down the entire tree, in order to collect nestlings, leading to the loss of nest sites and site abandonment. Furthermore, the petition asserts that the remaining habitat of the species has been reduced due to the clearing of many gallery forests for agriculture and pasture land use.

The scarlet macaw is found throughout Central and South America, with an estimated range of approximately 2,586,885 square miles (m^2) (6,700,000 square kilometers (km^2)) (IUCN 2008e). The species prefers humid lowland evergreen forests and gallery woodland savannas, primarily near exposed river banks and clearings with large trees (del Hoyo *et al.* 1997, p. 421). The petition asserts that habitat destruction and captures for the pet trade are the greatest threats to the species. The petition claims that habitat destruction, as a result of forest clearing, settlement, and agriculture, is common throughout the species' range. The petition also states that anti-poaching enforcement is not keeping up with the demand for this species in the pet trade, where one bird can sell for over $1,000 (U.S.).

The white cockatoo is endemic to several islands in North Maluku, Indonesia, and inhabits primary, logged, and secondary forests up to 2,953 ft (900 m) (IUCN 2008h). The species also occurs in mangroves, on plantations, and on agricultural land (IUCN 2008h). The petition claims that the greatest threats to the species are habitat destruction and the pet trade. The petition states that an increase in logging activity has decreased the availability of large trees suitable for nest sites throughout the species' range. In addition, the petition asserts that trapping of this species for the pet trade far exceeds the catch quota issued by the Indonesian government.

The yellow-billed parrot is primarily found in the wet areas of Jamaica, inhabiting wet limestone forests at elevations up to 3,937 ft (1,200 m) (IUCN 2008a). The petition lists two primary threats to the species: habitat destruction and the pet trade. The petition claims that the species' habitat, as well as nest sites, has been reduced due to logging and mining activities, and that trapping of this species for the pet trade is common.

The yellow-crested cockatoo is native to Timor-Leste and Indonesia, and inhabits forest, forest edge, scrub, and agricultural land (IUCN 2008j). The petition asserts that the significant decline in the population of the species is directly attributable to trapping for the pet trade. The petition cites evidence that suggests that the international pet trade has placed the highest pressure on the wild population of the species. In addition, the petition claims that habitat loss, due to logging and agricultural conversion of forested lands, and the persecution of the species as a crop pest, has placed additional pressure on the remaining wild population.

Finding

On the basis of our review, which focused on the threats facing these parrot species, we find that the petition presents substantial scientific or commercial information indicating that listing may be warranted for the following 12 species of parrots: Blue-headed macaw, crimson shining parrot, great green macaw, grey-cheeked parakeet, hyacinth macaw, military macaw, Philippine cockatoo, red-crowned parrot, scarlet macaw, white cockatoo, yellow-billed parrot, and yellow-crested cockatoo. Therefore, we are initiating a status review to determine if listing any of these 12 species under the Act is warranted. To ensure that the status review is comprehensive, we are soliciting scientific and commercial information regarding these 12 species. Under section 4(b)(3)(B) of the Act, within 12 months after receiving a petition that is found to present substantial information indicating that the petitioned action may be warranted, we are required to make a finding as to whether listing the species is warranted, not warranted, or warranted but precluded by other pending listing proposals.

References Cited

A complete list of all references cited herein is available upon request from the U.S. Fish and Wildlife Service, Branch of Listing (see **FOR FURTHER INFORMATION CONTACT** section).

Author

The primary authors of this notice are staff members of the Division of Scientific Authority, U.S. Fish and Wildlife Service.

Authority

The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: June 16, 2009.

Marvin E. Moriarty,

Acting Director, U.S. Fish and Wildlife Service.

[FR Doc. E9–16354 Filed 7–13– 09; 8:45 am]

BILLING CODE 4310–55–S

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 218

RIN 0648–AX86

Taking of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Training Operations Conducted Within the Gulf of Mexico Range Complex

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

ACTION: Proposed rule; request for comments.

SUMMARY: NMFS has received requests from the U.S. Navy (Navy) for authorizations for the take of marine mammals incidental to training and operational activities conducted by the Navy's Atlantic Fleet within the Gulf of Mexico (GOMEX) Range Complex for the period beginning December 3, 2009 and ending December 2, 2014. Pursuant to the implementing regulations of the Marine Mammal Protection Act (MMPA), NMFS is proposing regulations to govern that take and requesting information, suggestions, and comments on these proposed regulations.

DATES: Comments and information must be received no later than August 13, 2009.

ADDRESSES: You may submit comments, identified by 0648–AX86, by any one of the following methods:

- Electronic Submissions: Submit all electronic public comments via the Federal eRulemaking Portal *http://www.regulations.gov*.
- Hand delivery or mailing of paper, disk, or CD–ROM comments should be addressed to Michael Payne, Chief, Permits, Conservation and Education Division, Office of Protected Resources, National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910–3225.

Instructions: All comments received are part of the public record and will generally be posted to *http://www.regulations.gov* 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.

NMFS will accept anonymous comments (enter NA in the required

fields if you wish to remain anonymous). Attachments to electronic comments will be accepted in Microsoft Word, Excel, WordPerfect, or Adobe PDF file formats only.

FOR FURTHER INFORMATION CONTACT: Shane Guan, Office of Protected Resources, NMFS, (301) 713–2289, ext. 137.

SUPPLEMENTARY INFORMATION:

Availability

A copy of the Navy's application may be obtained by writing to the address specified above (See **ADDRESSES**), telephoning the contact listed above (see **FOR FURTHER INFORMATION CONTACT**), or visiting the Internet at: *http://www.nmfs.noaa.gov/pr/permits/incidental.htm#applications*. The Navy's Draft Environmental Impact Statement (DEIS) for the GOMEX Range Complex was published in November 2008, and may be viewed at *http://www.gomexrangecomplexeis.com/*. NMFS participated in the development of the Navy's DEIS as a cooperating agency under the National Environmental Policy Act (NEPA).

Background

Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce (Secretary) to allow, upon request, the incidental, but not intentional taking of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) if certain findings are made and regulations are issued or, if the taking is limited to harassment, notice of a proposed authorization is provided to the public for review.

Authorization for incidental takings may 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, 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.

With respect to military readiness activities, the MMPA defines ''harassment'' as:

> (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 October 2, 2008, NMFS received an application from the Navy requesting an authorization for the take of marine mammal species/stocks incidental to the proposed training operations within the GOMEX Range Complex over the course of 5 years. These training activities are classified as military readiness activities. The Navy states that these training activities may cause various impacts to marine mammal species in the proposed GOMEX Range Complex Study Area. The Navy requests an authorization to take 8 species of cetaceans annually by Level B harassment, and 1 individual each of pantropical spotted dolphin and spinner dolphin by Level A harassment (injury). Please refer to the take table on page 6–17 of the LOA application for detailed information of the potential exposures from explosive ordnance (per year) for marine mammals in the GOMEX Range Complex. However, due to the implementation of the proposed mitigation and monitoring measures, NMFS believes that the actual take would be less than estimated.

Description of the Specified Activities

The GOMEX Study Area encompasses areas at sea, undersea, and Special Use Airspace (SUA) in the northern Gulf of Mexico off the coast of the U.S. (Figures 1 and 2 of the LOA application). The portions of the GOMEX Study Area to be considered for the proposed action consist of the BOMBEX Hotbox (surface and subsurface waters) located within the Pensacola Operation Area (OPAREA), SUA warning areas W–151A/B/C and W–155A/B (surface waters), and underwater detonation (UNDET) Area E3 (surface and subsurface waters), located within the territorial waters off Padre Island, Texas, near Corpus Christi NAS. The portions of the GOMEX Study Area addressed in the Navy's LOA application encompass:

- 1,496 nm^2 (5,131 km^2) of sea space (BOMBEX Hotbox, where high explosives occur, and UNDET Area E3 where underwater detonations occur); and
- 11,714 nm^2 (40,178 km^2) of SUA warning areas (vessel movements only) The BOMBEX Hotbox is an in-water operating and maneuvers area with defined air, ocean surface, and subsurface areas. The BOMBEX Hotbox is located in the offshore waters of the northeastern Gulf of Mexico (GOM) adjacent to Florida and Alabama. The northernmost boundary of the BOMBEX Hotbox is located 23 nm (42.6 km) from the coast of the Florida panhandle at latitude 30 °N, the eastern boundary is approximately 200 nm (370.4 km) from the coast of the Florida peninsula at longitude 86°48′ W.

The SUA warning areas, W–151A/B/C and W–155A/B, are in-water operating and maneuver areas with defined air and ocean surface. W–151A/B/C and W–155A/B are located in and above the offshore waters of the northeastern GOM adjacent to Florida and Alabama.

The UNDET Area E3 is a defined surface and subsurface area located in the waters south of Corpus Christi NAS and offshore of Padre Island, Texas. The westernmost boundary is located 7.5 nm (13.9 km) from the coast of Padre Island at 97°9′33″ W and 27°24′26″ N at the Western most corner. It lies entirely within the territorial waters (0 to 12 nm, or 0 to 22.2 km) of the U.S. and the majority of it lies within Texas state waters (0 to 9 nm, or 0 to 16.7 km). It is a very shallow water training area with depths ranging from 20 to 26 m.

In the application submitted to NMFS, the Navy requests an authorization to take marine mammals incidental to conducting training operations within the GOMEX Range Complex. These training activities consist of surface warfare. Although vessel movement is also a component of the proposed GOMEX Range Complex training activities, the Navy concludes that it is unlikely marine mammals would be taken by vessel movement with the implementation of mitigation and monitoring measures described in the Mitigation Measures and Monitoring Measures sections.

Surface Warfare

Surface Warfare (SUW) supports defense of a geographical area (*e.g.*, a zone or barrier) in cooperation with surface, subsurface, and air forces. SUW operations detect, localize, and track surface targets, primarily ships. Detected ships are monitored visually and with radar. Operations include identifying surface contacts, engaging with weapons, disengaging, evasion, and avoiding attack, including implementation of radio silence and deceptive measures. For the proposed GOMEX Range Complex training operations, SUW events involving the use of explosive ordnance include air-to-surface Bombing Exercises [BOMEX (A–S)] and small arms training (involving explosive hand grenades) that occur at sea.

(A) Bombing Exercise (Air-to-Surface) [BOMEX (A–S)]

Strike fighter aircraft, such as F/A–18s, deliver explosive bombs against at-sea surface targets with the goal of destroying the target. BOMBEX (A–S) training in the GOMEX Study Area occurs only during daylight hours in the BOMBEX Hotbox area.

For the proposed BOMBEX (A–S), two aircraft will approach an at-sea target from an altitude of between 15,000 ft (4,572 m) to less than 3,000 ft (914.4 m) and release a high explosive (HE) 1,000-pound (lb) bomb on the target. MK–83 bombs would be used. MK–83 bombs have a net explosive weight (NEW) of 415.8 lbs. The typical bomb release altitude is below 3,000 ft (914.4 m) and the target is usually a flare. The time in between bomb drops is approximately 3 minutes.

(B) Small Arms Training (Explosive Hand Grenades)

Small arms training is a part of quarterly reservist training and operational activities for the Mobile Expeditionary Security Group (MESG) that operates out of Corpus Christi Naval Air Station (NAS). The MESG trains with MK3A2 (0.5-lb NEW) anti-swimmer concussion grenades. The MK3A2 grenades are small and contain high explosives in an inert metal or plastic shell. They detonate at about 3 m under the water's surface within 4 to 5 seconds of being deployed. The detonation depth may be shallower depending upon the speed of the boat at the time the grenade is deployed.

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

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

This exercise is usually a live-fire exercise with M3A2 Anti-swimmer Concussion Grenades, but at times blanks may be used so boat crews can practice their ship-handling skills for the employment of weapons without being concerned with the safety requirements involved with HE weapons. Boat crews may use high or low speeds to approach and engage targets simulating swimmers with anti-swimmer concussion grenades. The purpose of this exercise is to develop marksmanship skills and small boat ship-handling tactics skills required to employ these weapons. Training usually lasts 1–2 hours. Small arms training in the GOMEX Study Area will occur during day or evening hours in the UNDET Area E3.

Table 1 summarizes the level of Surface Warfare training activities planned in the GOMEX Range Complex for the proposed action.

TABLE 1—LEVEL OF SURFACE WARFARE TRAINING ACTIVITIES PLANNED IN THE GOMEX RANGE COMPLEX PER YEAR

Operation	Platform	System/ordnance	Number of events	Training area	Potential time of day	Event duration
Bombing Exercise (BOMBEX) (Air-to-Surface, At-Sea).	F/A–18	MK–831,000-lb High Explosive (HE) bomb] 415.8 lbs NEW.	1 event (4 bombs in succession).	BOMBEX Hotbox	Daytime only.	1 hour.
Small Arms Training ..	Maritime Expeditionary Support Group (Various Small Boats).	MK3A2 anti-swimmer grenades (8-oz HE grenade) 0.5 lb NEW.	6 events* (20 live grenades).	UNDET Area E3	Day or night.	1 hour.

* An individual event can include detonation of up to 10 live grenades, but no more than 20 live grenades will be used per year.

Vessel Movement

Vessel movements are associated with most training and operational activities in the GOMEX Study Area. Currently, the number of Navy vessels operating in the GOMEX Study Area varies based on training schedules and can range from 0 to about 10 vessels at any given time. Vessel sizes range from small boats (<35 ft, or 10.7 m) for a harbor security boat to 1,092 ft (332.8 m) for a CVN (carrier vessel nuclear) and speeds generally range from 10 to 14 knots, but may be considerably faster, for example an aircraft carrier ''making wind'' while launching and recovering aircraft, and for small boat operations. Operations involving vessel movements occur intermittently and are variable in duration, ranging from a few hours up to 2 weeks. These operations are widely dispersed throughout the GOMEX Study Area, which is an area encompassing 11,714 nm^2 (40,178 km^2). Most vessel movements occur in the offshore OPAREAs, but vessel movements associated with MESG training in the UNDET Area E3 and Commander Naval Installations Command (CNIC) harbor security group training in the Panama City OPAREA occur between shore and 12 nm (22.2 km), including the nearshore zone (<3 nm, or 5.6 km). The Navy logs about 180 total vessel days within the GOMEX Study Area during a typical year. Consequently, the density of Navy vessels within the GOMEX Study Area at any given time is low (*i.e.*, less than 0.0113 ships/nm^2 (0.0386 km^2)).

Description of Marine Mammals in the Area of the Specified Activities

Twenty-nine marine mammal species have confirmed or potential occurrence in the GOMEX Study Area. These include 28 cetacean species and 1 sirenian species (DoN, 2007a), which can be found in Table 2. Although it is possible that any of the 29 species of marine mammals may occur in the Study Area, only 21 of those species are expected to occur regularly in the region. Most cetacean species are in the Study Area year-round (*e.g.*, sperm whales and bottlenose dolphins), while a few (*e.g.*, fin whales and killer whales) have accidental or transient occurrence in the area.

TABLE 2—MARINE MAMMAL SPECIES FOUND IN THE GOMEX RANGE COMPLEX

Family and scientific name	Common name	Federal status
Order Cetacea		
Suborder Mysticeti (baleen whales)		
Eubalaena glacialis	North Atlantic right whale	Endangered.
Megaptera novaeangliae	Humpback whale	Endangered.
Balaenoptera acutorostrata	Minke whale.	
B. brydei	Bryde's whale.	
B. borealis	Sei whale	Endangered.
B. physalus	Fin whale	Endangered.
B. musculus	Blue whale	Endangered.
Suborder Odontoceti (toothed whales)		
Physeter macrocephalus	Sperm whale	Endangered.
Kogia breviceps	Pygmy sperm whale.	
K. sima	Dwarf sperm whale.	
Ziphius cavirostris	Cuvier's beaked whale.	
M. europaeus	Gervais' beaked whale.	
M. bidens	Sowerby's beaked whale.	
M. densirostris	Blainville's beaked whale.	
Steno bredanensis	Rough-toothed dolphin.	
Tursiops truncatus	Bottlenose dolphin.	
Stenella attenuata	Pantropical spotted dolphin.	
S. frontalis	Atlantic spotted dolphin.	
S. longirostris	Spinner dolphin.	
S. clymene	Clymene dolphin.	
S. coeruleoalba	Striped dolphin.	
Lagenodephis hosei	Fraser's dolphin.	
Grampus griseus	Risso's dolphin.	
Peponocephala electra	Melon-headed whale.	
Feresa attenuata	Pygmy killer whale.	
Pseudorca crassidens	False killer whale.	
Orcinus orca	Killer whale.	
G. macrorhynchus	Short-finned pilot whale.	
Order Sirenia		
Trichechus manatus	West Indian manatee	Endangered.

The information contained in this section relies heavily on the data gathered in the Marine Resources Assessments (MRAs). The Navy MRA Program was implemented by the Commander, Fleet Forces Command, to initiate collection of data and information concerning the protected and commercial marine resources found in the Navy's OPAREAs. Specifically, the goal of the MRA program is to describe and document the marine resources present in each of the Navy's OPAREAs. The MRA for the GOMEX OPAREA was published in 2007 (DoN, 2007a). The MRA data were used to provide a regional context for each species. The MRA represents a compilation and synthesis of available scientific literature (*e.g.*, journals, periodicals, theses, dissertations, project reports, and other technical reports published by government agencies, private businesses, or consulting firms), and NMFS reports including stock assessment reports (SARs), recovery plans, and survey reports. This information was used to evaluate the potential for occurrence of marine mammal species in the GOMEX Study Area.

