U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
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November 19, 2020

LTC Timothy Pochop
United States Marine Corps
Marine Corps Base Hawaii
PO Box 63002
Kaneohe Bay, HI 96863-3002

RE: Request for Informal ESA Consultation on application of fire retardant FORTIFY on Marine Corps Base Hawaii, Kaneohe, Hawaii (I-PI-20-1875-AG, PIRO-2020-03086, LFE/099-20)

Dear Colonel Pochop:

On October 21, 2020, NOAA's National Marine Fisheries Service (NMFS) received your written request for concurrence that the U.S. Marine Corps' proposed action to use the fire retardant FORTIFY on Marine Corps Base Hawaii (MCBH) in Kaneohe, Hawaii, is not likely to adversely affect (NLAA) the following endangered or threatened species or designated critical habitat under NMFS' jurisdiction: endangered Hawaiian monk seals, threatened Central North Pacific green turtles, or endangered hawksbill turtles. This response to your request was prepared by NMFS pursuant to Section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. §1531 *et seq*.), implementing regulations at 50 CFR 402, and agency guidance for the preparation of letters of concurrence.

Updates to the regulations governing interagency consultation (50 CFR part 402) were effective on October 28, 2019 [84 FR 44976]. We are applying the updated regulations to this consultation. As the preamble to the final rule adopting the regulations noted, "[t]his final rule does not lower or raise the bar on section 7 consultations, and it does not alter what is required or analyzed during a consultation. Instead, it improves clarity and consistency, streamlines consultations, and codifies existing practice." We have reviewed the information and analyses relied upon to complete this letter of concurrence in light of the updated regulations and conclude the letter is fully consistent with the updated regulations.

This letter underwent pre-dissemination review using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554. A complete record of this consultation is on file at the Pacific Island Regional Office, Honolulu, Hawaii.

Proposed Action

The action involves applying FORTIFY™, an ammonium polyphosphate-based mixture in an aqueous form containing polymeric viscosity modifiers (i.e. guar gum, clay) (Yu et al. 2019), as a preventative fire-retarding treatment on pyrophytic vegetation on MCBH Kaneohe Bay Range Training Facility (KBRTF) to reduce the fire hazard associated with live fire training. The gulch is used by explosive ordnance technicians to detonate unexploded ordnance, train combat engineers on the anti-personnel obstacle breaching system, and train Marine units on the deployment of claymores. Many times these trainings result in fires due to hot metal shrapnel or hot motors landing in the tall dry pyrophytic grasses that dominate the area, which threaten the approximately 2000 red-footed boobies in the northwest corner of the KBRTF. FORTIFY would be used to control the spread of fire in two locations.

FORTIFY, a viscoelastic fluid, adheres to vegetation surface to form a weather resistant film. This film may last an entire fire season (May-September). There are two proposed phases.

Phase 1: FORTIFY will be sprayed once on the invasive pyrophytic vegetation, mostly grasses, in HE Finger and on the steep slopes of the central large gulch (Figure 1). The application will likely occur in May 2021 (pending weather cooperation). Fire retardant will not be applied aerially or near waterways, but instead will be applied using standard pumps and sprayers. FORTIFY will not be applied if rain is forecasted within 48 hours after the planned day of application.

Figure 1. Kaneohe Bay Range Training Facility, including the gulch and HE Finger where FORTIFY would be applied, and Fossil beach.

Phase 2: If FORTIFY proves effective at mitigating the spread of fire, the Marine Corps will apply it along predetermined fuel and fire breaks and on slopes below primary booby nesting trees (Figure 2). These are areas where vegetation cannot be managed due to hidden unexploded ordnance, steep terrain, or maintenance is too intensive to conduct. FORTIFY will only be

applied once annually for a couple years to assess its efficacy over the wet and dry seasons. If proven effective at fire control, FORTIFY will only be applied no more than twice a year.

