



United States Department of the Interior



FISH AND WILDLIFE SERVICE

Caribbean Ecological Services

Field Office

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JUN 26 2014

In Reply Refer To:
FWS/R4/CESFO/72147-027

Mr. Dan Waddill
Head of Vieques Restoration Section
Naval Facilities Engineering Command
Attn: Code EV31
6506 Hampton Blvd.
Norfolk, VA 23508-1278

Re: Time Critical Removal Action (TCRA) for
Potential Area of Concern (PAOC) Engineering
Evaluation (EE) within unexploded ordnance UXO
17, Atlantic Fleet Weapons Training Area, Vieques
Former Naval Training Range, Vieques, PR.

Dear Mr. Waddill:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion (BO) based on our review of the proposed Time Critical Removal Action (TCRA) for Potential Area of Concern (PAOC) Engineering Evaluation (EE) within unexploded ordnance 17 (UXO 17), Atlantic Fleet Weapons Training Area, Vieques Former Naval Training Range and its effects on the hawksbill sea turtle (*Eretmochelys imbricata*) in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). Your request for formal consultation was received on January 24, 2014. On March 03, 2014, the Service concurred with the U.S. Navy's determination that the project may affect, but is likely to adversely affect the hawksbill sea turtle. We also concurred with the Navy's "no effect" and "not likely to adversely affect" determinations for 10 listed species (see Table 1).

This BO is based on information provided in the January 2014 Final Biological Assessment (BA) for PAOC EE – UXO 17, Vieques, Puerto Rico. A complete administrative record of this consultation is on file at the Caribbean Ecological Services Field Office in Boquerón, Puerto Rico. The BA did not include effect determinations for the leatherback sea turtle and green sea turtle. However, the Service would concur with a "not likely to adversely affect" determination since proposed work activities will not be conducted in open sand areas and any indirect effects would be small in scale and discountable.

Table 1. Species evaluated for effects where a determination of “no effect (NE)” or “not likely to adversely affect (NLAA)” was made by the U.S. Navy and concurred by the Service.

Species	Present in action area but “No effect”	Present in action area, but “not likely to be adversely affected”
<i>Calyptanthus thomasi</i> (no common name)	X	
<i>Goetzea elegans</i> (matabuey)	X	
<i>Eugenia woodburyana</i> (no common name)	X	
<i>Varronia rupicola</i> (no common name)	X (candidate spp)	
Yellow-shouldered blackbird (<i>Agelaius xanthomus</i>)	X	
Roseate tern (<i>Sterna dougallii dougallii</i>)	X	
Piping plover (<i>Charadrius melodus</i>)	X	
<i>Chamaecrista glandulosa</i> var. <i>mirabilis</i> (no common name)		X
Puerto Rican boa (<i>Epicrates inornatus</i>)		X
<i>Stahlia monosperma</i> (Cobana negra)		X
Leatherback sea turtle (<i>Dermochelys coriacea</i>)*		X
Green sea turtle (<i>Chelonia mydas</i>)*		X

*Species not addressed in the Navy’s BA, but for which the Service would concur with a NLAA determination.

The species listed in Table 1 will not be discussed further in this biological opinion.

Consultation History

- January 24, 2014 – The Navy submitted the Final Biological Assessment (BA) for the PAOC EE for UXO 17 for the TCRA in the vicinity of La Chiva beach formerly known as Blue beach within the Vieques National Wildlife Refuge (VNWR). The Navy requested formal consultation for the hawksbill sea turtle and anticipated Incidental Take for the species. The Navy also determined no effect determination and may affect, but not likely to adversely affect determination for the species listed in Table 1.
- March 03, 2014 – The Service concurred with effect determination on candidate and listed species in the Final BA. We concurred that the proposed action may affect, but is likely to adversely affect the endangered hawksbill sea turtle. Formal consultation was initiated and we mentioned that we expected to provide the Navy with a BO no later than June 6, 2014.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

Unless cited otherwise, the following information for this section was obtained from the December 2013 Draft TCRA Work Plan (WP) for Munitions Response Site UXO 17 (CH2MHILL 2013a).

The primary objective of the TCRA is to reduce the potential explosive hazard due to the presence of surface and/or shallow (top 1 foot) subsurface munitions and explosives of concern (MEC)/material potentially presenting an explosive hazard (MPPEH) at the terrestrial area within and around La Chiva beach (also known as Blue beach). In order to mitigate the potential explosive hazard associated with surface and shallow MEC/MPPEH encountered, the scope of the TCRA is to locate and visually inspect surface items and intrusively investigate shallow subsurface metallic anomalies, to the extent practicable. This will be done with an all-metals detector in the TCRA area (Figure 1). In order to effectively survey for and clear the area of MEC/MPPEH, the proposed action will necessitate an exposed ground surface, requiring the removal of vegetation down to a height of 6 inches above the ground (CH2MHILL 2014).

According to the TCRA WP, the following tasks need to be completed:

1. Vegetation cutting and removal to allow access to the work area.
2. Surface clearance to address any MEC/MPPEH on the ground surface and to minimize clutter that could negatively influence the subsurface anomaly identification.
3. Subsurface anomaly identification and excavation.
4. Handling and disposal of recovered items.
5. Demobilization and Reporting.

Vegetation will be removed in accordance with the Vegetation Removal Standard Operating Procedure (SOP MR-1) in the Master Sampling and Analysis Plan, East Vieques Terrestrial UXO Sites, Former Vieques Naval Training Range (CH2MHILL 2013b) (Attachment I). According to SOP MR-1, vegetation removal will be conducted with hand tools (i.e. chain saws, trimmers, etc.), with mechanical cutting equipment (i.e. cutting heads, tractors, etc.) and a back hoe if necessary. In addition, all cut vegetation will be accumulated onsite and left in place.

Individual operating grids (30 m x 30 m) will be established throughout the TCRA area. Once vegetation is removed, the ground surface and shallow subsurface will be cleared of MEC/MPPEH and other metallic debris following the SOPs for surface and subsurface anomalies. All items recovered will be either moved for controlled detonation, blown in place, or removed from the grid and consolidated onsite in a designated area. Upon completion of the TCRA, the excavations will be backfilled following anomaly excavation and removal. Areas where vegetation has been removed will be allowed to naturally re-vegetate.

The depth of excavation will be 1 foot unless at the 1 foot depth an item or portion of an item is visible and is a probable MEC/MPPEH. If a probable MEC/MPPEH is observed, excavation

will continue until the item is positively identified as being or not a MEC/MPPEH. If at the 1 foot level nothing is observed, the excavation will be abandoned.

Action Area

Service regulations define the “action area” as “all areas affected directly or indirectly by the federal action and not merely the immediate area involved in the action,” (50 CFR § 402.02). Accordingly this BO will address all areas potentially affected by the action within habitat for the federally listed species covered in this BO.

For the purpose of this BO, the action area (AA) is defined as the footprint contained within the TCRA UXO 17 boundary (CH2MHILL 2014), plus additional open sand beach areas of La Chiva beach (Figure 1). Although no TCRA actions are proposed for the open sand beach areas, for the purpose of this BO we include the open sand beach areas because it is an essential component of the sea turtle nesting habitat. Both adults and hatchling hawksbill sea turtles use this area for transit between the water and the nesting habitat. The open sand is also an active nesting beach for the leatherback sea turtle. Because of the nature of the project, unexpected actions and/or possible UXO detonation effects on sea turtle nests within the open sand beach area may still occur and are discussed further below (see Direct Effects section of this BO). The following table shows the approximate areas for each boundary defined for the AA.