The density estimates that were used in previous Navy environmental documents have been recently updated to provide a compilation of the most recent data and information on the occurrence, distribution, and density of marine mammals. The updated density estimates presented in this LOA application are derived from the Navy OPAREA Density Estimates (NODEs) for the GOMEX OPAREA report (DoN, 2007b).

Density estimates for cetaceans were either modeled using available line-transect survey data or derived using cetacean abundance estimates found in the 2006 NOAA stock assessment reports (SARs) (Waring *et al.*, 2007), which can be viewed at *http://www.nmfs.noaa.gov/pr/sars/species.htm*. The abundance estimates in the stock assessment reports are from Mullin and Fulling (2004).

For the model-based approach, density estimates were calculated for each species within areas containing survey effort. A relationship between these density estimates and the associated environmental parameters such as depth, slope, distance from the shelf break, sea surface temperature (SST), and chlorophyll a (chl *a*) concentration was formulated using generalized additive models (GAMs). This relationship was then used to generate a two-dimensional density surface for the region by predicting densities in areas where no survey data exist.

The analyses for cetaceans were based on sighting data collected through shipboard surveys conducted by NMFS SEFSC between 1996 and 2004. Species-specific density estimates derived through spatial modeling were compared with abundance estimates found in the 2006 NOAA SARs to ensure consistency. All spatial models and density estimates were reviewed by and coordinated with NMFS Science

Center technical staff and scientists with the University of St. Andrews, Scotland, Centre for Environmental and Ecological Modeling (CREEM). For a more detailed description of the methods involved in calculating the density estimates provided in this LOA request, please refer to the NODE report for the GOMEX OPAREA (DoN, 2007b). The following lists how density estimates were derived for each species:

Model-Derived Density Estimates—Line Transect Survey Data

Sperm whale, dwarf and pygmy sperm whales, beaked whales, rough-toothed dolphin, bottlenose dolphin (Tursiops truncatus), pantropical spotted dolphin, Atlantic spotted dolphin, striped dolphin, spinner dolphin, and Risso's dolphin.

Stock Assessment Report or Literature-Derived Density Estimates

Bryde's whale, Clymene dolphin, Fraser's dolphin, killer whale, false killer whale, pygmy killer whale, melon-headed whale, short-finned pilot whale.

Potential Impacts to Marine Mammal Species

The Navy considers that explosions associated with BOMBEX (A–S) and small arms training are the activities with the potential to result in Level A or Level B harassment of marine mammals. Vessel strikes were also analyzed for potential effect to marine mammals.

Vessel Strikes

Collisions with commercial and Navy ships can result in serious injury and may occasionally cause fatalities to cetaceans and manatees. Although the most vulnerable marine mammals may be assumed to be slow-moving cetaceans or those that spend extended periods of time at the surface in order to restore oxygen levels within their tissues after deep dives (*e.g.*, sperm whale), fin whales are actually struck most frequently (Laist *et al.*, 2001). Manatees are also particularly susceptible to vessel interactions and collisions with watercraft constitute the leading cause of mortality (USFWS, 2007). Smaller marine mammals such as bottlenose and Atlantic spotted dolphins move more quickly throughout the water column and are often seen riding the bow wave of large ships. Marine mammal responses to vessels may include avoidance and changes in dive patterns (NRC, 2003).

After reviewing historical records and computerized stranding databases for evidence of ship strikes involving baleen and sperm whales, Laist *et al.* (2001) found that accounts of large whale ship strikes involving motorized boats in the area date back to at least the late 1800s. Ship collisions remained infrequent until the 1950s, after which point they increased. Laist *et al.* (2001) report that both the number and speed of motorized vessels have increased over time for trans-Atlantic passenger services, which transit through the area. They concluded that most strikes occur over or near the continental shelf, that ship strikes likely have a negligible effect on the status of most whale populations, but that for small populations or segments of populations the impact of ship strikes may be significant.

Although ship strikes may result in the mortality of a limited number of whales within a population or stock, Laist *et al.* (2001) also concluded that, when considered in combination with other human-related mortalities in the area (*e.g.*, entanglement in fishing gear), these ship strikes may present a concern for whale populations.

Of 11 species known to be hit by ships, fin whales are struck most frequently; followed by right whales, humpback whales, sperm whales, and gray whales (Laist *et al.*, 2001). In some areas, one-third of all fin whale and right whale strandings appear to involve ship strikes. Sperm whales spend long periods (typically up to 10 minutes; Jacquet *et al.*, 1996) ''rafting'' at the surface between deep dives. This could make them exceptionally vulnerable to ship strikes. Berzin (1972) noted that there were ''many'' reports of sperm whales of different age classes being struck by vessels, including passenger ships and tug boats. There were also instances in which sperm whales approached vessels too closely and were cut by the propellers (NMFS, 2006).

In the Gulf of Mexico, sperm whales are of particular concern. Sperm whales spend extended periods of time at the surface in order to restore oxygen levels within their tissues after deep dives. In addition, some baleen whales such as the North Atlantic right whale seem generally unresponsive to vessel sound, making them more susceptible to vessel collisions (Nowacek *et al.*, 2004a). In comparison with other regions of the U.S., the Gulf of Mexico is the least common area for ship strikes of large whales (Jensen and Silber, 2003). Between 1972 and 1999, eight confirmed or possible large whale ship strikes were recorded in the Gulf of Mexico, including two that collided with Navy vessels; four of these resulted in mortality of the animal (Jensen and Silber, 2003) and one resulted in extensive damage to a Navy vessel (Laist *et al.*, 2001). It is not known whether the shipstrikes involving Navy vessels resulted in the mortality of the animal (Laist *et al.*, 2001; Jensen and Silber, 2003).

Accordingly, the Navy has proposed mitigation measures to reduce the potential for collisions with surfaced marine mammals (for more details refer to Proposed Mitigation Measures below). Based on the implementation of Navy mitigation measures and the relatively low density of Navy ships in the Study Area the likelihood that a vessel collision would occur is very low.

Vessel Movement

There are limited data concerning marine mammal behavioral responses to vessel traffic and vessel noise, and a lack of consensus among scientists with respect to what these responses mean or whether they result in short-term or long-term adverse effects. In those cases where there is a busy shipping lane or where there is large amount of vessel traffic, marine mammals may experience acoustic masking (Hildebrand, 2005) if they are present in the area (*e.g.*, killer whales in Puget Sound; Foote *et al.*, 2004; Holt *et al.*, 2008). In cases where vessels actively approach marine mammals (*e.g.*, whale watching or dolphin watching boats), scientists have documented that animals exhibit altered behavior such as increased swimming speed, erratic movement, and active avoidance behavior (Bursk, 1983; Acevedo, 1991; Baker and MacGibbon, 1991; Trites and Bain, 2000; Williams *et al.*, 2002; Constantine *et al.*, 2003), reduced blow interval (Ritcher *et al.*, 2003), disruption of normal social behaviors (Lusseau, 2003; 2006), and the shift of behavioral activities which may increase energetic costs (Constantine *et al.*, 2003; 2004)). A detailed review of marine mammal reactions to ships and boats is available in Richardson *et al.* (1995). For each of the marine mammals taxonomy groups, Richardson *et al.* (1995) provided the following assessment regarding cetacean reactions to vessel traffic:

Toothed whales: ''In summary, toothed whales sometimes show no avoidance reaction to vessels, or even approach them. However, avoidance can occur, especially in response to vessels of types used to chase or hunt the animals. This may cause temporary displacement, but we know of no clear evidence that toothed whales have abandoned significant parts of their range because of vessel traffic.''

Baleen whales: ''When baleen whales receive low-level sounds from distant or

stationary vessels, the sounds often seem to be ignored. Some whales approach the sources of these sounds. When vessels approach whales slowly and nonaggressively, whales often exhibit slow and inconspicuous avoidance maneuvers. In response to strong or rapidly changing vessel noise, baleen whales often interrupt their normal behavior and swim rapidly away. Avoidance is especially strong when a boat heads directly toward the whale.''

It is important to recognize that behavioral responses to stimuli are complex and influenced to varying degrees by a number of factors such as species, behavioral contexts, geographical regions, source characteristics (moving or stationary, speed, direction, *etc.*), prior experience of the animal, and physical status of the animal. For example, studies have shown that beluga whales reacted differently when exposed to vessel noise and traffic. In some cases, naive beluga whales exhibited rapid swimming from ice-breaking vessels up to 80 km away, and showed changes in surfacing, breathing, diving, and group composition in the Canadian high Arctic where vessel traffic is rare (Finley *et al.*, 1990). In other cases, beluga whales were more tolerant of vessels, but differentially responsive by reducing their calling rates, to certain vessels and operating characteristics (especially older animals) in the St. Lawrence River where vessel traffic is common (Blane and Jaakson, 1994). In Bristol Bay, Alaska, beluga whales continued to feed when surrounded by fishing vessels and resisted dispersal even when purposefully harassed (Fish and Vania, 1971).

In reviewing more than 25 years of whale observation data, Watkins (1986) concluded that whale reactions to vessel traffic were ''modified by their previous experience and current activity: habituation often occurred rapidly, attention to other stimuli or preoccupation with other activities sometimes overcame their interest or wariness of stimuli.'' Watkins noticed that over the years of exposure to ships in the Cape Cod area, minke whales (*Balaenoptera acutorostrata*) changed from frequent positive (such as approaching vessels) interest to generally uninterested reactions; finback whales (*B. physalus*) changed from mostly negative (such as avoidance) to uninterested reactions; right whales (*Eubalaena glacialis*) apparently continued the same variety of responses (negative, uninterested, and positive responses) with little change; and humpbacks (*Megaptera novaeangliae*) dramatically changed from mixed responses that were often negative to often strongly positive reactions. Watkins (1986) summarized that ''whales near shore, even in regions with low vessel traffic, generally have become less wary of boats and their noises, and they have appeared to be less easily disturbed than previously. In particular locations with intense shipping and repeated approaches by boats (such as the whale-watching areas of Stellwagen Bank), more and more whales had P [positive] reactions to familiar vessels, and they also occasionally approached other boats and yachts in the same ways.''

In the case of the GOMEX Range Complex, naval vessel traffic is expected to be much lower than in areas where there are large shipping lanes and large numbers of fishing vessels and/or recreational vessels. Nevertheless, the proposed action area is well traveled by a variety of commercial and recreational vessels, so marine mammals in the area are expected to be habituated to vessel noise.

As described earlier in this document, operations involving vessel movements occur intermittently and are variable in duration, ranging from a few hours up to 2 weeks. These operations are widely dispersed throughout the GOMEX Range Complex OPAREA, which is a vast area encompassing 11,714 nm^2. The Navy logs about 180 total vessel days within the Study Area during a typical year. Consequently, the density of ships within the Study Area at any given time is extremely low (*i.e.*, less than 0.0113 ships/nm^2).

Moreover, naval vessels transiting the study area or engaging in the training exercises will not actively or intentionally approach a marine mammal or change speed drastically. All vessels transiting to, from, and within the range complexes will be traveling at speeds generally ranging from 10 to 14 knots. In addition, mitigation measures described below require Navy vessels to keep at least 500 yards (460 m) away from any observed whale and at least 200 yards (183 m) from marine mammals other than whales, and avoid approaching animals head-on. Although the radiated sound from the vessels will be audible to marine mammals over a large distance, it is unlikely that animals will respond behaviorally to low-level distant shipping noise as the animals in the area are likely to be habituated to such noises (Nowacek *et al.*, 2004). In light of these facts, NMFS does not expect the Navy's vessel movements to result in Level B harassment.

Assessment of Marine Mammal Response to Anthropogenic Sound

Marine mammals respond to various types of anthropogenic sounds introduced in the ocean environment. Responses are typically subtle and can include shorter surfacings, shorter dives, fewer blows per surfacing, longer intervals between blows (breaths), ceasing or increasing vocalizations, shortening or lengthening vocalizations, and changing frequency or intensity of vocalizations (NRC, 2005). However, it is not known how these responses relate to significant effects (*e.g.*, long-term effects or population consequences). The following is an assessment of marine mammal responses and disturbances when exposed to anthropogenic sound.

I. Physiology

Potential impacts to the auditory system are assessed by considering the characteristics of the received sound (*e.g.*, amplitude, frequency, duration) and the sensitivity of the exposed animals. Some of these assessments can be numerically based (*e.g.*, temporary threshold shift [TTS] of hearing sensitivity, permanent threshold shift [PTS] of hearing sensitivity, perception). Others will be necessarily qualitative, due to a lack of information, or will need to be extrapolated from other species for which information exists.

Potential physiological responses to the sound exposure are ranked in descending order, with the most severe impact (auditory trauma) occurring at the top and the least severe impact occurring at the bottom (the sound is not perceived).

Auditory trauma represents direct mechanical injury to hearing related structures, including tympanic membrane rupture, disarticulation of the middle ear ossicles, and trauma to the inner ear structures such as the organ of Corti and the associated hair cells. Auditory trauma is always injurious that could result in PTS and is always assumed to result in a stress response.

Auditory fatigue refers to a loss of hearing sensitivity after sound stimulation. The loss of sensitivity persists after, sometimes long after, the cessation of the sound. The mechanisms responsible for auditory fatigue differ from auditory trauma and would primarily consist of metabolic exhaustion of the hair cells and cochlear tissues. The features of the exposure (*e.g.*, amplitude, frequency, duration, temporal pattern) and the individual animal's susceptibility would determine the severity of fatigue and whether the

effects were temporary (TTS) or permanent (PTS). Auditory fatigue (PTS or TTS) is always assumed to result in a stress response.

Sounds with sufficient amplitude and duration to be detected among the background ambient noise are considered to be perceived. This category includes sounds from the threshold of audibility through the normal dynamic range of hearing (*i.e.*, not capable of producing fatigue).

To determine whether an animal perceives the sound, the received level, frequency, and duration of the sound are compared to what is known of the species' hearing sensitivity.

Since audible sounds may interfere with an animal's ability to detect other sounds at the same time, perceived sounds have the potential to result in auditory masking. Unlike auditory fatigue, which always results in a stress response because the sensory tissues are being stimulated beyond their normal physiological range, masking may or may not result in a stress response, depending on the degree and duration of the masking effect. Masking may also result in a unique circumstance where an animal's ability to detect other sounds is compromised without the animal's knowledge. This could conceivably result in sensory impairment and subsequent behavior change; in this case, the change in behavior is the lack of a response that would normally be made if sensory impairment did not occur. For this reason, masking also may lead directly to behavior change without first causing a stress response.

The features of perceived sound (*e.g.*, amplitude, duration, temporal pattern) are also used to judge whether the sound exposure is capable of producing a stress response. Factors to consider in this decision include the probability of the animal being naive or experienced with the sound (*i.e.*, what are the known/unknown consequences of the exposure).

If the received level is not of sufficient amplitude, frequency, and duration to be perceptible by the animal, by extension, this does not result in a stress response (not perceived). Potential impacts to tissues other than those related to the auditory system are assessed by considering the characteristics of the sound (*e.g.*, amplitude, frequency, duration) and the known or estimated response characteristics of non-auditory tissues. Some of these assessments can be numerically based (*e.g.*, exposure required for rectified diffusion). Others will be necessarily qualitative, due to lack of information. Each of the potential responses may or may not result in a stress response.

Direct tissue effects—Direct tissue responses to sound stimulation may range from tissue shearing (injury) to mechanical vibration with no resulting injury.

No tissue effects—The received sound is insufficient to cause either direct (mechanical) or indirect effects to tissues. No stress response occurs.

II. The Stress Response

The 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. The term ''stress'' has taken on an ambiguous meaning in the scientific literature, but with respect to the later discussions of allostasis and allostatic loading, 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 is characterized 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 is ultimately defined by increases in the secretion of the glucocorticoid steroid hormones, predominantly cortisol in mammals. The amount of increase in circulating glucocorticoids above baseline may be an indicator of the overall severity of a stress response (Hennessy *et al.*, 1979). Each component of the stress response is variable in time; *e.g.*, adrenalines are released nearly immediately and are used or cleared by the system quickly, whereas cortisol levels may take long periods of time to return to baseline.

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. In considering potential stress responses of marine mammals to acoustic stressors, each of these should be considered. For example, is the acoustic stressor in an area where animals engage in breeding activity? Are animals in the region resident and likely to have experience with the stressor (*i.e.*, repeated exposures)? Is the region a foraging ground or are the animals passing through as transients? What is the ratio of young (naive) to old (experienced) animals in the population? It is unlikely that all such questions can be answered from empirical data; however, they should be addressed in any qualitative assessment of a potential stress response as based on the available literature.

