Environmental Assessment
University of the Virgin Islands
Virgin Islands Shoreline Protections
St. Thomas, USVI

4335-DR-VI

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FEMA

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APPENDICES

LIST OF ABBREVIATIONS

CFR	Code of Federal Regulations
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
IPaC	Information for Planning and Conservation
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fishery Service
NRHP	National Register of Historic Places
NOAA	National Oceanic Atmospheric Administration
PEIS	Programmatic Environmental Impact Statement
STEER	St. Thomas East End Reserve
TNC	The Nature Conservancy
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USVI	United States Virgin Islands
U.S.C.	United States Code
UVI	University of the Virgin Islands
VIDPNR	Virgin Islands Department of Planning and Natural Resources

VISHPO Virgin Islands State Historic Preservation Office

VITEMA Virgin Islands Territorial Emergency Management Agency

1.0 INTRODUCTION

In September 2017, Hurricanes Irma and Maria caused significant damages to the United States Virgin Islands (USVI or "the territory"). President Donald Trump issued one disaster declaration (DR-4335-VI) for Irma on September 7, and another one (DR-4340-VI) for Maria on September 20 encompassing the entire territory. The declarations authorized federal assistance to affected communities and certain non-profit organizations in accordance with the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1974 (42 United States Code [U.S.C.] § 5172), as amended. The Declaration also authorized direct federal assistance. The Virgin Islands Territorial Emergency Management Agency is FEMA's grant Recipient and the University of the Virgin Islands (UVI) is FEMA's Subrecipient.

This Environmental Assessment (EA) is prepared in accordance with Section 102 of the National Environmental Policy Act (NEPA) of 1969, as amended; and the Regulations for Implementation of NEPA (40 Code of Federal Regulations [CFR] Parts 1500 to 1508). This EA considers the potential environmental impacts of the proposed project and alternatives to determine whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI). In accordance with above regulations and FEMA Directive 108-1 and FEMA Instruction 108-1-1, FEMA is required, during decision-making, to evaluate and consider the environmental consequences of major federal actions it funds or undertakes.

2.0 PURPOSE AND NEED

FEMA's Hazard Mitigation Grant Program fosters the protection of health, safety and welfare of citizens, assists communities in mitigating damages caused by disasters, and reduces future losses resulting from natural disasters. The purpose of this project is to support UVI's ongoing efforts to increase the resiliency of USVI coastlines to reduce damages from future storms. The need is to build upon past efforts to bolster natural systems that reduce erosion and damages from wave action during storms. Natural shoreline features offer natural protection by dissipating destructive wave action and thereby reduce storm surge that can cause erosion.

3.0 BACKGROUND

Damage occurred throughout the territory as a result of Hurricanes Irma and Maria's wind-driven rain, hurricane force winds, and storm surge. These forces impacted critical infrastructure of the islands including the natural defenses of the USVI coastline. The National Weather Service noted the storm surge was recorded at its highest at 2.8 ft Mean Higher High Water according to the National Ocean Services gauges. It was estimated that the unrecorded maximum inundation levels ranged between 3 to 5 ft above ground level for St. Croix and 1 to 3 ft for St. Thomas and St. John. The increased water levels caused storm related impacts to coastal habitats and species. The aquatic environment serves as a natural defense to coastline development, including public infrastructure.

Events such as Hurricanes Irma and Maria serve as one of many stressors to coastal habitats and the species that depend on them to exist and strive. The storms damaged coral by dislodging, breaking, and in cases burying under outwash sediment. In addition, coral species are facing bleaching from changes in water temperature and chemistry and new threats to survival such as the spread of Stony Coral Tissue Loss disease. Mangroves have been damaged both by the storms and by clear cutting for development. The National Oceanic Atmospheric Administration (NOAA) aims to develop and provide technical assistance as well as data collection, monitoring, and evaluation for coastal restoration projects. NOAA had developed a Programmatic Environmental Impact Statement (PEIS) to evaluate such restoration actions to coastal species, habitats, and systems. The PEIS serves as an all-encompassing evaluation tool by NOAA components for various species restoration activities, including coral and mangrove restoration activities nationwide. FEMA consulted the PEIS for NOAA's unique and technical expertise for these types of activities in developing this EA.

The current mangrove nursery is located at the MacLean Marine Science Center on the St. Thomas campus of UVI. The existing coral and mangrove land-based nursery is located at the Center for Marine Environmental Studies at Brewer's Bay, St. Thomas. Work on this initiative under other funding sources was initiated by The Nature Conservancy (TNC) but are now managed by the Center for Marine and Environmental Studies at UVI, with input and assistance from TNC.

4.0 ALTERNATIVES

FEMA and the Subrecipient considered alternatives that fulfill the purpose and need for this project. This consideration is based upon engineering constraints, environmental impacts, and available property. Budgetary constraints are included but not the controlling factor.

Additionally, a No Action alternative, also known as the "Future without Federal Project Condition," is included in the analysis. This section discusses the No Action alternative and the proposed alternative that would satisfy the purpose and need.

4.1 Alternative 1: No Action

The No Action Alternative would result in no FEMA funding supporting natural coastal protection measures in the U.S. Virgin Islands. While UVI would continue its coral and mangrove activities with existing funding, an opportunity to expand the program and restore wide areas would be missed, leading the USVI to continued damages to properties and infrastructure near the coastline. Not only would residential and commercial structures continue to be damaged by storm surge, but the coastline would also continue to erode, thus increasing the number of vulnerable structures.

Mangroves also provide protection to property and structures on the islands by absorbing much of the stormwater and removing toxins from the water before it goes back to the ocean. If no action

is taken, these vital functions served by the mangroves would continue to diminish through development and storm damage.

4.2 Alternative 2: Proposed Alternative

The Proposed Alternative involves the expansion of coral and mangrove nurseries, out planting of coral reefs and planting of mangrove seedlings in locations surrounding St. Thomas, USVI. Ten metal coral trees with duckbill anchors will be installed at that site (see Figures A3 and A4). Activities at the nurseries include propagating seedlings in seawater tables, which are bins containing water with a grid to support individual growth (see Figure A7). At coral nurseries, seawater tables are simple submerged gridded substrate for coral to attach to as it begins to grow (see Figure A5). The coral trees will be installed by hammering the anchors 0.5 m into the seabed with a steel rod and hammer. The mangrove seedlings will be planted 25 cm into the seabed in damaged areas. Both coral and mangrove will be accomplished using hand tools, specifically by personnel in scuba gear for the coral planting. Additionally, this project will include expansion of existing coral nurseries and a new in-water coral nursery on the island of Great St. James consisting of ten coral trees with anchors. It would also include installation of in-water mangrove seedlings at this location. These measures would enable more research on each in a controlled environment before out planting in natural habitats.

Proposed work will occur in the nearshore coastal areas around St. Thomas and Great and Little St. James. UVI will determine the specific sites in consultation with the USVI Division of Coastal Zone Management using scoping surveys, coastal risk modeling, and coastal vulnerability maps from TNC. As of the writing of this EA, UVI has identified general coral out planting areas on St. Thomas at Brewers Bay, Hull Bay, Flat Cay, Triangle Rocks, Buck Island, East End, and Coki Point (Appendix A, Table 1 and Figure 1). Existing in-water nurseries are located at West Cay and Flat Cay on St. Thomas. Corals will be tested for viability and vulnerability to disease to ensure out plantings are successful. UVI has identified general mangrove seeding areas at Magen's Bay, Mandahl Bay, Red Hook, St. Thomas East End Reserve (STEER), Range Cay, and Perseverance Bay (Appendix A, Table 2 and Figure 2).