Table 2. Approximate areas of hawksbill habitat and boundaries defined for the AA.

Boundary	Area (acres)
Hawksbill forested nesting area	11
Open sand beach area	7
Total hawksbill terrestrial habitat	18
PAOC EE TCRA	106
AA (PAOC EE TCRA & Open Sand)	113

The BA establishes that the TCRA boundary covers approximately 106 acres of forested habitat, of which approximately 11 acres (10%) were identified by the Navy as hawksbill forested nesting habitat. For the reasons explained in the previous paragraph, we estimated the AA in 113 acres because we added approximately 7 acres of open sand beach area. Therefore for the purpose of this BO, the AA area contains approximately 18 acres (15.9%) of hawksbill terrestrial habitat (nesting and transit) (Figure 1).

Proposed Conservation Measures

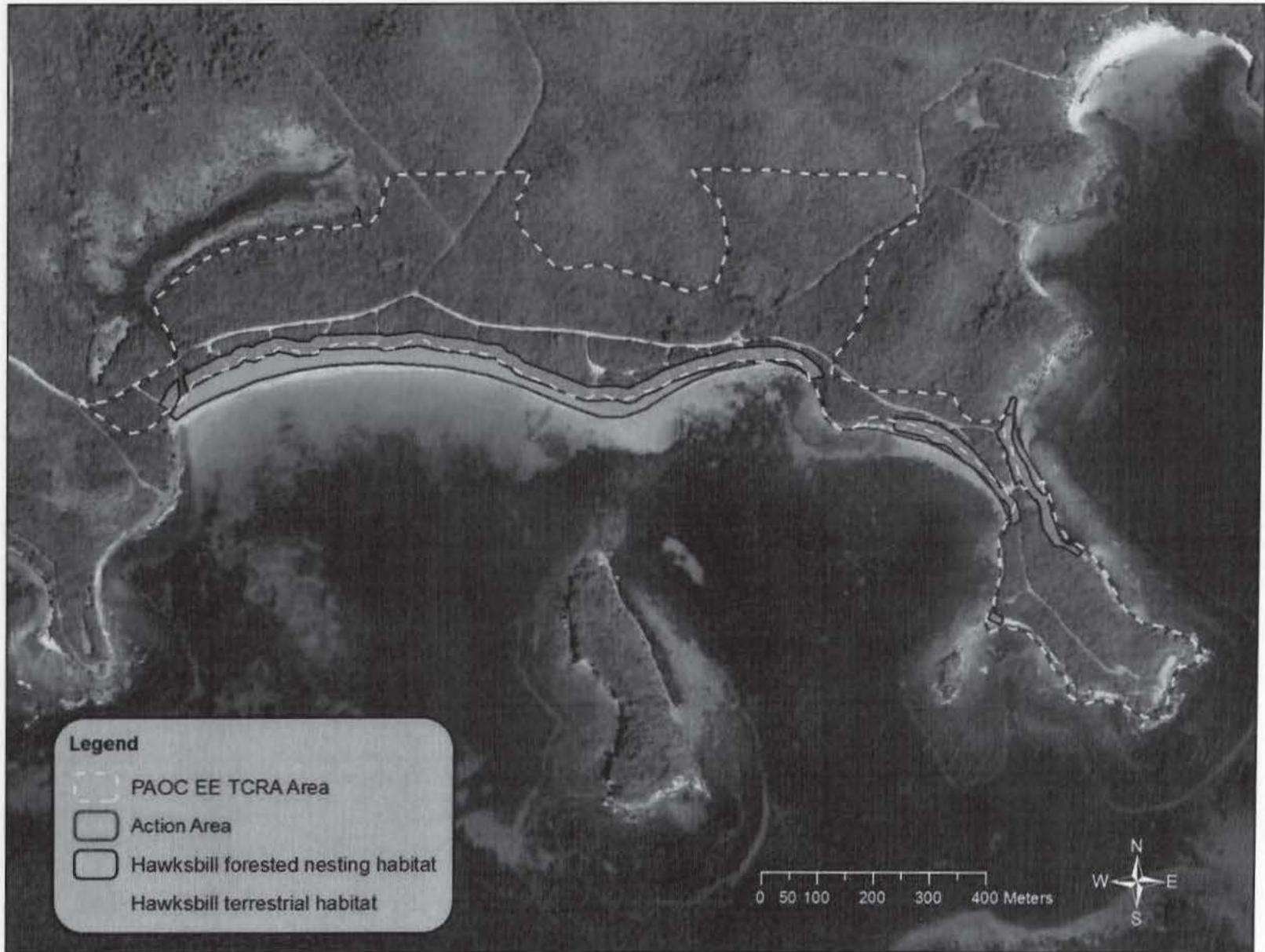
Section 4.5 of the Final BA for the PAOC EE within UXO 17 (CH2MHILL 2014) describes the following conservation measures proposed by the Navy to prevent, minimize, or otherwise mitigate adverse effects on the hawksbill sea turtle nesting habitat:

- A. To provide protection of the hawksbill nesting habitat within the TCRA area, the vegetated area between Playa La Chiva and the roadway will have the minimum amount of vegetation cut while still achieving the necessary objective of the TCRA. In order to make certain this occurs, a biologist/environmental scientist will oversee the vegetation removal in this area and actively coordinate with the Vieques National Wildlife Refuge (VNWR) staff during the vegetation clearance. This oversight will ensure that only invasive vegetation is completely removed and that all native and naturalized vegetation is trimmed just enough to allow for the objectives of the TCRA to be met. As vegetation crews cannot be effectively trained to clear only invasive vegetation, the biologist/environmental scientist will provide onsite guidance during the duration of vegetation removal. This will include the following:
- The main stems/trunks of species such as sea grape, portia tree, and noni tree will not be cut to the extent it would cause plant death unless the MEC clearance teams cannot access the area without cutting the main stem/trunk. In this case, the cutting will be documented prior to removal.
 - As the hawksbill sea turtle prefers to nest under a low canopy, steps will be taken to ensure that the canopy within a 2-foot radius of the main stem/trunk is not cut any higher than 2 feet from the ground surface unless the MEC clearance teams cannot access the area without cutting the canopy beyond these specifications. In this case, the cutting will be documented prior to removal.
 - Sea turtle monitoring will begin on Playa La Chiva 75 days prior to the implementation of this TCRA action if the action will occur during the hawksbill nesting season from June through December. As the possibility of nesting year round is present, if the action begins from January through May, monitoring will begin 30 days prior to the implementation of the action. Avoidance of nest sites will be practiced by implementing a 20-foot buffer around confirmed nests where no heavy equipment may be used. Nest locations will be identified by placing "Do not cut" flagging tape on vegetation around a 20-foot perimeter of the nest location and vegetation teams will be advised not to work in these areas. The exact nest location will be marked with GPS/triangulation to known points only and will not be conspicuously marked to prevent possible poaching. Munitions demolition will not take place within 100 feet of the nest site unless necessary to insure public safety. Hand clearance of an area within 4 feet of the nest will not be permitted until after the nest has hatched.
 - Vegetation piles will not be placed in turtle nesting habitat as the piles may impede turtles attempting to nest. All cut vegetation will be moved to an area outside of the turtle nesting zone which will either be on the south side of the road adjacent to the roadway or north of the roadway.
- B. In the event that any other federally threatened or endangered (T&E) species is encountered during the TCRA action, the following conservation measures will be taken:

- Work will immediately cease if a suspected T&E species is encountered and the onsite Title II Representative will be advised. The Title II Representative for this TCRA will be the onsite biologist/environmental scientist or the Range Coordinator if the biologist/environmental scientist is not available. Teams working in this area will be provided with field guides that give brief descriptions of T&E species, and the onsite biologist/environmental scientist will provide guidance to teams on the T&E that may be encountered in this area.
 - If a T&E plant species is encountered during this activity, the area where the specimen is found will be avoided by placing a suitable buffer around the specimen. The size of the buffer will be dependent on the type and size of the specimen. The USFWS VNWR Refuge Manager, Caribbean Ecological Services Field Office (CESFO) and Clean-up Project Manager will be advised of the finding.
 - In the event a T&E animal species is encountered during this activity, work will stop in the area where the specimen is encountered and the area will be avoided by placing a suitable buffer around the specimen. The size of the buffer will be dependent on the type and size of the specimen. The onsite biologist/environmental scientist will make a determination as to how the specimen is utilizing the area and determine the area to be avoided and the length of time the area will need to be avoided. The USFWS VNWR Refuge Manager, CESFO and Clean-up Project Manager will be advised of the finding.
- C. As part of scope of the Time Critical Removal Action (TCRA) at Potential Area of Concern EE (PAOC EE; also known as Blue Beach), native vegetation within the hawksbill nesting zone may be pruned or removed where necessary to complete the TCRA. Where native vegetation (suitable for hawksbill nesting) within this zone is affected, the Navy will perform the following measures:
- At approximately 6 months after the TCRA is completed, the Navy, in coordination with the U.S. Fish and Wildlife Service, will assess the condition of pruned native vegetation and the locations where native vegetation was removed within the hawksbill nesting zone.
 - If native vegetation that was pruned has not survived, the Navy will replace the plant(s) at the same location with seagrape or other hawksbill suitable vegetation species that is locally available.
 - Where native vegetation was removed, the Navy will plant at the same location seagrape or other hawksbill suitable vegetation species that is locally available.
 - Considering the habitat requirements of the species to be planted, if environmental conditions at the locations described above do not appear entirely suitable for survival and growth of a new plant, a nearby location may be identified for planting.
 - Planting will be conducted within the rainy season to maximize survivorship of planting individuals.

- In order to avoid possible effects of planting on sea turtles, planting activities will be closely coordinated with the USFWS. If required, beach monitoring for turtle nests prior to planting will be conducted by USFWS.

Figure 1. La Chiva beach with TCRA, Action Area and hawksbill terrestrial habitat boundaries.



STATUS OF THE SPECIES/CRITICAL HABITAT

Species/Habitat description

The following information was copied from the 1993 Recovery Plan for Hawksbill Turtles in the U.S. Caribbean Sea, Atlantic Ocean, and Gulf of Mexico (NMFS and USFWS 1993).

The hawksbill is a small to medium-sized marine turtle. Nesting females average less than 3 feet in curved carapace length (Eckert 1992) and weight may be to 176 pounds in the Caribbean (Pritchard et al. 1983). Hatchlings in the U.S. Caribbean average about 1.6 inches straight carapace length and range in weight from 0.5 to 0.7 ounces (Hillis and Mackay 1989; Van Dam and Sarti 1989; Eckert 1992).

The hawksbill sea turtle is characterized by: two pairs of prefrontal scales; thick, posteriorly overlapping scutes on the carapace; four pairs of costal scutes; two claws on each flipper; and a beak like mouth. In addition, when on land the hawksbill has an alternating gait, unlike the leatherback and green sea turtles.

The carapace is heart shaped in very young turtles and becomes more elongate with maturity. The lateral and posterior carapace margins are sharply serrated in all but very old individuals. Carapace scutes are often richly patterned with irregularly radiating streaks of brown and black on an amber background. The scutes of the plastron are usually clear yellow. The scales of the head and forelimbs are dark brown or black and have sharply defined yellow scutes.

Hawksbill use different habitats at different stages of their life cycle. Sightings (Hornell 1927, Gunter 1981), strandings (Vargo *et al.* 1986; Carr 1987; Amos 1989) and gut-content analyses (Meylan 1984b) suggest that posthatchling hawksbills occupy the pelagic environment, taking shelter in weedlines that accumulate at convergence zones. Coral reefs are widely recognized as the resident foraging habitat of juveniles, subadults, and adults. This habitat association is undoubtedly related to their diet of sponges, organisms that need solid substrate for attachment. The ledges and caves of the reef provide shelter for resting both during the day and night. Hawksbills are found around rocky outcrops and high-energy shoals, which are optimum sites for sponge growth. Hawksbills are known to inhabit mangrove-fringed bays and estuaries, particularly along the eastern shore of continents where coral reefs are absent (Carr 1952). In the Caribbean, sea grass beds, which are thought to be peripheral habitat for hawksbills, sustain hawksbill foraging aggregations comparable to reef habitat (Bjorndal and Bolten 2010).

Hawksbills nest on low- and high-energy beaches in tropical oceans of the world, frequently sharing the high energy beaches with green turtles. Both insular and mainland nesting sites are known. Hawksbills will nest on small pocket beaches and, because of their small body size and great agility, can traverse fringing reefs that limit access by other species. They exhibit a wide tolerance for nesting substrate type and nests are typically placed under vegetation.

Life history and Population dynamics

The few data available for hawksbills suggest slow growth and an advanced age at sexual maturity, as has been demonstrated for several other species of sea turtles. Rates of growth vary among different size classes (Limpus 1992) and seem to decrease considerably after sexual maturity is reached. Based on data from growth rate studies (Boulon 1983, Diez and Van Dam 2002; Leon and Diez 1999; Krueger *et al.* 2011), age at sexual maturity has been estimated as 20 years or more in the Caribbean.

Although some hawksbills can nest year round depending on the locality, there is an approximate 6-month peak nesting season. For example the majority of the nests in the Caribbean are made from June to November. Nesting in the Caribbean is principally nocturnal, although rare daytime nesting is known. The entire nesting process takes approximately 1 to 3 hours.

Hawksbills have strong philopatry for their nesting beaches (Bjorndal *et al.* 1985), and are capable of returning to specific beach areas (Carr and Stancyk 1975, Diamond 1976, Lund 1985, Melucci *et al.* 1992). Hawksbills nest on average about 4.5 times per season at intervals of approximately 14 days (Corliss *et al.* 1989; Van Dam and Sarti 1990). As many as 12 clutches may be produced by a single female in one season (Melucci *et al.* 1992). In Florida and the U.S. Caribbean, clutch size is approximately 140 eggs, and several records exist of over 200 eggs per nest. In the U.S. Caribbean, nesting migration intervals of 2 to 3 years appear to predominate (Garduño-Andrade 1999; Richardson *et al.* 1999; Beggs *et al.* 2007).