The stress response may or may not result in a behavioral change, depending on the characteristics of the exposed animal. However, provided a stress response occurs, we assume that some contribution is made to the animal's 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). The same hormones associated with the stress response vary naturally throughout an animal's life, providing support for particular life history events (*e.g.*, pregnancy) and predictable environmental conditions (*e.g.*, seasonal changes). The allostatic load is the cumulative cost of allostasis incurred by an animal and is generally characterized with respect to an animal's energetic expenditure. Perturbations to an animal that may occur with the presence of a stressor, either biological (*e.g.*, predator) or anthropogenic (*e.g.*, construction), can contribute to the allostatic load (Wingfield, 2003). Additional costs are cumulative and additions to the allostatic load over time may contribute to reductions in the probability of achieving ultimate life history functions (*e.g.*, survival, maturation, reproductive effort and success) by producing pathophysiological states (the conditions of disease or injury). The contribution to the allostatic load from a stressor requires estimating the magnitude and duration of the stress response, as well as any secondary contributions that might result from a change in behavior.

If the acoustic source does not produce tissue effects, is not perceived by the animal, or does not produce a stress response by any other means, we assume that the exposure does not contribute to the allostatic load. Additionally, without a stress response or auditory masking, it is assumed that there can be no behavioral change. Conversely, any immediate effect of exposure that produces an injury is assumed to also produce a stress response and contribute to the allostatic load.

III. Behavior

Changes in marine mammal behavior are expected to result from an acute stress response. This expectation is based on the idea that some sort of physiological trigger must exist to change any behavior that is already being performed. The exception to this rule is the case of auditory masking. The presence of a masking sound may not produce a stress response, but may interfere with the animal's ability to detect and discriminate biologically relevant signals. The inability to detect and discriminate biologically relevant signals hinders the potential for normal behavioral responses to auditory cues and is thus considered a behavioral change.

Impulsive sounds from explosions have very short durations as compared to other sounds like sonar or ship noise, which are more likely to produce auditory masking. Additionally the explosive sources analyzed in this document are used infrequently and the training events are typically of short duration. Therefore, the potential for auditory masking is unlikely.

Numerous behavioral changes can occur as a result of stress response. For each potential behavioral change, the magnitude in the change and the severity of the response needs to be estimated. Certain conditions, such as stampeding (*i.e.*, flight response) or a response to a predator, might have a probability of resulting in injury. For example, a flight response, if significant enough, could produce a stranding event. Each disruption to a natural behavioral pattern (*e.g.*, breeding or nursing) may need to be classified as Level B harassment. All behavioral disruptions have the potential to contribute to the allostatic load. This secondary potential is signified by the feedback from the collective behaviors to allostatic loading.

IV. Life Function

IV.1. Proximate Life Functions

Proximate life history functions are the functions that the animal is engaged in at the time of acoustic exposure. The disruption of these functions, and the magnitude of the disruption, is something that must be considered in determining how the ultimate life history functions are affected. Consideration of the magnitude of the effect to each of the proximate life history functions is dependent upon the life stage of the animal. For example, an animal on a breeding ground which is sexually immature will suffer relatively little consequence to disruption of breeding behavior when compared to an actively displaying adult of prime reproductive age.

IV.2. Ultimate Life Functions

The ultimate life functions are those that enable an animal to contribute to the population (or stock, or species, *etc.*). The impact to ultimate life functions will depend on the nature and magnitude of the perturbation to proximate life history functions. Depending on the severity of the response to the stressor, acute perturbations may have nominal to profound impacts on ultimate life functions. For example, unit-level use of sonar by a vessel transiting through an area that is utilized for foraging, but not for breeding, may disrupt feeding by exposed animals for a brief period of time. Because of the brevity of the perturbation, the impact to ultimate life functions may be negligible. By contrast, weekly training over a period of years may have a more substantial impact because the stressor is chronic. Assessment of the magnitude of the stress response from the chronic perturbation would require an understanding of how and whether animals acclimate to a specific, repeated stressor and whether chronic elevations in the stress response (*e.g.*, cortisol levels) produce fitness deficits.

The proximate life functions are loosely ordered in decreasing severity of impact. Mortality (survival) has an immediate effect, in that no future reproductive success is feasible and there is no further addition to the population resulting from reproduction. Severe injuries may also lead to reduced survivorship (longevity) and prolonged alterations in behavior. The latter may further affect an animal's overall reproductive success and reproductive effort. Disruptions of breeding have an immediate impact on reproductive effort and may impact reproductive success. The magnitude of the effect will depend on the duration of the disruption and the type of behavior change that was provoked. Disruptions to feeding and migration can affect all of the ultimate life functions; however, the impacts to reproductive effort and success are not likely to be as severe or immediate as those incurred by mortality and breeding disruptions.

Explosive Ordnance Exposure Analysis

The underwater explosion from a weapon 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. The effects of an underwater explosion on a marine mammal depends 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. Potential impacts can range from brief effects (such as behavioral disturbance), tactile perception, physical discomfort, slight injury of the internal organs and the auditory system, to death of the animal (Yelverton *et al.*, 1973; O'Keeffe and Young, 1984; DoN, 2001). 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). Generally, the higher the level of impulse and pressure level exposure, the more severe the impact to an individual.

Injuries resulting from a shock wave take place at boundaries between tissues of different density. Different velocities are imparted to tissues of different densities, and this can lead to their physical disruption. Blast effects are greatest at the gas-liquid interface (Landsberg, 2000). Gas-containing organs, particularly the lungs and gastrointestinal tract, are especially susceptible (Goertner, 1982; Hill, 1978; Yelverton *et al.*, 1973). In addition, gas-containing organs including the 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). Intestinal walls can bruise or rupture, with subsequent hemorrhage and escape of gut contents into the body cavity. Less severe gastrointestinal tract injuries include contusions, petechiae (small red or purple spots caused by bleeding in the skin), and slight hemorrhaging (Yelverton *et al.*, 1973).

Because the ears are the most sensitive to pressure, they are the organs most sensitive to injury (Ketten, 2000). Sound-related damage associated with blast noise can be theoretically distinct from injury from the shock wave, particularly farther from the explosion. If an animal is able to hear a noise, at some level it can damage its hearing by causing decreased sensitivity (Ketten, 1995) (See *Assessment of Marine Mammal Response to Anthropogenic Sound* Section above). Sound-related trauma can be lethal or sublethal. Lethal

impacts are those that result in immediate death or serious debilitation in or near an intense source and are not, technically, pure acoustic trauma (Ketten, 1995). Sublethal impacts include hearing loss, which is caused by exposures to perceptible sounds. Severe damage (from the shock wave) to the ears includes tympanic membrane rupture, fracture of the ossicles, damage to the cochlea, hemorrhage, and cerebrospinal fluid leakage into the middle ear. Moderate injury implies partial hearing loss due to tympanic membrane rupture and blood in the middle ear. Permanent hearing loss also can occur when the hair cells are damaged by one very loud event, as well as by prolonged exposure to a loud noise or chronic exposure to noise. The level of impact from blasts depends on both an animal's location and, at outer zones, on its sensitivity to the residual noise (Ketten, 1995).

The exercises that use explosives in this request include BOMBEX (A–S) and GUNEX (S–S). Table 1 summarizes the number of events and specific areas where each occurs for each type of explosive ordnance used. There is no difference in how many events take place between the different seasons. Fractional values are a result of evenly distributing the annual totals over the four seasons. For example, there is one BOXEX event per year that can take place in the BOMBEX Hotbox during any season, so there are 0.25 event modeled for each season.

Definition of Harassment

As mentioned previously, with respect to military readiness activities, Section 3(18)(B) of the MMPA defines ''harassment'' as: (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].

I. Level B Harassment

Of the potential effects that were described in the *Assessment of Marine Mammal Response to Anthropogenic Sound* and the *Explosive Ordnance Exposure Analysis* sections, the following are the types of effects that fall into the Level B Harassment category:

(A) *Behavioral Harassment*—Behavioral disturbance that rises to the level described in the definition above, when resulting from exposures to underwater detonations, is considered Level B Harassment. Some of the lower level physiological stress responses discussed in the *Assessment of Marine Mammal Response to Anthropogenic Sound* section will 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 Level B Harassment is predicted based on estimated behavioral responses, those takes may have a stress-related physiological component as well.

(B) *Acoustic Masking and Communication Impairment*—Acoustic masking is considered Level B Harassment as it can disrupt natural behavioral patterns by interrupting or limiting the marine mammal's receipt or transmittal of important information or environmental cues.

(C) *TTS*—As discussed previously, TTS can affect how an animal behaves in response to the environment, including conspecifics, predators, and prey. The following physiological mechanisms are thought to play a role in inducing auditory fatigue: effects to sensory hair cells in the inner ear that reduce their sensitivity, modification of the chemical environment within the sensory cells, residual muscular activity in the middle ear, displacement of certain inner ear membranes, increased blood flow, and post-stimulatory reduction in both efferent and sensory neural output. Ward (1997) suggested that when these effects result in TTS rather than PTS, they are within the normal bounds of physiological variability and tolerance and do not represent a physical injury. Additionally, Southall *et al.* (2007) indicate that although PTS is a tissue injury, TTS is not because the reduced hearing sensitivity following exposure to intense sound results primarily from fatigue, not loss, of cochlear hair cells and supporting structures and is reversible. Accordingly, NMFS classifies TTS (when resulting from exposure to underwater detonations) as Level B Harassment, not Level A Harassment (injury).

II. Level A Harassment

Of the potential effects that were described in the *Assessment of Marine Mammal Response to Anthropogenic Sound* section, the following are the types of effects that fall into the Level A Harassment category:

(A) *PTS*—PTS is irreversible and considered to be an injury. PTS results from exposure to intense sounds that cause a permanent loss of inner or outer cochlear hair cells or exceed the elastic limits of certain tissues and membranes in the middle and inner ears and result in changes in the chemical composition of the inner ear fluids.

(B) *Physical Disruption of Tissues Resulting from Explosive Shock Wave*—Physical damage of tissues resulting from a shock wave (from an explosive detonation) is classified as 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, damage to the cochlea, hemorrhage, and cerebrospinal fluid leakage into the middle ear.

Acoustic Take Criteria

For the purposes of an MMPA incidental take authorization, three types of take are identified: Level B Harassment; Level A Harassment; and mortality (or serious injury leading to mortality). The categories of marine mammal responses (physiological and behavioral) that fall into the two harassment categories were described in the previous section.

Because the physiological and behavioral responses of the majority of the marine mammals exposed to underwater detonations cannot be detected or measured, a method is needed to estimate the number of individuals that will be taken, pursuant to the MMPA, based on the proposed action. To this end, NMFS uses an acoustic criteria that estimate at what received level (when exposed to explosive detonations) Level B Harassment, Level A Harassment, and mortality (for explosives) of marine mammals would occur. The acoustic criteria for Underwater Detonations are discussed.

Thresholds and Criteria for Impulsive Sound

Criteria and thresholds for estimating the exposures from a single explosive activity on marine mammals were established for the Seawolf Submarine Shock Test Final Environmental Impact Statement (FEIS) (''Seawolf'') and subsequently used in the *USS Winston*

S. Churchill (DDG–81) Ship Shock FEIS (''*Churchill*'') (DoN, 1998 and 2001a). NMFS adopted these criteria and thresholds in its final rule on unintentional taking of marine animals occurring incidental to the shock testing (NMFS, 2001a). Since the ship-shock events involve only one large explosive at a time, additional assumptions were made to extend the approach to cover multiple explosions for BOMBEX (A–S). In addition, this section reflects a revised acoustic criterion for small underwater explosions (*i.e.*, 23 pounds per square inch [psi] instead of previous acoustic criteria of 12 psi for peak pressure), which is based on the final rule issued to the Air Force by NMFS (NMFS, 2005b).

I.1. Thresholds and Criteria for Injurious Physiological Impacts

I.1.a. Single Explosion

For injury, NMFS uses dual criteria: eardrum rupture (*i.e.*, tympanic-membrane injury) and onset of slight lung injury. These criteria are considered indicative of the onset of injury. The threshold for tympanic-membrane (TM) rupture corresponds to a 50 percent rate of rupture (*i.e.*, 50 percent of animals exposed to the level are expected to suffer TM rupture). This value is stated in terms of an Energy Flux Density Level (EL) value of 1.17 inch pounds per square inch (in-lb/in ^{2}), approximately 205 dB re 1 microPa ^{2}-sec.

The threshold for onset of slight lung injury is calculated for a small animal (a dolphin calf weighing 26.9 lbs), and is given in terms of the ''Goertner modified positive impulse,'' indexed to 13 psi-msec (DoN, 2001). This threshold is conservative since the positive impulse needed to cause injury is proportional to animal mass, and therefore, larger animals require a higher impulse to cause the onset of injury. This analysis assumed the marine species populations were 100 percent small animals. The criterion with the largest potential impact range (most conservative), either TM rupture (energy threshold) or onset of slight lung injury (peak pressure), will be used in the analysis to determine Level A exposures for single explosive events.

For mortality, NMFS uses the criterion corresponding to the onset of extensive lung injury. This is conservative in that it corresponds to a 1 percent chance of mortal injury, and yet any animal experiencing onset severe lung injury is counted as a lethal exposure. For small animals, the threshold is given in terms of the Goertner modified positive impulse, indexed to 30.5 psi-msec. Since the Goertner approach depends on propagation, source/animal depths, and animal mass in a complex way, the actual impulse value corresponding to the 30.5 psi-msec index is a complicated calculation. To be conservative, the analysis used the mass of a calf dolphin (at 26.9 lbs) for 100 percent of the populations.

I.1.b. Multiple Explosions

For this analysis, the use of multiple explosions only applies to the MK–83 bombs used in BOMBEX. Since BOMBEX events require multiple explosions, the *Churchill* approach had to be extended to cover multiple sound events at the same training site. For multiple exposures, accumulated energy over the entire training time is the natural extension for energy thresholds since energy accumulates with each subsequent shot (explosion); this is consistent with the treatment of multiple arrivals in *Churchill*. For positive impulse, it is consistent with *Churchill* to use the maximum value over all impulses received.

I.2. Thresholds and Criteria for Non-Injurious Physiological Effects

The NMFS' criterion for non-injurious harassment is TTS—a slight, recoverable loss of hearing sensitivity (DoN, 2001). For this assessment, there are dual criteria for TTS, an energy threshold and a peak pressure threshold. The criterion with the largest potential impact range (most conservative) either the energy or peak pressure threshold, will be used in the analysis to determine Level B TTS exposures.

I.2.a. Single Explosion—TTS-Energy Threshold

The first threshold is a 182 dB re 1 microPa ^{2}-sec maximum energy flux density level in any 1/3-octave band at frequencies above 100 Hertz (Hz) for toothed whales and in any 1/3-octave band above 10 Hz for baleen whales. For large explosives, as in the case of the *Churchill* FEIS, frequency range cutoffs at 10 and 100 Hz make a difference in the range estimates. For small explosives (<1,500 lb NEW), as what was modeled for this analysis, the spectrum of the shot arrival is broad, and there is essentially no difference in impact ranges for toothed whales or baleen whales.

The TTS energy threshold for explosives is derived from the Space and Naval Warfare Systems Center (SSC) pure-tone tests for TTS (Schlundt *et al.*, 2000; Finneran and Schlundt, 2004). The pure-tone threshold (192 dB as the lowest value) is modified for explosives by (a) interpreting it as an energy metric, (b) reducing it by 10 dB to account for the time constant of the mammal ear, and (c) measuring the energy in 1/3-octave bands, the natural filter band of the ear. The resulting threshold is 182 dB re 1 microPa ^{2}-sec in any 1/3-octave band. The energy threshold usually dominates and is used in the analysis to determine potential Level B exposures for single explosion ordnance.

I.2.b. Single Explosion—TTS-Peak Pressure Threshold

The second threshold applies to all species and is stated in terms of peak pressure at 23 psi (about 225 dB re 1 microPa). This criterion was adopted for Precision Strike Weapons (PSW) Testing and Training by Eglin Air Force Base in the Gulf of Mexico (NMFS, 2005b). It is important to note that for small shots near the surface (such as in this analysis), the 23-psi peak pressure threshold generally will produce longer impact ranges than the 182-dB energy metric. Furthermore, it is not unusual for the TTS impact range for the 23-psi pressure metric to actually exceed the without-TTS (behavioral change without onset of TTS) impact range for the 177-dB energy metric.

I.2.c. Multiple Explosions—TTS

For multiple explosions, accumulated energy over the entire training time is the natural extension for energy thresholds since energy accumulates with each subsequent shot/detonation. This is consistent with the energy argument in *Churchill*. For peak pressure, it is consistent with *Churchill* to use the maximum value over all impulses received.

I.3. Thresholds and Criteria for Behavioral Effects

I.3.a. Single Explosion

For a single explosion, to be consistent with *Churchill*, TTS is the criterion for Level B harassment. In other words, because behavioral disturbance for a single explosion is likely to be limited to a short-lived startle reaction, use of the TTS criterion is considered sufficient protection and therefore behavioral effects (Level B behavioral harassment without onset of TTS) are not expected for single explosions.

I.3.b. Multiple Explosions—Without TTS

For this analysis, the use of multiple explosions only applies to FIREX (with IMPASS). Because multiple explosions would occur within a discrete time period, a new acoustic criterion—

behavioral disturbance (without TTS)—is used to account for behavioral effects significant enough to be judged as harassment, but occurring at lower noise levels than those that may cause TTS.