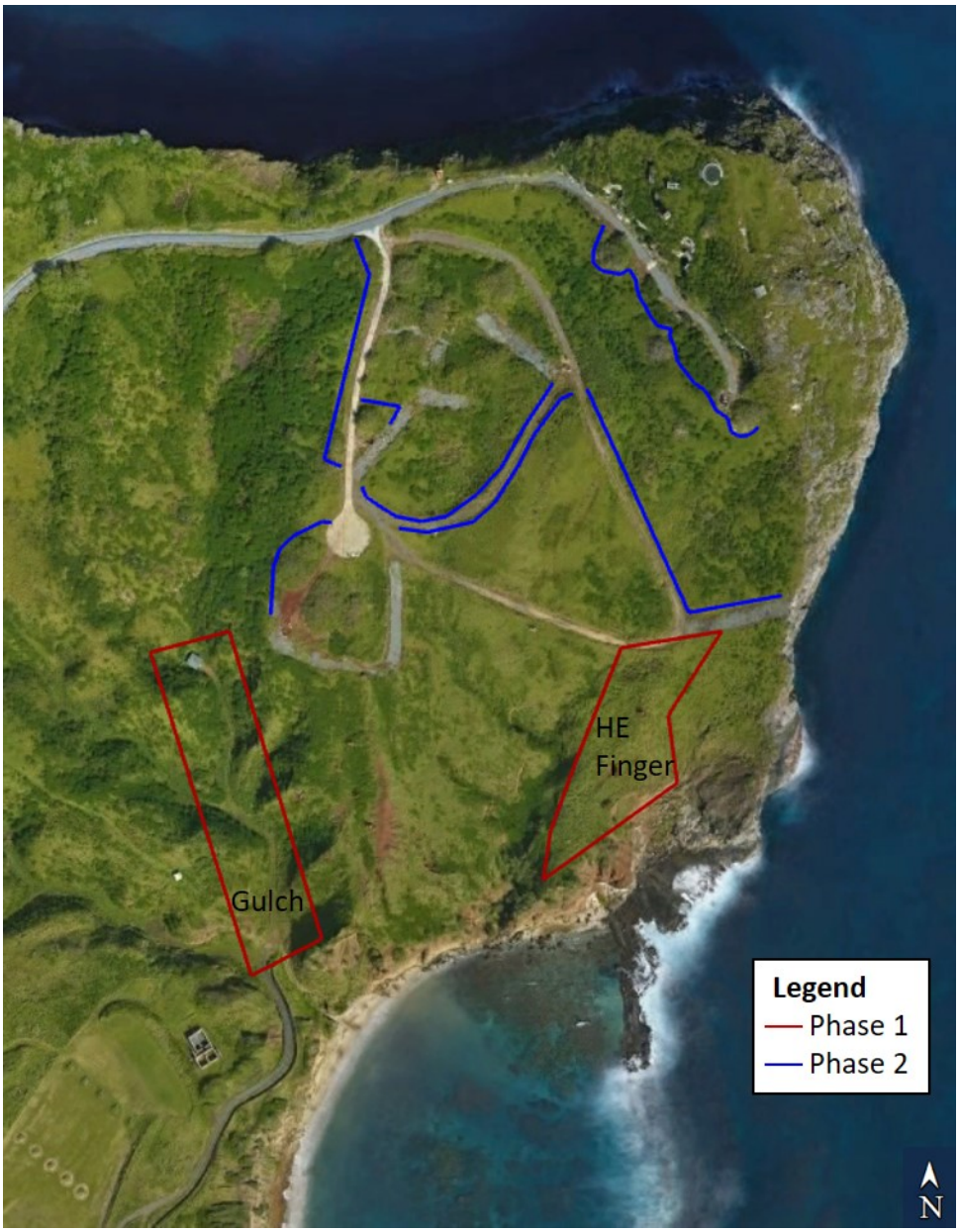

Figure 2. Mokapu Peninsula areas on which FORTIFY will be administered. Phase 1 is in red, Phase 2 is in blue.

Action Area

The action area for the proposed activity encompasses the areas upon which FORTIFY will be sprayed on Mokapu Peninsula and the area in which it would travel to the ocean.

- Gulch: the action area is the 1.9 acres that are to be sprayed and the area extending to the ocean approximately 33 meters away

- HE Finger: the action area is the 1.3 acres to be sprayed with FORTIFY along with the area extending approximately 36 meter to the ocean
- Phase II area containing the booby colony: the lines to be sprayed extending 11 m from the farthest east blue line to the coast, and 46 m north from the top of the two blue lines in Figure 2

The action area is not anticipated to extend very far into the ocean in any measurable concentration, given the adherence of the fire retardant to the vegetation in conjunction with spraying during the dry season and utilization of core logs, absorbent socks, and silt fencing (or something similar) to capture sediment runoff.

Listed Species

The ESA-listed threatened and endangered species under NMFS' jurisdiction listed in Table 1 are known to occur, or could reasonably be expected to occur, in the action area, and may be affected by the proposed activities. Detailed information about the biology, habitat, and conservation status of the animals listed in Table 1 can be found in their status reviews, recovery plans, federal register notices, and other sources at https://www.fisheries.noaa.gov/topic/endangered-species-conservation.

Table 1. Common name, scientific name, ESA status, effective listing date, and Federal Register reference for ESA-listed species considered in this consultation.

Species	Scientific Name	ESA Status	Effective Listing Date	Federal Register Reference
Green Sea Turtle Central North Pacific	*Chelonia mydas*	Threatened	05/06/2016	81 FR 20057
Hawksbill Sea Turtle	*Eretmochelys imbricata*	Endangered	06/03/1970	35 FR 8491
Hawaiian Monk Seal	*Neomonachus schauinslandi*	Endangered	11/23/1976	41 FR 51612

In the MCBH Kaneohe eastern shoreline, no nesting or haulouts have been observed by hawksbill sea turtles, thus occurrence in Fossil Bay is low. The hawksbill sea turtle, while utilizing the coastal waters of the Main Hawaiian Islands, nest only on the south coast of Hawaii Island[1].