Current global nesting abundance is provided for 88 nesting assemblages among 10 ocean regions around the world (NMFS and USFWS 2013). The primary information source for evaluating trends in global hawksbill populations is nesting beach data. For Puerto Rico, a recent trend shows an increase of hawksbill nesting mainly from Mona Island. The 2013 nesting season reported 2230 hawksbill nests in Puerto Rico, the majority of those being recorded from Mona Island (<http://www.tortugasmaunabo.com/censo%202013.htm>).

Status and distribution

The hawksbill sea turtle was federally listed as an endangered species on June 2, 1970 (35 FR 8491). The hawksbill sea turtle has experienced global population declines with about 70 percent of the sites examined showing a decrease in nesting abundance over time (NMFS and USFWS 2007). Most populations are declining, depleted, or remnants of larger aggregations. Hawksbills were previously abundant, as evidenced by high-density nesting at a few remaining sites and by trade statistics. The decline of this species is primarily due to human exploitation for tortoiseshell. While the legal hawksbill shell trade ended when Japan agreed to stop importing shell in 1993, a significant illegal trade continues. It is believed that individual hawksbill populations around the world will continue to disappear under the current regime of exploitation for eggs, meat, and tortoiseshell, loss of nesting and foraging habitat, incidental capture in fishing gear, ingestion of and entanglement in marine debris, oil pollution, and boat collisions.

The most significant hawksbill nesting in Puerto Rico occurs on Mona Island, which is located in the middle of the Mona Passage between Hispaniola and the mainland of Puerto Rico (NMFS and USFWS 2013). Nesting also occurs on Culebra Island, Vieques Island, and some mainland beaches. Nesting populations of Puerto Rico appeared to be in decline until the early 1990s, but all have increased during the periods they were surveyed: Mona Island (1974-2005), +539%; Caja de Muertos (1995-2003), +23%; Culebra Island (1993-2005), +190%; and Humacao (1987-2004), +930% (NMFS and USFWS 2007). Mona Island now hosts some 280-467 nesting females annually (van Dam *et al.* in press).

The hawksbill is found in tropical and subtropical seas of the Atlantic, Pacific, and Indian Oceans. Hawksbills are closely associated with coral reefs, one of the most endangered of all marine ecosystem types. The species is widely distributed in the Caribbean Sea and western Atlantic Ocean. In the U.S. Caribbean, hawksbill nesting occurs on beaches throughout Puerto Rico and the U.S. Virgin Islands (NMFS and USFWS 1993). Critical habitat for the hawksbill sea turtle has been designated for selected beaches and/or waters of Mona, Monito, Culebra, and Culebrita Islands, Puerto Rico.

Analysis of the species/critical habitat likely to be affected

The proposed TCRA may affect adult nesting hawksbill sea turtles, hawksbill nests and eggs, hawksbill hatchlings, and hawksbill nesting habitat. The proposed activities may affect approximately 18 acres of hawksbill nesting habitat. These 18 acres are estimated based on the characteristics of the suitable forested nesting habitat (about 25 meter wide buffer area from the line of the coastal vegetation landward) and the additional open sand beach area. Because of the nature of the actions (specifically UXO detonation and/or unexpected events), the TCRA may have an effect on sea turtle nests found in the additional 7 acres of open sand located seaward the TCRA. This open sand beach may also serve as hawksbill nesting area and it is an active nesting beach for leatherbacks, and has been in the past for green sea turtles as well. There is no designated critical habitat for hawksbill sea turtles in Vieques.

ENVIRONMENTAL BASELINE

This BO will only consider the 113 acres contained within the AA (Figure 1) of La Chiva Beach in Vieques, Puerto Rico, for the TCRA project and its direct and indirect impacts on sea turtle nesting habitat.

Status of the species within the action area

Table 2 shows sea turtle nesting numbers for La Chiva Beach since 2011. Numbers may represent an underestimate of the actual total nesting due to unequal efforts within and between each year. In addition, La Chiva Beach is not monitored consistently throughout the year for all sea turtle nesting seasons, with the most intense surveys occurring from April to July for the leatherback nesting season. Thus, Table 2 represents the minimum number of nests documented for each species per year. The leatherback is the most common species and green sea turtle nests are considered rare. Records show that hawksbill utilizes the vegetated area adjacent to La

Chiva Beach for nesting and the area is confirmed as good habitat for the species (CH2MHILL 2014).

Table 2. Sea turtle nests documented at La Chiva Beach from 2010 up to June 12, 2014 (data provided by VNWR).

SPECIES	YEAR			
	2011	2012	2013	2014
Hawksbill	5	4	1	0
Leatherback	10	7	15	4
Green	0	0	0	0

Factors affecting the species environment within the action area (AA)

The AA is influenced by the various actions described for the TCRA and other recreational and natural activities that take place within La Chiva Beach. The area contains coastal vegetation, rocky outcrops, open sand beach, vehicle access road with parking areas, gazebo type structures and access pathways. The AA lies within the area managed by the VNWR. Although the AA is approximately 113 acres, proposed actions may affect approximately 18 acres of hawksbill nesting habitat. Of these 18 acres, only 11 acres currently harbor forested habitat and 7 acres consist of open sand area.

The Service and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS) share Federal jurisdiction for sea turtles under the Act. The Service has responsibility for sea turtles on the nesting beach while NMFS has jurisdiction for sea turtles in the marine environment.

EFFECTS OF THE ACTION

Factors to be considered

The proposed TCRA for Munitions Response Site UXO 17 will occur within and adjacent to nesting habitat for the hawksbill sea turtle. Activities proposed involve impacts to hawksbill sea turtles in the terrestrial environment, which includes the following life stages: adult nesting sea turtles, nests and eggs, and hatchlings as they emerge from the nest and crawl to the sea.

Main factors to consider are the proposed vegetation removal and UXO MEC/MPPEH handling and disposal mechanisms and their possible effects on hawksbill nesting and habitat. Proposed conservation measures will avoid/minimize detrimental effects on nesting hawksbill and its habitat. For example, munitions demolition will not take place within 100 feet of any nest site unless necessary to insure public safety. In addition, no TCRA will take place during nighttime hours, when most of the sea turtle nesting occurs.

According to the Vegetation Removal SOP MR-1, the vegetation will be cut to a height of approximately 6 inches above ground surface to eliminate interference with MEC/MPPEH

detection or digital mapping activities. In addition, and unless absolutely necessary, cutting trees larger than 3 inches in diameter will be prohibited. However, this procedure may not be the most suitable to minimize effects on the nesting habitat. For example, the bay cedar *Suriana maritima*, a suitable hawksbill nesting habitat vegetation species, is rarely 3 inches in diameter, and most if not all would be cut according to the Vegetation Removal SOP MR-1. However, the Navy proposed to hire a qualified biologist to identify native vegetation to minimize cutting of native vegetation suitable for hawksbill sea turtles. Thus, the field work conducted by a trained biologist to minimize cutting of native vegetation may minimize the overall effects to the hawksbill habitat.

According to the information provided, the entire TCRA for UXO 17 is expected to last 6 months. Thus, the direct effects would be expected to be short-term in duration. However, these effects may continue to impact nesting and hatchling sea turtles and sea turtle nests in subsequent nesting seasons, while the surviving native vegetation recovers from the TCRA. A total of 117 hawksbill nests were recorded in all of Vieques for the 2013 season (ATMAR 2014).

