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National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
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OCT 7 2003

F/SER3:KPB

J. Hammond Eve, Regional Supervisor
Leasing and Environment
Gulf of Mexico OCS Region
Mineral Management Service (MMS)
1201 Elmwood Park Boulevard
New Orleans, LA 70123-2394

OCT 10 2003

Dear Mr. Eve:

This correspondence transmits a new section 7 consultation on the Minerals Management Service's (MMS) proposed *De Minimus Explosive Severing Operations on the Outer Continental Shelf of the Gulf of Mexico* as required by the Endangered Species Act of 1973 (ESA). This correspondence replaces the July 30, 2003, section 7 consultation letter from the National Marine Fisheries Service (NOAA Fisheries) regarding this action. The reference number assigned to these consultations is F/SER/2003/00823.

In your letter dated June 19, 2003, you requested that NOAA Fisheries amend the 1988 generic biological opinion (Opinion) issued for explosive removals in the Gulf of Mexico using charges of up to 50 lb, and exempt removals using charges of 5 lb or less from some of the terms and conditions of that Opinion. However, given the limitations of the 1988 Opinion (limited depths and species considered in the Opinion), and since that Opinion is the subject of a new Programmatic Environmental Assessment in final preparation by MMS in anticipation of reinitiation of consultation, NOAA Fisheries has determined that it is more appropriate to conduct this consultation solely on explosive removals using charges of ≤ 5 lb, and to remove these activities from the coverage of the 1988 Opinion. Following consultation and issuance of the July 30, 2003 opinion on 5-lb removals, MMS responded with suggested changes to the terms and conditions that resulted in reinitiation of consultation on this action. As a result of the reinitiated consultation, NOAA Fisheries concurs with MMS that these small charge explosive removals performed as described below are not likely to adversely affect ESA-listed species under NOAA Fisheries jurisdiction. No takes are authorized for explosive removals using charges of ≤ 5 lb and they are no longer covered by the terms of the 1988 Opinion.

The MMS is mandated under the Outer Continental Shelf Lands Act (OCSLA) to ensure that all structures and related components are removed from the seafloor after a lease expires or when oil and gas facilities are deemed unsafe. In most cases, bottom-founded structures are required to be severed at a minimum sub-seafloor depth of 15 feet below the mudline to reduce interference with future OCS activities. Explosive charges have served as a convenient and cost-effective method in decommissioning operations, but heavier net explosive weight "bulk" charges are used more frequently in the Gulf of Mexico than the smaller, more efficient shaped charges. The MMS estimates that 20-25 small-charge explosive operations using ≤ 5 lb will occur each year as a result of this action. MMS believes that due to the option of using small, shaped charges, the



estimated use of small charge explosive operations would result in 30-35 less removals using larger, bulk explosive charges in the Gulf of Mexico. A decrease in the use of bulk charges would result in a decreased environmental impact (e.g., adult and larval fish kills). The shaped charges used in most pile and caisson severing operations consist of an explosive compound that is "shaped" or "formed" to more efficiently detonate and sever the structures. The zones of influences for C-4 shaped charges ≤ 5 lb are presented in Table 1.

The three main explosives used are RDX (Hexahydrotrinitrotriazine), HMX (Octahydro-tetranitrotetrazine), and C-4 (plasticized RDX putty). These charges are usually deployed remotely using a charge deployment system or are placed into position by divers. Multiple 5 lb charges are required for cutting a pile ≥ 36 -in diameter and for well/conductor severing, but staggering the detonation of the charges will not result in a greater environmental impact. When larger targets need to be severed, multiple deployment devices are loaded with one or two charges each and detonated in staggered stages, effectively cutting the pile in halves or quarters.

Table 1. Impact zone calculations for C-4 charges ≤ 5 lb within a tubular casing placed 15 feet below the mudline.

C-4 Charge (lb)	Range to 12 psi		Range to 182 dB EFD in any 1/3-Octave Band	
	(m)	(ft)	(m)	(ft)
5	206	676	75	246
4	191	626	67	220
3	173	569	58	191
2	152	497	48	156
1	120	394	34	111

ESA-listed species under the purview of NOAA Fisheries which are considered under this ESA section 7 consultation include the sperm whale (*Physeter macrocephalus*), leatherback sea turtle (*Dermochelys coriacea*), green sea turtle (*Chelonia mydas*), Kemp's ridley sea turtle (*Lepidochelys kempii*), hawksbill sea turtle (*Eretmochelys imbricata*), and loggerhead sea turtle (*Caretta caretta*), and the Gulf sturgeon (*Acipenser oxyrinchus desotoi*). No critical habitat has been designated in the project area.

