *et al.*, 1997; Finneran *et al.*, 2003). Observed responses of wild marine mammals to loud pulsed sound sources (typically seismic guns or acoustic harassment devices) have been varied but often consist of avoidance behavior or other behavioral changes suggesting discomfort (Morton and Symonds, 2002; Thorson and Reyff, 2006; see also Gordon *et al.*, 2004; Wartzok *et al.*, 2003; Nowacek *et al.*, 2007).

Because the few available studies show wide variation in response to underwater sound, it is difficult to quantify exactly how sound from the Maritime WSEP operational testing would affect marine mammals. It is likely that the onset of underwater detonations could result in temporary, short term changes in an animal's typical behavior and/or avoidance of the affected area. These behavioral changes may include (Richardson *et al.*, 1995): changing durations of surfacing and dives, number of blows per surfacing, or moving direction and/or speed; reduced/increased vocal activities; changing/cessation of certain behavioral activities (such as socializing or feeding); visible startle response or aggressive behavior (such as tail/fluke slapping or jaw clapping); or avoidance of areas where sound sources are located.

The biological significance of any of these behavioral disturbances is difficult to predict, especially if the detected disturbances appear minor. However generally, one could expect the consequences of behavioral modification to be biologically significant if

the change affects growth, survival, or reproduction. Significant behavioral modifications that could potentially lead to effects on growth, survival, or reproduction include:

- Drastic changes in diving/surfacing patterns (such as those thought to cause beaked whale stranding due to exposure to military mid-frequency tactical sonar);
- Habitat abandonment due to loss of desirable acoustic environment; and
- Cessation of feeding or social interaction.

The onset of behavioral disturbance from anthropogenic sound depends on both external factors (characteristics of sound sources and their paths) and the specific characteristics of the receiving animals (hearing, motivation, experience, demography) and is difficult to predict (Southall *et al.*, 2007). However, Finneran and Schlundt (2004) and Schlundt *et al.*, 2000 reported on observations of behavioral reactions in captive dolphins and belugas to pure tones (different type of noise than that produced from an underwater detonation). The behavioral impacts threshold for mid-frequency cetaceans exposed to multiple, successive detonations is 165 dB re 1 $\mu\text{Pa}^2\text{s}$ SEL (mid-frequency weighted).

Auditory Masking

Natural and artificial sounds can disrupt behavior by masking, or interfering with, a marine mammal's ability to hear other sounds. Masking occurs when the receipt of a sound interferes with by another coincident sound at similar frequencies and at similar or higher levels (Clark *et al.*, 2009). Chronic exposure to excessive, though not high-intensity, sound could cause masking at particular frequencies for marine mammals, which utilize sound for vital biological functions. Masking can interfere with detection of acoustic signals such as communication calls, echolocation sounds, and environmental

sounds important to marine mammals for other purposes such as navigation. Therefore, under certain circumstances, marine mammals whose acoustical sensors or environment are being severely masked could also be impaired from maximizing their performance fitness in survival and reproduction. If the coincident (masking) sound were man-made, it could be potentially harassing if it disrupted hearing-related behavior. It is important to distinguish TTS and PTS, which persist after the sound exposure, from masking, which occurs during the sound exposure. Introduced underwater sound may, through masking, more specifically reduce the effective communication distance of a marine mammal species if the frequency of the source is close to that used as a signal by the marine mammal, and if the anthropogenic sound is present for a significant fraction of the time (Richardson *et al.*, 1995). Marine mammals are thought to be able to compensate for communication masking by adjusting their acoustic behavior through shifting call frequencies, increasing call volume, and increasing vocalization rates. For example in one study, blue whales increased call rates when exposed to noise from seismic surveys in the St. Lawrence Estuary (Di Iorio and Clark 2010). Other studies reported that some North Atlantic right whales exposed to high shipping noise increased call frequency (Parks *et al.*, 2007) and some humpback whales responded to low-frequency active sonar playbacks by increasing song length (Miller *et al.*, 2000). Additionally, beluga whales change their vocalizations in the presence of high background noise possibly to avoid masking calls (Au *et al.*, 1985; Lesage *et al.*, 1999; Scheifele *et al.*, 2005).

While it may occur temporarily, we do not expect auditory masking to result in detrimental impacts to an individual's or population's survival, fitness, or reproductive success. Dolphin movement is not restricted within the W-151A test area, allowing for

movement out of the area to avoid masking impacts and the sound resulting from the underwater detonations is short in duration. Also, masking is typically of greater concern for those marine mammals that utilize low frequency communications, such as baleen whales and, as such, is not likely to occur for marine mammals in the W-151A test area.

Vessel and Aircraft Presence

The marine mammals most vulnerable to vessel strikes are slow-moving and/or spend extended periods of time at the surface in order to restore oxygen levels within their tissues after deep dives (*e.g.*, North Atlantic right whales (*Eubalaena glacialis*), fin whales (*Balaenoptera physalus*), and sperm whales). Smaller marine mammals such as common bottlenose and Atlantic spotted dolphins (the species anticipated to occur in the area of Eglin AFB's activities) are agile and move more quickly through the water, making them less susceptible to ship strikes. NMFS and Eglin AFB are not aware of any vessel strikes of common bottlenose and Atlantic spotted dolphins within in W-151 during training operations and both parties do not anticipate that Eglin AFB vessels engaged in the specified activity would strike any marine mammals.

Dolphins within the Gulf of Mexico are continually exposed to recreational, commercial, and military vessels. Behaviorally, marine mammals may or may not respond to the operation of vessels and associated noise. Responses to vessels vary widely among marine mammals in general, but also among different species of small cetaceans. Responses may include attraction to the vessel (Richardson *et al.*, 1995); altering travel patterns to avoid vessels (Constantine 2001; Nowacek *et al.*, 2001; Lusseau 2003, 2006); relocating to other areas (Allen and Read, 2000); cessation of feeding, resting, and social interaction (Baker *et al.*, 1983; Bauer and Herman 1986; Hall

1982; Krieger and Wing 1984; Lusseau 2003; Constantine *et al.*, 2004); abandoning feeding, resting, and nursing areas (Jurasz and Jurasz 1979; Dean *et al.*, 1985; Glockner-Ferrari and Ferrari 1985, 1990; Lusseau 2005; Norris *et al.*, 1985; Salden 1988; Forest 2001; Morton and Symonds 2002; Courbis 2004; Bejder 2006); stress (Romano *et al.*, 2004); and changes in acoustic behavior (Van Parijs and Corkeron 2001). However, in some studies marine mammals display no reaction to vessels (Watkins 1986; Nowacek *et al.*, 2003) and many odontocetes show considerable tolerance to vessel traffic (Richardson *et al.*, 1995). Dolphins may actually reduce the energetic cost of traveling by riding the bow or stern waves of vessels (Williams *et al.*, 1992; Richardson *et al.*, 1995).

Aircraft produce noise at frequencies that are well within the frequency range of cetacean hearing and also produce visual signals such as the aircraft itself and its shadow (Richardson *et al.*, 1995, Richardson and Wursig 1997). A major difference between aircraft noise and noise caused by other anthropogenic sources is that the sound is generated in the air, transmitted through the water surface and then propagates underwater to the receiver, diminishing the received levels significantly below what is heard above the water's surface. Sound transmission from air to water is greatest in a sound cone 26 degrees directly under the aircraft.