Those areas listed for coral and mangrove out planting surround St. Thomas on all sides and are near essentially all land uses of the island, from private residences to roads to utilities to recreational activities. For example, numerous businesses, residences, a public school, a wastewater treatment plant, and the ferry terminal to St. John are within the 100-year floodplain near Red Hook.

The Subrecipient will determine specific sites within those general areas for out planting based on the best conditions at the time of out planting for successful implantation. The criteria for that is having the ideal conditions for successful coral transplantation onto existing or artificial reefs. This includes warm water, ample sunlight, and the presence of suitable bedrock. For mangroves the

ideal conditions are any site where regeneration of mangrove communities occurs naturally over time.

5.0 AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS

This section discusses the potential environmental impacts and proposed mitigation measures associated with the No Action Alternative and the Proposed Action. When possible, FEMA considers quantitative information to establish potential impacts; the potential qualitative impacts are evaluated based on the criteria listed in in Table 5.0.1.

Table 5.0.1: Impact Significance and Context Evaluation Criteria for Potential Impacts

Impact Scale	Criteria
No impact	The resource area would not be affected and there would be no impact.
Negligible	Changes would either be non-detectable or, if detected, would have effects that would be slight and local. Adverse impacts would be well below regulatory standards, as applicable.
Minor	Changes to the resource would be measurable, but the changes would be small and localized. Adverse impacts would be within or below regulatory standards, as applicable. Mitigation measures would reduce any potential adverse effects.
Moderate	Changes to the resource would be measurable and have either localized or regional scale impacts. Adverse impacts would be within or below regulatory standards, but historical conditions would be altered on a short-term basis. Mitigation measures would be necessary, and the measures would reduce any potential adverse effects.
Major	Changes to the resource would be readily measurable and would have substantial consequences on regional levels. Adverse impacts would exceed regulatory standards. Mitigation measures to offset the adverse effects would be required to reduce impacts, though long-term changes to the resource would be expected.

Section 9 presents the Summary of Impacts Table for the Alternatives analysis. FEMA is omitting the following environmental resource topics from further evaluation under this EA because they do not apply to the projects or locations considered in this NEPA document.

Table 5.0.2: Resources eliminated from evaluation

Topic	Reason
Bald and Golden Eagles	Bald and Golden Eagles are not found in the U.S. Virgin Islands.
Safe Drinking Water Act of 1974	According to the U.S. Environmental Protection Agency's (USEPA) Map of Sole Source Aquifer Locations, there are no such aquifers within the U.S. Virgin Islands.
Fish and Wildlife Coordination Act	The Act does not apply for grant funding projects or other activities that receive financial assistance from a federal agency.

5.1 Water Quality

Congress enacted the Federal Water Pollution Control Act in 1948 which was later reorganized and expanded in 1972 and became known as the Clean Water Act in 1977. This law regulates discharge of pollutants into water with sections falling under the jurisdiction of the United States Army Corps of Engineers (USACE) and the USEPA. Section 404 of the Clean Water Act establishes the USACE permit requirements for discharging dredged or fill materials into Waters of the United States and traditional navigable waterways. USACE regulation of activities within navigable waters is also authorized under the 1899 Rivers and Harbors Act. Under the National Pollution Discharge Elimination System, the USEPA regulates both point and non-point pollutant sources, including stormwater and stormwater runoff. Activities that disturb one acre of ground or more are required to apply for a State Pollution Discharge Elimination System through the Virgin Islands Department of Planning and Natural Resources (VIDPNR) as delegated by the USEPA.

5.1.1 Existing Conditions

The proposed project area includes the coral nurseries, coral reef out planting sites, mangrove nursery, and mangrove out-planting sites. Existing coral nurseries are located at West Cay, Flat Cay, and Coki Point. The Subrecipient proposes the additional coral nursery site at Great St. James Bay. The potential coral reef out-planting sites are located at Brewers Bay, Hull Bay, Flat Cay, Triangle Rocks, Buck Island, Coki Point, STEER, Great St. James Bay and Little St. James Bay. The Subrecipient proposes the mangrove restoration sites at Perseverance Bay, Magen's Bay, Mandahl Bay, Range Cay, Red Hook and STEER. Activities at the land-based nursery would not affect any bodies of water and would be completely within the existing footprint of the laboratory building.

The proposed project locations are within coastal waters, with the exception of the land-based nursery. According to the USVI 2016 Integrated Report, non-point source pollution is the major source of surface water contamination in the VI. This can be attributed to improper erosion control and storm water mitigation.

5.1.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

The No Action Alternative would result in a minor to moderate, long term, adverse impact. Under this alternative, UVI would continue to study ecological resources with available funding and associated priorities. Without an increased effort towards coral and mangrove restoration, coastal areas will continue to be subject to erosion and outwash of pollutants into coastal waters.

Coral reefs serve as habitat for fish and other marine species. They provide reduction of wave action and serves a barrier of protection to St. Thomas and its infrastructure. The No Action Alternative can lead to a delay in coral reef restoration due to the limited amount of coral and mangrove nurseries available.

Mangroves provide a natural catch basin to control sediment pollution into surface-water resources. The No Action Alternative will leave the marine ecosystems to be subject to pollution from sediment erosion. Restoration activities supported by NOAA to benefit marine water include reef restoration and creation and nearshore erosion reduction and prevention. An increase in sediments in the marine ecosystem leads to a decrease in suitable habitat for fish nurseries and migratory birds.

Alternative 2: Preferred Alternative

The proposed alternative will install additional coral trees at the existing coral nurseries at West Cay, Flat Cay and Coki Point. These existing nurseries are already equipped with anchors to house the additional coral trees, so there would be no further disturbance to soils causing sedimentation in these locations. The disturbance to the soils during the installation of anchors at the new sea-based coral nursery at Great St. James Bay will be negligible and temporary as they will be installed by hand, minimizing sedimentation. The land-based nursery does not affect any bodies of water and will be completely within the existing footprint of the laboratory building.

The mangrove land-based nursery will consist of seawater tables to be installed in the Center for Marine and Environmental Studies laboratory. There will be no effect on water quality as all activity will take place within the existing facility. The out-planting of the mangrove seedlings will be at various locations around St. Thomas where FEMA anticipates minor to moderate, long-term, beneficial effects for the water quality. Mangrove trees, specifically the red mangrove, are known to have water filtration properties in their roots.

5.2 Air Quality

The Clean Air Act of 1970 (42 USC 7401–7661 [2009]) is a comprehensive federal law that regulates air emissions from area, stationary, and mobile sources. The Act authorized the USEPA to establish National Ambient Air Quality Standards to protect public health and the environment.

These include standards for six criteria air pollutants: lead, nitrogen dioxide, ozone, carbon monoxide, sulfur dioxide, and particulate matter. Particulate matter includes both less than 10 micrometers in diameter and fine matter less than 2.5 micrometers in diameter. Areas where the monitored concentration of a criteria pollutant exceeds the applicable air quality standards are designated as "in non-attainment" of the standards.

5.2.1 Existing Conditions

As of August 2020, there are no non-attainment areas in the territory.