Analyses for effects of the action

Beneficial Effects

Beneficial effects are those effects of an action that are wholly positive, without any adverse effects on a listed species or designated critical habitat. The only beneficial effects considered for the TCRA and described in the BA (CH2MHILL 2014), are those associated with the sea turtle nest surveys and proposed conservation measures to avoid/minimize direct effects on the sea turtle nests if found.

Direct Effects

The proposed TCRA will directly affect approximately 11 acres of forested hawksbill nesting habitat by cutting and/or removing the vegetation available for the species for nesting. All TCRA within this area has the potential to adversely affect nesting hawksbill sea turtles, hawksbill nests and eggs, hawksbill hatchlings, and hawksbill nesting habitat. Direct effects on all life stages of the hawksbill may result in harm, harass and mortality from habitat and nest disturbance as a result of the vegetation removal activities and associated human and machinery traffic.

Vegetation removal may change the nesting behavior of adult female sea turtles, diminish nesting success, and cause reduced hatching and emerging success. Decreased cover and protection from the vegetation removal may also change the incubation conditions within the nest because of increased temperatures (NMFS and USFWS 1993; NMFS and USFWS 2007; Ackerman 1997). Any decrease in productivity and/or survival rates would contribute to the vulnerability of the sea turtles nesting in Vieques.

In addition, the TCRA could result in the burial or crushing of nests or hatchlings. Some nest may be inadvertently missed or misidentified as false crawls during daily patrols. Even under

the best of conditions, about 7 percent of the nests can be misidentified as false crawls by experienced sea turtle nest surveyors (Schroeder 1994). However, for the purpose of this action, qualified and experienced personnel will be treating any crawls as a potential nest for avoidance purposes. Driving directly above or over incubating egg clutches or on the beach can cause sand compaction, which may result in adverse impacts on nest site selection, digging behavior, clutch viability, and emergence by hatchlings, as well as directly killing pre-emergent hatchlings (Mann 1977, Nelson and Dickerson 1987, Nelson 1988). Any ATV use for turtle monitoring shall be maintained below the water line to avoid nests.

Detonation for all UXO MEC/MPPEH found within the TCRA area may also have direct effects on sea turtles nests, as specified by the Navy (GMI 2006). If the ordnance to be donated in place is large or close to a sea turtle nest within the AA, the nest could be damaged or destroyed in the crater formed from the explosion. Vibration from the explosion could adversely affect the nest siphon or egg chamber resulting in mortality to the embryos of hatchlings. Large holes, mounds, or debris left on site following ordnance removal or detonation could impede the movement of female sea turtles from the sea to a nesting area or back to the sea. However, excavations resulting from removal or detonation will be backfilled during the action and will not impede sea turtle movement. Further, no vegetative debris will be left within sea turtle nesting habitat.

Visual cues are the primary sea-finding mechanism for hatchling sea turtles (Mrosovsky and Carr 1967, Mrosovsky and Shettleworth 1968, Dickerson and Nelson 1989, Witherington and Bjorndal 1991). When artificial lighting is present on or near the beach, it can misdirect hatchlings once they emerge from their nests and prevent them from reaching the ocean (Philibosian 1976, Mann 1977, FWC 2007, Berry *et al.* 2013). In addition, a significant reduction in sea turtle nesting activity has been documented on beaches illuminated with artificial lights (Witherington 1992, Knowles *et al.* 2009, Lake and Eckert 2009). The Service does not anticipate effects from lighting since no lighting will be used for the TCRA.

Some conservation measures have been proposed in order to avoid/minimize direct adverse effects on all sea turtle life stages and nests (see Proposed Conservation Measures of this BO).

Indirect Effects

Indirect impacts to the hawksbill and its nesting habitat may occur within La Chiva Beach. According to the TCRA WP (CH2MHILL 2013a), areas where vegetation has been removed will be allowed to naturally re-vegetate. However, the TCRA will temporarily modify hawksbill nesting habitat, which may result in hawksbills to nest in less suitable areas with less vegetation (Ficetola 2007). All native vegetation affected by the TCRA that does not survive will be considered a permanent modification of habitat. Although hawksbills are known to nest in different habitats, the benefits of protecting natural vegetation cover at hawksbill nesting beaches is well documented (Horrocks and Scott 1991, Kamel and Mrosovsky 2005, Kamel and Mrosovsky 2006a, Kamel and Mrosovsky 2006b, Ficetola 2007, IAC 2010, Ditmer and Stapleton 2012, Kamel 2013). In addition, invasive plant species exploiting the newly available cleared habitat may further degrade the quality of the coastal vegetation used by the hawksbill for nesting and provide means for further exotic vegetation growth.

No interrelated or interdependent effects are anticipated.

Species' response to a proposed action

The main adverse effect of the TCRA is the modification of the hawksbill nesting habitat. This may result in a decreased nesting success, especially during the first years post TCRA. Once the TCRA is completed, hawksbill nesting habitat may be considered less suitable. Suitability should increase as vegetation grows back and after an assessment is made to if a reforestation effort is needed. Habitat degradation may result in behavior modification of nesting females and or hatchlings, such as:

- an increase in false crawls and their return to the water without nesting;
- displacement of female turtles into nesting habitat that is sub-optimal;
- an increase in the physiological cost of nesting;
- a possible decrease in nesting activity;
- disorientations of nesting females and hatchlings;
- and decrease in the survival rate of the eggs within a nest.

In addition, the TCRA may result in the loss of entire sea turtle nest or hatchlings because of any incidental disturbance, burial or crushing that may result from all TCRA related activities (*i.e.* detonation, vehicle use).

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this BO. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. The Service is not aware of any cumulative effects in the project area.

CONCLUSION

After reviewing the current status of the hawksbill sea turtles, the environmental baseline for the action area, the effects of the proposed TCRA, the proposed "Conservation Measures", and the cumulative effects, it is the Service's biological opinion that the project, as proposed, is not likely to jeopardize the continued existence of the hawksbill sea turtle and is not likely to destroy or adversely modify critical habitat. No critical habitat has been designated or proposed for the hawksbill sea turtles in Vieques, Puerto Rico. We based this conclusion on the following:

1. The TCRA will only take place during daylight hours, when most sea turtle nesting does not occur.
2. Species specific conservation measures will be implemented before, during and after the TCRA to avoid/minimize possible direct and indirect effects, which have been shown to help minimize adverse impacts to sea turtles.

3. Within the past 3 years of sea turtle nesting activity in Vieques, hawksbill sea turtle nesting that occurs on La Chiva beach represents a small percentage of nesting on other beaches in Vieques and throughout the species entire Caribbean range. For example, for the 2013 season only 1 hawksbill nest was recorded in La Chiva beach out of the 117 total hawksbill nests for all of Vieques; 4 out of 250 total nests in 2012; and 5 nests out of 63 total nests in 2011.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be implemented by the Navy so that they become binding conditions of any authorization issued for the exemption in section 7(o)(2) to apply. The Navy has a continuing duty to regulate the activity covered by this incidental take statement. If the the Navy (1) fails to adhere to the terms and conditions of the incidental take statement, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Navy must report the progress of the action and its impacts on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE ANTICIPATED

The Service anticipates that approximately 18 acres of hawksbill habitat will be subject to incidental take as a result of this proposed action. Take is expected to be in the form of: (1) degradation of vegetated hawksbill nesting habitat; (2) destruction of all nests that may be deposited within the TCRA timeframe and missed by a nest surveyor; (3) behavior modification and/or reduced hatchling emergence success, resulting in false crawls or situations where they choose marginal or less suitable nesting areas to deposit eggs; or (4) harassment in the form of disturbing or interfering with female sea turtles attempting to nest during daytime within the TCRA area.