There are fewer reports of reactions of odontocetes to aircraft than those of pinnipeds. Responses to aircraft include diving, slapping the water with pectoral fins or tail fluke, or swimming away from the track of the aircraft (Richardson *et al.*, 1995). The nature and degree of the response, or the lack thereof, are dependent upon the nature of the flight (*e.g.*, type of aircraft, altitude, straight vs. circular flight pattern). Wursig *et al.* (1998) assessed the responses of cetaceans to aerial surveys in the north central and

western Gulf of Mexico using a DeHavilland Twin Otter fixed-wing airplane. The plane flew at an altitude of 229 m (751.3 ft) at 204 km/hr (126.7 mph) and maintained a minimum of 305 m (1,000 ft) straight line distance from the cetaceans. Water depth was 100 to 1,000 m (328 to 3,281 ft). Bottlenose dolphins most commonly responded by diving (48 percent), while 14 percent responded by moving away. Other species (*e.g.*, beluga (*Delphinapterus leucas*) and sperm whales) show considerable variation in reactions to aircraft but diving or swimming away from the aircraft are the most common reactions to low flights (less than 500 m; 1,640 ft).

Direct Strike by Ordnance

Another potential risk to marine mammals is direct strike by ordnance, in which the ordnance physically hits an animal. While strike from an item falling through the water column is possible, the potential risk of a direct hit to an animal within the target area would be so low because objects sink slowly and most projectiles fired at targets usually hit those targets.

Anticipated Effects on Habitat

Detonations of live ordnance would result in temporary changes to the water environment. Munitions could hit the targets and not explode in the water. However, because the targets are located over the water, in water explosions could occur. An underwater explosion from these weapons could send a shock wave and blast noise through the water, release gaseous by-products, create an oscillating bubble, and cause a plume of water to shoot up from the water surface. However, these effects would be temporary and not expected to last more than a few seconds.

Similarly, Eglin AFB does not expect any long-term impacts with regard to hazardous constituents to occur. Eglin AFB considered the introduction of fuel, debris, ordnance, and chemical materials into the water column within its EA and determined the potential effects of each to be insignificant. We summarize Eglin AFB's analyses in the following paragraphs (for a complete discussion of potential effects, please refer to section 3.3 in Eglin AFB's EA).

Metals typically used to construct bombs, missiles, and gunnery rounds include copper, aluminum, steel, and lead, among others. Aluminum is also present in some explosive materials. These materials would settle to the seafloor after munitions detonate. Metal ions would slowly leach into the substrate and the water column, causing elevated concentrations in a small area around the munitions fragments. Some of the metals, such as aluminum, occur naturally in the ocean at varying concentrations and would not necessarily impact the substrate or water column. Other metals, such as lead, could cause toxicity in microbial communities in the substrate. However, such effects would be localized to a very small distance around munitions fragments and would not significantly affect the overall habitat quality of sediments in the northeastern Gulf of Mexico. In addition, metal fragments would corrode, degrade, and become encrusted over time.

Chemical materials include explosive byproducts and also fuel, oil, and other fluids associated with remotely controlled target boats. Explosive byproducts would be introduced into the water column through detonation of live munitions. Explosive materials would include 2,4,6-trinitrotoluene (TNT) and Research Department Formula X (RDX), among others. Various byproducts are produced during and immediately after

detonation of TNT and RDX. During the very brief time that a detonation is in progress, intermediate products may include carbon ions, nitrogen ions, oxygen ions, water, hydrogen cyanide, carbon monoxide, nitrogen gas, nitrous oxide, cyanic acid, and carbon dioxide (Becker 1995). However, reactions quickly occur between the intermediates, and the final products consist mainly of water, carbon monoxide, carbon dioxide, and nitrogen gas, although small amounts of other compounds are typically produced as well.

Chemicals introduced into the water column would be quickly dispersed by waves, currents, and tidal action, and eventually become uniformly distributed. A portion of the carbon compounds such as carbon monoxide and carbon dioxide would likely become integrated into the carbonate system (alkalinity and pH buffering capacity of seawater). Some of the nitrogen and carbon compounds, including petroleum products, would be metabolized or assimilated by phytoplankton and bacteria. Most of the gas products that do not react with the water or become assimilated by organisms would be released into the atmosphere. Due to dilution, mixing, and transformation, none of these chemicals are expected to have significant impacts on the marine environment.

Explosive material that is not consumed in a detonation could sink to the substrate and bind to sediments. However, the quantity of such materials is expected to be inconsequential. When munitions function properly, nearly full combustion of the explosive materials will occur, and only extremely small amounts of raw material will remain. In addition, any remaining materials would be naturally degraded. TNT decomposes when exposed to sunlight (ultraviolet radiation), and is also degraded by microbial activity (Becker, 1995). Several types of microorganisms have been shown to

metabolize TNT. Similarly, RDX decomposes by hydrolysis, ultraviolet radiation exposure, and biodegradation.

While we anticipate that the specified activity may result in marine mammals avoiding certain areas due to temporary ensonification, this impact to habitat and prey resources would be temporary and reversible. The main impact associated with the proposed activity would be temporarily elevated noise levels and the associated direct effects on marine mammals, previously discussed in this notice. Marine mammals are anticipated to temporarily vacate the area of live fire events. However, these events usually do not last more than 90 to 120 minutes at a time, and animals are anticipated to return to the activity area during periods of non-activity. Thus, based on the preceding discussion, we do not anticipate that the proposed activity would have any habitat-related effects that could cause significant or long-term consequences for individual marine mammals or their populations.

Proposed Mitigation

In order to issue an Authorization under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, and other means of effecting the least practicable adverse impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and the availability of such species or stock for taking for certain subsistence uses (where relevant).

The NDAA of 2004 amended the MMPA as it relates to military-readiness activities and the incidental take authorization process such that “least practicable adverse

impact” shall include consideration of personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

NMFS and Eglin AFB have worked to identify potential practicable and effective mitigation measures, which include a careful balancing of the likely benefit of any particular measure to the marine mammals with the likely effect of that measure on personnel safety, practicality of implementation, and impact on the “military-readiness activity.” We refer the reader to Section 11 of Eglin AFB’s application for more detailed information on the proposed mitigation measures which include the following:

Vessel-Based Monitoring

Eglin AFB would station a large number of range clearing boats (approximately 30 to 35) around the test site to prevent non-participating vessels from entering the human safety zone. Based on the composite footprint, range clearing boats will be located approximately 15.28 km (9.5 mi) from the detonation point (see Figure 11-1 in Eglin AFB’s application). However, the actual distance will vary based on the size of the munition being deployed.

Trained protected species observers (PSO) would be aboard five of these boats and will conduct protected species surveys before and after each test. The protected species survey vessels will be dedicated solely to observing for marine species during the pre-mission surveys while the remaining safety boats clear the area of non-authorized vessels. The protected species survey vessels will begin surveying the area at sunrise. The area to be surveyed will encompass the zone of influence (ZOI), which is discussed in more detail below.