5.2.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

Under the No Action alternative, FEMA anticipates no impacts to air quality.

Alternative 2: Preferred Alternative

Activities included in this activity are limited to individual personnel planting by hand, monitoring species growth, and engaging in administrative functions within existing facilities. FEMA anticipates negligible to no impacts to air quality or emissions.

5.3 Wetlands

Executive Order (EO) 11990 Wetlands Management requires federal agencies to avoid funding activities that directly or indirectly support occupancy, modification, or development of wetlands, whenever there are practicable alternatives. It also requires that the proposed action includes all practicable measures to minimize harm to wetlands that may result from such actions. FEMA uses the eight-step decision-making process to evaluate potential effects on, and mitigate impacts to, wetlands in compliance with EO 11990. FEMA's regulations for conducting the eight-step process are contained in 44 CFR Part 9.

5.3.1 Existing Conditions

Besides the land-based nursery, the proposed project locations are largely within near-shore areas that are subtidal, meaning they typically stay submerged below the water. The waters for both coral and mangrove habitats are shallow, allowing for photosynthetic organisms under the water.

5.3.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

The No Action Alternative would not directly impact any wetlands. Future development may further degrade existing mangrove stands, diminishing the protection they offer to coastal

resiliency in future storms. FEMA anticipates that this may result in minor, long-term, adverse impacts while UVI planting efforts remain subject to other funding sources and associated goals.

Alternative 2: Preferred Alternative

FEMA anticipates the coral restoration activities would have a moderate, long-term, beneficial impact on the wetlands at the proposed sites. Healthy coral reefs protect coastal wetlands from wave action, which subsequently limits erosion, loss of life, and damage to property.

Most of the potential mangrove out planting sites are within marine tidal and subtidal wetlands. The mangrove restoration will improve natural detention of sediment and runoff of pollutants. It will also increase habitat for species that fosters healthy wetland ecosystems to provide economic and environmental value in these areas.

The eight-step decision making process is attached in Appendix B.

5.4 Floodplain

Executive Order 11988, Floodplain Management, requires that federal agencies avoid direct or indirect support of development within the floodplain whenever there is a practicable alternative. Like EO 11990, it also requires federal agencies to consider minimization standards to reduce impacts to the risk of flooding and floodplain values. FEMA uses Flood Insurance Rate Maps to identify the floodplains for the National Flood Insurance Program. Federal actions within the 1% chance of annual flooding areas, known as the 100-year floodplain, require the federal agency to conduct an eight-step decision making process. This process, like NEPA, requires the evaluation of alternatives prior to finding the action.

5.4.1 Existing Conditions

All proposed coral and mangrove nurseries and out planting areas are within 100-year floodplain, except for Triangle Rocks, which is outside the mapped areas. 100-year floodplains on St. Thomas often run far inland from the coast and include essentially all types of infrastructure, land uses, and natural areas found on the island.

5.4.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

FEMA anticipates long-term minor impacts from the No Action alternative while UVI planting efforts remain subject to other funding sources and associated goals. Properties along coastal areas may be subject to erosive forces in future storm events and storm surge unchecked by natural barriers may increasingly inundate properties.

Alternative 2: Preferred Alternative

FEMA anticipates the proposed alternative to expand the coral and mangrove nurseries and out plant both across St. Thomas will have a moderate, long-term, beneficial, impact to the floodplain. The eight-step decision making process is attached in Appendix B. Coral reefs and mangroves provide protection not only to the coastline but also protection for each other.

Mangroves reduce the erosion of shorelines and the sediment that travels into the waters surrounding St. Thomas. The potential out planting sites for the mangroves are within 100-year floodplains and will also impact nearby coral reefs. In these areas the coral reefs will thrive due to the protection provided by the out planted mangroves. Harmful erosion and non-point source pollution after storms will decrease due to the strengthened mangrove populations on the coastline. In turn, the bolstered coral reef population will provide reduced wave action to the mangrove populations. The sum of these effects will serve to protect the natural and built environments within the onshore floodplains across St. Thomas.

5.5 Coastal Resources

The Coastal Zone Management Act administered by states with shorelines in coastal zones requires those states to have a Coastal Zone Management Plan to manage coastal development. Projects falling within designated coastal zones must be evaluated to ensure they are consistent with the Coastal Zone Management Plan. Projects receiving federal assistance must follow the procedures outlined in 15 CFR 930.90 – 930.101 for federal coastal zone consistency determinations, as implemented through Virgin Islands Code Title 12, Chapter 21.

The Coastal Barrier Resources Act of 1982 created designated areas under the jurisdiction of the United States Fish and Wildlife Service (USFWS) that are ineligible for both direct and indirect federal expenditures, with limited exceptions. This act was amended by the Coastal Barrier Improvement Act of 1990, which added a new category of coastal barriers called Otherwise Protected Areas in which, only flood insurance is restricted.

5.5.1 Existing Conditions

The entire USVI is designated as coastal zone divided into two tiers and is administered by the VIDPNR. Portions of the coastal and mangrove restoration project sites are in a Coastal Barrier Resources System Unit: mangrove restoration sites at Perseverance Bay, Magen's Bay, Mandahl Bay, Red Hook, and St. Thomas East End Reserves, and the coral restoration site at Buck Island, which is classified as an Otherwise Protected Area.

5.5.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

The No Action Alternative would not directly impact any coastal resources. Coral reefs and mangroves provide several functions including reducing wave action, providing habitats for marine wildlife, and protecting infrastructure that supports the community. While UVI would continue to use existing nurseries, restoration activities would be limited to other sources of funding and associated goals of those sources.

Alternative 2: Preferred Alternative

FEMA anticipates that the proposed alternative would result in a minor, long-term, beneficial impact to coastal resources. The VIDPNR reviews permit applications for coastal zone consistency – FEMA sent this consultation on 8/28/2020 (Appendix C3). FEMA also consulted on 8/28/2020 and USFWS concurred on 8/31/2020 (Appendix C2) this project meets exemptions under CBRA.

The coral reefs provide wave reducing effects on the coastline. This will provide a direct positive impact to the coastline, infrastructure, and the mangroves. The reduction of wave energy that impacts the coast during storm activities can greatly improve the protection of natural and man-made near-shore features, as well as improved viability of the out planted mangrove seedlings.

Mangroves provide a habitat for fish nurseries, help reduce erosion, and protect the coastline. Successfully out planted mangroves can provide protection to both coastal properties and the coral reefs by reducing the amount of erosion and storm water runoff as non-point source pollution. The restoration activities of coral reefs and mangroves can create reciprocal protections to each other that secure the coastline of St. Thomas.

5.6 Threatened and Endangered Species

The Endangered Species Act (ESA) of 1973 provides a program for the conservation of threatened and endangered plants and animals and the habitats in which they are found. The lead federal agencies for implementing ESA are the USFWS and the NOAA National Marine Fisheries Service (NMFS). The law requires federal agencies to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. The law also prohibits any action that causes a "taking" of any listed species of endangered fish or wildlife.

5.6.1 Existing Conditions

Based on the USFWS Information for Planning and Consultation (IPaC) system, there are four federally listed threatened and endangered species in St. Thomas. These include the West Indian manatee (*Trichechus manatus*, Threatened), the leatherback sea turtle (*Dermochelys coriacae*,

Endangered), and the hawksbill sea turtle (*Eretmochelys imbricate*, Endangered), and the Virgin Islands tree boa (*Epicrates monensis granti*, Endangered).