The threshold is based on test results published in Schlundt *et al.* (2000), with derivation following the approach of the *Churchill* FEIS for the energy-based TTS threshold. The original Schlundt *et al.* (2000) data and the report of Finneran and Schlundt (2004) are the basis for thresholds for behavioral disturbance (without TTS). As reported by Schlundt *et al.* (2000), instances of altered behavior generally began at lower exposures than those causing TTS; however, there were many instances when subjects exhibited no altered behavior at levels above the onset-TTS levels. Regardless of reactions at higher or lower levels, all instances of altered behavior were included in the statistical summary.

The behavioral disturbance (without TTS) threshold for tones is derived from the SSC tests, and is found to be 5 dB below the threshold for TTS, or 177 dB re: 1 microPa^2-s maximum EL in any ⅓-octave band at frequencies above 100 Hz for toothed whales/sea turtles and in any ⅓-octave band above 10 Hz for baleen whales. As stated previously for TTS, for small explosives (<1500-lb NEW), as what was modeled for this analysis, the spectrum of the shot arrival is broad, and there is essentially no difference in impact ranges for toothed whales/sea turtles or baleen whales. For BOMBEX involving MK–83 bombs, behavioral disturbance (without TTS) (177 dB re: 1 microPa^2-s) is the criterion that dominates in the analysis to determine potential behavioral exposures (MMPA-Level B) due to the use of multiple explosions.

II. Summary of Thresholds and Criteria for Impulsive Sounds

Table 3 summarizes the effects, criteria, and thresholds used in the assessment for impulsive sounds. The criteria for behavioral effects without physiological effects used in this analysis are based on use of multiple explosives that only take place during a BOMBEX event.

TABLE 3—EFFECTS, CRITERIA, AND THRESHOLDS FOR IMPULSIVE SOUNDS

Effect	Criteria	Metric	Threshold	Effect
Mortality	Onset of Extensive Lung Injury	Goertner modified positive impulse.	Indexed to 30.5 psi-msec (assumes 100 percent small animal at 26.9 lbs).	Mortality.
Injurious Physiological.	50% Tympanic Membrane Rupture.	Energy flux density	1.17 in-lb/in^2 (about 205 dB re 1 microPa^2-sec).	Level A.
Injurious Physiological.	Onset Slight Lung Injury	Goertner modified positive impulse.	Indexed to 13 psi-msec (assumes 100 percent small animal at 26.9 lbs).	Level A.
Non-injurious Physiological.	TTS	Greatest energy flux density level in any ⅓-octave band (>100 Hz for toothed whales and >10 Hz for baleen whales)—for total energy over all exposures 1.	82 dB re 1 microPa^2-sec	Level B.
Non-injurious Physiological.	TTS	Peak pressure over all exposures	23 psi	Level B.
Non-injurious Behavioral.	Multiple Explosions Without TTS	Greatest energy flux density level in any ⅓-octave (>100 Hz for toothed whales and > 10Hz for baleen whales)—for total energy over all exposures (multiple explosions only).	177 dB re 1 microPa^2-sec	Level B.

The criteria for mortality, Level A Harassment, and Level B Harassment resulting from explosive detonations were initially developed for the Navy's *Sea Wolf* and *Churchill* ship-shock trials and have not changed since other MMPA authorizations issued for explosive detonations. The criteria, which are applied to cetaceans and pinnipeds are summarized in Table 3. Additional information regarding the derivation of these criteria is available in the Navy's FEIS for the GOMEX Range Complex and in the Navy's *Churchill* FEIS (U.S. Department of the Navy, 2001).

III. Acoustic Environment

Sound propagation (the spreading or attenuation of sound) in the oceans of the world is affected by several environmental factors: water depth, variations in sound speed within the water column, surface roughness, and the geo-acoustic properties of the ocean bottom. These parameters can vary widely with location.

Four types of data are used to define the acoustic environment for each analysis site:

Seasonal Sound Velocity Profiles (SVP)—Plots of propagation speed (velocity) as a function of depth, or SVPs, are a fundamental tool used for predicting how sound will travel. Seasonal SVP averages were obtained for each training area.

Seabed Geo-acoustics—The type of sea floor influences how much sound is absorbed and how much sound is reflected back into the water column.

Wind Speeds—Several environmental inputs, such as wind speed and surface roughness, are necessary to model acoustic propagation in the prospective training areas.

Bathymetry Data—Bathymetry data are necessary to model acoustic propagation and were obtained for each of the training areas.

IV. Acoustic Effects Analysis

The acoustic effects analysis presented in the following sections is summarized for each major type of exercise. A more in-depth effects analysis is in Appendix A of the LOA application and the Addendum.

1. BOMBEX

Modeling was completed for four explosive sources (sequential detonation of four bombs per event) involved in BOMBEX with an assumed detonation depth of 1 m. The NEW used in simulations of the MK83 is 415.8 lbs.

Determining the zone of influence (ZOI) for the thresholds in terms of total EFD, impulse, peak pressure and 1/3-octave bands EFD must treat the sequential explosions differently than the single detonations. For the MK–83, two factors are involved for the sequential explosives that deal with the spatial and temporal distribution of the detonations as well as the effective accumulation of the resultant acoustics. In view of the ZOI determinations, the sequential detonations are modeled as a single point event with only the EFD summed incoherently:

$$Total\ EFD\ db = 10\ \log_{10} \sum_{i=1}^{n} 10^{(EFD_i/10)}$$

The multiple explosion energy criterion was used to determine the ZOI for the Level B without TTS exposure analysis. Table 4 shows the ZOI results of the model estimation. The ZOI, when multiplied by the animal densities and total number of events (Table 1), provides the exposure estimates for that animal species for the given bomb source.

BOMBEX is restricted to one location (BOMBEX Hotbox). In addition to other mitigation measures (see Mitigation Measures section below), aircraft will survey the target area for marine mammals before and during the exercise. Ships will not fire on the target until the area is surveyed and determined to be free of marine mammals. The exercise will be suspended if any marine mammals enter the buffer area (5,100-yard or 4,663-m radius around target). The implementation of mitigation measures like these effectively reduce exposures in the ZOI.

TABLE 4—ESTIMATED ZOIS (KM^2) USED IN EXPOSURE CALCULATIONS FOR BOMBEX USING MK–83 (415.8 LBS NEW) IN THE GOMEX RANGE COMPLEX FOR DIFFERENT SEASONS

Estimated ZOI @ 177 dB re 1 μPa^2-sec (multiple detonations only)				Estimated ZOI @ 182 dB re 1 μPa^2-sec or 23 psi				Estimated ZOI @ 205 dB re 1 μPa^2-sec or 13 psi				Mortality ZOI @ 30.5 psi			
Win	Spr	Sum	Fall	Win	Spr	Sum	Fall	Win	Spr	Sum	Fall	Win	Spr	Sum	Fall
98.93	115.93	161.39	173.27	55.53	76.82	137.33	158.07	4.84	4.84	4.84	4.98	<0.01	<0.01	<0.01	<0.01

Note: ZOIs for the MK–83 bombs are modeled as multiple detonations (4 bombs dropped in succession at same location).

2. Small Arms Training

Modeling was completed for the MK3A2 explosive anti-swimmer grenades, which assumed a 6 ft (1.8 m) detonation depth. The NEW used in simulations of the MK3A2 grenade is 0.5 lb.

Determining the ZOI for the thresholds in terms of total energy flux density (EFD), impulse, peak pressure and 1/3-octave bands EFD must treat the sequential explosions differently than the single detonations. For the MK3A2, two factors are involved for the sequential explosives that deal with the spatial and temporal distribution of the detonations as well as the effective accumulation of the resultant acoustics. In view of the ZOI determinations, the sequential detonations are modeled as a single point event with only the EFD summed incoherently:

$$TotalEFD_{db} = 101\ \log_{10} \sum_{i=1}^{n} 10^{(EFDi/10)}$$

The multiple explosion energy criterion was used to determine the ZOI for the non-injurious behavioral (without TTS) exposure analysis.

Table 5 shows the ZOI results of the model estimation. The ZOI, when multiplied by the animal densities and total number of events, provides the exposure estimates for that animal species. Grenade use is restricted to one location (UNDET Area E3) (see Figure 2 of the Navy's LOA application). In addition to other mitigation measures (see Mitigation Measures section below), lookouts will visually survey the target area for marine mammals. The exercise will not be conducted until the area is clear and will suspend the exercise if any enter the buffer area. Implementation of mitigation measures like these reduce the likelihood of exposure and potential effects in the ZOI.

TABLE 5—ESTIMATED ZOIS (KM^2) USED IN EXPOSURE CALCULATIONS FOR SMALL ARMS TRAINING USING MK3A2 ANTI-SWIMMER GRENADES (0.5 LBS NEW) IN THE GOMEX RANGE COMPLEX FOR DIFFERENT SEASONS

Estimated ZOI @ 177 dB re 1 μPa^2-sec (multiple detonations only)				Estimated ZOI @ 182 dB re 1 μPa^2-sec or 23 psi				Estimated ZOI @ 205 dB re 1 μPa^2-sec or 13 psi				Mortality ZOI @ 30.5 psi			
Win	Spr	Sum	Fall	Win	Spr	Sum	Fall	Win	Spr	Sum	Fall	Win	Spr	Sum	Fall
4.94	5.45	4.71	5.81	1.80	2.18	1.96	3.27	0.09	0.09	0.09	0.10	<0.01	<0.01	<0.01	<0.01

Note: ZOIs for the MK3A2 bombs are modeled as multiple detonations (4 bombs dropped in succession at same location).

3. Summary of Potential Exposures From Explosive Ordnance Use

Explosions that occur in the GOMEX Study Area with the potential to impact marine mammals are associated with training during BOMBEX and small arms training events. Explosive ordnance use is limited to specific training areas. Within the GOMEX Study Area, explosive use associated with BOMBEX events occur in the BOMBEX Hotbox. The use of MK3A2 anti-swimmer grenades is associated with small arms training events, which are limited to the UNDET Area E3 box.

An explosive analysis was conducted to estimate the number of marine mammals that could be exposed to impacts from explosive ordnance use associated with BOMBEX and small arms training. Table 6 provides a summary of the explosive analysis modeling results.

Exposure estimates could not be calculated for several species (blue whale, fin whale, humpback whale, North Atlantic right whale, sei whale, and minke whale) because density data could not be calculated for the GOMEX Study Area due to the limited available data for these species; however, the likelihood of exposure for species not expected to occur in the GOMEX Study Area should be even lower than for the species with occurrence frequent enough for densities to be calculated. In addition to the low likelihood of exposure, the proposed mitigation measures presented below would be implemented prior to release of ordnance. Since the fin, North Atlantic right, humpback, blue, sei, and minke whale are considered rare in the GOMEX Range Complex, no exposures are expected for these species. In addition, the West Indian manatee is not expected to occur where explosive

ordnance is used; therefore no exposures are expected for this species.

Lookouts will monitor the area before ordnance is used. Sperm whales will have high detection rates at the surface because of their large body size and pronounced blows; however, sperm whales are long, deep divers and may be submerged, and thus not visually detectable, for over an hour. It is likely that lookouts would detect Atlantic spotted dolphins, bottlenose dolphins, Clymene dolphins, pantropical spotted dolphins, Risso's dolphins, spinner dolphins and striped dolphins due to their gregarious nature and active surface behavior. Implementation of mitigation measures will reduce the likelihood of exposure and potential effects.

TABLE 6—SUMMARY OF POTENTIAL EXPOSURES FROM EXPLOSIVE ORDNANCE (PER YEAR) FOR MARINE MAMMALS IN THE GOMEX RANGE COMPLEX BY THE NAVY MODELING

Species/training operation	Potential exposures @177 dB re 1 microPa^2-s (multiple detonations only)	Potential exposures @182 dB re 1 microPa^2-s or 23 psi-ms	Potential exposures @205 dB re 1 microPa^2-s or 13 psi-ms	Potential exposures @30.5 psi-ms
Sperm whale:				
BOMBEX training	0	0	0	0
Small Arms training	0	0	0	0
Total Exposures	0	0	0	0
Atlantic spotted dolphin:				
BOMBEX training	1	1	0	0
Small Arms training	0	0	0	0
Total Exposures	1	1	0	0
Beaked whales:				
BOMBEX training	0	0	0	0
Small Arms training	0	0	0	0
Total Exposures	0	0	0	0
Bottlenose dolphin:				
BOMBEX training	6	6	0	0
Small Arms training	4	3	0	0
Total Exposures	10	9	0	0
Bryde's whale:				
BOMBEX training	0	0	0	0
Small Arms training	0	0	0	0
Total Exposures	0	0	0	0
Clymene dolphin:				
BOMBEX training	3	3	0	0
Small Arms training	0	0	0	0
Total Exposures	3	3	0	0
False killer whale:				
BOMBEX training	0	0	0	0
Small Arms training	0	0	0	0
Total Exposures	0	0	0	0
Fraser's dolphin:				
BOMBEX training	0	0	0	0
Small Arms training	0	0	0	0
Total Exposures	0	0	0	0
Killer whale:				
BOMBEX training	0	0	0	0
Small Arms training	0	0	0	0
Total Exposures	0	0	0	0
Kogia spp.:				
BOMBEX training	0	0	0	0
Small Arms training	0	0	0	0
Total Exposures	0	0	0	0

TABLE 6—SUMMARY OF POTENTIAL EXPOSURES FROM EXPLOSIVE ORDNANCE (PER YEAR) FOR MARINE MAMMALS IN THE GOMEX RANGE COMPLEX BY THE NAVY MODELING—Continued

Species/training operation	Potential exposures @177 dB re 1 microPa^2-s (multiple detonations only)	Potential exposures @182 dB re 1 microPa^2-s or 23 psi-ms	Potential exposures @205 dB re 1 microPa^2-s or 13 psi-ms	Potential exposures @30.5 psi-ms
Melon-headed whale:				
BOMBEX training	1	1	0	0
Small Arms training	0	0	0	0
Total Exposures	1	1	0	0
Pantropical spotted dolphin:				
BOMBEX training	14	12	1	0
Small Arms training	0	0	0	0
Total Exposures	14	12	1	0
Pygmy killer whale:				
BOMBEX training	0	0	0	0
Small Arms training	0	0	0	0
Total Exposures	0	0	0	0
Risso's dolphin:				
BOMBEX training	1	1	0	0
Small Arms training	0	0	0	0
Total Exposures	1	1	0	0
Rough-toothed dolphin:				
BOMBEX training	0	0	0	0
Small Arms training	0	0	0	0
Total Exposures	0	0	0	0
Short-finned pilot whale:				
BOMBEX training	0	0	0	0
Small Arms training	0	0	0	0
Total Exposures	0	0	0	0
Spinner dolphin:				
BOMBEX training	14	13	1	0
Small Arms training	0	0	0	0
Total Exposures	14	13	1	0
Striped dolphin				
BOMBEX training	4	4	0	0
Small Arms training	0	0	0	0
Total Exposures	4	4	0	0

Proposed Mitigation Measures

In order to issue an incidental take authorization (ITA) under Section 101(a)(5)(A) of the MMPA, NMFS must prescribe regulations setting 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.'' The NDAA 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.'' The GOMEX Range Complex training activities described in this document are considered military readiness activities.

NMFS reviewed the Navy's proposed GOMEX Range Complex training activities and the proposed GOMEX Range Complex mitigation measures presented in the Navy's application to determine whether the activities and mitigation measures were capable of achieving the least practicable adverse effect on marine mammals.

Any mitigation measure prescribed by NMFS should be known 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 below:

(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 a biologically important time

or location) exposed to underwater detonations or other activities expected to result in the take of marine mammals (this goal may contribute to (1), above, or to reducing harassment takes only).

(3) A reduction in the number of times (total number or number at biologically important time or location) individuals would be exposed to underwater detonations or other activities expected 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 underwater detonations or other activities expected 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) A reduction in 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.

(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 (shut-down zone, *etc.*).

NMFS reviewed the Navy's proposed mitigation measures, which included 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.'' These mitigation measures are listed below.

General Maritime Measures

The mitigation measures presented below would be taken by Navy personnel on a regular and routine basis. These are routine measures and are considered ''Standard Operating Procedures.''

I. Personnel Training—Lookouts

The use of shipboard lookouts is a critical component of all Navy standard operating procedures. Navy shipboard lookouts (also referred to as ''watchstanders'') are qualified and experienced observers of the marine environment. Their duties require that they report all objects sighted in the water to the Officer of the Deck (OOD) (*e.g.*, trash, a periscope, marine mammals, sea turtles) and all disturbances (*e.g.*, surface disturbance, discoloration) that may be indicative of a threat to the vessel and its crew. There are personnel serving as lookouts on station at all times (day and night) when a ship or surfaced submarine is moving through the water.

For the past few years, the Navy has implemented marine mammal spotter training for its bridge lookout personnel on ships and submarines. This training has been revamped and updated as the Marine Species Awareness Training (MSAT) and is provided to all applicable units. The lookout training program incorporates MSAT, which addresses the lookout's role in environmental protection, laws governing the protection of marine species, Navy stewardship commitments, and general observation information, including more detailed information for spotting marine mammals. MSAT may also be viewed on-line at *https://portal.navfac.navy.mil/go/msat*.