Because of human safety issues, observers will be required to leave the test area at least 30 minutes in advance of live weapon deployment and move to a position on the safety zone periphery, approximately 15.28 km (9.5 mi) from the detonation point. Observers will continue to scan for marine mammals from the periphery. Animals that may enter the area after Eglin AFB has completed the pre-mission surveys and prior to detonation would not reach the predicted smaller slight lung injury and/or mortality zones.

Determination of the Zone of Influence

Historically, Eglin AFB has conservatively used the number of live weapons deployed to estimate take of marine mammals. This method assumed a fresh population of marine mammals for each detonation to calculate the number taken. However, NMFS requested mission-day scenarios in order to be able to model accumulated energy. Therefore, each mission-day scenario is considered a separate event to model takes as opposed to modeling for each live detonation. Eglin developed three mission-day categories (Category A, which represents levels of activities considered a worst-case scenario consisting of ordnances with large explosive weights as well as surface and subsurface detonations; Category B, which represents a 'typical' mission day based on levels of weapons releases during past Maritime WSEP activities; and Category C, which represents munitions with smaller explosive weights and surface detonations only), and estimated the number of days each category would be executed during the 2017 Maritime WSEP missions (See Table 1-3 in Eglin AFB's application for the Mission Day Scenarios). Table 4 below provides the categorization of mission days (Table 1-3 in Eglin AFB's application), and Table 5 provides the maximum range of effects for all

criteria and thresholds for mission-day Categories A, B, and C. These ranges were calculated based on explosive acoustic characteristics, sound propagation, and sound transmission loss in the study area (which incorporates water depth, sediment type, wind speed, bathymetry, and temperature/salinity profiles). Refer to Appendix A of Eglin AFB’s application for a complete description of the acoustic modeling methodology used in the analysis.

Table 4 - Live Munitions Categorized as Representative Mission Days.

Mission Category	Munition	NEW (lbs)	Detonation Type	Munitions/Day	Mission Days/Year	Total Munitions/Year
A	GBU-10/-24/-31	945	Subsurface (10’ depth)	1	2	2
	GBU-49	500	Surface	2		4
	JASSM	255	Surface	2		4
	GBU-12 (PWII)/-54 (LJDAM)/-38/-32 (JDAM)	192	Subsurface (10’ depth)	3		6
B	AGM-65 (Maverick)	86	Surface	2	4	8
	CBU-105 (WCMD)	83	Airburst	1		4
	GBU-39 (Small Diameter Bomb)	37	Surface	1		4
	AGM-114 (Hellfire)	20	Subsurface (10’ depth)	5		20
C	AGM-176 (Griffin)	13	Surface	5	2	10
	2.75 rockets or AGR-20A/B	12	Surface	50		100
	AIM-9X	7.9	Surface	1		2
	PGU-12 HEI 30 mm	0.1	Surface	500		1,000

Table 5 - Criteria and Threshold Radii (in meters) for Maritime WSEP Mission-Day Categories.

Mission-Day Category	Level A Harassment	Level B Harassment	
	PTS	TTS	Behavioral
	185 dB SEL	170 dB SEP	165 dB SEL
A	945 m	4,666 m	7,479 m
B	248 m	2,225 m	3,959 m
C	286 m	1,128 m	1,863 m

Mortality and slight lung injury threshold ranges would extend from 47 to 216 m and 84 to 595 m, respectively, depending on the mission-day category. These ranges would fall within the Level A harassment ranges. Based on the planned activities on a given mission day, and the ranges presented in Table 4, Eglin AFB would ensure that the area equating to the Level A harassment threshold range is free of protected species. By clearing the Level A harassment threshold range of protected species, animals that may enter the area after the completed pre-mission surveys but prior to detonation would not reach the smaller slight lung injury or mortality zones. Because of human safety issues, Eglin AFB would require observers to leave the test area at least 30 minutes in advance of live weapon deployment and move to a position on the safety zone periphery, approximately 15 km (9.5 mi) from the detonation point. Observers would continue to scan for marine mammals from the periphery, but effectiveness would be limited as the boat would remain at a designated station.

Video Monitoring: In addition to vessel-based monitoring, Eglin AFB would position three high-definition video cameras on the GRATV anchored on-site, as described earlier, to allow for real-time monitoring for the duration of the mission. The camera configuration and actual number of cameras used would depend on specific mission requirements. In addition to monitoring the area for mission objective issues, the camera(s) would also monitor for the presence of protected species. A trained marine species observer from Eglin Natural Resources would be located in Eglin AFB's Central

Control Facility, along with mission personnel, to view the video feed before and during test activities. The distance to which objects can be detected at the water surface by use of the cameras is considered generally comparable to that of the human eye.

The GRATV will be located about 183 m (600 ft) from the target. The larger mortality threshold ranges correspond to the modified Goertner model adjusted for the weight of an Atlantic spotted dolphin calf, and extend from 0 to 216 m (0 to 709 ft) from the target, depending on the ordnance, and the Level A ranges for both common bottlenose and Atlantic spotted dolphins extend up to 945 m (3,100 ft) from the target, depending on the ordnance and harassment criterion. Given these distances, observers could reasonably be expected to view a substantial portion of the mortality zone in front of the camera, although a small portion would be behind or to the side of the camera view. Based on previous monitoring reports for this activity, the pre-training surveys for delphinids and other protected species within the mission area are effective. Observers can view some portion of the Level A harassment zone, although the view window would be less than that of the mortality zone (a large percentage would be behind or to the side of the camera view).

In addition to the two types of visual monitoring discussed earlier in this section, Eglin AFB personnel are present within the mission area (on boats and the GRATV) on each day of testing well in advance of weapon deployment, typically near sunrise. They will perform a variety of tasks including target preparation, equipment checks, etc., and will opportunistically observe for marine mammals and indicators as feasible throughout test preparation. However, we consider these observations as supplemental to the proposed mitigation monitoring and would only occur as time and schedule permits.

Eglin AFB personnel would relay information on these types of sightings to the Lead Biologist, as described in the following mitigation sections.

Pre-mission Monitoring

The purposes of pre-mission monitoring are to: (1) Evaluate the mission site for environmental suitability, and (2) verify that the ZOI is free of visually detectable marine mammals, as well as potential indicators of these species. On the morning of the mission, the Test Director and Safety Officer will confirm that there are no issues that would preclude mission execution and that weather is adequate to support mitigation measures.

Sunrise or Two Hours Prior to Mission

Eglin AFB range clearing vessels and protected species survey vessels will be on site at least two hours prior to the mission. The Lead Biologist on board one survey vessel will assess the overall suitability of the mission site based on environmental conditions (sea state) and presence/absence of marine mammal indicators. Eglin AFB personnel will communicate this information to Tower Control and personnel will relay the information to the Safety Officer in Central Control Facility.

One and One-Half Hours Prior to Mission

Vessel-based surveys will begin approximately one and one-half hours prior to live weapons deployment. Surface vessel observers will survey the ZOI and relay all marine species and indicator sightings, including the time of sighting, GPS location, and direction of travel, if known, to the Lead Biologist. The Lead Biologist will document all sighting information on report forms which he/she will submit to Eglin Natural Resources after each mission. Surveys would continue for approximately one hour. During this time, Eglin AFB personnel in the mission area will also observe for marine species as feasible.