The West Indian manatee is one of the few seldomly seen marine mammals found in the USVI waters. It is largely herbivorous, feeding on seagrasses, but it will occasionally feed on fish as well. According to USFWS Southeast Region West Indian manatee page, sightings of the West Indian manatee in USVI waters are rare, but fossils have been found in St. Croix.

Leatherback sea turtle nesting season happens between March and August. Females nest five to seven times during the nesting seasons on long stretches of sandy beaches. Leatherbacks' main diet is jellyfish, which is found among both coral reefs and mangroves.

The hawksbill sea turtle is usually found in coral reefs foraging on their main food source, sponges. Hawksbills also use coral reefs for resting within the structures formed by the reefs. They occasionally seek out sponges in mangroves as well.

The VI tree boa is found in St. Thomas only. It is nocturnal and preys mainly on lizards. One of the habitats listed for the endangered VI tree boa is mangrove forest.

5.6.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

The No Action alternative would result in a lack of FEMA funding to support planting activities. While UVI would continue restoration activities with existing funding sources, areas that go without coral or mangrove planting would continue to be exposed to stressors that degrade ecosystems. This would cause long-term, adverse, minor impacts on wildlife and vegetation. Of the federally listed species, leatherback and hawksbill sea turtles and VI tree boa would face dangers of habitat degradation. Lesser long-term adverse impacts would be expected for the West Indian manatee as it is a less frequent visitor to the Virgin Islands.

If No Action is taken to restore corals, both listed species of sea turtles may be adversely impacted by the absence of healthy thriving coral reefs in some areas. The sponges that the hawksbill feeds on and jelly fish the leatherback feeds on would both be less abundant, as well as the corals themselves, which hawksbills use for shelter and refuge. Additionally, nesting may be interrupted by sedimentation from unattenuated wave action on some shorelines.

Without restoration, mangroves would continue deteriorating and eroding, leading to an overall deficit of ecological services for the organisms dependent upon it. As with the coral ecosystem, this would mean a lack of refuge and food for both the leatherback and hawksbill sea turtles, as well as the Virgin Islands tree boa, which frequents adult mangrove trees. Additionally, then there will be less protection against predators and adverse weather, no refuge or nursery grounds, and the species diversity in the mangrove ecosystem will decline.

Alternative 2: Preferred Alternative

The proposed alternative will have long-term, minor, beneficial impacts on the federally listed species. Boosting funding towards coral and mangrove restorations will improve habitat and food chains by improving crucial aspects of near-shore ecosystems.

The UVI routinely applies for permits for on-going studies and restoration activities for NOAA species, administered by the VIDPNR. FEMA expects UVI to obtain and comply with applicable permits under this alternative. FEMA consulted with USFWS regarding potential effects to the Virgin Islands tree boa and West Indian manatee. FEMA's made the determination that the project "may affect, but is not likely to adversely affect" each of the species and sent a consultation to USFWS on 8/28/2020 (Appendix C1).

5.7 Cultural Resources

FEMA must consider the potential effects of its funded actions upon cultural resources prior to engaging in any undertaking. FEMA evaluates potential effects in accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, implemented by 36 CFR Part 800. The NHPA defines an historic property as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion" on the National Register of Historic Places (NRHP). FEMA evaluates the Area of Potential Effects pursuant to 36 CFR 800.4(a)(1), defined as the geographic area(s) within which the undertaking may directly or indirectly affect cultural resources. FEMA evaluates properties with undetermined eligibility for listing in the NRHP as though they are, until an official determination is made.

5.7.1 Existing Conditions

FEMA searched Virgin Islands State Historic Preservation Office (VISHPO) records, site form data and site map files, nomination forms from the NRHP, and various academic publications pertaining to the area to determine if historic standing structures or archaeological resources were present within ½ mile of the fourteen proposed project areas. The research revealed that six of the fourteen areas have documented cultural resources which potentially could be affected by project activities. Some of the sites are listed or eligible for listing on the NRHP, while others have undetermined eligibility.

Prehistoric cultural resources in the USVI are largely archaeological districts comprised of indigenous village sites occupied between 1499 Before the Current Era (BCE) and 1499 CE. These sites can range from former village, fishing, and ceremonial sites to clusters or scatters of prehistoric ceramics dating between 1100 BCE and 1492 CE.

Historic archaeological sites typically date between 1600 and 1864 CE. The profiles of these sites vary from remnant rock shelters, to the foundations of historic structure encampments, port facilities, and shipwrecks. Importantly, the archaeological record in the USVI also includes sites

related to the tormented history of slavery. There are numerous sites on the islands that relate to "Slave villages" and burials (Siegel and Righter eds., 2011).

The six proposed project areas with cultural resources encompass or neighbor 38 previously recorded historic properties. These include historic standing structures and historic, prehistoric, or multi-component archaeological sites with both historic and prehistoric components. Of the 38, five are listed on the NRHP, eight are eligible for listing, and 25 have undetermined eligibility.

FEMA has agreed upon a programmatic approach to NHPA Section 106 consultation with the VISHPO and UVI (see FEMA letter 8/31/2020 and VISHPO concurrence sent 9/14/2020, Appendix C4). The programmatic consultation defines the format, process, and timelines for continuing Section 106 Consultations between the parties. Specific footprints for each restoration site will be identified by the Subrecipient during the fieldwork planning stage for each upcoming season, and concurrence be reached prior to conducting work.

5.7.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

The No Action alternative would have no potential impacts, or adverse effects, to historic standing structures or archaeological resources. All potential cultural resources would remain undisturbed as there would be no coral or mangrove restoration activities. However, in the absence of restoration activities, degradation to coastal sites may occur due to unattenuated wave action and coastal erosion.

Alternative 2: Preferred Alternative

FEMA determined there would be no impact to historic standing structure properties as all the work would occur either in the water or at near-shore locations, not further inland where the historic standing structures are located.

FEMA has determined there is the potential for negligible to minor impacts to archaeological resources during mangrove and coral restoration activities at the proposed project sites during out planting. There is the potential for adverse effect on intact subsurface archaeological deposits during staging and out planting activities. However, since no heavy equipment staging will be required, and all work will be completed with simple hand tools using best management practices, the potential for adverse effect are minimal. Additionally, consultation and coordination with VISHPO will include known site avoidance, and the potential for monitoring or site guidance.

5.8 Socioeconomics

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires federal agencies to identify and address disproportionately high and adverse human health, requires federal agencies or environmental effects its activities. According to the NOAA PEIS, "restoration activities supported by NOAA help to ensure the enhancement of environmental quality for all populations in the United States. Generally, activities under this program do not have an adverse impact on any minority or low-income population and result in long-term or permanent beneficial impacts by funding projects that restore and improve coastal or marine habitats, which provides employment opportunities and results in improved ecosystem services to coastal inhabitants" (NOAA 2015).