EFFECT OF THE TAKE

In this BO, the Service determined that the level of anticipated take is not likely to result in jeopardy to the species. Critical habitat has not been designated in the TCRA area; therefore, the project will not result in destruction or adverse modification of critical habitat.

REASONABLE AND PRUDENT MEASURES

The Navy is implementing conservation measures as part of the proposed action to avoid/minimize take of the hawksbill sea turtle and its habitat. These measures include cutting the minimum amount of vegetation, presence of a biologist/environmental scientist to oversee vegetation removal, and sea turtle nest monitoring. The Service's evaluation on this BO includes consideration of the measures developed by the Navy to reduce the adverse effects of the proposed project on the species.

The following reasonable and prudent measures (RPMs) are intended to supplement the protective measures proposed by the Navy and are necessary and appropriate to minimize the incidental take of the hawksbill and its habitat. Any subsequent changes in the proposed conservation measures or in the conditions under which these activities will occur, may constitute a modification of the proposed action and may warrant re-initiation of formal consultation, as specified at 50 CFR § 402.16.

1. The Navy in coordination with the Service shall ensure that conservation measures, avoidance/minimization procedures, and vegetation removal are implemented as explained in this BO, and overseen by qualified and experienced personnel.
2. Before the project starts, the Navy shall ensure that all TCRA personnel are clearly aware and understand the conservation measures, reasonable and prudent measure and the terms and condition outlined in this BO.
3. The Navy shall conduct daily sea turtle surveys at La Chiva beach utilizing qualified and experienced personnel and as specified in the Terms and Condition below.
4. The Navy shall monitor and report the levels of incidental take on the hawksbill. Monthly progress and a final report at the end of the action shall be submitted to the Caribbean Ecological Services Field Office (CESFO) and VNWR.
5. In case any MEC/MPPEH cannot be safely removed and and detonation in place is required, the Navy shall take all necessary precautions to avoid the take of any sea turtle nests present within the AA.
6. The Navy shall notify the VNWR and CESFO within 24 hours if a sea turtle adult, hatchling, egg, or nest is harmed or destroyed as a direct or indirect result of the project.

7. All anthropogenic garbage brought in or produced by the project team within the TCRA shall be disposed of accordingly in predator proof receptacles, and removed. No garbage shall be left in the premises once the project ends.
8. Once the TCRA is completed, the Navy shall assess survivorship of all the native vegetation within the TCRA as specified in the Terms and Conditions below.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the Navy must comply with the following terms and conditions, which implement the reasonable and prudent measures, described above and outline reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. Daily sea turtle nesting surveys shall be conducted by qualified and experience personnel on La Chiva beach as specified in the Proposed Conservation Measures section of this BO and in the Service's July 12, 2013, letter (Included in Attachment II of this BO), with the exception of the data sheet. Survey personnel shall utilize the data sheet included in Attachment III of this BO. Once monitoring begins, it shall continue daily for the duration of the TCRA. Sea turtle monitoring shall begin during daylight morning hours before any TCRA.
2. The VNWR and CESFO shall be informed within 24 hours of any sea turtle activity in La Chiva beach and recorded accordingly in the data sheet. Full survey results shall be submitted to the Service every week and in the final TCRA project report.
3. If a hawksbill nest is found during surveys, all the necessary precautions to avoid detrimental effects on the nest shall be taken. Necessary precautions include the sea turtle nest conservation measures proposed by the Navy and those within the July 12, 2013 letter (Attachment II), with the exception of the data sheet. All TCRA personnel must be made aware of the position of the nest and the nest shall be marked accordingly.
4. For any detonation of ordnance, the Navy shall establish appropriate buffer protection zone around active sea turtles nest in order to avoid detonation effects on the nest. Nest buffer protection zones shall be based on the size of the munitions, the distance the energy is deflected, size of craters, and other relevant factors. The Navy shall delay all detonations that may affect a sea turtle nest until the nest is no longer active.
5. If any nesting turtles are sighted during daylight hours, TCRA within hawksbill nesting habitat must cease immediately until the turtle has returned to the water and the nest is marked for avoidance. All precaution shall be taken as to not interfere with the nesting sea turtle.
6. A minimum amount of vegetation will be cut within each 30 m x 30 m operating grid. Prior to any vegetation removal, trees 3 inches or larger in diameter (DBH) and all native plant species shall be identified. Unless it is absolutely necessary, cutting of any native

trees shall be prohibited. If any native trees must be cut, the following information shall be recorded prior to cutting: species: GPS location, DBH size, justification as to why it needed to be cut, and a photo of the tree (preferably showing why it hinders TCRA).

7. Clearing of all other native vegetation that provides hawksbill nesting habitat shall proceed as specified in the Proposed Conservation Measures section of this BO.
8. All cut vegetation shall be removed from hawksbill habitat.
9. All TCRA staging areas must be located off the beach. Nighttime storage of construction equipment not in use must be off the beach as well.
10. The Navy shall allow Service personnel to accompany Navy personnel to assess implementation of TCRA vegetation clearing procedures and compliance.
11. Upon locating a dead, injured, or sick individual of an endangered or threatened species, initial notification must be made to the VNWR Office at (787)741-2138 and Jan P. Zegarra, Caribbean Ecological Services Field Office at (787) 851-7297 x 220.

If, during the course of the action, the anticipated level of incidental take is exceeded (11 acres of forested hawksbill nesting habitat), such incidental take represents new information requiring re-initiation of consultation and review of the reasonable and prudent measures provided. The Navy must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. At this time, no additional conservation recommendations are available.

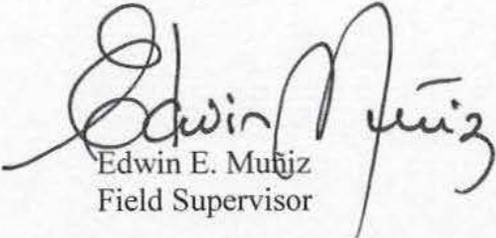
REINITIATION NOTICE

This concludes formal consultation on the action outlined in the opening paragraph. As provided in 50 CFR §402.16, re-initiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded within the project's footprint in hawksbill nesting habitat area of approximately 18 acres; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion or if the project has not been completed within 2 years of the issuance of this BO; (3) the Service's action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical

habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending re-initiation.

If you have any questions about this BO please contact Marelisa Rivera, Deputy Field Supervisor at 787-851-7297 extension 206.

Sincerely,



Edwin E. Mujiz
Field Supervisor

Attachments

jpz/mtr

cc:

National Sea Turtle Coordinator, NFESFO, Jacksonville FL

Regional Section 7 Coordinator, Southeast Region

USFWS Project Manager, Boqueron

EPA Project Manager, New York

EPA Project Manager, Vieques

EQB Project Manager, San Juan

NOAA Project Manager

VNWR, Vieques, PR

DNER Project Manager, San Juan

DNER Sea Turtle Coordinator, San Juan

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Attachment I. Vegetation Removal Standard Operating Procedure (SOP MR-1) in the Master Sampling and Analysis Plan, East Vieques Terrestrial UXO Sites, Former Vieques Naval Training Range (CH2MHILL 2013b). 1 p.