If marine mammals or indicators are observed within the ZOI for that day's mission activities, the range will be declared "fouled," a term that signifies to mission personnel that conditions are such that a live ordnance drop cannot occur (*e.g.*, protected species or civilian vessels are in the mission area). If there are no observations of marine mammals or indicators of marine mammals, Eglin AFB would declare the range clear of protected species.

One-Half Hour Prior to Mission

At approximately 30 minutes prior to live weapon deployment, marine species observers will be instructed to leave the mission site and remain outside the safety zone, which on average will be 15.28 km (9.5 mi) from the detonation point. The actual size is determined by weapon net explosive weight and method of delivery. The survey team will continue to monitor for protected species while leaving the area. As the survey vessels leave the area, marine species monitoring of the immediate target areas will continue at the Central Control Facility through the live video feed received from the high definition cameras on the GRATV. Once the survey vessels have arrived at the perimeter of the safety zone (approximately 30 minutes after leaving the area per instructions from Eglin AFB, depending on actual travel time), Eglin AFB will declare the range as "green" and the mission will proceed, assuming all non-participating vessels have left the safety zone as well.

Execution of Mission

Immediately prior to live weapons drop, the Test Director and Safety Officer will communicate to confirm the results of marine mammal surveys and the appropriateness

of proceeding with the mission. The Safety Officer will have final authority to proceed with, postpone, or cancel the mission. Eglin AFB would postpone the mission if:

- Any of the high-definition video cameras are not operational for any reason;
 - Any marine mammal is visually detected within the ZOI. Postponement would continue until the animal(s) that caused the postponement is: (1) confirmed to be outside of the ZOI on a heading away from the targets; or (2) not seen again for 30 minutes and presumed to be outside the ZOI due to the animal swimming out of the range;
 - Any large schools of fish or large flocks of birds feeding at the surface are within the ZOI. Postponement would continue until Eglin AFB personnel confirm that these potential indicators are outside the ZOI:
- Any technical or mechanical issues related to the aircraft or target boats;
- or
- Any non-participating vessel enters the human safety zone prior to weapon release.

In the event of a postponement, protected species monitoring would continue from the Central Control Facility through the live video feed. Observers would also continue to monitor from the vessels at the safety perimeter, with limited effectiveness due to the distance from the detonation site.

Post-Mission Monitoring

Post-mission monitoring determines the effectiveness of pre-mission mitigation by reporting sightings of any marine mammals. Post-detonation monitoring surveys will

commence once the mission has ended or, if required, as soon as personnel declare the mission area safe. Vessels will move into the survey area from outside the safety zone and monitor for at least 30 minutes, concentrating on the area down-current of the test site. This area is easily identifiable because of the floating debris in the water from impacted targets. Up to 10 Eglin AFB support vessels will be cleaning debris and collecting damaged targets from this area thus spending several hours in the area once Eglin AFB completes the mission. Observers will document and report any marine mammal species, number, location, and behavior of any animals observed to Eglin Natural Resources.

Mission Delays Due to Weather

Eglin AFB would delay or reschedule Maritime WSEP missions if the Beaufort sea state is greater than number 4 at the time of the testing activities. The Lead Biologist aboard one of the survey vessels will make the final determination of whether conditions are conducive for sighting protected species or not.

We have carefully evaluated Eglin AFB's proposed mitigation measures in the context of ensuring that we prescribe the means of effecting the least practicable impact on the affected marine mammal species and stocks and their habitat. Our evaluation of potential measures included consideration of the following factors in relation to one another:

- The manner in which, and the degree to which, the successful implementation of the measure is expected to minimize adverse impacts;
- The proven or likely efficacy of the specific measure to minimize adverse impacts as planned; and

- The practicability of the measure for applicant implementation.

Any mitigation measure(s) prescribed by NMFS should be able to accomplish, have a reasonable likelihood of accomplishing (based on current science), or contribute to the accomplishment of one or more of the general goals listed here:

1. Avoidance or minimization of injury or death of marine mammals wherever possible (goals 2, 3, and 4 may contribute to this goal);

2. A reduction in the numbers of marine mammals (total number or number at biologically important time or location) exposed to stimuli expected to result in incidental take (this goal may contribute to 1, above, or to reducing takes by behavioral harassment only);

3. A reduction in the number of times (total number or number at biologically important time or location) individuals would be exposed to stimuli that we expect to result in the take of marine mammals (this goal may contribute to 1, above, or to reducing harassment takes only);

4. A reduction in the intensity of exposures (either total number or number at biologically important time or location) to training exercises that we expect to result in the take of marine mammals (this goal may contribute to 1, above, or to reducing the severity of harassment takes only);

5. Avoidance or minimization of adverse effects to marine mammal habitat, paying special attention to the food base, activities that block or limit passage to or from biologically important areas, permanent destruction of habitat, or temporary destruction/disturbance of habitat during a biologically important time; and

6. For monitoring directly related to mitigation—an increase in the probability of detecting marine mammals, thus allowing for more effective implementation of the mitigation.

Based on our evaluation of Eglin AFB’s proposed measures, as well as other measures that may be relevant to the specified activity, we have preliminarily determined that the proposed mitigation measures provide the means of effecting the least practicable impact on marine mammal species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance (while also considering personnel safety, practicality of implementation, and the impact of effectiveness of the military readiness activity).

Proposed Monitoring and Reporting

In order to issue an Authorization for an activity, section 101(a)(5)(D) of the MMPA states that we must set forth “requirements pertaining to the monitoring and reporting of such taking.” The MMPA implementing regulations at 50 CFR 216.104(a)(13) indicate that requests for an authorization must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and our expectations of the level of taking or impacts on populations of marine mammals present in the proposed action area.

Eglin AFB submitted a marine mammal monitoring plan in their Authorization application. We may modify or supplement the plan based on comments or new information received from the public during the public comment period. Any monitoring requirement we prescribe should improve our understanding of one or more of the following:

- Occurrence of marine mammal species in action area (*e.g.*, presence, abundance, distribution, density);
- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) Action or environment (*e.g.*, source characterization, propagation, ambient noise); (2) Affected species (*e.g.*, life history, dive patterns); (3) Co-occurrence of marine mammal species with the action; or (4) Biological or behavioral context of exposure (*e.g.*, age, calving or feeding areas);
- Individual responses to acute stressors, or impacts of chronic exposures (behavioral or physiological);
- How anticipated responses to stressors impact either: (1) Long-term fitness and survival of an individual; or (2) Population, species, or stock;
- Effects on marine mammal habitat and resultant impacts to marine mammals; and
- Mitigation and monitoring effectiveness.

NMFS proposes to include the following measures in the Maritime WSEP Authorization (if issued). They are:

(1) Eglin AFB will track the use of the EGTTR for test firing missions and protected species observations, through the use of mission reporting forms;

(2) Eglin AFB will submit a summary report of marine mammal observations and Maritime WSEP activities to the NMFS Southeast Regional Office (SERO) and the Office of Protected Resources 90 days after expiration of the current Authorization. This report must include the following information: (i) Date and time of each Maritime WSEP

exercise; (ii) a complete description of the pre-exercise and post-exercise activities related to mitigating and monitoring the effects of Maritime WSEP exercises on marine mammal populations; and (iii) results of the Maritime WSEP exercise monitoring, including number of marine mammals (by species) that may have been harassed due to presence within the activity zone;

(3) Eglin AFB will monitor for marine mammals in the proposed action area. If Eglin AFB personnel observe or detect any dead or injured marine mammals prior to testing, or detects any injured or dead marine mammal during live fire exercises, Eglin AFB must cease operations and submit a report to NMFS within 24 hours and

(4) Eglin AFB must immediately report any unauthorized takes of marine mammals (*i.e.*, serious injury or mortality) to NMFS and to the respective Southeast Region stranding network representative. Eglin AFB must cease operations and submit a report to NMFS within 24 hours.