5.8.1 Existing Conditions

FEMA typically uses USEPA's EJScreen tool to evaluate potential impacts on communities of concern. However, data for this tool is not generally available for small geographic and small population areas, such as USVI. American Community Survey estimates is likewise not readily available for USVI and the applicable Census data is over ten years old at this point. The Central Intelligence Agency estimates the USVI population as of July 2020 to be 106,235 with over 34% of the population aged 55 or above. The 2010 estimates 15.6% of the population as White with the vast majority listed as Black at 76% with the balance identifying as Asian or other; 17.4% of the population self-identify as Latino. English speakers make up 71.4% of the population followed by Spanish or Spanish-Creole at 17.2% and French or French-Creole at 8.6%. The unemployment rate is estimated at 10.4% in 2017 and population below poverty line at 28.9% as of 2002. Approximately 80% of the labor force was employed in service industries as of 2003 with tourism playing a substantial role in the economy.

The STEER Management Plan provides details of restoring mangroves and corals since they are important marine habitats which continue to provide vital ecological services for thousands of species found in both places. Mangroves and coral reefs provide many ecological services which indirectly benefits the tourism industry and the local economy. Some of the strategic actions STEER aim to accomplish are replanting wetland vegetation, restoring mangrove fringes, and conduct resiliency surveys for mangroves, corals, and seagrass in collaboration with NOAA Coral Watch, UVI, and USVI Division of Coastal Zone Management. Similarly, NOAA's coral restoration activities include promoting recruitment and recovery in order to protect the existing coral populations.

5.8.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

The No Action alternative will have no adverse impacts on low-income and minority populations within the action areas.

Alternative 2: Preferred Alternative

The Proposed Action will have no adverse impacts on low-income and minority populations.

Restoration of mangroves and corals in accordance with the STEER Management Plan will have long-term, minor, beneficial impacts to the surrounding areas. Infrastructure of communities in shoreline areas will be better protected by bolstered mangrove and coral populations. The combination of these effects will allow for economic growth due to better-protected coastal properties and the appeal that coral reefs have to visitors of St. Thomas.

5.9 Cumulative Impacts

In accordance with NEPA, this EA considers the overall cumulative impact of the Proposed Alternative and other actions that are related in terms of time or proximity. According to the Council of Environmental Quality regulations, cumulative impacts represent the "impact on the environment which results from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what federal agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7).

Cumulative impacts are those impacts "… which result from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions…" (40 CFR 1508.7) The statutory basis for considering cumulative impacts of federal actions is the NEPA of 1969, 42 U.S.C. 4321 et seq. In the context of evaluating the scope of a proposed action, direct, indirect and cumulative impacts must be considered.

The NOAA PEIS states, "Because project implementation periods (and the associated adverse effects from construction activities) are short-term, and the beneficial impacts from a project are long-term, generally, the cumulative impact of the proposed action program-wide is estimated to have a net beneficial impact to the identified resources … because the long-term benefits essentially reflect increased sustainability and quality of coastal habitat, restored ecosystem services, and improved fishery production" (NOAA, 2015). While this statement is referring to the implementation of the entire NOAA program across the United States, it is applicable on the scale of the work proposed in this EA surrounding St. Thomas as well.

FEMA is aware of USACE permitting to improve underwater cabling and electrical connectivity in 2018-2019 including access to Great and Little St. James. The permits include the condition of avoiding existing federally protected coral. USACE has also issued permits since the disaster to boat services and a marina in the STEER. FEMA expects UVI to coordinate with the Virgin Islands Water and Power Authority, as needed, to avoid potential impacts between underwater cabling and new planting of coral. FEMA is also aware of a grant UVI received from the National Science Foundation supporting coral research in the USVI. At the time of this writing, FEMA understands the primary purpose of the grant is to fund research, not including planting or expansion of the coral or mangrove nurseries.

FEMA anticipates beneficial cumulative impacts as a result of supporting on-going studies and planting efforts, potential increase in eco-tourism, habitat improvements, and potential increase in fishery stocks. Additional beneficial impacts to water quality and resilience of the coastline from erosion and failure are expected and may support projects not yet scoped that reduce flood risk to coastal properties.

6.0 PERMITS AND PROJECT CONDITIONS

The Subrecipient is responsible for obtaining all applicable federal, state, and local permits and other authorizations for project implementation prior to construction and adherence to all permit conditions. The Subrecipient must obtain and comply with permitting for on-going studies and restoration activities for NOAA species, administered by the VIDPNR as delegated by NOAA. Any substantive change to the approved scope of work will require re-evaluations by FEMA for compliance with NEPA and other laws and EOs. The Subrecipient must also adhere to conditions identified in continuing consultations with resource agencies as specific work sites are identified. Failure to comply with grant conditions may jeopardize federal funds.

7.0 AGENCY COORDINATION AND PUBLIC INVOLVEMENT

This EA is available for agency and public review and comment for a period of 30 days. The EA is available for download at https://www.fema.gov/disaster/4335 and on FEMA's website at https://www.fema.gov/multimedia-library. The EA was also distributed for online posting to UVI, the VI Territorial Emergency Management Agency (VITEMA), and sent to the Virgin Islands Coral Reef Advisory Group email list.

Interested parties may request an electronic copy of the EA by emailing FEMA at FEMAR2COMMENT@fema.dhs.gov. This EA reflects the evaluation and assessment of the federal government, the decision maker for the federal action; however, FEMA will take into consideration any substantive comments received during the public review period to inform the final decision regarding grant approval and project implementation.

The public is invited to submit written comments by emailing FEMAR2Comment@fema.dhs.gov or via mail to:

FEMA 4335-4340 JFO
Attn: Environmental Planning and Historic Preservation
4500 Sunny Isle Shopping Center
Unit 37 and 38
Christiansted, VI 00820

If FEMA receives no substantive comments from the public and/or agency reviewers, FEMA will adopt the EA as final and issue a FONSI. If FEMA receives substantive comments, they will be evaluated, and FEMA will address them as part of FONSI documentation or in a final EA.

8.0 SUMMARY OF IMPACTS

Resource	No Action	Proposed Action
5.1 Water Quality	Long-term, minor to moderate, adverse	Short-term, negligible to no impact; Long-term, minor to moderate, beneficial impact
5.2 Air Quality	No impact	Negligible to no impact
5.3 Wetlands	Long-term, minor, adverse	Long-term, moderate, beneficial
5.4 Floodplains	Long-term, minor, adverse	Long-term, moderate, beneficial
5.5 Coastal Resources	No impact	Long-term, minor, beneficial
5.6 Threatened and Endangered Species	Long-term, minor, adverse	Long-term, minor, beneficial
5.7 Cultural Resources	No impact	Negligible to minor adverse
5.8 Socioeconomics	No Impact	Long-term, minor, beneficial

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Appendix A

Project Locations and Examples

Table A1 - Proposed Coral Out Planting Areas

Coral Restoration Locations	Latitude, Longitude (decimal degrees)
Brewers Bay	18.341857, -64.979342
Hull Bay	18.370816, -64.954674
Flat Cay	18.316614, -64.988521
Triangle Rocks	18.316205, -64.919965
Buck Island (St. Thomas)	18.279245, -64.895240
East End	18.315937, -64.843997
Great and Little St. James	18.304290, -64.827810
Coki Point	18.350591, -64.864182

Figure A1 – Map of Proposed Coral Out Planting Areas

Table A2 - Proposed Mangrove Out Planting Areas

Mangrove Restoration Locations	Latitude, Longitude (decimal degrees)
Magen's Bay	18.362399, -64.923228
Mandahl	18.360383, -64.894540
Red Hook	18.323073, -64.853535
STEER (St. Thomas East End Reserves)	18.312937, -64.873037
Range Cay	18.339432, -64.977119
Perseverance Bay	18.352338, -64.995615

Figure A2 – Map of Proposed Mangrove Out Planting Areas

Figure A3 – Photograph of mature coral trees located in the Flat Cay nursery. Note that the structures are fully submerged.