Vegetation Removal

1.1 Purpose and Scope

The purpose of this Standard Operating Procedure (SOP) is to identify the means and methods to be employed when removing vegetation in support of munitions response (MR) activities.

1.2 Equipment and Materials

- Hand tools – chain saws, trimmers, weed eaters, etc.
- Mechanical cutting equipment, as allowable – mechanized cutting heads, tractors with cutting decks, etc
- Back hoe (optional).

1.3 Procedures and Guidelines

1.3.1 General

- Vegetation removal will be conducted by hand (manual) utilizing hand carried tools (e.g., weed eaters) in areas that have not been surface cleared and completed the quality control/quality assurance (QC/QA) process or are otherwise deemed unsafe for mechanical vegetation cutting. Mechanical cutting of vegetation may occur if the area has completed the QC/QA process and is deemed safe to do so, in accordance with the NOSSA- and DDESB-endorsed Explosive Safety Submission established for the project.
- Unless it is absolutely necessary, cutting trees larger than 3 inches in diameter will be prohibited. Trees will be felled into an area that has already been surface swept for MEC.
- The vegetation will typically be cut to a height of approximately 6 inches above ground surface to eliminate interference with munitions and explosives of concern (MEC) detection or digital geophysical mapping (DGM) survey activities.
- All cut vegetation will be accumulated onsite and left in place.

1.3.2 Vegetation Removal Process

1. Prior to any field activities related to the removal of vegetation, the area(s) to be cleared of vegetation will be identified through the Work Area Determination (WAD) process, or some other equivalent means. The WAD process will consist of reviewing the areas requiring vegetation removal in relation to known areas where sensitive vegetation or habitats exist at the project site as identified through the Biological Assessment. All areas cleared of vegetation will be approved by FWS prior to vegetation removal. Any restrictions on vegetation removal and potential plant species that cannot be cut will be identified prior to approving the area for vegetation removal.
2. Following the WAD approval, UXO Technicians will inspect all areas of the grid ahead of the vegetation removal crews with the aid of handheld magnetometers. The UXO Technicians will mark any MEC or other hazards by encircling the hazard with flagging tape.
3. The vegetation removal will be supervised by UXO Technician III and a UXO Technician II. Laborers will use hand tools that are appropriate for the vegetation being cut, such as chain saws, power string trimmers, and machetes.
4. Trees will be trimmed or removed on a case-by-case basis and only as required to accomplish the project tasks. If removal is required, the tree will be cut using chain saws or other hand held equipment. The tree will be sectioned, if necessary, to remove it from the immediate area, so it does not interfere with MEC detection or survey activities.

1.4 Attachments

- None

Attachment II. USFWS July 12, 2013 letter to the Navy. 7 p.



United States Department of the Interior



FISH AND WILDLIFE SERVICE

Caribbean Ecological Services

Field Office

P.O. Box 491

Boqueron, PR 00622

JUL 12 2013

In Reply Refer To:
FWS/R4/CESFO/72147-027

Mr. Dan Waddill
Head of Vieques Restoration Section
Naval Facilities Engineering Command
Attn: Code EV31
6506 Hampton Blvd.
Norfolk, VA 23508-1278

Re: Sea turtle monitoring program
Vieques, Puerto Rico

Dear Mr. Waddill:

This letter is to follow up the June 13, 2013, Vieques MOA meeting with Service staff Rich Henry, Susan Silander, Mike Barandiaran, Felix Lopez, yourself and Mr. Brett Doerr of CH2MHILL regarding the current implementation of the sea turtle nest monitoring program during Navy activities on Vieques beaches to comply with the Endangered Species Act of 1973, as amended. During that meeting we also discussed Navy's commitments to monitor sea turtle nesting activities prior and during Navy activities on beaches.

The munitions response actions planned and implemented on the Vieques National Wildlife Refuge have the potential to adversely affect federally-listed sea turtles and their nesting beaches. If appropriate monitoring efforts are not implemented, the Navy's activities may result in damages to sea turtle nests, including the mortality of eggs and hatchlings. The Service and the Navy agreed that the Endangered Species Act (ESA) was an Applicable or Relevant and Appropriate Requirement (ARAR) and the best way to comply with the substantive requirements was to follow the consultation process pursuant Section 7(a)(2) of the ESA. As part of the process the Navy developed a Biological Assessment (BA) in May 2006 to assess possible effects of the proposed cleanup activities in the Live Impact Area (LIA) on federally-listed sea turtles and proposed conservation measures to appropriately minimize the effects on the species and their habitats.

The Service concurred with the Navy that the proposed actions (as described in the BA) and the implementation of the conservation measures were appropriate to minimize possible adverse effects to the level that were "not likely to adversely affect" listed species. Based on the actions and implementation of the conservation measures, we did not anticipate "take" of listed species, thus, formal consultation was precluded.

Over the years, several amendments to the 2006 BA have been made to address additional munitions sites, including the following:

- 1) Amendment 1, Eastern Conservation Area 2007, now known as UXO-1.
- 2) Former VNTR and SWMU-4 Turtle Nesting Areas 2007, this included all other sea turtle nesting beaches in eastern Vieques plus SWMU-4 in western Vieques. Published after additional Service site visits to the new beach areas.
- 3) Biological Assessment for Selected Portions of the Surface Impact Area and Eastern Maneuver Area 2010.
- 4) Biological Assessment for PI-9, PI-13, and Debris Piles within UXO-15, 2012.

All the subsequent BA amendments default back to the sea turtle effect determinations and conservation measures of the original 2006 BA.

Based on our discussions during the recent MOA meeting and a review of the commitments made in the 2006 BA, the Navy and CH2MHILL will carry out the following:

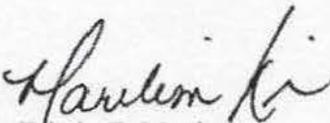
- 1) Designate one qualified and experienced person as the main sea turtle beach monitor; this person will monitor all beaches on which the Navy is carrying out work as established by the beach zone criteria in the 2006 BA. This will be the principal responsibility of the designated person.
- 2) At least two alternate qualified and experienced sea turtle beach monitors will be designated in the event the primary monitor is not available on a given day.
- 3) By "qualified and experienced" the Service requires that sea turtle beach monitors should have received training on sea turtle monitoring and data collection and have worked previously as sea turtle beach monitors. The Vieques NWR sea turtle coordinator will provide the necessary training and guidance to the Navy sea turtle monitors.
- 4) Sea turtle data for nesting and hatching will be recorded for each nest found on the designated data sheets (See enclosure). Data sheets will be sent to the Vieques NWR sea turtle coordinator at the end of each calendar week.
- 5) As mentioned in the meeting, the sea turtle data sheets could be integrated into the existing PDA used for data recording for munitions work; this would expedite the information transfer process, we leave this at the discretion of the Navy and its contractors.
- 6) If the relocation of a sea turtle nest is needed, this requires specialized training. As per Section 3.3.9 of the 2006 BA relocation can be only be conducted by a biologist with the required DNER permit and training.
- 7) Any concerns or issues regarding the implementation of the sea turtle conservation measures will be immediately reported to the FWS Project Manager for resolution.