Monitoring Results From Previously Authorized Activities

Eglin AFB complied with the mitigation and monitoring required under the previous Authorization for 2016 WSEP activities. Marine mammal monitoring occurred before, during, and after each Maritime WSEP mission. During the course of these activities, Eglin AFB's monitoring did not suggest that they had exceeded the take levels authorized under Authorization. In accordance with the 2015 Authorization, Eglin AFB submitted a monitoring report (available at:

www.nmfs.noaa.gov/pr/permits/incidental/military.htm).

Under the 2016 Authorization, Eglin AFB anticipated conducting Maritime WSEP training missions over approximately two to three weeks, but actually conducted a

total of five mission days: February 11 and March 14-17 associated with live ordnance delivery. Due to weather conditions and high sea states, no live missions were conducted February 8-10. Munitions that were actually dropped accounted for only approximately 41 percent of what was authorized in the 2016 IHA.

During the February 2016 mission, Eglin AFB released one AGM-65 Maverick. The AGM-65 Maverick is a penetrating blast-fragment warhead that detonates at the surface, and has 86 lb NEW. Eglin AFB conducted the required monitoring for marine mammals or indicators of marine mammals (*e.g.*, flocks of birds, baitfish schools, or large fish schools) before, during, and after each mission and observed a mixture of six bottlenose and spotted dolphins approximately seven miles outside of the largest ZOI, so no action was required. No protected species were observed within the ZOI during pre-mission surveys, mission activities, or during post-mission surveys. Therefore, the mission resulted in no acoustic impacts to marine mammals.

During the March 2016 live fire missions, Eglin AFB expended two AGM-65 Mavericks and twelve AGM-114 Hellfire missiles. The NEW of the munitions that detonated at the water surface or up to 3 m (10 ft) below the surface are 86 lb for the AGM-65 Maverick missiles and 13 lb for the AGM-114 Hellfire missiles. Eglin AFB conducted the required monitoring for marine mammals or indicators of marine mammals (*e.g.*, flocks of birds, baitfish schools, or large fish schools) before, during, and after each mission and observed two species of marine mammals: the common bottlenose dolphin and Atlantic spotted dolphin; one sea turtle; and two flocks of approximately 10-20 birds on two separate occasions (upon investigation, there was no evidence of protected species

associated with either flock of birds). Eglin AFB confirmed that all protected species observed were outside of the ZOI at the conclusion of each pre-mission survey.

After each mission, Eglin AFB re-entered the ZOI to begin post-mission surveys for marine mammals and debris-clean-up operations. Eglin AFB personnel did not observe reactions indicative of disturbance during the pre-mission surveys and did not observe any marine mammals during the post-mission surveys. In summary, Eglin AFB reports that no observable instances of take of marine mammals occurred incidental to the Maritime WSEP training activities under the 2016 Authorization.

Estimated Numbers of Marine Mammals Taken by Harassment

The definition of harassment as it applies to a “military readiness activity” is: (i) any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild (Level A Harassment); or (ii) 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 (Level B Harassment).

NMFS’ analysis identified the physiological responses, and behavioral responses that could potentially result from exposure to underwater explosive detonations. In this section, we will relate the potential effects to marine mammals from underwater detonation of explosives to the MMPA regulatory definitions of Level A and Level B harassment. This section will also quantify the effects that might occur from the proposed military readiness activities in W-151.

At NMFS' recommendation, Eglin AFB updated the thresholds used for onset of temporary threshold shift (TTS; Level B Harassment) and onset of permanent threshold shift (PTS; Level A Harassment) to be consistent with the thresholds outlined in NMFS's new "Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing" (NMFS, 2016). NMFS believes that the thresholds outlined in the new Technical Guidance represent the best available science. The report is available on the internet at: http://www.nmfs.noaa.gov/pr/acoustics/Acoustic%20Guidance%20Files/opr-55_acoustic_guidance_tech_memo.pdf.

Level B Harassment

Of the potential effects described earlier in this document, the following are the types of effects that fall into the Level B harassment category:

Behavioral Harassment

Behavioral disturbance that rises to the level described in the above definition, when resulting from exposures to non-impulsive or impulsive sound, is Level B harassment. Some of the lower level physiological stress responses discussed earlier would also likely co-occur with the predicted harassments, although these responses are more difficult to detect and fewer data exist relating these responses to specific received levels of sound. When predicting Level B harassment based on estimated behavioral responses, those takes may have a stress-related physiological component.

Temporary Threshold Shift (TTS)

As discussed previously, TTS can affect how an animal behaves in response to the environment, including conspecifics, predators, and prey. NMFS classifies TTS (when

resulting from exposure to explosives and other impulsive sources) as Level B harassment, not Level A harassment (injury).

Level A Harassment

Of the potential effects that were described earlier, the following are the types of effects that fall into the Level A Harassment category:

Permanent Threshold Shift (PTS)

PTS (resulting either from exposure to explosive detonations) is irreversible and NMFS considers this to be an injury.

Table 6 in this document outlines the acoustic thresholds used by NMFS for this Authorization when addressing noise impacts from explosives.

Table 6 –Impulsive sound explosive thresholds used by Eglin AFB in its current acoustics impacts modeling.

Group	Level B Harassment		Level A Harassment			Mortality
	Behavioral	TTS	PTS	Gastro-Intestinal Tract	Lung	
Mid-frequency Cetaceans	165 dB SEL	170 dB SEL	185 dB SEL	237 dB SPL	$39.1 M^{1/3} (1+[D_{Rm}/10.081])^{1/2}$ Pa-sec Where: M = mass of the animals in kg D _{Rm} = depth of the receiver (animal) in meters	$91.4 M^{1/3} (1+D_{Rm}/10.081)^{1/2}$ Pa-sec Where: M = mass of the animals in kg D _{Rm} = depth of the receiver (animal) in meters

TTS = temporary threshold shift; PTS = permanent threshold shift; dB = decibels; SEL = sound exposure level; SPL = sound pressure level

Table 7 provides the estimated maximum range or radius, from the detonation point to the various thresholds described in Tables 4-6 (Note: for PTS and TTS dual metrics, the more conservative metric was used).

Table 7 – Distances (m) to harassment thresholds from Eglin AFB’s explosive ordnance.