Figure A4 – Photograph of a UVI graduate student attaching coral fragments to a newly installed coral tree in the Flat Cay nursery

Figure A5 – Freshly fragmented corals in a seawater table at the University of the Virgin Islands

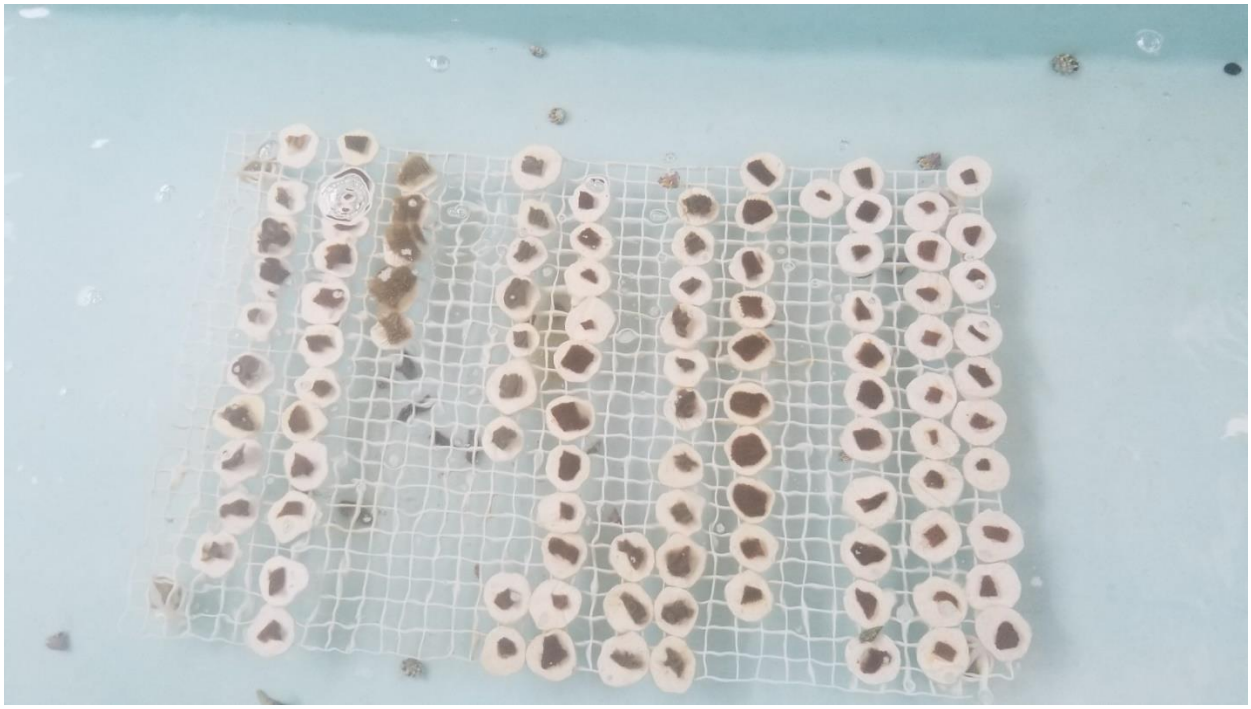

Figure A6 – Photograph of a UVI graduate student outplanting a mature coral fragment onto the reef using a two-part underwater epoxy (photo courtesy of D. Mele)

Figure A7 – Mangrove seedlings in the land-based mangrove nursery at the University of the Virgin Islands

Appendix B

EO11988/EO11990 Eight-Step Decision Making Process

University of the Virgin Islands: Virgin Islands Shoreline Protections, St. Thomas, USVI
Executive Order 11988 – Floodplain Management
Eight-Step Decision Making Process

Date: 08/10/2020

Step 1 **Determine if the proposed action is located in the Base Floodplain.**

The proposed project is located within the *100-Year (or 500-Year) Floodplain*, with most areas being Coastal High Hazard Areas that involve high velocity waters such as wave action. The project areas and corresponding designated Special Flood Hazard Areas (SFHA), the National Flood Insurance Program's Flood Insurance Rate Map and Base Flood Elevation (BFE) (NGVD 1929) are listed on the table below.

Location	Coordinates	SFHA Designation	FIRM Community-Panel Number	BFE
Magen's Bay	18.362399, -64.923228	VE	7800000011G 7800000012G 7800000026G 7800000027G	15ft
Mandahl	18.360383, -64.894540	AE	7800000013G	13ft
Red Hook	18.323073, -64.853535	VE	7800000029G	12ft
STEER (St. Thomas East End Reserves)	18.312937, -64.873037	AE VE	7800000028G 7800000029G 7800000043G 7800000044G	12ft
Range Cay	18.339432, -64.977119	VE	7800000024G	12ft
Perseverance Bay	18.352338, -64.995615	AE	7800000024G	9ft
Brewers Bay	18.341857, -64.979342	VE	7800000024G	12ft
Hull Bay	18.370816, -64.954674	VE	7800000010G	19ft
Flat Cay	18.316614, -64.988521	VE	7800000039G	8ft
West Cay	18.358213, -65.048207	VE	7800000022G 7800000007G	7ft
Triangle Rocks	18.316205, -64.919965	--	7800000042G	Outside of BFE Boundary
Buck Island (St. Thomas)	18.279245, -64.895240	VE	7800000054G	6ft
East End	18.315937, -64.843997	VE	7800000030G	18ft
Great and Little St. James	18.304290, -64.82781	VE	7800000045G 7800000046G	8ft
Coki Point	18.350591, -64.864182	VE	7800000014G	23ft

Table 1 – Proposed Work Locations

Step 2 **Early public notice (Preliminary Notice)**

A disaster wide cumulative public notice was published in the Virgin Islands Daily News newspaper on November 18-19, 2017.

Step 3 **Identify and evaluate alternatives to locating in the base floodplain.**

The scope of work for this project includes expanding the existing coral in water nurseries and out-planting coral and mangrove individuals at various locations on St. Thomas. The in-water coral nurseries will be anchored with duckbill anchors that will prevent the coral trees from being discarded at sea. Using hand tools, the coral out plantings will be epoxied to existing reefs and the mangrove out plantings will be in planted at the appropriate depth to ensure the plants are not going to be undermined by flooding and promote growth. The project areas are located within the 100-year floodplain of several bays on the island of St. Thomas (See Table 1, previous page).

The project purpose and need would not be met with the No Action alternative. The No Action Alternative would not offer protection to the coastal shorelines of St. Thomas and the recovery of the coral and mangrove populations would continue to decline.

There are no practicable alternatives to locating the proposed project outside the SFHA to address floodplain management and EO 11988 compliance. The coral in water nurseries and the coral and mangrove out planting sites are functionally dependent on the floodplain; therefore, they must be located at the various bays to fulfill the project's purpose and function in the design capacity.

Step 4 **Identify impacts of proposed action associated with occupancy or modification of the floodplain.**

The proposed project will not adversely impact natural habitat values or other functions of the floodplain. The project will beneficially impact the natural habitat values at the various sites after long-term implementation once the coral reefs and mangrove populations start to increase. The increase of these populations will provide habitat for other species and provide shoreline protection. The proposed project would not promote further development, since the goal of the proposed project is restoration of coral and mangrove populations, and protection of shorelines. The proposed project is not anticipated to induce flooding on any other downstream or upstream facilities or properties and will have a flood reducing benefit to the site areas over time.