1. All bridge personnel, Commanding Officers, Executive Officers, officers standing watch on the bridge, maritime patrol aircraft aircrews, and Mine Warfare (MIW) helicopter crews will complete MSAT.

2. Navy lookouts would undertake extensive training to qualify as a watchstander in accordance with the Lookout Training Handbook (NAVEDTRA 12968–D).

3. Lookout training will include on-the-job instruction under the supervision of a qualified, experienced watchstander. Following successful completion of this supervised training period, lookouts will complete the Personal Qualification Standard Program, certifying that they have demonstrated the necessary skills (such as detection and reporting of partially submerged objects).

4. Lookouts will be trained in the most effective means to ensure quick and effective communication within the command structure to facilitate implementation of protective measures if marine species are spotted.

5. Surface lookouts would scan the water from the ship to the horizon and be responsible for all contacts in their sector. In searching the assigned sector, the lookout would always start at the forward part of the sector and search aft (toward the back). To search and scan, the lookout would hold the binoculars steady so the horizon is in the top third of the field of vision and direct the eyes just below the horizon. The lookout would scan for approximately five seconds in as many small steps as possible across the field seen through the binoculars. They would search the entire sector in approximately five-degree steps, pausing between steps for approximately five seconds to scan the field of view. At the end of the sector search, the glasses would be lowered to allow the eyes to rest for a few seconds, and then the lookout would search back across the sector with the naked eye.

II. Operating Procedures and Collision Avoidance

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

2. Commanding Officers will make use of marine species detection cues and information to limit interaction with marine species to the maximum extent possible consistent with safety of the ship according to the proposed mitigation and monitoring measures.

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

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

5. After sunset and prior to sunrise, lookouts will employ Night Lookouts Techniques in accordance with the Lookout Training Handbook (NAVEDTRA 12968–D).

6. While in transit, personnel aboard naval vessels will be alert at all times, use extreme caution, and proceed at a ''safe speed'' (the minimum speed at which mission goals or safety will not be compromised) so that the vessel can take proper and effective action to avoid a collision with any marine animal and can be stopped within a distance appropriate to the prevailing circumstances and conditions.

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

8. Naval vessels will maneuver to keep at least 500 yds (460 m) away from

any observed whale and avoid approaching whales head-on. This requirement does not apply if a vessel's safety is threatened, such as when change of course will create an imminent and serious threat to a person, vessel, or aircraft, and to the extent vessels are restricted in their ability to maneuver. Restricted maneuverability includes, but is not limited to, situations when vessels are engaged in dredging, submerged operations, launching and recovering aircraft or landing craft, minesweeping operations, replenishment while underway and towing operations that severely restrict a vessel's ability to deviate course. Vessels will take reasonable steps to alert other vessels in the vicinity of the whale.

9. Where feasible and consistent with mission and safety, vessels will avoid closing to within 200-yd (183 m) of marine mammals other than whales (whales addressed above).

10. Floating weeds, algal mats, Sargassum rafts, clusters of seabirds, and jellyfish are good indicators of marine mammal presence. Therefore, increased vigilance in watching for marine mammals will be taken where these conditions exist.

11. Navy aircraft participating in exercises at sea will conduct and maintain, when operationally feasible and safe, surveillance for marine species of concern as long as it does not violate safety constraints or interfere with the accomplishment of primary operational duties described in the Navy's LOA application. Marine mammal detections will be immediately reported to assigned Aircraft Control Unit for further dissemination to ships in the vicinity of the marine species as appropriate where it is reasonable to conclude that the course of the ship will likely result in a closing of the distance to the detected marine mammal.

12. All vessels will maintain logs and records documenting training operations should they be required for event reconstruction purposes. Logs and records will be kept for a period of 30 days following completion of a major training exercise.

Coordination and Reporting Requirements

The Navy will coordinate with the local NMFS Stranding Coordinator for any unusual marine mammal behavior and any stranding, beached live/dead, or floating marine mammals that may occur at any time during training activities or within 24 hours after completion of training activities. Additionally, the Navy will follow internal chain of command reporting procedures as promulgated through Navy instructions and orders.

Proposed Mitigation Measures for Specific At-Sea Training Events

These measures are standard operating procedures that are in place currently and will be used in the future for all activities being analyzed in this LOA request.

I. Small Arms Training—Explosive Hand Grenades (MK3A2 Grenades)

This activity occurs in the UNDET Area E3 of the GOMEX Study Area. The following mitigation measures are proposed by the Navy for the small arms training.

(A) Lookouts visually survey for floating weeds, algal mats, Sargassum rafts, marine mammals.

(B) A 200-yard (182-m) radius buffer zone will be established around the intended target. The exercises will be conducted only if the buffer is clear of sighted marine mammals and sea turtles.

II. Air-to-Surface At-Sea Bombing Exercises (BOMBEX, 500-lb to 2,000-lb Explosive Bombs)

This activity occurs in W–155A/B (hot box) area of the GOMEX Study Area. The location was established to be within 150 nm from shore-based facilities (the established flight distance restriction for F/A–18 jets during unit level training events). The following mitigation measures are proposed by the Navy for the BOMBEX training.

(A) Aircraft would visually survey the target and buffer zone for marine mammals prior to and during the exercise. The survey of the impact area would be made by flying at 1,500 feet altitude or lower, if safe to do so, and at the slowest safe speed. Release of ordnance through cloud cover is prohibited; aircraft must be able to actually see ordnance impact areas. Survey aircraft should employ most effective search tactics and capabilities.

(B) A buffer zone of a 5,100-yard (4,663-m) radius would be established around the intended target zone. The exercises would be conducted only if the buffer zone is clear of sighted marine mammals and sea turtles.

(C) If surface vessels are involved, lookouts would survey for Sargassum rafts, which may be inhabited by immature sea turtles. Ordnance would not be targeted to impact within 5,100 yards (4,663 m) of known or observed Sargassum rafts or coral reefs.

(D) At-sea BOMBEXs using live ordnance will occur during daylight hours only.

Monitoring Measures

In order to issue an ITA for an activity, Section 101(a)(5)(A) of the MMPA states that NMFS 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 LOAs must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present.

Monitoring measures prescribed by NMFS should accomplish one or more of the following general goals:

(1) An increase in the probability of detecting marine mammals, both within the safety zone (thus allowing for more effective implementation of the mitigation) and in general to generate more data to contribute to the effects analyses.

(2) An increase in our understanding of how many marine mammals are likely to be exposed to levels of underwater detonations or other stimuli that we associate with specific adverse effects, such as behavioral harassment, TTS, or PTS.

(3) An increase in our understanding of how marine mammals respond (behaviorally or physiologically) to underwater detonations or other stimuli expected to result in take and how anticipated adverse effects on individuals (in different ways and to varying degrees) may impact the population, species, or stock (specifically through effects on annual rates of recruitment or survival).

(4) An increased knowledge of the affected species.

(5) An increase in our understanding of the effectiveness of certain mitigation and monitoring measures.

(6) A better understanding and record of the manner in which the authorized entity complies with the incidental take authorization.

Proposed Monitoring Plan for the GOMEX Range Complex

The Navy has provided NMFS with a copy of the draft GOMEX Range Complex Monitoring Plan. Additionally, NMFS and the Navy have incorporated a suggestion from the public, which recommended the Navy hold a peer review workshop to discuss the Navy's Monitoring Plans for the multiple range complexes and training exercises in which the Navy would receive ITAs.

The Navy must notify NMFS immediately (or as soon as clearance

procedures allow) if the specified activity is thought to have resulted in the mortality or injury of any marine mammals, or in any take of marine mammals not identified in this document.

The Navy must conduct all monitoring and/or research required under the Letter of Authorization, if issued.

With input from NMFS, a summary of the monitoring methods required for use during training events in the GOMEX Range Complex are described below. These methods include a combination of individual elements that are designed to allow a comprehensive assessment.

I. Vessel or Aerial Surveys

(A) The Navy shall visually survey a minimum of 1 explosive event per year. If possible, the event surveyed will be one involving multiple detonations. One of the vessel or aerial surveys should involve professionally trained marine mammal observers (MMOs).

(B) When operationally feasible, for specified training events, aerial or vessel surveys shall be used 1–2 days prior to, during (if reasonably safe), and 1–5 days post detonation.

(C) Surveys shall include any specified exclusion zone around a particular detonation point plus 2,000 yards beyond the border of the exclusion zone (*i.e.*, the circumference of the area from the border of the exclusion zone extending 2,000 yards outwards). For vessel-based surveys a passive acoustic system (hydrophone or towed array) could be used to determine if marine mammals are in the area before and/or after a detonation event.

(D) When conducting a particular survey, the survey team shall collect:

- Location of sighting;
- Species (if not possible, indicate whale, dolphin or pinniped);
- Number of individuals;
- Whether calves were observed;
- Initial detection sensor;
- Length of time observers maintained visual contact with marine mammal;
- Wave height;
- Visibility;
- Whether sighting was before, during, or after detonations/exercise, and how many minutes before or after;
- Distance of marine mammal from actual detonations (or target spot if not yet detonated);
- Observed behavior—Watchstanders will report, in plain language and without trying to categorize in any way, the observed behavior of the animal(s) (such as animal closing to bow ride, paralleling course/speed, floating on surface and not swimming *etc.*), including speed and direction;
- Resulting mitigation implementation—Indicate whether explosive detonations were delayed, ceased, modified, or not modified due to marine mammal presence and for how long; and
- If observation occurs while explosives are detonating in the water, indicate munitions type in use at time of marine mammal detection (*e.g.*, were the 5-inch guns actually firing when the animals were sighted? Did animals enter an area 2 minutes after a huge explosion went off?).

II. Passive Acoustic Monitoring

The Navy is required to conduct passive acoustic monitoring when operationally feasible.

(A) Any time a towed hydrophone array is employed during shipboard surveys the towed array shall be deployed during daylight hours for each of the days the ship is at sea.

(B) The towed hydrophone array shall be used to supplement the ship-based systematic line-transect surveys (particularly for species such as beaked whales that are rarely seen).

III. Marine Mammal Observers on Navy Platforms

(A) MMOs selected for aerial or vessel surveys shall be placed on a Navy platform during one of the exercises being monitored per year. The remaining designated exercise(s) shall be monitored by the Navy lookouts/watchstanders.

(B) The MMO must possess expertise in species identification of regional marine mammal species and experience collecting behavioral data.

(C) MMOs shall not be placed aboard Navy platforms for every Navy training event or major exercise, but during specifically identified opportunities deemed appropriate for data collection efforts. The events selected for MMO participation shall take into account safety, logistics, and operational concerns.

(D) MMOs shall observe from the same height above water as the lookouts.

(E) The MMOs shall not be part of the Navy's formal reporting chain of command during their data collection efforts; Navy lookouts shall continue to serve as the primary reporting means within the Navy chain of command for marine mammal sightings. The only exception is that if an animal is observed within the shutdown zone that has not been observed by the lookout, the MMO shall inform the lookout of the sighting, and the lookout shall take the appropriate action through the chain of command.

(F) The MMOs shall collect species identification, behavior, direction of travel relative to the Navy platform, and distance first observed. All MMO sightings shall be conducted according to a standard operating procedure. Information collected by MMOs should be the same as those collected by Navy lookout/watchstanders described above.

The Monitoring Plan for the GOMEX Range Complex has been designed as a collection of focused ''studies'' (described fully in the GOMEX Monitoring Plan) to gather data that will allow the Navy to address the following questions:

(A) What are the behavioral responses of marine mammals that are exposed to explosives?

(B) Is the Navy's suite of mitigation measures effective at avoiding injury and mortality of marine mammals?

Data gathered in these studies will be collected by qualified, professional marine mammal biologists or trained Navy lookouts/watchstanders that are experts in their field. This monitoring plan has been designed to gather data on all species of marine mammals that are observed in the GOMEX Range Complex study area.

Monitoring Workshop

During the public comment period on past proposed rules for Navy actions (such as the Hawaii Range Complex (HRC) and Southern California Range Complex (SOCAL) proposed rules), NMFS received a recommendation that a workshop or panel be convened to solicit input on the monitoring plan from researchers, experts, and other interested parties. The GOMEX Range Complex proposed rule included an adaptive management component and both NMFS and the Navy believe that a workshop would provide a means for Navy and NMFS to consider input from participants in determining whether (and if so, how) to modify monitoring techniques to more effectively accomplish the goals of monitoring set forth earlier in the document. NMFS and the Navy believe that this workshop concept is valuable in relation to all of the Range Complexes and major training exercise rules and LOAs that NMFS is working on with the Navy at this time. Consequently, NMFS has determined that this single Monitoring Workshop will be included as a component of all of the rules and LOAs that NMFS will be processing for the Navy in the next year or so.

The Navy, with guidance and support from NMFS, will convene a Monitoring Workshop, including marine mammal and acoustic experts as well as other interested parties, in 2011. The Monitoring Workshop participants will review the monitoring results from the

previous two years of monitoring pursuant to the GOMEX Range Complex rule as well as monitoring results from other Navy rules and LOAs (*e.g.*, VACAPES, AFAST, SOCAL, HRC, and other rules). The Monitoring Workshop participants would provide their individual recommendations to the Navy and NMFS on the monitoring plan(s) after also considering the current science (including Navy research and development) and working within the framework of available resources and feasibility of implementation. NMFS and the Navy would then analyze the input from the Monitoring Workshop participants and determine the best way forward from a national perspective. Subsequent to the Monitoring Workshop, modifications would be applied to monitoring plans as appropriate.

Integrated Comprehensive Monitoring Program

In addition to the site-specific Monitoring Plan for the GOMEX Range Complex, the Navy will complete the Integrated Comprehensive Monitoring Program (ICMP) Plan by the end of 2009. The ICMP is currently in development by the Navy, with Chief of Naval Operations Environmental Readiness Division (CNO-N45) having the lead. The program does not duplicate the monitoring plans for individual areas (*e.g.*, AFAST, HRC, SOCAL, VACAPES); instead it is intended to provide the overarching coordination that will support compilation of data from both range-specific monitoring plans as well as Navy funded research and development (R&D) studies. The ICMP will coordinate the monitoring programs' progress towards meeting its goals and develop a data management plan. A program review board is also being considered to provide additional guidance. The ICMP will be evaluated annually to provide a matrix for progress and goals for the following year, and will make recommendations on adaptive management for refinement and analysis of the monitoring methods.

The primary objectives of the ICMP are to:

- Monitor and assess the effects of Navy activities on protected species;
- Ensure that data collected at multiple locations is collected in a manner that allows comparison between and among different geographic locations;
- Assess the efficacy and practicality of the monitoring and mitigation techniques;
- Add to the overall knowledge-base of marine species and the effects of Navy activities on marine species.

The ICMP will be used both as: (1) a planning tool to focus Navy monitoring priorities (pursuant to ESA/MMPA requirements) across Navy Range Complexes and Exercises; and (2) an adaptive management tool, through the consolidation and analysis of the Navy's monitoring and watchstander data, as well as new information from other Navy programs (*e.g.*, R&D), and other appropriate newly published information.

In combination with the 2011 Monitoring Workshop and the adaptive management component of the GOMEX Range Complex rule and the other Navy rules (*e.g.* VACAPES Range Complex, Jacksonville Range Complex, *etc.*), the ICMP could potentially provide a framework for restructuring the monitoring plans and allocating monitoring effort based on the value of particular specific monitoring proposals (in terms of the degree to which results would likely contribute to stated monitoring goals, as well the likely technical success of the monitoring based on a review of past monitoring results) that have been developed through the ICMP framework, instead of allocating based on maintaining an equal (or commensurate to effects) distribution of monitoring effort across range complexes. For example, if careful prioritization and planning through the ICMP (which would include a review of both past monitoring results and current scientific developments) were to show that a large, intense monitoring effort in Hawaii would likely provide extensive, robust and much-needed data that could be used to understand the effects of sonar throughout different geographical areas, it may be appropriate to have other range complexes dedicate money, resources, or staff to the specific monitoring proposal identified as ''high priority'' by the Navy and NMFS, in lieu of focusing on smaller, lower priority projects divided throughout their home range complexes.

The ICMP will identify:

- A means by which NMFS and the Navy would jointly consider prior years' monitoring results and advancing science to determine if modifications are needed in mitigation or monitoring measures to better effect the goals laid out in the Mitigation and Monitoring sections of the GOMEX Range Complex rule.
- Guidelines for prioritizing monitoring projects.
- If, as a result of the workshop and similar to the example described in the paragraph above, the Navy and NMFS decide it is appropriate to restructure the monitoring plans for multiple ranges such that they are no longer evenly allocated (by rule), but rather focused on priority monitoring projects that are not necessarily tied to the geographic area addressed in the rule, the ICMP will be modified to include a very clear and unclassified recordkeeping system that will allow NMFS and the public to see how each range complex/project is contributing to all of the ongoing monitoring programs (resources, effort, money, *etc.*).

Adaptive Management

NMFS proposes to include an adaptive management component in the final regulations governing the take of marine mammals incidental to Navy training exercises in the GOMEX Range Complex. The use of adaptive management will give NMFS the ability to consider new data from different sources to determine (in coordination with the Navy) on an annual basis if mitigation or monitoring measures should be modified or added (or deleted) if new data suggests that such modifications are appropriate (or are not appropriate) for subsequent annual LOAs, if issued.