8) Annual reports should be submitted to CESFO at the end of each calendar year. Negative reports should also be sent to CESFO in order to document years when no Navy sea turtle monitoring occurred. The reports should consist of a narrative of what beaches were surveyed, duration of work, problems encountered etc. They should include maps of the beaches and turtle nest locations. The report should include a table which should indicate the beach, number of nests by species and hatching data. The Vieques NWR sea turtle coordinator can provide additional guidance if needed.

We appreciate the Navy's cooperation in this matter.

The Caribbean Ecological Service Field Office and Vieques National Wildlife Refuge Staff are available to further discuss the data needs and requirements, please feel free to contact Felix Lopez CESFO at 787-851-7297 x 210 or Mike Barandiaran, Vieques NWR Manager at 787-741-2138.

Sincerely,


for Edwin E. Muñiz
Field Supervisor


Susan Silander
Project Leader

encl (1)
fhl
cc:

VINWR, Vieques
Brett Doerr, CH2MHILL
DNER, San Juan

Data Sheet for Sea Turtle Nesting Activities on Vieques

Date: _____

Hour: _____ (AM PM)

Observer: _____

Name of Beach: _____

Species

Dermochelys coriacea (leatherback) _____

Eretmochelys imbricata (hawksbill) _____

Chelonia mydas (green sea turtle) _____

Other/Unknown: _____

Nest Data

Nest _____ Crawl _____ Nest Attempt _____

m. _____ from mark/stake # _____

m. _____ from mark/stake # _____

Distance from nest to vegetation line: _____ m

Distance from nest to high tide line: _____ m

GPS: (in Lat/Long, WGS 84) _____ N

_____ W

Final Nest Destination

Natural _____ Robbed _____

Relocated _____ Preyed upon _____

Reloc. by: _____

Information on Relocated Nest:

Place: _____

m. _____ from mark/stake # _____

m. _____ from mark/stake # _____

GPS in Lat/Long: _____ N

_____ W

Contact FWS Vieques Sea Turtle coordinator prior to attempting sea turtle nest relocation.

Hatching Data

Approximate Date of Hatching: _____

Approximate hour: _____ (AM, PM)

Excavation Date: _____

Hour: _____ (AM, PM)

I. Preyed upon..... _____

II. Not Hatched _____

A. Closed eggs with dead embryos..... _____

B. Closed eggs w/out dead embryos (yolk only)..... _____

C. Live turtles in perforated (open) eggs..... _____

D. Dead turtles in perforated (open) eggs..... _____

III. Hatched

A. Found inside the nest

1. Shells..... _____

2. Live..... _____

3. Dead..... _____

B. Left the nest or found outside the nest

1. Live..... _____

2. Dead..... _____

IV. Total # of eggs with yoke..... _____

V. Total # of eggs without yoke (infertile)..... _____

VI. Turtles removed alive from the nest _____

A. Liberated..... _____

Date of liberation:

B. Died..... _____

Hatching Success

Total # of Shells _____ x 100

Total # of eggs with yoke

Emergence Success

Shells - dead in nest - live in nest _____ x 100

Total # of eggs with yoke

Observations: _____

Diagram of nest location (if applicable):

CONSERVATION MEASURES FOR THE PUERTO RICAN BOA - USFWS

General Information:

The Endangered Puerto Rican boa (*Epicrates inornatus*) is an endemic species and it is the largest snake that inhabits the Puerto Rico Island Shelf. The color and pattern of the Puerto Rican boa is highly variable. The species color can range from tan to dark brown with irregular diffuse marking on the dorsum but some individuals lack marking and are uniformly dark. Juveniles have reddish brown ground color with numerous pronounced markings. The Puerto Rican boa can be found in the habitat range from the sea level to about 400 m of elevation. The boa tolerates a wide variety of habitat types ranging from wet montane to subtropical dry forest and can be found from virgin forest to areas that exhibit various degrees of human disturbance like roadside or out buildings. Boas are more active at night, remaining less active concealed or basking in the sun during the day. The U.S. Fish and Wildlife Service (Federal Register October 13, 1970) listed the Puerto Rican boa (*Epicrates inornatus*) as endangered in 1970 and it is protected by the Endangered Species Act of 1973, as amended. Any person that injures, captures, or kills a Puerto Rican boa is subject to penalties under federal law of up to \$100,000, one year in prison or a combination of both.

Recommendations:

The U.S. Fish and Wildlife Service (hereafter the Service) has developed recommendations to avoid or minimize impacts on the boa during a project development in an area where the boa may occur. The recommendations are the following:

- A. Prior to any earth movements or vegetation clearing, the boundaries of the project area, the buffer areas and areas to be protected should be clearly marked in the project plan and in the field.
- B. A pre-construction meeting should be conducted to inform supervisors and employees about the conservation of protected species, as well as penalties for harassing or harming such species.
- C. Prior to any use of machinery on areas where the boa may occur, the vegetation should be cleared by hand to provide time to the boa, if present, to be detected or move away from the area. All personnel involved in site clearing must be informed of the potential presence of the snake, and the importance of protecting the snakes.
- D. Before activities commence each workday during the vegetation clearing phase, the experienced personal in identifying and searching for boas should survey the areas to be cleared that day, to ensure that no boas are present or affected within the work area. If boas are found within the working area, activities should stop at the area where the boas are found until the boas move out of the area on their own. Activities at other work

sites, where no boas have been found after surveying the area, may continue. If relocation of the species is necessary, any relocated boas should be transferred by authorized personnel of the Department of Natural and Environmental Resources (DNER) to appropriate habitat close to the project site. Any findings should be reported to the Service and to the DNER Ranger office so they can further assist you in developing sound conservation measures and specific recommendations to avoid, minimize and/or compensate for any impacts to this species.

- E. Strict measures should be established to minimize boa casualties by motor vehicles or other equipment. Before operating or moving equipment and vehicles in staging areas near potential boa habitats (within 25 meters of potential boa habitat), these should be thoroughly inspected to ensure that no boas are lodged in the standing equipment or vehicles. If boas are found within vehicles or equipment, authorized personnel of DNER must be notified immediately for proper handling and relocation. Any relocated boas should be transferred to appropriate habitat close to the project site.

Attachment III. Navy Sea Turtle Monitoring Form. 1p.

Data Sheet for Sea Turtle Nesting Activities on Vieques

Date: _____

Hour: _____ (AM PM)

Observer: _____

Name of Beach: _____

Species

Dermochelys coriacea (leatherback) _____

Eretmochelys imbricata (hawksbill) _____

Chelonia mydas (green sea turtle) _____

Other/Unknown: _____

Nest Data

Nest ___ Crawl ___ Nest Attempt ___

m. _____ from mark/stake # _____

m. _____ from mark/stake # _____

Distance from nest to vegetation line: _____ m

Distance from nest to high tide line: _____ m

GPS: (in Lat/Long, WGS 84) _____ N

_____ W

Final Nest Destination

Natural ___ Robbed ___

Relocated ___ Preyed upon ___

Reloc. by: _____

Information on Relocated Nest:

Place: _____

m. _____ from mark/stake # _____

m. _____ from mark/stake # _____

GPS in Lat/Long: _____ N

_____ W

Contact FWS Vieques Sea Turtle coordinator prior to attempting sea turtle nest relocation.