The proposed project would invest federal and non-federal monies into the restoration of coral and mangrove populations, the coral nurseries and coral and mangrove out-planting are fully submerged in water and mangroves populations are resilient shoreline protectors; therefore, the proposed project sites would not be at risk to flood damage.

The proposed project benefits the public good through the long-term effects that would result from restoring the coral and mangrove population. These effects include restoring the coral population which will provide habitat for marine species, improve recreation and the fishing industry, and provide wave reducing action in the restoration areas. The effects provided by mangrove restoration include providing a habitat for terrestrial and marine species and providing coastline protection for the island.

Step 5 **Design or modify the proposed action to minimize threats to life and property and preserve its natural and beneficial floodplain values.**

The coral and mangrove restoration project will provide benefits to the island of St. Thomas that will over time minimize risk of future floodplain damage. The in-water coral nurseries will be anchored with duckbill anchors that will prevent the coral trees from being discarded at sea. The coral out plantings will be epoxied to existing reefs and the mangrove out plantings will be in planted at the appropriate depth to ensure the plants are not going to be undermined by flooding and promote growth.

Step 6 **Re-evaluate the proposed action.**

The proposed project will not aggravate the current flood hazard because the facilities would not impede or redirect flood flows. The project will not disrupt floodplain values because it will not change water levels or reduce habitat in the floodplain. Therefore, it is still practicable to commence the proposed project within the floodplain.

Alternatives consisting of locating the project outside the floodplain are not practicable.

A no action alternative would not resolve the need to mitigate damages from wave action and erosion in future storms. The propose project is functionally dependent on the floodplain and must be located at the various bays across the island of St. Thomas. The public good of the project's function outweighs the risk of floodplain occupancy.

After evaluating alternatives, including impacts and minimization opportunities, FEMA and the subrecipient determined that the proposed project is the most feasible alternative. It is our determination that there is no practicable alternative to locating the proposed project outside the 100-Year Floodplain.

Step 7 **Findings and Public Explanation (Final Notification)**

A disaster wide cumulative public notice was published in the Virgin Islands Daily News newspaper on November 18-19, 2017. An additional public notice will be provided in the public comment period for the Environmental Assessment for this project.

Step 8 **Implement the action**

Approval is conditioned on review of implementation and post-implementation phases to ensure compliance with the requirement(s) stated in 44 CFR 9.11.

The proposed project will be constructed in accordance with floodplain development requirements, National Flood Insurance Program, and other applicable laws, regulations and executive orders.

U.S Department of Homeland Security
FEMA Region II
FEMA 4335/4340-JFO
4500 Sunny Isles Shopping Center
Units 37,38
Christiansted, VI 00820

August 28, 2020

Marelisa Rivera
Deputy Field Supervisor
U.S. Fish and Wildlife Service
Caribbean Ecological Services Field Office
P.O. Box 491, Boquerón, Puerto Rico 00622

Subject: **Endangered Species Act Section 7 Consultation:** FEMA-4335-DR-USVI
FEMA Project: Hazard Mitigation Grants Program, DR4335-F007
Sub-Applicant: University of the Virgin Islands, St. Thomas
Project Title: Expanding science-based coral and mangrove restoration to protect Virgin Islands shorelines (GPS: See Map attached for all sites)

Dear Ms. Rivera:

In accordance with Section 7 of the Endangered Species Act (16 U.S.C. 1531 *eq seq.*) (ESA) and its implementing regulations 50 CFR Part 402, the Federal Emergency Management Agency (FEMA) requests a consultation with the U.S. Fish and Wildlife Service (USFWS) for the following project entitled: "Expanding science-based coral and mangrove restoration to protect Virgin Islands shorelines." The sub-applicant, the University of the Virgin Islands (UVI), is requesting FEMA funding through the Hazard Mitigation Grant Program (HMGP) which is authorized under the Robert T. Stafford Disaster Relief and Emergency Assistance Act, P.L. 93-288, as amended, in response to major Disaster Declaration FEMA- 4340-DR-USVI, dated September 20, 2017.

In accordance with the ESA, FEMA has determined that the proposed coral and mangrove restoration project **may affect but is not likely to adversely affect** the VI tree boa (*Epicrates monensis granti*), listed as endangered, and the Antillean Manatee/West Indian manatee (*Trichechus manatus),* listed as threatened.

Project Purpose

The University of the Virgin Islands is proposing to enhance its coral and mangrove restoration operations and develop a restoration-oriented citizen science program in order to provide natural coastline at various sites around the island of St. Thomas, USVI. The proposed project has two specific goals:

Goal 1 - Expand nursery operations for corals and mangroves to include more coral species, provide science-driven identification of stress-resistant genotypes and restoration sites, and track out-plantings (Photos 1 – 4).

Goal 2 - Formalize a citizen-science program that is focused on nursery efforts in order to engage the public and provide for sustainability of the program.

Description of the Proposed Action

Goal 1:

Coral-focused Actions
These actions include increasing the number of coral "trees" at each of two (2) existing nurseries which are located off the coast of St. Thomas. The number of trees will increase from 10 to 20, and an on-land nursery component will be added to include five (5) seawater tables located at the Center for Marine and Environmental Studies (CMES) on the University of the Virgin Islands (UVI) St. Thomas campus. The nurseries were established by The Nature Conservancy (TNC), but are now managed by CMES with input and assistance from TNC.

The species stocked in both the on-land and in-water nurseries will increase from *Acropora cervicornis* to also include other species such as *A. palmata*, *Orbicella annularis*, *O. faveolata*, *O. franksi* and *Dendrogyra cylindrus*. Corals will be tracked and genotyped by the Baums Laboratory at Pennsylvania State University (Penn State). Coral fragments will be collected opportunistically. Fragments that have grown to a large enough size will be out-planted to sites critical to shoreline protection. These sites will be selected in consultation with the Virgin Islands Division of Coastal Zone Management (CZM) and using coastal vulnerability maps produced for TNC. Coral out-planting sites will be monitored for growth and mortality, with the goal of identifying resilient genotypes.

Mangrove-focused Actions
These actions include increasing the number of seawater tables at CMES from 1 to 10 tables. The seawater tables are dedicated to cultivating red mangrove (*Rhizophora mangle*) seedlings and will be managed by the Virgin Islands Marine Advisory Service (VIMAS) along with CMES. The genetic identity of each seedling will be cataloged by the Stanford Lab at UVI and individuals will be tagged and tracked to out-planting. Seedlings will be out-planted quarterly to sites vulnerable to coastal storm impacts and amenable to mangrove growth. As with corals, sites will be selected in consultation with CZMA and using coastal vulnerability maps from TNC. Nursery seedlings and out-planted trees will be monitored for growth and mortality to determine which genotypes exhibit the fastest growth.

Goal 2:

The University of the Virgin Islands will create a Reef Response Citizen Science program (VI Reef Response) which will provide participants with opportunities to engage in authentic scientific investigations relevant to the restoration of coastal habitats in the USVI. This program will be in partnership with researchers and scientists from UVI and Penn State.