Mission-Day Category	Mortality	Level A Harassment				Level B Harassment		
	Modified Goertner Model 1	Slight Lung Injury	GI Tract Injury	PTS		TTS		Behavioral
		Modified Goertner Model 2	237 dB SPL	185 dB SEL	230 dB Peak SPL	170 dB SEL	224 dB SPL	165 dB SEL
Bottlenose dolphin								
A	193	534	180	945	705	4,666	1,302	7,479
B	110	180	156	248	180	2,225	180	3,959
C	37	73	83	286	169	1,128	180	1,863
Atlantic spotted dolphin								
A	216	595	180	945	705	4,666	1,302	7,479
B	136	180	156	248	180	2,225	180	3,959
C	47	84	83	286	169	1,128	180	1,863

dB = decibels; GI = gastrointestinal; SEP = sound exposure level; SPL = sound pressure level; PTS = permanent threshold shift; TTS = temporary threshold shift

The ranges presented above were used to calculate the ZOI for each criterion/threshold. To eliminate double counting of ‘takes’, impact areas from higher impact categories (*e.g.*, PTS) were subtracted from areas associated with lower impact categories (*e.g.*, TTS). The estimated number of marine mammals potentially exposed to the various impact thresholds was calculated with a two-dimensional approach using the product of the adjusted impact area, animal density, and annual number of events for each mission-day category. A ‘take’ is considered to occur for SEL metrics if the received level is equal to or above the associated threshold within the appropriate frequency band of the sound received, adjusted for the appropriate weighting function value of that frequency band. Similarly, a ‘take’ would occur for impulse and peak SPL metrics if the received level is equal to or above the associated threshold.

Density Estimation

Density estimates for bottlenose dolphin and spotted dolphin were obtained from Duke University Marine Geospatial Ecology Lab Reports (Roberts et al., 2016). Raster

data from Duke University were imported into ArcGIS and overlaid onto the Maritime WSEP mission area. Density values were provided in 100 km² boxes. A 30-km by 30-km (900 km²) area centered on the Maritime WSEP mission location was selected, which consisted of nine 100-km² blocks. Density values from those blocks were averaged and converted to number of animals per square kilometer to obtain average annual density estimates for the common bottlenose and Atlantic spotted dolphins used in this analysis (see Table 8 for the resultant densities for these species).

Table 8 - Marine mammal density estimates within Eglin AFB's EGTTR.

Species	Density (animals/km ²)
Bottlenose dolphin	0.433
Atlantic spotted dolphin	0.148

Take Estimation

Table 9 indicates the modeled potential for lethality, injury, and non-injurious harassment (including behavioral harassment) to marine mammals in the absence of mitigation measures. Eglin AFB and NMFS estimate that approximately three marine mammals could be exposed to injurious Level A harassment noise levels (187 dB SEL) and approximately 326 animals could be exposed to Level B harassment (TTS and Behavioral) noise levels in the absence of mitigation measures.

Table 9 – Modeled number of marine mammals potentially affected by Maritime WSEP operations.

Species	Mortality	Level A Harassment (PTS only)	Level B Harassment (TTS)	Level B Harassment (Behavioral)
Bottlenose dolphin	0	2	87	157
Atlantic spotted dolphin	0	1	29	53
TOTAL	0	3	116	210

Based on the mortality exposure estimates calculated by the acoustic model and the anticipated effectiveness of mitigation measures, zero marine mammals are expected

to be affected by pressure levels associated with mortality or serious injury. Zero marine mammals are expected to be exposed to pressure levels associated with slight lung injury or gastrointestinal tract injury.

NMFS generally considers PTS to fall under the injury category (Level A Harassment). An animal would need to stay very close to the sound source for an extended amount of time to incur a serious degree of PTS, which could increase the probability of mortality. In this case, it would be highly unlikely for this scenario to unfold given the nature of any anticipated acoustic exposures that could potentially result from a mobile marine mammal that NMFS generally expects to exhibit avoidance behavior to loud sounds within the EGTTTR. NMFS concludes that possibility of minor PTS in the form of slight upward shift of hearing threshold at certain frequency bands by a few individuals of marine mammals is extremely low, but not unlikely. The majority of ‘takes’ resulting from Eglin AFB’s WSEP activities would constitute Level B harassment, such as TTS and behavioral harassment.

Negligible Impact Analysis and Preliminary Determinations

NMFS has defined “negligible impact” in 50 CFR 216.103 as “. . . an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival” (*i.e.*, population-level effects). An estimate of the number of Level B harassment takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be “taken” through behavioral harassment, we consider other factors, such as the likely nature of any responses (*e.g.*, intensity, duration), the context of any responses

(*e.g.*, critical reproductive time or location, migration), as well as the number and nature of estimated Level A harassment takes, the number of estimated mortalities, and effects on habitat.

To avoid repetition, the discussion below applies to each of the species for which we propose to authorize incidental take for Eglin AFB's activities, given that expected impacts are expected to be the same for both species.

In making a negligible impact determination, we consider:

- The number of anticipated injuries, serious injuries, or mortalities;
- The number, nature, and intensity, and duration of Level B harassment;
- The context in which the takes occur (*e.g.*, impacts to areas of significance, impacts to local populations, and cumulative impacts when taking into account successive/contemporaneous actions when added to baseline data);
- The status of stock or species of marine mammals (*i.e.*, depleted, not depleted, decreasing, increasing, stable, impact relative to the size of the population);
- Impacts on habitat affecting rates of recruitment/survival; and
- The effectiveness of monitoring and mitigation measures to reduce the number or severity of incidental take.

For reasons stated previously in this document and based on the following factors, Eglin AFB's specified activities are not likely to cause long-term behavioral disturbance, serious injury, or death.

The takes from Level B harassment would be due to potential behavioral disturbance and TTS. The takes from Level A harassment would be due to some, likely lesser, degree of PTS. Activities would only occur over a timeframe of two to three

weeks in beginning in February 2017, with one or two missions occurring per day. It is possible that some individuals may be taken more than once if those individuals are located in the exercise area on two different days when exercises are occurring.

Noise-induced threshold shifts (TS, which includes PTS) are defined as increases in the threshold of audibility (*i.e.*, the sound has to be louder to be detected) of the ear at a certain frequency or range of frequencies (ANSI 1995; Yost 2000). Several important factors relate to the magnitude of TS, such as level, duration, spectral content (frequency range), and temporal pattern (continuous, intermittent) of exposure (Yost 2000; Henderson *et al.*, 2008). TS occurs in terms of frequency range (Hz or kHz), hearing threshold level (dB), or both frequency and hearing threshold level (CDC 2004).

In addition, there are different degrees of PTS: ranging from slight/mild to moderate and from severe to profound (Clark 1981). Profound PTS or the complete loss of the ability to hear in one or both ears is commonly referred to as deafness (CDC 2004; WHO 2006). High-frequency PTS, presumably as a normal process of aging that occurs in humans and other terrestrial mammals, has also been demonstrated in captive cetaceans (Ridgway and Carder 1997; Yuen *et al.*, 2005; Finneran *et al.*, 2005; Houser and Finneran 2006; Finneran *et al.*, 2007; Schlundt *et al.*, 2011) and in stranded individuals (Mann *et al.*, 2010).

In terms of what is analyzed for the potential PTS (Level A harassment) in marine mammals as a result of Eglin AFB's Maritime WSEP operations, if it occurs, NMFS has determined that the levels would be slight/mild because most cetaceans would be expected to show relatively high levels of avoidance. Further, it is uncommon to sight marine mammals within the target area, especially for prolonged durations. Results from

monitoring programs associated other Eglin AFB activities and for Eglin AFB's 2016 Maritime WSEP activities have shown the absence of marine mammals within the EGTTTR during and after maritime operations. Avoidance varies among individuals and depends on their activities or reasons for being in the area.