Very intense pressure waves (e.g., blast waves from explosions) have the potential to cause damage to body tissues in marine animals. Damage is most likely to occur where substantial impedance differences occur (e.g., across air/tissue interfaces in the middle ear, sinuses, lungs, and intestines). Several studies have shown that underwater explosions can injure and kill sea turtles. In March and April of 1986, 51 dead sea turtles, primarily Kemp's ridleys, washed ashore on Texas beaches after the removal of platforms that involved 22 underwater explosions. Underwater explosions were identified as the probable cause of the strandings. NOAA Fisheries

studied the effects of offshore structure removals on sea turtles at various distances of 213.4 m (700 ft), 365.8 m (1,200 ft), 548.6 m (1,800 ft), and 914.4 m (3,000 ft) resulting from a single platform removal using 23 kg (50 lb) of nitromethane. The charges were placed inside platform pilings at a depth of 5 m below the mudline. Four turtles within 365.8 m (1,200 ft) of the explosion were unconscious as was a loggerhead at 914.4 m (3,000 ft). Sea turtles were expected to have drowned if not recovered from the water following the explosion. All turtles exposed to the blast exhibited everted cloacas and vasodilation lasting 2-3 weeks.

Blast damage in marine mammals has been investigated using both submerged terrestrial mammals^{1,2,3} and dolphin cadavers.⁴ Marine mammals are at greatest risk of injury when they are at the same depth as, or slightly above, the explosion. Risks drop off quite sharply above and below this depth. For example, a harbor porpoise within 750 m of an explosion of a 545 kg charge at 38 m is likely to suffer injury if it is at the same depth, but at 30 m above, or 43-m below it, only animals within 500 m are likely to be injured.

Fish primarily hear by means of the ear and the lateral line. The lateral line responds to differences between motion of the fish and motion of the surrounding water and is sensitive to low frequencies (<1 to 345 Hz) from the immediate environment (two to three body lengths from the fish). The ear detects signals at considerable distances from the fish over a much wider range of frequencies, from well below 50 Hz to over 2,000 Hz.^{5,6}

Fish may be most susceptible to hearing damage at the most sensitive frequencies in their hearing range; species with the most sensitive hearing may be affected at lower sound pressure levels

¹Goertner, J.F. 1982. Prediction of underwater explosion safe ranges for sea mammals. NSWC/WOL TR-82-188, Rep. No. NTIS AD-A139823. Naval Surface Weap. Cent., White Oak Lab., Silver Spring, MD.

²Yelverton, J.T., Richmond, D.R., Fletcher, E.R., & Jones, R.K. 1973. Safe distances from underwater explosion for mammals and birds, Rep. No. DNA 3114T. Lovelace Foundation for Medical Education and Research, Albuquerque, NM, Albuquerque, NM.

³Richmond, D.R., Yelverton, J.T., & Fletcher, F.R. 1973. Far-field underwater blast injuries produced by small charges, Rep. No. DNA 3081T. Lovelace Foundation for Medical Education and Research.

⁴Myrick, A.C., Cassano, E.R., & Oliver, C.W. 1990 Potential for physical injury, other than hearing damage, to dolphins from seal bombs used in the yellowfin tuna purse-seine fishery: Results from openwater tests, Admin. Rep. LJ-90-08. U.S. National Mar. Fish.Serv., La Jolla, CA.

⁵Schwartz, A.L. 1985. The behaviour of fishes in their acoustic environment. *Environmental Biology of Fishes* 13:3-15.

⁶Popper, A.N., and T.J. Carlson. 1998. Applications of sound and other stimuli to control fish behavior. *Transactions of the American Fisheries Society* 127:673-707.

than those with less acute hearing. Gulf sturgeon hearing abilities have not been measured, but this species is believed to be a hearing generalist, having low frequency sensitivity. Fish with swim bladders, such as the Gulf sturgeon, are more likely to be killed since the pressure wave can rupture the air-filled swim bladder. However, sturgeon appear to be relatively unaffected by explosive charges. Through necropsies following exposure to underwater explosions, shortnose sturgeon have been shown to suffer relatively little damage to the swim bladder from explosions, but rather exhibited distended intestines with gas bubbles inside and hemorrhaging to the body wall lining.⁷ The main issues of concern with respect to the effects of small explosive charges on the Gulf sturgeon are the potential for hearing and tissue damage; however, Gulf sturgeon are not known to have habitat associations with oil and gas structures and therefore are not believed to be vulnerable to the potential adverse effects described above.

The range for onset of temporary threshold shift (TTS) in marine mammals is currently accepted as the minimum distance at which either 182 dB re 1 micro Pa²-sec in any 1/3-octave band or 12 psi peak pressure is exceeded. TTS and the zones of impact for a range to 12 psi (ZOI) for all calculations are based on a model developed by Applied Research Associates.⁸ This model considers the effects of pressure waves generated by charges detonated within tubulars (e.g., piles and caissons) and below the mudline.

For sperm whales and sea turtles, the risk of damage can be reduced by blasting only when observations indicate that there are no cetaceans or sea turtles within the danger area. However, probabilities of seeing protected species, especially small ones such as sea turtles, may be low in poor environmental conditions. Passive acoustic monitoring used in addition to visual observation can significantly increase detection probabilities for sperm whales for activities occurring in water depths >200 meters. MMS indicated that the proposed action will include the following measures to avoid any potentially adverse effects to listed species under the jurisdiction of NOAA Fisheries.