Green sea turtles are a common occurrence in Hawaii waters, including those of the MCBH Kaneohe. Given the nesting events documented from April through August of 2019 and 2020, green sea turtles are common along the beaches of MCBH Kaneohe.

Hawaiian monk seals have been sighted on the Mokapu Peninsula northern beaches. From January through September 2020, 30 Hawaiian monk seal haulouts were documented on MCBH Kaneohe beaches, which includes six on Fossil Beach from January through October 2020.

[1] https://www.fisheries.noaa.gov/species/hawksbill-turtle

Critical Habitat

Critical habitat was revised for Hawaiian monk seals in 2015 (80 FR 50925). The revision included an exclusion of the MCBH Kaneohe Bay. Therefore critical habitat will not be discussed further. Detailed information on Hawaiian monk seal critical habitat can be found at https://www.fisheries.noaa.gov/action/critical-habitat-hawaiian-monk-seals.

Analysis of Effects

To determine that a proposed action is not likely to adversely affect ESA-listed species, NMFS must find that the effects of the proposed action are expected to be insignificant, discountable[2], or completely beneficial. As defined in the joint USFWS-NMFS Endangered Species Consultation Handbook, beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs[3]. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not: 1) be able to meaningfully measure, detect, or evaluate insignificant effects; or 2) expect discountable effects to occur (USFWS & NMFS 1998). This standard, as well as consideration of the probable duration, frequency, and severity of potential interactions, was applied during the analysis of effects of the proposed action on ESA-listed marine species, as is described in the consultation request and biological evaluation. Only activities that have the potential to adversely affect ESA-listed species are discussed here.

The Marine Corps identified the following stressors that have the potential to affect listed marine species in the action area:

- Skin and eye irritation
- Toxicity

Skin and Eye Irritation, and Toxicity

Skin and/or eye irritation could potentially occur to Hawaiian monk seals and green and hawksbill sea turtles if there is prolonged contact with FORTIFY. However, FORTIFY does not cause significant eye and skin irritation even in full concentrated strength. FORTIFY is not classified as a hazardous chemical as defined by the OSHA Hazard Communication Standard, and prevention when in contact with the chemical is to wash with soap and water, rinse if in the mouth, and rinse with water if in the eyes (LaderaTech 2019). The composition is ammonium polyphosphate and performance additives, which are proprietary and unknown publicly.

[2] When the terms "discountable" or "discountable effects" appear in this document, they refer to potential effects that are found to support a "not likely to adversely affect" conclusion because they are extremely unlikely to occur. The use of these terms should not be interpreted as having any meaning inconsistent with our regulatory definition of "effects of the action."

[3] Take" is defined by the ESA as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect any threatened or endangered species. NMFS defines "harass" as to "create the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering." NMFS defines "harm" as "an act which actually kills or injures fish or wildlife." Such an act may include significant habitat modification or degradation where it actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding or sheltering. Take of species listed as endangered is prohibited at the time of listing, while take of threatened species may not be specifically prohibited unless NMFS has issued regulations prohibiting take under section 4(d) of the ESA.

The findings for toxicity are as follows:

Animal	Measuring for:	Method administered	Level	Rating
Rat	Acute toxicity	Oral	LD50: >5,050 mg/kg	Practically non-toxic
Rabbit	Acute toxicity	Dermal	LD50: >2.020 mg/kg	No more than slightly toxic
	Eye damage	Eyes		Mildly irritating
	Skin corrosion			Non-irritating
Rainbow trout	Toxicity	In water	96 hr LC_{50}[4]: >400 mg/L	Practically non-toxic
Zebrafish	Toxicity	In water	96 hr LC_{50}[5]: >1000 mg/L	Practically non-toxic

With respect to its ingested toxicity, it was practically non-toxic when administered to rats; in fact, no rats died or were sick from its administration (Murphy 2019). Toxicity levels at LD_{50} with a value of 100 or less can result in death of an animal; FORTIFY is considered "practically non-toxic" and has a toxicity level of more than 5,050 mg/kg in rats, more than 400 mg/L in rainbow trout, and more than 1000 mg/L in zebrafish. Thus, it is unlikely that it will be toxic to Hawaiian monk seals, or green or hawksbill sea turtles.