The following are some of the possible sources of applicable data:

- Results from the Navy's monitoring from the previous year (either from GOMEX Range Complex or other locations).
- Findings of the Workshop that the Navy will convene in 2011 to analyze monitoring results to date, review current science, and recommend modifications, as appropriate to the monitoring protocols to increase monitoring effectiveness.
- Compiled results of Navy funded research and development (R&D) studies (presented pursuant to the ICMP, which is discussed elsewhere in this document).
- Results from specific stranding investigations (either from GOMEX Range Complex or other locations).
- Results from general marine mammal and sound research (funded by the Navy or otherwise).
- Any information which reveals that marine mammals may have been taken in a manner, extent or number not authorized by these regulations or subsequent Letters of Authorization.

Mitigation measures could be modified or added (or deleted) if new data suggests that such modifications would have (or do not have) a reasonable likelihood of accomplishing the goals of mitigation laid out in this proposed rule and if the measures are practicable. NMFS would also

coordinate with the Navy to modify or add to (or delete) the existing monitoring requirements if the new data suggest that the addition of (or deletion of) a particular measure would more effectively accomplish the goals of monitoring laid out in this proposed rule. The reporting requirements associated with this rule are designed to provide NMFS with monitoring data from the previous year to allow NMFS to consider the data and issue annual LOAs. NMFS and the Navy will meet annually, prior to LOA issuance, to discuss the monitoring reports, Navy R&D developments, and current science and whether mitigation or monitoring modifications are appropriate.

Reporting Measures

In order to issue an ITA for an activity, Section 101(a)(5)(A) of the MMPA states that NMFS must set forth ''requirements pertaining to the monitoring and reporting of such taking''. Effective reporting is critical to ensure compliance with the terms and conditions of a LOA, and to provide NMFS and the Navy with data of the highest quality based on the required monitoring. As NMFS noted in its proposed rule, additional detail has been added to the reporting requirements since they were outlined in the proposed rule. The updated reporting requirements are all included below. A subset of the information provided in the monitoring reports may be classified and not releasable to the public.

NMFS will work with the Navy to develop tables that allow for efficient submission of the information required below.

General Notification of Injured or Dead Marine Mammals

Navy personnel will ensure that NMFS (regional stranding coordinator) is notified immediately (or as soon as operational security allows) if an injured or dead marine mammal is found during or shortly after, and in the vicinity of, any Navy training exercise utilizing underwater explosive detonations or other activities. The Navy will provide NMFS with species or description of the animal(s), the condition of the animal(s) (including carcass condition if the animal is dead), location, time of first discovery, observed behaviors (if alive), and photo or video (if available).

Annual GOMEX Range Complex Monitoring Plan Report

The Navy shall submit a report annually on November 1 describing the implementation and results (through September 1 of the same year) of the GOMEX Range Complex Monitoring Plan, described above. Data collection methods will be standardized across range complexes to allow for comparison in different geographic locations. Although additional information will also be gathered, the MMOs collecting marine mammal data pursuant to the GOMEX Range Complex Monitoring Plan shall, at a minimum, provide the same marine mammal observation data required in major range complex training exercises section of the Annual GOMEX Range Complex Exercise Report referenced below.

The GOMEX Range Complex Monitoring Plan Report may be provided to NMFS within a larger report that includes the required Monitoring Plan Reports from multiple Range Complexes.

Annual GOMEX Range Complex Exercise Report

The Navy is in the process of improving the methods used to track explosives used to provide increased granularity. The Navy will provide the information described below for all of their explosive exercises. Until the Navy is able to report in full the information below, they will provide an annual update on the Navy's explosive tracking methods, including improvements from the previous year.

(i) Total annual number of each type of explosive exercise (of those identified as part of the ''specified activity'' in this final rule) conducted in the GOMEX Range Complex.

(ii) Total annual expended/detonated rounds (missiles, bombs, etc.) for each explosive type.

GOMEX Range Complex 5-yr Comprehensive Report

The Navy shall submit to NMFS a draft report that analyzes and summarizes all of the multi-year marine mammal information gathered during the GOMEX Range Complex exercises for which annual reports are required (Annual GOMEX Range Complex Exercise Reports and GOMEX Range Complex Monitoring Plan Reports). This report will be submitted at the end of the fourth year of the rule (March 2014), covering activities that have occurred through September 1, 2013.

Estimated Take of Marine Mammals

With respect to the MMPA, NMFS' effects assessment serves four primary purposes: (1) To prescribe the permissible methods of taking (*i.e.*, Level B Harassment (behavioral harassment), Level A harassment (injury), or mortality, including an identification of the number and types of take that could occur by Level A or B harassment or mortality) and to prescribe other means of affecting the least practicable adverse impact on such species or stock and its habitat (*i.e.*, mitigation); (2) to determine whether the specified activity will have a negligible impact on the affected species or stocks of marine mammals (based on the likelihood that the activity will adversely affect the species or stock through effects on annual rates of recruitment or survival); (3) to determine whether the specified activity will have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (however, there are no subsistence communities that would be affected in the GOMEX Range Complex, so this determination is inapplicable for this rulemaking); and (4) to prescribe requirements pertaining to monitoring and reporting.

In the *Assessment of Marine Mammal Response to Anthropogenic Sound* section, NMFS' analysis identified the lethal responses, physical trauma, sensory impairment (permanent and temporary threshold shifts and acoustic masking), physiological responses (particular stress responses), and behavioral responses that could potentially result from explosive ordnance exposures. 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 and attempt to quantify the effects that might occur from the specific training activities that the Navy is proposing in the GOMEX Range Complex.

Take Calculations

In estimating the potential for marine mammals to be exposed to an acoustic source, the Navy completed the following actions:

(1) Evaluated potential effects within the context of existing and current regulations, thresholds, and criteria;

(2) Identified all acoustic sources that will be used during Navy training activities;

(3) Identified the location, season, and duration of the action to determine which marine mammal species are likely to be present;

(4) Determined the estimated number of marine mammals (*i.e.*, density) of each species that will likely be present in the respective OPAREAs during the Navy training activities;

(5) Applied the applicable acoustic threshold criteria to the predicted sound exposures from the proposed activity. The results were then evaluated to

determine whether the predicted sound exposures from the acoustic model might be considered harassment; and

(6) Considered potential harassment within the context of the affected marine mammal population, stock, and species to assess potential population viability. Particular focus on recruitment and survival are provided to analyze whether the effects of the action can be considered to have a negligible impact on marine mammal species or stocks.

Starting with a sound source, the attenuation of an emitted sound due to propagation loss is determined. Uniform animal distribution is overlaid onto the calculated sound fields to assess if animals are physically present at sufficient received sound levels to be considered ''exposed'' to the sound. If the animal is determined to be exposed, two possible scenarios must be considered with respect to the animal's physiology—effects on the auditory system and effects on non-auditory system tissues. These are not independent pathways and both must be considered since the same sound could affect both auditory and non-auditory tissues. Note that the model does not account for any animal response; rather the animals are considered stationary, accumulating energy until the threshold is tripped.

These modeling results do not take into account the mitigation measures (detailed in the Mitigation Measure section above) that lower the potential for exposures to occur given standard range clearance procedures and the likelihood that these species can be readily detected (*e.g.*, small animals move quickly throughout the water column and are often seen riding the bow wave of large ships or in large groups). Nevertheless, based on the modeling results, 2 Atlantic spotted dolphins, 19 bottlenose dolphins, 6 Clymene dolphins, 2 melon-headed whales, 26 pantropical spotted dolphins, 2 Risso's dolphins, 27 spinner dolphins, and 8 striped dolphins would be taken by Level B harassment (sub-TTS and TTS) as a result of the Navy training activities in the GOMEX Range Complex. In addition, 1 individual each of pantropical spotted dolphin and spinner dolphin would be taken by Level A harassment (injury). Please refer to Table 6 for a detailed list of marine mammals that would be taken as a result of the proposed Navy training activities within the GOMEX Range Complex. NMFS does not believe that there would be any mortality of any marine mammal resulting from the proposed training activities due to the sparse training activities and the implementation of mitigation and monitoring measures described above. Therefore, mortality of marine mammals would not be authorized. With the mitigation and monitoring measures implemented, the estimated take could be further reduced.

Effects on Marine Mammal Habitat

Marine mammal habitat and prey species could be affected by the explosive ordnance testing and the sound generated by such activities. Based on the analysis contained in the Navy's DEIS and the information below, NMFS has determined that the GOMEX Range Complex training activities will not have adverse or long-term impacts on marine mammal habitat or prey species.

Unless the sound source or explosive detonation is stationary and/or continuous over a long duration in one area, the effects of underwater detonation and its associated sound are generally considered to have a less severe impact on marine mammal habitat than the physical alteration of the habitat. Marine mammals may be temporarily displaced from areas where Navy training is occurring, but the area will be utilized again after the activities have ceased.

Effects on Food Resources

There are currently no well-established thresholds for estimating effects to fish from explosives other than mortality models. Fish that are located in the water column, in proximity to the source of detonation could be injured, killed, or disturbed by the impulsive sound and could leave the area temporarily. Continental Shelf Inc. (2004) summarized a few studies conducted to determine effects associated with removal of offshore structures (*e.g.*, oil rigs) in the Gulf of Mexico. Their findings revealed that at very close range, underwater explosions are lethal to most fish species regardless of size, shape, or internal anatomy. In most situations, cause of death in fish has been massive organ and tissue damage and internal bleeding. At longer range, species with gas-filled swimbladders (*e.g.*, snapper, cod, and striped bass) are more susceptible than those without swimbladders (*e.g.*, flounders, eels).

Studies also suggest that larger fish are generally less susceptible to death or injury than small fish. Moreover, elongated forms that are round in cross section are less at risk than deep-bodied forms. Orientation of fish relative to the shock wave may also affect the extent of injury. Open water pelagic fish (*e.g.*, mackerel) seem to be less affected than reef fishes. The results of most studies are dependent upon specific biological, environmental, explosive, and data recording factors.

The huge variation in fish populations, including numbers, species, sizes, and orientation and range from the detonation point, makes it very difficult to accurately predict mortalities at any specific site of detonation. A total of 7 hours explosive detonation events, with each event lasting for approximately 1 hour, are widely dispersed in two locations within the large GOMEX study area over the seasons for each year. Most fish species experience a large number of natural mortalities, especially during early life-stages, and any small level of mortality caused by the GOMEX Range Complex training exercises involving explosives will likely be insignificant to the population as a whole.

Therefore, potential impacts to marine mammal food resources within the GOMEX Range Complex are expected to be minimal given both the very geographic and spatially limited scope of most Navy at-sea activities including underwater detonations, and the high biological productivity of these resources. No short or long term effects to marine mammal food resources from Navy activities are anticipated within the GOMEX Range Complex.

Analysis and Negligible Impact Determination

Pursuant to NMFS' regulations implementing the MMPA, an applicant is required to estimate the number of animals that will be ''taken'' by the specified activities (*i.e.*, takes by harassment only, or takes by harassment, injury, and/or death). This estimate informs the analysis that NMFS must perform to determine whether the activity will have a ''negligible impact'' on the species or stock. Level B (behavioral) harassment occurs at the level of the individual(s) and does not assume any resulting population-level consequences, though there are known avenues through which behavioral disturbance of individuals can result in population-level effects. A negligible impact finding is based on the lack of likely adverse 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, NMFS must consider other factors, such as the likely nature of any responses (their intensity, duration,

etc.), the context of any responses (critical reproductive time or location, migration, *etc.*), as well as the number and nature of estimated Level A takes, the number of estimated mortalities, and effects on habitat.

The Navy's specified activities have been described based on best estimates of the planned detonation events the Navy would conduct for the proposed GOMEX Range Complex training activities. The events are generally short in duration, with each of the seven annual events lasting for about 1 hour. Taking the above into account, along with the fact that NMFS anticipates no mortalities (and few injuries) to result from the action, the fact that there are no specific areas of reproductive importance for marine mammals recognized within the GOMEX Range Complex, the sections discussed below, and dependent upon the implementation of the proposed mitigation measures, NMFS has determined that Navy training exercises utilizing underwater detonations will have a negligible impact on the affected marine mammal species and stocks present in the GOMEX Range Complex Study Area.

NMFS' analysis of potential behavioral harassment, temporary threshold shifts, permanent threshold shifts, injury, and mortality to marine mammals as a result of the GOMEX Range Complex training activities was provided earlier in this proposed rule and is analyzed in more detail below.

Behavioral Harassment

The Navy plans a total of 1 BOMBEX training event (with 4 bombs in succession for 1 hour) and 6 small arms training events (with 20 live grenades for each 1-hour event) annually. The total training exercises proposed by the Navy in the GOMEX Range Complex amount to approximately 7 hours per year. These detonation events are widely dispersed in two of the designated sites within the GOMEX Range Complex Study Area. The probability that detonation events will overlap in time and space with marine mammals is low, particularly given the densities of marine mammals in the GOMEX Range Complex Study Area and the implementation of monitoring and mitigation measures. Moreover, NMFS does not expect animals to experience repeat exposures to the same sound source as animals will likely move away from the source after being exposed. In addition, these isolated exposures, when received at distances of Level B behavioral harassment (*i.e.*, 177 dB re 1 microPa ^{2}-sec), are expected to cause brief startle reactions or short-term behavioral modification by the animals. These brief reactions and behavioral changes are expected to disappear when the exposures cease. Therefore, these levels of received impulse noise from detonation are not expected to affect annual rates or recruitment or survival.

TTS

NMFS and the Navy have estimated that individuals of some species of marine mammals may sustain some level of temporarily threshold shift TTS from underwater detonations. TTS can last from a few minutes to days, be of varying degree, and occur across various frequency bandwidths. The TTS sustained by an animal is primarily classified by three characteristics:

- Frequency—Available data (of mid-frequency hearing specialists exposed to mid- to high-frequency sounds—Southall *et al.*, 2007) suggest that most TTS occurs in the frequency range of the source up to one octave higher than the source (with the maximum TTS at ½-octave above).
- Degree of the shift (*i.e.*, how many dB is the sensitivity of the hearing reduced by)—generally, both the degree of TTS and the duration of TTS will be greater if the marine mammal is exposed to a higher level of energy (which would occur when the peak dB level is higher or the duration is longer). Since the impulse from detonation is extremely brief, an animal would have to approach very close to the detonation site to increase the received SEL. The threshold for the onset of TTS for detonations is a dual criteria: 182 dB re 1 microPa^2-sec or 23 psi, which might be received at distances from 345–2,863 m from the centers of detonation based on the types of NEW involved to receive the SEL that causes TTS compared to similar source level with longer durations (such as sonar signals).
- Duration of TTS (Recovery time)—Of all TTS laboratory studies, some using exposures of almost an hour in duration or up to 217 SEL, almost all recovered within 1 day (or less, often in minutes), though in one study (Finneran *et al.*, 2007), recovery took 4 days.
- Although the degree of TTS depends on the received noise levels and exposure time, all studies show that TTS is reversible and animals' sensitivity is expected to recover fully in minutes to hours. Therefore, NMFS expects that TTS would not affect annual rates of recruitment or survival.

Acoustic Masking or Communication Impairment

As discussed above, it is also possible that anthropogenic sound could result in masking of marine mammal communication and navigation signals. However, masking only occurs during the time of the signal (and potential secondary arrivals of indirect rays), versus TTS, which occurs continuously for its duration. Impulse sounds from underwater detonation are extremely brief and the majority of most animals' vocalizations would not be masked. Therefore, masking effects from underwater detonation are expected to be minimal and unlikely. If masking or communication impairment were to occur briefly, it would be in the frequency ranges below 100 Hz, which overlaps with some mysticete vocalizations; however, it would likely not mask the entirety of any particular vocalization or communication series because of the short impulse.

PTS, Injury, or Mortality

The Navy's model estimated that 1 pantropical spotted dolphin and 1 spinner dolphin could experience 50-percent tympanic membrane rupture or slight lung injury (Level A harassment) as a result of the training activities utilizing underwater detonation by BOMBEX in the GOMEX Range Complex Study Area. However, these estimates do not take into consideration the proposed mitigation and monitoring measures. For underwater detonations, the animals have to be within an area between certain injury zones of influence (ZOI) to experience Level A harassment. Such injury ZOI varies from 0.09 km^2 to 4.98 km^2 (or at distances between 169 m to 1,259 m from the center of detonation) depending on the types of munition used and the season of the action. Though it is possible that Navy observers could fail to detect an animal at a distance of more than 1 km (an injury ZOI during BOMBEX, which is planned to have 1 event annually), all injury ZOIs from small arms trainings are smaller than 0.1 km^2 (178 m in radius) and NMFS believes it is unlikely that any marine mammal could be detected by lookouts/watchstanders or MMOs. As discussed previously, the Navy plans to utilize aerial or vessel surveys to detect marine mammals for mitigation implementation and indicated that they are capable of effectively monitoring safety zones.