NMFS' predicted estimates for Level A harassment take are likely overestimates of the likely injury that will occur. NMFS expects that successful implementation of the required vessel-based and video-based mitigation measures would avoid Level A take in some instances. Also, NMFS expects that some individuals would avoid the source at levels expected to result in injury. Nonetheless, although NMFS expects that Level A harassment is unlikely to occur at the numbers proposed to be authorized, because it is difficult to quantify the degree to which the mitigation and avoidance will reduce the number of animals that might incur PTS, we are proposing to authorize (and analyze) the modeled number of Level A takes (three), which does not take the mitigation or avoidance into consideration. However, we anticipate that any PTS incurred because of mitigation and the likely short duration of exposures, would be in the form of only a small degree of permanent threshold shift and not total deafness.

While animals may be impacted in the immediate vicinity of the activity, because of the short duration of the actual individual explosions themselves (versus continual sound source operation) combined with the short duration of the Maritime WSEP operations, NMFS has preliminarily determined that there will not be a substantial impact on marine mammals or on the normal functioning of the nearshore or offshore Gulf of Mexico ecosystems. We do not expect that the proposed activity would impact rates of recruitment or survival of marine mammals since we do not expect mortality (which

would remove individuals from the population) or serious injury to occur. In addition, the proposed activity would not occur in areas (and/or times) of significance for the marine mammal populations potentially affected by the exercises (*e.g.*, feeding or resting areas, reproductive areas), and the activities would only occur in a small part of their overall range, so the impact of any potential temporary displacement would be negligible and animals would be expected to return to the area after the cessations of activities.

Although the proposed activity could result in Level A (PTS only, not slight lung injury or gastrointestinal tract injury) and Level B (behavioral disturbance and TTS of lesser degree and shorter duration) harassment of marine mammals, the level of harassment is not anticipated to impact rates of recruitment or survival of marine mammals because the number of exposed animals is expected to be low due to the short-term (*i.e.*, four hours a day or less) and site-specific nature of the activity. We do not anticipate that the effects would be detrimental to rates of recruitment and survival because we do not expect serious or extended behavioral responses that would result in energetic effects at the level to impact fitness.

Moreover, the mitigation and monitoring measures proposed for the Authorization (described earlier in this document) are expected to further minimize the potential for harassment. The protected species surveys would require Eglin AFB to search the area for marine mammals, and if any are found in the live fire area, then the exercise would be suspended until the animal(s) has left the area or relocated. Moreover, marine species observers located in the Eglin control tower would monitor the high-definition video feed from cameras located on the instrument barge anchored on-site for the presence of protected species. Furthermore, Maritime WSEP missions would be delayed or

rescheduled if the sea state is greater than a 4 on the Beaufort Scale at the time of the test. In addition, Maritime WSEP missions would occur no earlier than two hours after sunrise and no later than two hours prior to sunset to ensure adequate daylight for pre- and post-mission monitoring.

Based on the preliminary analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the mitigation and monitoring measures, NMFS finds that Eglin AFB's Maritime WSEP operations will result in the incidental take of marine mammals, by Level A and Level B harassment only, and that the taking from the Maritime WSEP exercises will not have an adverse effect on annual rates of recruitment or survival, and therefore will have a negligible impact on the affected species or stocks.

Impact on Availability of Affected Species or Stock for Taking for Subsistence Uses

There are no relevant subsistence uses of marine mammals implicated by this action. Therefore, NMFS has preliminarily determined that the total taking of affected species or stocks would not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

Endangered Species Act (ESA)

Due to the location of the activity and past experience with similar authorizations for these activities, no ESA-listed marine mammal species are likely to be affected. Therefore, NMFS has preliminarily determined that this proposed Authorization would have no effect on ESA-listed species. However, prior to the agency's decision on the issuance or denial of this Authorization, NMFS will make a final determination on whether additional consultation is necessary.

National Environmental Policy Act (NEPA)

In 2015, Eglin AFB provided NMFS with an EA titled, Maritime Weapon Systems Evaluation Program (WSEP) Operational Testing in the Eglin Gulf Testing and Training Range (EGTTR), Florida. The EA analyzed the direct, indirect, and cumulative environmental impacts of the specified activities on marine mammals. NMFS, after review and evaluation of the Eglin AFB EA for consistency with the regulations published by the Council of Environmental Quality (CEQ) and NOAA Administrative Order 216-6, Environmental Review Procedures for Implementing the National Environmental Policy Act, adopted the EA. After considering the EA, the information in the 2014 IHA application, and the **Federal Register** notice, as well as public comments, NMFS' issuance of the 2015 Authorization and determination that the activity was not likely to result in significant impacts on the human environment, NMFS adopted Eglin AFB's EA under 40 CFR 1506.3; and issued a FONSI statement on issuance of an Authorization under section 101(a)(5) of the MMPA.

In accordance with NOAA Administrative Order 216-6 (Environmental Review Procedures for Implementing the National Environmental Policy Act, May 20, 1999), NMFS will again review the information contained in Eglin AFB's EA and determine whether the EA accurately and completely describes the preferred action alternative and the potential impacts on marine mammals. Based on this review and analysis, NMFS may reaffirm the 2015 FONSI statement on issuance of an annual authorization under section 101(a)(5) of the MMPA or supplement the EA if necessary.

Proposed Authorization

As a result of these preliminary determinations, we propose to issue an Authorization to Eglin AFB for conducting Maritime WSEP activities, for a period of one year from the date of issuance, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. The proposed Authorization language is provided in the next section. The wording contained in this section is proposed for inclusion in the Authorization (if issued).

1. This Authorization is valid for a period of one year from February 4, 2017 through February 3, 2018.

2. This Authorization is valid only for activities associated with the Maritime WSEP operations utilizing munitions identified in the Attachment.

3. The incidental taking, by Level A and Level B harassment, is limited to: Atlantic bottlenose dolphin (*Tursiops truncatus*); and Atlantic spotted dolphin (*Stenella frontalis*) as specified in Table 1, below.

Table 1 – Modeled number of marine mammals potentially affected by Maritime WSEP operations.

Species	Mortality	Level A Harassment (PTS only)	Level B Harassment (TTS)	Level B Harassment (Behavioral)
Bottlenose dolphin	0	2	87	157
Atlantic spotted dolphin	0	1	29	53
TOTAL	0	3	116	210

The taking by serious injury or death of these species, the taking of these species in violation of the conditions of this Incidental Harassment Authorization, or the taking by harassment, serious injury or death of any other species of marine mammal is prohibited and may result in the modification, suspension or revocation of this Authorization.

4. Mitigation

When conducting this activity, the following mitigation measures must be undertaken:

- If daytime weather and/or sea conditions preclude adequate monitoring for detecting marine mammals and other marine life, maritime strike operations must be delayed until adequate sea conditions exist for monitoring to be undertaken. Daytime maritime strike exercises will be conducted only when sea surface conditions do not exceed Beaufort sea state 4 (i.e., wind speed 13-18 mph (11-16 knots); wave height 1 m (3.3 ft)), the visibility is 5.6 km (3 nm) or greater, and the ceiling is 305 m (1,000 ft) or greater;
- On the morning of the maritime strike mission, the test director and safety officer will confirm that there are no issues that would preclude mission execution and that the weather is adequate to support monitoring and mitigation measures.