Yu et al. (*in press*) conducted testing of environmental impacts on soil chemistry after treatment with FORTIFY and two other fire retardants. After 5 cm of simulated rainfall incrementally applied, FORTIFY retained roughly 40% of its application, which is more than other types of fire retardants, and only 30% of the applied retardant leaked off onto the grass. FORTIFY did not create any significant change in soil pH, total carbon, or total nitrogen across simulated rain events of 0.75 cm, 2.5 cm, 11 cm, and 71 cm. However, FORTIFY did raise the amount of phosphorus in the soil after 11 cm of rainfall, but after 71 cm rainfall, the total soil phosphorus concentrations returned to the baseline. Because FORTIFY adheres better to vegetation than other fire retardants, the amount of ammonium and nitrate in the soil remained similar to the baseline, but available phosphate increased (Yu et al. *in press*). MCBH Kaneohe averages 100 cm or less rainfall annually (Marine Corps Base Hawaii 2020).

FORTIFY is being applied to an area above the ocean. It has the potential to reach the coast and ocean during a rain event as runoff. However, with only 30% of the chemical reaching the soil during application, a 60% runoff rate (at 5 cm rain simulated rainfall), and few rainfall events monthly in Kaneohe Bay during which rainfall was around 5 cm (or almost 2 inches)[6] during the time that FORTIFY would be applied, it is unlikely that FORTIFY would reach the ocean before its biodegradable chemical constituents are absorbed into the soil. FORTIFY would also be diluted by the rain and its subsequent entry into the ocean. Additionally, MCBH intends to use the following conservation measures to mitigate the possibility of FORTIFY reaching the ocean:

1. FORTIFY will not be applied in the rain, and will only be applied when no rain is forecasted within 48 hours from the day the fire retardant is applied.
2. FORTIFY will not be applied closer than 50 meters from any waterway.
3. At least a 15-foot vegetative barrier along the shoreline will be maintained.

[4] 96 hr LC_{50}: acute short term toxicity test to determine the concentration at which 50% of the exposed test population dies after 96 hours.
[5] 96 hr LC_{50}: acute short term toxicity test to determine the concentration at which 50% of the exposed test population dies after 96 hours.
[6] https://www.weather.gov/hfo/cli_graphs

4. Core logs, absorbent socks, and siltation fencing or similar items will be strategically installed to intercept surface run-off laden sediments.
5. FORTIFY will only be applied per the product label. The minimal amount of active ingredient will be applied to provide an effective barrier.
6. If there is any indication the fire retardant has moved off-site, best management practices (BMPs) will be reevaluated and may be moved or added to.
7. One year after FORTIFY has been applied and before any re-application, testing will be conducted near the shoreline and beach for residue from FORTIFY's active ingredients.

Based on the extremely low level of toxicity, the low levels of rainfall during and shortly after application, the adherence of FORTIFY to vegetation, the distance at which FORTIFY would have to travel to reach areas where listed marine species could be exposed, dilution of FORTIFY by rain and subsequently the ocean, and the implemented BMPs, the proposed action is likely to result in discountable effects to Hawaiian monk seals, green sea turtles, or hawksbill sea turtles. If FORTIFY were to reach the ocean and expose sea turtles or monk seals, the effects of skin and eye irritation and toxicity would be insignificant.

Conclusion

Considering the information and assessments presented in the consultation request and available reports and information, and in the best scientific information available about the biology and expected behaviors of the ESA-listed marine species considered in this consultation; NMFS concurs with your determination that the proposed action is not likely to adversely affect the following ESA-listed species: endangered Hawaiian monk seals, threatened Central North Pacific green turtles, or endangered hawksbill turtles.

This concludes your consultation responsibilities under the ESA for species under NMFS's jurisdiction. If necessary, consultation pursuant to Essential Fish Habitat would be completed by NMFS' Habitat Conservation Division in a separate communication.

Reinitiation Notice

ESA Consultation must be reinitiated if: 1) take occurs to an endangered species, or to a threatened species for which NMFS has issued regulations prohibiting take under section 4(d) of the ESA; 2) new information reveals effects of the action that may affect ESA-listed species or designated critical habitat in a manner or to an extent not previously considered; 3) the identified action is subsequently modified in a manner causing effects to ESA-listed species or designated critical habitat not previously considered; or 4) a new species is listed or critical habitat designated that may be affected by the action.

If you have further questions, please contact Sarah Pautzke at Sarah.Pautzke@noaa.gov. Thank you for working with NMFS to protect our nation's living marine resources.

Sincerely,

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Ann M. Garrett
Assistant Regional Administrator

Protected Resources Division

Cc: Lance Bookless (lance.bookless1@usmc.mil)
NMFS File No.: PIRO-2020-03086
PIRO Reference No.: I-PI-20-1875-AG

References

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Marine Corps Base Hawaii. 2020. Biological Evaluation for the Marine Corps Base Hawaii for the use of FORTIFY fire retardant on the Kaneohe Bay Range Training Facility, Kaneohe Bay, Oahu. F. D. Environmental Compliance and Protection Division.

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