Based on these assessments, NMFS determined that approximately 2 Atlantic spotted dolphins, 19 bottlenose dolphins, 6 Clymene dolphins, 2 melon-headed whales, 26 pantropical spotted dolphins, 2 Risso's dolphins, 27 spinner dolphins, and 8 striped dolphins could be affected by Level B harassment (TTS and sub-TTS) as a result of the proposed GOMEX Range Complex training activities. These numbers represent

approximately 0.01%, 0.51%, 0.09%, 0.09%, 0.08%, 0.13%, 1.36%, and 0.24% of Atlantic spotted dolphins, bottlenose dolphins (Gulf of Mexico oceanic stock), Clymene dolphins, melon-headed whales, pantropical spotted dolphins, Risso's dolphins, spinner dolphins, and striped dolphins, respectively, in the vicinity of the proposed GOMEX Range Complex Study Area (calculation based on NMFS 2007 U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessment).

In addition, the Level A takes of 1 pantropical spotted dolphin and 1 spinner dolphin represent 0.0029% and 0.0503% of these species, respectively, in the vicinity of the proposed GOMEX Range Complex Study Area (calculation based on NMFS 2007 U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessment). Given these very small percentages, NMFS does not expect there to be any long-term adverse effect on the populations of the aforementioned dolphin species. No marine mammals are expected to be killed as a result of these activities.

Additionally, the aforementioned take estimates do not account for the implementation of mitigation measures. With the implementation of mitigation and monitoring measures, NMFS expects that the takes would be reduced further. Coupled with the fact that these impacts will likely not occur in areas and times critical to reproduction, NMFS has preliminarily determined that the total taking over the 5-year period of the regulations and subsequent LOAs from the Navy's GOMEX Range Complex training activities will have a negligible impact on the marine mammal species and stocks present in the GOMEX Range Complex Study Area.

Subsistence Harvest of Marine Mammals

NMFS has preliminarily determined that the issuance of 5-year regulations and subsequent LOAs (as warranted) for Navy training exercises in the GOMEX Range Complex would not have an unmitigable adverse impact on the availability of the affected species or stocks for subsistence use since there are no such uses in the specified area.

ESA

There are six ESA-listed marine mammal species that are listed as endangered under the ESA with confirmed or possible occurrence in the GOMEX Range Complex: humpback whale, North Atlantic right whale, fin whale, blue whale, sei whale, and sperm whale. The Navy has begun consultation with NMFS pursuant to section 7 of the ESA, and NMFS will also consult internally on the issuance of an LOA under section 101(a)(5)(A) of the MMPA for training exercises in the GOMEX Range Complex. Consultation will be concluded prior to a determination on the issuance of the final rule and an LOA.

NEPA

The Navy is preparing an Environmental Impact Statement (EIS) for the proposed GOMEX Range Complex training activities. A draft EIS was released in November 2008 and it is available at *http://www.gomexrangecomplexeis.com/*. NMFS is a cooperating agency (as defined by the Council on Environmental Quality (40 CFR 1501.6)) in the preparation of the EIS. NMFS has reviewed the Draft EIS and will be working with the Navy on the Final EIS (FEIS).

NMFS intends to adopt the Navy's FEIS, if adequate and appropriate, and we believe that the Navy's FEIS will allow NMFS to meet its responsibilities under NEPA for the issuance of the 5-year regulation and LOAs for training activities in the GOMEX Range Complex. If the Navy's FEIS is not adequate, NMFS will supplement the existing analysis and documents to ensure that we comply with NEPA prior to the issuance of the final rule or LOA.

Preliminary Determination

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat and dependent upon the implementation of the mitigation measures, NMFS preliminarily finds that the total taking from Navy training exercises utilizing underwater explosives in the GOMEX Range Complex will have a negligible impact on the affected marine mammal species or stocks. NMFS has proposed regulations for these exercises that prescribe the means of affecting the least practicable adverse impact on marine mammals and their habitat and set forth requirements pertaining to the monitoring and reporting of that taking.

Classification

This action does not contain a collection of information requirement for purposes of the Paperwork Reduction Act.

This proposed rule has been determined to be not significant for purposes of Executive Order 12866.

Pursuant to the Regulatory Flexibility Act, the Chief Counsel for Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy of the Small Business Administration that this rule, if adopted, would not have a significant economic impact on a substantial number of small entities. The Regulatory Flexibility Act requires Federal agencies to prepare an analysis of a rule's impact on small entities whenever the agency is required to publish a notice of proposed rulemaking. However, a Federal agency may certify, pursuant to 5 U.S.C. Section 605 (b), that the action will not have a significant economic impact on a substantial number of small entities. The Navy is the entity that will be affected by this rulemaking, not a small governmental jurisdiction, small organization or small business, as defined by the Regulatory Flexibility Act. This rulemaking authorizes the take of marine mammals incidental to a specified activity. The specified activity defined in the proposed rule includes the use of underwater detonations during training activities that are only conducted by the U.S. Navy. Additionally, the proposed regulations are specifically written for ''military readiness'' activities, as defined by the NDAA, which means they cannot apply to small businesses. Consequently, any requirements imposed by a Letter of Authorization issued pursuant to these regulations, and any monitoring or reporting requirements imposed by these regulations, will be applicable only to the Navy. Because this action, if adopted, would directly affect the Navy and not a small entity, NMFS concludes the action would not result in a significant economic impact on a substantial number of small entities. As a result, an initial regulatory flexibility analysis is not required and none has been prepared.

List of Subjects in 50 CFR Part 218

Exports, Fish, Imports, Incidental take, Indians, Labeling, Marine mammals, Navy, Penalties, Reporting and recordkeeping requirements, Seafood, Sonar, Transportation.

Dated: July 7, 2009.

Samuel D. Rauch III,

Deputy Assistant Administrator for Regulatory Programs, National Marine Fisheries Service.

For reasons set forth in the preamble, 50 CFR part 218 is proposed to be amended as follows:

PART 218—REGULATIONS GOVERNING THE TAKING AND IMPORTING OF MARINE MAMMALS

1. The authority citation for part 218 continues to read as follows:

Authority: 16 U.S.C. 1361 *et seq.*

2. Subpart D is added to part 218 to read as follows:

Subpart D—Taking Marine Mammals Incidental to U.S. Navy Training in the Gulf of Mexico Range Complex (GOMEX Range Complex)

Sec.

Subpart D—Taking Marine Mammals Incidental to U.S. Navy Training in the Gulf of Mexico Range Complex (GOMEX Range Complex)

§ 218.30 Specified activity and specified geographical area.

(a) Regulations in this subpart apply only to the U.S. Navy for the taking of marine mammals that occurs in the area outlined in paragraph (b) of this section and that occur incidental to the activities described in paragraph (c) of this section.

(b) The taking of marine mammals by the Navy is only authorized if it occurs within the GOMEX Range Complex Operation Areas (OPAREAs), which is located along the southern east coast of the U.S. described in Figures 1 and 2 of the LOA application and consist of the BOMBEX Hotbox (surface and subsurface waters) and underwater detonation (UNDET) Area E3 (surface and subsurface waters), located within the territorial waters off Padre Island, Texas, near Corpus Christi NAS.

(1) The northernmost boundary of the BOMBEX Hotbox is located 23 nm (42.6 km) from the coast of the Florida panhandle at latitude 30° N, the eastern boundary is approximately 200 nm (370.4 km) from the coast of the Florida peninsula at longitude 86°48′ W.

(2) The UNDET Area E3 is a defined surface and subsurface area located in the waters south of Corpus Christi NAS and offshore of Padre Island, Texas. The westernmost boundary is located 7.5 nm (13.9 km) from the coast of Padre Island at 97°9′33′ W and 27°24′26″ N at the westernmost corner. It lies entirely within the territorial waters (0 to 12 nm, or 0 to 22.2 km) of the U.S. and the majority of it lies within Texas state waters (0 to 9 nm, or 0 to 16.7 km). It is a very shallow water training area with depths ranging from 20 to 26 m.

(c) The taking of marine mammals by the Navy is only authorized if it occurs incidental to the following activities within the designated amounts of use:

(1) The detonation of the underwater explosives indicated in paragraph (c)(1)(i) of this section conducted as part of the training events indicated in paragraph (c)(1)(ii) of this section:

(i) Underwater Explosives:

(A) MK–83 (1,000 lb High Explosive bomb);

(B) MK3A2 anti-swimmer concussion grenades (0.5 lbs NEW).

(ii) Training Events:

(A) BOMBEX (Air-to-Surface)—up to 5 events over the course of 5 years (an average of 1 event per year, with 4 bombs in succession for each event);

(B) Small Arms Training with MK3A2 anti-swimmer concussion grenade—up to 30 events over the course of 5 years (an average 6 events per year, with 20 live grenades used for each event).

(2) [Reserved]

§ 218.31 Permissible methods of taking.

(a) Under Letters of Authorization issued pursuant to § 216.106 of this chapter and § 218.36, the Holder of the Letter of Authorization may incidentally, but not intentionally, take marine mammals within the area described in § 218.30(b), provided the activity is in compliance with all terms, conditions, and requirements of this subpart and the appropriate Letter of Authorization.

(b) The activities identified in § 218.30(c) must be conducted in a manner that minimizes, to the greatest extent practicable, any adverse impacts on marine mammals and their habitat.

(c) The incidental take of marine mammals under the activities identified in § 218.30(c) is limited to the following species, by the indicated method of take and the indicated number of times:

(1) Level B Harassment:

(i) Bottlenose dolphin (*Tursiops truncatus*)—95 (an average of 19 annually);

(ii) Pantropical spotted dolphin (*Stenella attenuata*)—130 (an average of 26 annually);

(iii) Clymene dolphin (*S. clymene*)—30 (an average of 6 annually);

(iv) Atlantic spotted dolphin (*S. frontalis*)—10 (an average of 2 annually);

(v) Spinner dolphin (*S. longirostris*)—135 (an average of 27 annually);

(vi) Striped dolphin (*S. coeruleoalba*)—40 (an average of 8 annually);

(vii) Risso's dolphin (*Grampus griseus*)—10 (an average of 2 annually);

(viii) Melon-headed whales (*Peponocephala electra*)—10 (an average of 2 annually);

(2) Level A Harassment (injury):

(i) Pantropical spotted dolphin—5 (an average of 1 annually);

(ii) Spinner dolphin—5 (an average of 1 annually);

§ 218.32 Prohibitions.

Notwithstanding takings contemplated in § 218.31 and authorized by a Letter of Authorization issued under § 216.106 of this chapter and § 218.36, no person in connection with the activities described in § 218.30 may:

(a) Take any marine mammal not specified in § 218.31(c);

(b) Take any marine mammal specified in § 218.31(c) other than by incidental take as specified in § 218.31(c)(1) and (2);

(c) Take a marine mammal specified in § 218.31(c) if such taking results in more than a negligible impact on the species or stocks of such marine mammal; or

(d) Violate, or fail to comply with, the terms, conditions, and requirements of this Subpart or a Letter of Authorization issued under § 216.106 of this chapter and § 218.36.

§ 218.33 Mitigation.

(a) When conducting training activities identified in § 218.30(c), the mitigation measures contained in the Letter of Authorization issued under § 216.106 of this chapter and § 218.36 must be implemented. These mitigation measures include, but are not limited to:

(1) General Maritime Measures:

(i) Personnel Training—Lookouts:

(A) All bridge personnel, Commanding Officers, Executive Officers, officers standing watch on the bridge, maritime patrol aircraft aircrews, and Mine Warfare (MIW) helicopter crews shall complete Marine Species Awareness Training (MSAT).

(B) Navy lookouts shall undertake extensive training to qualify as a watchstander in accordance with the Lookout Training Handbook (NAVEDTRA 12968–D).

(C) Lookout training shall include on-the-job instruction under the supervision of a qualified, experienced watchstander. Following successful completion of this supervised training period, lookouts shall complete the Personal Qualification Standard Program, certifying that they have demonstrated the necessary skills (such as detection and reporting of partially submerged objects).

(D) Lookouts shall be trained in the most effective means to ensure quick and effective communication within the command structure to facilitate implementation of protective measures if marine species are spotted.

(E) Surface lookouts shall scan the water from the ship to the horizon and be responsible for all contacts in their sector. In searching the assigned sector, the lookout shall always start at the forward part of the sector and search aft (toward the back). To search and scan, the lookout shall hold the binoculars steady so the horizon is in the top third of the field of vision and direct the eyes just below the horizon. The lookout shall scan for approximately five seconds in as many small steps as possible across the field seen through the binoculars. They shall search the entire sector in approximately five-degree steps, pausing between steps for approximately five seconds to scan the field of view. At the end of the sector search, the glasses shall be lowered to allow the eyes to rest for a few seconds, and then the lookout shall search back across the sector with the naked eye.

(F) At night, lookouts shall scan the horizon in a series of movements that would allow their eyes to come to periodic rests as they scan the sector. When visually searching at night, they shall look a little to one side and out of the corners of their eyes, paying attention to the things on the outer edges of their field of vision. Lookouts shall also have night vision devices available for use.

(ii) Operating Procedures & Collision Avoidance:

(A) Prior to major exercises, a Letter of Instruction, Mitigation Measures Message or Environmental Annex to the Operational Order shall be issued to further disseminate the personnel training requirement and general marine species mitigation measures.

(B) Commanding Officers shall make use of marine species detection cues and information to limit interaction with marine species to the maximum extent possible consistent with safety of the ship.

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

(D) Personnel on lookout shall employ visual search procedures employing a scanning method in accordance with the Lookout Training Handbook (NAVEDTRA 12968–D).

(E) After sunset and prior to sunrise, lookouts shall employ Night Lookouts Techniques in accordance with the Lookout Training Handbook (NAVEDTRA 12968–D).

(F) While in transit, naval vessels shall be alert at all times, use extreme caution, and proceed at a ''safe speed'' (the minimum speed at which mission goals or safety will not be compromised) so that the vessel can take proper and effective action to avoid a collision with any marine animal and can be stopped within a distance appropriate to the prevailing circumstances and conditions.

(G) When marine mammals have been sighted in the area, Navy vessels shall increase vigilance and implement measures to avoid collisions with marine mammals and avoid activities that might result in close interaction of naval assets and marine mammals. Such measures shall include changing speed and/or course direction and would be dictated by environmental and other conditions (*e.g.*, safety or weather).

(H) Naval vessels shall maneuver to keep at least 500 yds (460 m) away from any observed whale and avoid approaching whales head-on. This requirement does not apply if a vessel's safety is threatened, such as when change of course will create an imminent and serious threat to a person, vessel, or aircraft, and to the extent vessels are restricted in their ability to maneuver. Vessels shall take reasonable steps to alert other vessels in the vicinity of the whale.

(I) Where feasible and consistent with mission and safety, vessels shall avoid closing to within 200-yd (183 m) of marine mammals other than whales (whales addressed above).

(J) Navy aircraft participating in exercises at sea shall conduct and maintain, when operationally feasible and safe, surveillance for marine species of concern as long as it does not violate safety constraints or interfere with the accomplishment of primary operational duties. Marine mammal detections shall be immediately reported to assigned Aircraft Control Unit for further dissemination to ships in the vicinity of the marine species as appropriate where it is reasonable to conclude that the course of the ship will likely result in a closing of the distance to the detected marine mammal.

(K) All vessels shall maintain logs and records documenting training operations should they be required for event reconstruction purposes. Logs and records shall be kept for a period of 30 days following completion of a major training exercise.

(2) Coordination and Reporting Requirements:

(i) The Navy shall coordinate with the local NMFS Stranding Coordinator for any unusual marine mammal behavior and any stranding, beached live/dead, or floating marine mammals that may occur at any time during or within 24 hours after completion of training activities.

(ii) The Navy shall follow internal chain of command reporting procedures as promulgated through Navy instructions and orders.

(3) Proposed Mitigation Measures for Specific At-sea Training Events—If a marine mammal is injured or killed as a result of the proposed Navy training activities (*e.g.*, instances in which it is clear that munitions explosions caused death), the Navy shall suspend its activities immediately and report such incident to NMFS.

(i) Air-to-Surface At-Sea Bombing Exercises (250-lbs to 2,000-lbs explosive bombs):

(A) This activity shall only occur in W–155A/B (hot box) area of the GOMEX Range Complex OPAREA.

(B) Aircraft shall visually survey the target and buffer zone for marine mammals prior to and during the exercise. The survey of the impact area shall be made by flying at 1,500 ft (457 m) altitude or lower, if safe to do so, and at the slowest safe speed. Release of ordnance through cloud cover is prohibited; aircraft must be able to actually see ordnance impact areas.

(C) A buffer zone of a 5,100-yard (4,663-m) radius shall be established around the intended target zone. The exercises shall be conducted only if the buffer zone is clear of sighted marine mammals.

(D) At-sea BOMBEXs using live ordnance shall occur during daylight hours only.

(ii) Small Arms Training—Explosive hand grenades (such as the MK3A2 grenades):

(A) Lookouts shall visually survey for marine mammals prior to and during exercise.

(B) A 200-yd (182-m) radius buffer zone shall be established around the intended target. The exercises shall be conducted only if the buffer zone is clear of marine mammals.

(b) [Reserved]

§ 218.34 Requirements for monitoring and reporting.

(a) The Holder of the Letter of Authorization issued pursuant to § 216.106 of this chapter and § 218.36 for activities described in § 218.30(c) is required to cooperate with the NMFS when monitoring the impacts of the activity on marine mammals.