Two Hours Prior to Mission

- Mission-related surface vessels will be stationed on site.
- Vessel-based observers on board at least one vessel will assess the overall suitability of the test site based on environmental conditions (*e.g.*, sea state) and presence/absence of marine mammal or marine mammal indicators (*e.g.*, large schools of fish, jellyfish, Sargassum rafts, and large flocks of birds feeding at the surface).

Observers will relay this information to the safety officer.

One and One-half Hours Prior to Mission

- Vessel-based surveys and video camera surveillance will commence. Vessel-based observers will survey the zone of impact (ZOI) calculated for that day's mission

category and relay all marine mammal and indicator sightings, including the time of sighting and direction of travel (if known) to the safety officer. Surveys will continue for approximately one hour.

- If marine mammals or marine mammal indicators are observed within the ZOI, the test range will be declared “fouled,” which will signify to mission personnel that conditions are such that a live ordnance drop cannot occur.
- If no marine mammals or marine mammal indicators are observed, the range will be declared “green,” which will signify to mission personnel that conditions are such that a live ordnance drop may occur.

One-half Hour Prior to Mission

- Approximately 30 minutes prior to live weapon deployment, vessel-based observers will be instructed to leave the test site and remain outside the safety zone, which will be approximately 9.5 miles from the detonation point (actual size will be determined by weapon net explosive weight (NEW) and method of delivery) during the conduct of the mission.
- Monitoring for marine mammals will continue from the periphery of the safety zone while the mission is in progress. Other safety boat crews will be instructed to observe for marine mammals during this time.
- After survey vessels have left the test site, marine species monitoring will continue for the Eglin control tower through the video feed received from the high definition cameras on the instrument barge.

Execution of Mission

- Immediately prior to live weapons drop, the Test Director and Safety Officer will communicate to confirm the results of the marine mammal survey and the appropriateness of proceeding with the mission. The Safety Officer will have final authority to proceed with, postpone, move, or cancel the mission.

- The mission will be postponed or moved if: Any marine mammal is visually detected within the ZOI, or large schools of fish, jellyfish, Sargassum rafts, or large flocks of birds feeding at the surface are observed within the ZOI. Postponement will continue until the animal(s) that caused the postponement is 1) confirmed to be outside of the ZOI due to swimming out of the range on a heading away from the targets; or 2) not seen again for 30 minutes and presumed to be outside the ZOI due to the animal swimming outside of the range. Postponement will continue until these potential indicators are confirmed to be outside the ZOI.

- In the event of a postponement, pre-mission monitoring will continue as long as weather and daylight hours allow (no later than two hours prior to sunset).

Post Mission

- Post-mission surveys will commence as soon as Explosive Ordnance Disposal (EOD) personnel declare the test area safe. These surveys will be conducted by the same vessel-based observers that conducted the pre-mission surveys.

- Survey vessels will move into the ZOI from outside the safety zone and monitor for at least 30 minutes, concentrating on the area down-current of the test site. Any marine mammals killed or injured as a result of the test will be documented and immediately reported to the National Marine Fisheries Service (NMFS) Southeast Region Marine Mammal Stranding Network at 877-433-8299 and the Florida Marine Mammal

Stranding Hotline at 888-404-3922. The species, number, location, and behavior of any animals observed will be documented and reported.

- If post-mission surveys determine that an injury or lethal take of a marine mammal has occurred, the next maritime strike mission will be suspended until the test procedure and the monitoring methods have been reviewed with NMFS and appropriate changes made.

5. Monitoring

The holder of this Authorization is required to cooperate with the National Marine Fisheries Service and any other Federal, state or local agency monitoring the impacts of the activity on marine mammals.

The holder of this Authorization will track their use of the EGTR for the Maritime WSEP missions and marine mammal observations, through the use of mission reporting forms.

Maritime strike missions will coordinate with other activities conducted in the EGTR (*e.g.*, Precision Strike Weapon and Air-to-Surface Gunnery missions) to provide supplemental post-mission observations of marine mammals in the operations area of the exercise.

Any dead or injured marine mammals observed or detected prior to testing or injured or killed during live drops, must be immediately reported to the NMFS Southeast Region Marine Mammal Stranding Network at 877-433-8299 and the Florida Marine Mammal Stranding Hotline at 888-404-3922.

Any unauthorized impacts on marine mammals must be immediately reported to the National Marine Fisheries Service's Southeast Regional Administrator, at 727-842-

5312, and the Chief of the Permits and Conservation Division, Office of Protected Resources, at 301-427-8401.

The monitoring team will document any marine mammals that were killed or injured as a result of the test and, if practicable, coordinate with the local stranding network and NMFS to assist with recovery and examination of any dead animals, as needed.

Activities related to the monitoring described in this Authorization, including the retention of marine mammals, do not require a separate scientific research permit issued under Section 104 of the Marine Mammal Protection Act.

6. Reporting

A draft report of marine mammal observations and Maritime WSEP mission activities must be submitted to the National Marine Fisheries Service's Southeast Regional Office, Protected Resources Division, 263 13th Ave. South, St. Petersburg, FL 33701 and NMFS's Office of Protected Resources, 1315 East West Highway, Silver Spring, MD 20910. This draft report must include the following information:

- Date and time of each maritime strike mission;
- A complete description of the pre-exercise and post-exercise activities related to mitigating and monitoring the effects of maritime strike missions on marine mammal populations;
- Results of the monitoring program, including numbers by species/stock of any marine mammals noted injured or killed as a result of the maritime strike mission and number of marine mammals (by species if possible) that may have been harassed due to presence within the ZOI; and

- A detailed assessment of the effectiveness of sensor based monitoring in detecting marine mammals in the area of Maritime WSEP operations.

The draft report will be subject to review and comment by NMFS. Any recommendations made by NMFS must be addressed in the final report prior to acceptance by NMFS. The draft report will be considered the final report for this activity under this Authorization if NMFS has not provided comments and recommendations within 90 days of receipt of the draft report.

7. Additional Conditions

- The maritime strike mission monitoring team will participate in the marine mammal species observation training. Designated crew members will be selected to receive training as protected species observers (PSO). PSOs will receive training in protected species survey and identification techniques through a NMFS-approved training program.
- The holder of this Authorization must inform the Director, Office of Protected Resources, National Marine Fisheries Service, (301-427-8400) or designee (301-427-8401) prior to the initiation of any changes to the monitoring plan for a specified mission activity.
- A copy of this Authorization must be in the possession of the Safety Officer on duty each day that maritime strike missions are conducted.
- Failure to abide by the Terms and Conditions contained in this Incidental Harassment Authorization may result in a modification, suspension or revocation of the Authorization.

Request for Public Comments

We request comment on our analysis, the draft authorization, and any other aspect of this **Federal Register** notice of proposed Authorization. Please include with your comments any supporting data or literature citations to help inform our final decision on Eglin AFB's renewal request for an MMPA authorization.

Dated: November 15, 2016.

Donna S. Wieting

Director, Office of Protected Resources

National Marine Fisheries Service

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