1. The placement and detonation of explosives shall be confined within piles and caissons.
2. Each detonation shall be staggered in order to spread the total pressure of the detonation over time, which in turn will reduce the impact zone radius. MMS NTL No. 2001-G08 presently requires an interval of 0.9 seconds (900 milliseconds) between individual blasts.
3. Charges shall be placed at a minimum depth of 15 feet below the sediment surface.
4. The zone of impact is defined as the distance from the detonation that 12 psi and 182 dB are not experienced. Sperm whale watch in the zone of impact shall occur for at least 60 minutes preceding each detonation in water depths > 200m. Sea turtle watch in the zone of impact shall occur for at least 30 minutes preceding each detonation in all water depths. Surveys for all listed species entering or within the zone of impact shall occur from a small water craft and/or an elevated platform on a derrick barge.
5. The observers shall be employees who have attended observer training courses offered by private or government entities.
6. Surveys for animals in the impact zone shall be conducted in Beaufort Sea States 0-3. Adequate environmental conditions shall be present for observations of animals in the

⁷Moser, M. 1999. Cape Fear River Blast Mitigation Tests: Results of Caged Fish Necropsies. CZR, Inc.

⁸Applied Research Associates, Inc. 2003. Shock Wave / Sound Propagation Model (MS Excel). Applied Research Associates, Inc. Littleton, CO.

- zone of impact.
7. Surveys for sea turtles and sperm whales shall not commence until 20 minutes following sunrise. All pre-detonation survey requirements for sea turtles and/or sperm whales shall be fully completed one hour before sunset.
 8. To meet the survey requirements above, the following time restrictions shall be set on detonations.
 - a. Detonations in water depths \leq 200m shall not occur until at least 50 minutes following sunrise.
 - b. Detonations in water depths $>$ 200m shall not occur until at least 80 minutes following sunrise.
 - c. All detonations shall be completed by one hour before sunset.
 9. No protected species in the observed zone will be forced out of those zones by human intervention including enticing animals to bow-ride. Operators shall follow the most recent requirement set forth in MMS' Notice to Lessees and Operators Vessel Strike Avoidance and Injured/Dead Protected Species Reporting (MMS NTL No. 2003-G10). Detonation shall not occur until the animal moves out of the caution zone on its own volition. Detonation will be delayed until the area is clear of protected species for at least 30 minutes.
 10. A trip report will be provided to NOAA Fisheries following the explosive removal activity that details the type and net explosive weight of the charges used, targets served, time of day pre- and post-observations were initiated and terminated, and information on any protected species observed in or outside the impact zone.
 11. In the unlikely event that a sea turtle or marine mammal is injured or killed during the detonations, MMS shall contact the NOAA Fisheries' Southeast Regional Office at (727) 570-5312 and the operations will cease. Every effort possible should be made to recover the carcass for necropsy in consultation with the appropriate NOAA Fisheries' Stranding Coordinator. The Sea Turtle Stranding and Salvage Network can be reached at (305) 361-4478, and the Southeast Region Marine Mammal Stranding Coordinator can be reached via a 24-hour pager at (305) 862-2850.

It is NOAA Fisheries' judgment that the minimization measures listed above make it likely that listed species occurring in the impacted areas will be detected during the use of explosive charges \leq 5 lb. Based on the above, NOAA Fisheries has determined that the proposed activities will not likely adversely affect endangered and threatened species, or their critical habitat, under the purview of NOAA Fisheries. Any unforeseen circumstances that may require the use of explosives in open water is not covered under this section 7 consultation and will require a separate interagency consultation under the ESA.

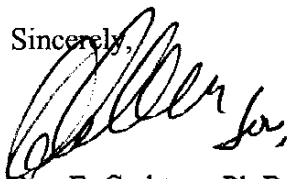
This concludes consultation responsibilities under section 7 of the ESA. Be advised that a new consultation must be initiated if a take occurs or new information reveals effects of the action not previously considered, or the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat in a manner or to an extent not previously considered, or if a new species is listed or critical habitat designated that may be affected by the identified action.

Incidental takes of bottlenose dolphins (*Tursiops truncatus*) and spotted dolphins (*Stenella attenuata* and *S. frontalis*) have been authorized under the Marine Mammal Protection Act as a result of explosive removal of OCS structures in waters \leq 200 m (67 FR 49869). If non-listed marine mammals may be present in the area of an action and may incur injury or harassment in

water depths > 200 m, an incidental take authorization under Marine Mammal Protection Act (MMPA) Section 101 (a)(5) will be necessary. Please contact Kenneth Hollingshead of our Headquarters Protected Resources staff at (301) 713-2055 for additional information regarding an MMPA take authorization.

I look forward to the continued close cooperation and coordination between our two agencies to conserve protected species. For questions, please contact Kyle Baker, fishery biologist, at the number above or via e-mail at Kyle.Baker@noaa.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Roy E. Crabtree, Jr.", written in a cursive style.

Roy E. Crabtree, Ph.D.
Regional Administrator

cc: F/PR2 - K. Hollingshead
F/PR3
File: 1514-22.J

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