(b) The Holder of the Authorization must notify NMFS immediately (or as soon as clearance procedures allow) if

the specified activity identified in § 218.30(c) is thought to have resulted in the mortality or serious injury of any marine mammals, or in any take of marine mammals not identified in § 218.31(c).

(c) The Navy must conduct all monitoring and required reporting under the Letter of Authorization, including abiding by the GOMEX Range Complex Monitoring Plan, which is incorporated herein by reference, and which requires the Navy to implement, at a minimum, the monitoring activities summarized below.

(1) Vessel or aerial surveys.

(i) The Holder of this Authorization shall visually survey a minimum of 1 explosive event per year. One of the vessel or aerial surveys should involve NMFS-approved marine mammal observers (MMOs). If it is impossible to conduct the required surveys due to lack of training exercises, the missed annual survey requirement shall roll into the subsequent year to ensure that the appropriate number of surveys (*i.e.*, total of five) occurs over the 5-year period of effectiveness of this subject.

(ii) When operationally feasible, for specified training events, aerial or vessel surveys shall be used 1–2 days prior to, during (if reasonably safe), and 1–5 days post detonation.

(iii) Surveys shall include any specified exclusion zone around a particular detonation point plus 2,000 yards beyond the border of the exclusion zone (*i.e.*, the circumference of the area from the border of the exclusion zone extending 2,000 yards outwards). For vessel based surveys a passive acoustic system (hydrophone or towed array) could be used to determine if marine mammals are in the area before and/or after a detonation event.

(iv) When conducting a particular survey, the survey team shall collect:

(A) Location of sighting;

(B) Species (if not possible, indicate whale, dolphin or pinniped);

(C) Number of individuals;

(D) Whether calves were observed;

(E) Initial detection sensor;

(F) Length of time observers maintained visual contact with marine mammal;

(G) Wave height;

(H) Visibility;

(I) Whether sighting was before, during, or after detonations/exercise, and how many minutes before or after;

(J) Distance of marine mammal from actual detonations (or target spot if not yet detonated);

(K) Observed behavior—Watchstanders shall report, in plain language and without trying to categorize in any way, the observed behavior of the animal(s) (such as animal closing to bow ride, paralleling course/speed, floating on surface and not swimming, *etc.*), including speed and direction;

(L) Resulting mitigation implementation—Indicate whether explosive detonations were delayed, ceased, modified, or not modified due to marine mammal presence and for how long; and

(M) If observation occurs while explosives are detonating in the water, indicate munitions type in use at time of marine mammal detection.

(2) Passive acoustic monitoring—the Navy shall conduct passive acoustic monitoring when operationally feasible.

(i) Any time a towed hydrophone array is employed during shipboard surveys the towed array shall be deployed during daylight hours for each of the days the ship is at sea.

(ii) The towed hydrophone array shall be used to supplement the ship-based systematic line-transect surveys (particularly for species such as beaked whales that are rarely seen).

(iii) The array should have the capability of detecting low frequency vocalizations (<1,000 Hz) for baleen whales and relatively high frequency (up to 30 kHz) for odontocetes. The use of two simultaneously deployed arrays can also allow more accurate localization and determination of diving patterns.

(3) Marine mammal observers on Navy platforms:

(i) As required in § 218.34(c)(1), MMOs who are selected for aerial or vessel surveys shall be placed on a Navy platform during one of the explosive exercises being monitored per year, the other designated exercise shall be monitored by the Navy lookouts/watchstanders.

(ii) The MMO must possess expertise in species identification of regional marine mammal species and experience collecting behavioral data.

(iii) MMOs shall not be placed aboard Navy platforms for every Navy training event or major exercise, but during specifically identified opportunities deemed appropriate for data collection efforts. The events selected for MMO participation shall take into account safety, logistics, and operational concerns.

(iv) MMOs shall observe from the same height above water as the lookouts.

(v) The MMOs shall not be part of the Navy's formal reporting chain of command during their data collection efforts; Navy lookouts shall continue to serve as the primary reporting means within the Navy chain of command for marine mammal sightings. The only exception is that if an animal is observed within the shutdown zone that has not been observed by the lookout, the MMO shall inform the lookout of the sighting and the lookout shall take the appropriate action through the chain of command.

(vi) The MMOs shall collect species identification, behavior, direction of travel relative to the Navy platform, and distance first observed. Information collected by MMOs should be the same as those collected by Navy lookout/watchstanders described in § 218.34(c)(1)(iv).

(d) The Navy shall complete an Integrated Comprehensive Monitoring Program (ICMP) Plan in 2009. This planning and adaptive management tool shall include:

(1) A method for prioritizing monitoring projects that clearly describes the characteristics of a proposal that factor into its priority.

(2) A method for annually reviewing, with NMFS, monitoring results, Navy R&D, and current science to use for potential modification of mitigation or monitoring methods.

(3) A detailed description of the Monitoring Workshop to be convened in 2011 and how and when Navy/NMFS will subsequently utilize the findings of the Monitoring Workshop to potentially modify subsequent monitoring and mitigation.

(4) An adaptive management plan,

(5) A method for standardizing data collection for GOMEX Range Complex and across range complexes,

(e) General Notification of Injured or Dead Marine Mammals—Navy personnel shall ensure that NMFS (regional stranding coordinator) is notified immediately (or as soon as clearance procedures allow) if an injured or dead marine mammal is found during or shortly after, and in the vicinity of, any Navy training exercise utilizing underwater explosive detonations. The Navy shall provide NMFS with species or description of the animal(s), the condition of the animal(s) (including carcass condition if the animal is dead), location, time of first discovery, observed behaviors (if alive), and photo or video (if available).

(f) Annual GOMEX Range Complex Monitoring Plan Report—The Navy shall submit a report annually on November 1 describing the implementation and results (through September 1 of the same year) of the GOMEX Range Complex Monitoring Plan. Data collection methods shall be standardized across range complexes to allow for comparison in different geographic locations. Although

additional information will also be gathered, the MMOs collecting marine mammal data pursuant to the GOMEX Range Complex Monitoring Plan shall, at a minimum, provide the same marine mammal observation data required in the data required in § 218.34(g). The GOMEX Range Complex Monitoring Plan Report may be provided to NMFS within a larger report that includes the required Monitoring Plan Reports from GOMEX Range Complex and multiple range complexes.

(g) Annual GOMEX Range Complex Exercise Report—The Navy shall provide the information described below for all of their explosive exercises. Until the Navy is able to report in full the information below, they shall provide an annual update on the Navy's explosive tracking methods, including improvements from the previous year.

(1) Total annual number of each type of explosive exercise (of those identified as part of the ''specified activity'' in this final rule) conducted in the GOMEX Range Complex.

(2) Total annual expended/detonated rounds (missiles, bombs, etc.) for each explosive type.

(h) GOMEX Range Complex 5-yr Comprehensive Report—The Navy shall submit to NMFS a draft report that analyzes and summarizes all of the multi-year marine mammal information gathered during the GOMEX Range Complex exercises for which annual reports are required (Annual GOMEX Range Complex Exercise Reports and GOMEX Range Complex Monitoring Plan Reports). This report shall be submitted at the end of the fourth year of the rule (March 2014), covering activities that have occurred through September 1, 2013.

(i) The Navy shall respond to NMFS comments and requests for additional information or clarification on the GOMEX Range Complex Comprehensive Report, the Annual GOMEX Range Complex Exercise Report, or the Annual GOMEX Range Complex Monitoring Plan Report (or the multi-Range Complex Annual Monitoring Plan Report, if that is how the Navy chooses to submit the information) if submitted within 3 months of receipt. These reports will be considered final after the Navy has addressed NMFS' comments or provided the requested information, or three months after the submittal of the draft if NMFS does not comment by then.

(j) In 2011, the Navy shall convene a Monitoring Workshop in which the Monitoring Workshop participants will be asked to review the Navy's Monitoring Plans and monitoring results and make individual recommendations (to the Navy and NMFS) of ways of improving the Monitoring Plans. The recommendations shall be reviewed by the Navy, in consultation with NMFS, and modifications to the Monitoring Plan shall be made, as appropriate.

§ 218.35 Applications for Letters of Authorization.

To incidentally take marine mammals pursuant to these regulations, the U.S. citizen (as defined by § 216.103 of this chapter) conducting the activity identified in § 218.30(a) (the U.S. Navy) must apply for and obtain either an initial Letter of Authorization in accordance with § 218.26 or a renewal under § 218.27.

§ 218.36 Letters of Authorization.

(a) A Letter of Authorization, unless suspended or revoked, will be valid for a period of time not to exceed the period of validity of this subpart, but must be renewed annually subject to annual renewal conditions in § 218.37.

(b) Each Letter of Authorization will set forth:

(1) Permissible methods of incidental taking;

(2) Means of effecting the least practicable adverse impact on the species, its habitat, and on the availability of the species for subsistence uses (*i.e.*, mitigation); and

(3) Requirements for mitigation, monitoring and reporting.

(c) Issuance and renewal of the Letter of Authorization will be based on a determination that the total number of marine mammals taken by the activity as a whole will have no more than a negligible impact on the affected species or stock of marine mammal(s).

§ 218.37 Renewal of Letters of Authorization and adaptive management.

(a) A Letter of Authorization issued under §§ 216.106 and 218.36 of this chapter for the activity identified in § 218.30(c) will be renewed annually upon:

(1) Notification to NMFS that the activity described in the application submitted under § 218.35 shall be undertaken and that there will not be a substantial modification to the described work, mitigation or monitoring undertaken during the upcoming 12 months;

(2) Timely receipt of the monitoring reports required under § 218.34; and

(3) A determination by the NMFS that the mitigation, monitoring and reporting measures required under § 218.33 and the Letter of Authorization issued under §§ 216.106 and 218.36 of this chapter, were undertaken and will be undertaken during the upcoming annual period of validity of a renewed Letter of Authorization.

(b) If a request for a renewal of a Letter of Authorization issued under § 216.106 of this chapter and § 218.37 indicates that a substantial modification to the described work, mitigation or monitoring undertaken during the upcoming season will occur, the NMFS will provide the public a period of 30 days for review and comment on the request. Review and comment on renewals of Letters of Authorization are restricted to:

(1) New cited information and data indicating that the determinations made in this document are in need of reconsideration, and

(2) Proposed changes to the mitigation and monitoring requirements contained in these regulations or in the current Letter of Authorization.

(c) A notice of issuance or denial of a renewal of a Letter of Authorization will be published in the **Federal Register**.

(d) NMFS, in response to new information and in consultation with the Navy, may modify the mitigation or monitoring measures in subsequent LOAs if doing so creates a reasonable likelihood of more effectively accomplishing the goals of mitigation and monitoring set forth in the preamble of these regulations. Below are some of the possible sources of new data that could contribute to the decision to modify the mitigation or monitoring measures:

(1) Results from the Navy's monitoring from the previous year (either from GOMEX Study Area or other locations).

(2) Findings of the Monitoring Workshop that the Navy will convene in 2011 (§ 218.34(j)).

(3) Compiled results of Navy funded research and development (R&D) studies (presented pursuant to the ICMP (§ 218.34(d)).

(4) Results from specific stranding investigations (either from the GOMEX Range Complex Study Area or other locations).

(5) Results from general marine mammal and sound research (funded by the Navy (described below) or otherwise).

(6) Any information which reveals that marine mammals may have been taken in a manner, extent or number not authorized by these regulations or subsequent Letters of Authorization.

§ 218.38 Modifications to Letters of Authorization.

(a) Except as provided in paragraph (b) of this section, no substantive

modification (including withdrawal or suspension) to the Letter of Authorization by NMFS, issued pursuant to §§ 216.106 and 218.36 of this chapter and subject to the provisions of this subpart shall be made until after notification and an opportunity for public comment has been provided. For purposes of this paragraph, a renewal of a Letter of Authorization under § 218.37, without modification (except for the period of validity), is not considered a substantive modification.

(b) If the Assistant Administrator determines that an emergency exists that poses a significant risk to the well-being of the species or stocks of marine mammals specified in § 218.30(b), a Letter of Authorization issued pursuant to §§ 216.106 and 218.36 of this chapter may be substantively modified without prior notification and an opportunity for public comment. Notification will be published in the **Federal Register** within 30 days subsequent to the action.

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 648

RIN 0648–AY00

Magnuson-Stevens Fishery Conservation and Management Act Provisions; Fisheries of the Northeastern United States; Atlantic Mackerel, Squid, and Butterfish Fisheries; Amendment 10

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

ACTION: Notice of availability of a fishery management plan amendment; request for comments.

SUMMARY: NMFS announces that the Mid-Atlantic Fishery Management Council (Council) has submitted Amendment 10 to the Atlantic Mackerel, Squid, and Butterfish (MSB) Fishery Management Plan (FMP) (Amendment 10), incorporating the public hearing document and the Initial Regulatory Flexibility Analysis (IRFA), for review by the Secretary of Commerce and is requesting comments from the public.

DATES: Comments must be received on or before September 14, 2009.

ADDRESSES: A final supplemental environmental impact statement (FSEIS) was prepared for Amendment 10 that describes the proposed action and other considered alternatives and provides a thorough analysis of the impacts of the proposed measures and alternatives. Copies of Amendment 10, including the FSEIS, the Regulatory Impact Review (RIR), and the Initial Regulatory Flexibility Analysis (IRFA), are available from: Daniel Furlong, Executive Director, Mid-Atlantic Fishery Management Council, Room 2115, Federal Building, 300 South New Street, Dover, DE 19904–6790. The FSEIS/RIR/IRFA is accessible via the Internet at *http://www.nero.nmfs.gov*.

You may submit comments on this notice of availability, identified by ''0648–AY00'', by any one of the following methods:

- Electronic Submissions: Submit all electronic public comments via the Federal e-Rulemaking portal *http://www.regulations.gov*;
- Fax: (978) 281–9135, Attn: Carrie Nordeen;
- Mail to Patricia A. Kurkul, Regional Administrator, NMFS, Northeast Regional Office, 55 Great Republic Drive, Gloucester, MA 01930. Mark the outside of the envelope ''Comments on MSB Amendment 10.''

Instructions: All comments received are a part of the public record and will generally be posted to *http://www.regulations.gov* without change. All Personal Identifying Information (e.g., name, address, etc.) voluntarily submitted by the commenter may be publicly accessible. Do not submit Confidential Business Information or otherwise sensitive or protected information. NMFS will accept anonymous comments. Attachments to electronic comments will be accepted in Microsoft Word, Excel, WordPerfect, or Adobe PDF formats only.

SUPPLEMENTARY INFORMATION:

Background

In February 2005, NMFS notified the Council that the butterfish stock was overfished, which triggered MSA requirements to implement rebuilding measures for the stock. In response, Amendment 10 to the MSB FMP was initiated by the Council in October 2005. Management measures for rebuilding butterfish are designed to reduce the fishing mortality on butterfish that occurs through discarding, which is the primary source of fishing mortality. Measures that reduce butterfish discards are expected to also reduce the bycatch of other finfish species in MSB fisheries.

The purpose of Amendment 10 is to bring the MSB FMP into compliance with Magnuson-Stevens Fishery Conservation and Management Act (MSA) requirements by: 1) Establishing a rebuilding program that allows the butterfish stock to rebuild and permanently protects the long-term health and stability of the stock; and 2) minimizing bycatch and the fishing mortality of unavoidable bycatch, to the extent practicable, in the MSB fisheries. Amendment 10 would increase the minimum codend mesh requirement for the *Loligo* squid (*Loligo*) fishery; establish a butterfish rebuilding program with a butterfish mortality cap program for the *Loligo* fishery; establish a 72–hr trip notification requirement for the *Loligo* fishery; and require an annual assessment of the butterfish rebuilding program by the Council's Scientific and Statistical Committee (SSC).

Initially, Amendment 9 to the MSB FMP (Amendment 9) was intended to bring the MSB FMP into compliance with MSA bycatch requirements, and contained several management measures intended to address deficiencies in the FMP that relate to discarding, especially as they affect butterfish. Specifically, those management measures would have attempted to reduce finfish discards by MSB small-mesh fisheries through mesh size increases in the directed *Loligo* fishery, removal of mesh size exemptions for the directed Illex squid fishery, and establishment of seasonal Gear Restricted Areas (GRAs). However, those specific management alternatives were developed in 2004, prior to the butterfish stock being declared overfished. On June 13, 2007, the Council recommended that all management measures developed as part of Amendment 9 to correct deficiencies in the FMP related to bycatch of finfish, especially butterfish, be considered in Amendment 10. Accordingly, no action was taken in Amendment 9 (73 FR 37382, July 1, 2008) to address bycatch.

The Council held three public meetings on Amendment 10 during June 2008. Following the public comment period that ended on June 23, 2008, the Council adopted Amendment 10 on October 16, 2008. In Amendment 10, measures recommended by the Council would:

- Establish a minimum mesh increase to 2–1/8 inches (54 mm) (from 1–7/8 inches (48 mm)) for the *Loligo* fishery during Trimesters I (Jan–Apr) and III (Sep–Dec), starting in 2010;
- Establish a butterfish mortality cap program for the *Loligo* fishery, starting in 2011;