Project Location

The Applicant has identified multiple proposed project locations for both the coral-focused actions and the mangrove-focused actions. Specific GPS coordinates are listed in Tables 1 and 2, with a brief discussion of the proposed locations below. The proposed project is located within, or partially within, Units VI-28, VI-29, VI-30, VI-32, VI-34 and VI-35P of the Coastal Barrier Resources System (CBRS).

Coral-focused Actions
Proposed coral out-planting sites will occur in the nearshore coastal areas around St. Thomas, and potentially, Great and Little St. James. Sites will be determined by scoping surveys, coastal risk modeling, and coastal vulnerability maps from TNC, and will be selected in consultation with the Virgin Islands CZMA. Specific locations on St. Thomas have been identified at Brewers Bay, Hull Bay, Flat Cay, Triangle Rocks, Buck Island, East End, and Coki Point (Table 1 and Figure 1).

Table 1. Coral restoration sites

Location	Latitude	Longitude
Brewers Bay	18.341857	-64.979342
Hull Bay	18.370816	-64.954674
Flat Cay	18.316614	-64.988521
Triangle Rocks	18.316205	-64.919965
Buck Island (St. Thomas)	18.279245	-64.895240
East End	18.315937	-64.843997
Great and Little St. James	18.304290	-64.827810
Coki Point	18.350591	-64.864182

Currently, no specific locations have been identified on Great and Little St. James. Existing in-water nurseries are located at West Cay and Flat Cay on St. Thomas.

Mangrove-focused Actions
Proposed mangrove seeding will occur in coastal areas of St. Thomas as determined by scoping surveys, coastal risk modeling, and coastal vulnerability maps from TNC, and will be selected in consultation with the Virgin Islands CZMA. Specific locations have been identified at Magen's Bay, Mandahl Bay, Red Hook, St. Thomas East End Reserve (STEER), Range Cay, and Perseverance Bay (Table 2 and Figure 2). The current mangrove nursery is located at the MacLean Marine Science Center on the St. Thomas campus of the University of the Virgin Islands.

Table 2. Mangrove restoration sites

Location	Latitude	Longitude
Magen's Bay	18.362399	-64.923228
Mandahl Bay	18.360383	-64.894540
Red Hook	18.323073	-64.853535
STEER	18.312937	-64.873037
Range Cay	18.339432	-64.977119
Perseverance Bay	18.352338	-64.995615

Description of the Existing Site Conditions and Action Area

Existing conditions in the action area include a substrate of soft-bottom sand and patchy sea grass beds with varying coverage of turtle grass, manatee grass, and shoal grass. Coral habitat includes scattered corals, aggregated patch reefs, colonized pavement, colonized pavement with channels, and colonized bedrocks. Mangrove habitat is dominated by red mangrove (*Rhizophora mangle*) at the intertidal zones.

The proposed action area for UVI's coral and mangrove restoration project includes the intertidal zone around St. Thomas with clear waters, visibility depths of fifteen (15) meters or greater, and average water temperature of 81 degrees Fahrenheit.

Affected Species and Potential Use of the Action Area

Based on the USFWS Information for Planning and Consultation (IPaC) system, there are four federally listed threatened and endangered species in St. Thomas; three of which can be found in coral reefs and four of which can be present in mangrove habitats. The West Indian (WI) manatee, the leatherback sea turtle (*Dermochelys coriacae*), and the hawksbill sea turtle (*Eretmochelys imbricata*) are found in both habitats, and the Virgin Islands tree boa occurs in the mangroves. All four listed species are federally protected under the Endangered Species Act. However, pertaining to the proposed action, there will be no impact to the terrestrial habitat of leatherback or hawksbill sea turtles, therefore, FEMA has determined that proposed action will not affect leatherback or hawksbill sea turtles on land. However, because of the proposed in-water work, FEMA has prepared a separate consultation with the National Marine Fisheries Service for these species.

Table 3: Listed Species Use of the Action Areas

Species	Species Use of the Action Area
VI Tree Boa (Endangered)	The endangered VI tree boa is found only in St. Thomas, of all the islands comprising the USVI. It is nocturnal and preys mainly on lizards. One of the habitats listed for the VI tree boa is mangrove forest.
West Indian Manatee (Threatened)	The West Indian manatee is one of the few seldomly seen marine mammals found in the USVI waters. It is largely an herbivore, feeding on seagrasses, but it will occasionally feed on fish as well. According to USFWS Southeast Region webpage, the West Indian manatee is seldom seen in the USVI waters, but fossils have been found in St. Croix. They are rare, transient visitors from Puerto Rico.

Affected Designated Critical Habitat (DCH)

The proposed action sites are located outside of any Designated Critical Habitat (DCH) and therefore, will have no negative effects to DCH. The proposed action, restoration of coral and mangroves, will likely have a positive impact on any future DCH.

Effects on Listed Species

The potential effects of the proposed project are expected to be minimal as the work will be accomplished with basic hand tools such as hammers, trowels, and shovels. Potential effects to listed species are discussed below.

Physical Effects

VI Tree boa - Impacts to the tree boa are expected to be minor since boas are terrestrial and usually found in adult mangrove trees. Mangrove seedlings will be planted using hand tools during the day. No heavy machinery will be used or staged at project sites. Encounters with tree boas are unlikely in these locations.

WI Manatee - Effects to WI manatees include the minor risk of collision or harassment from in-water work; however, physical effects are discountable due to conditions imposed upon the project and the manatee's ability to swim away from the temporary disturbance at project sites.

Habitat Effects

VI Tree boa – VI tree boas are nocturnal and known to occur on low-profile islets with low rises and cays with fossilized dunes and simple vegetation. Rarely, it may be seen basking during the day, however, it usually hides under rocks and fallen tree trunks. Negative temporary impacts to VI tree boa habitat are expected to be minor due to inspection conditions imposed on the project and the limited nature of the disturbance caused by out-

planting activities.

WI Manatee **–** WI manatees are only occasional visitors to the VI. If present, they could be temporarily unable to access the project areas for foraging or refuge due to avoidance of restoration activities and presence of researchers during the project. Since this species can swim away from the action sites during restoration activities and similar habitat is available nearby in the project area, the effects to the WI manatee are expected to be minor.

Long Term Effect on Habitat

The restoration of corals and mangroves will result in an increase in habitat for both species. It will, therefore, have a long-term beneficial impact on the protected species habitat.

Turbidity Effects

VI Tree boa - Mangrove out-plantings will have little effect since individual plants will be planted using hand tools.

WI Manatee – Manatees may be affected by temporary increases in turbidity in the project areas due to minor construction activities and presence of researchers in the water. FEMA anticipates these will be negligible given the limited project footprint, tools used, and project duration.

Noise Effects

VI Tree boa - Since restoration activities will be limited to minimal disturbance caused by individual plantings with hand tools, and will occur only during the day, the VI tree boa will be able to resume normal activities at night. Project conditions will require inspection of the work area prior to planting.

WI Manatee - Due to the mobility of WI manatee species and because the project occurs in open water, it is expected that manatees would be able to move away from any minimal noise disturbances created from the basic hand tools used. Similar habitats are found nearby, so the action area is not a sole resource. If an individual were to swim into the action area, it could be exposed to minimal noise caused by the use of hand tools for the restoration project, however, based on the conditions required (work will stop if a manatee is within 50 – 100 feet of the activity). Disturbance due to noise is expected to be minor.

Since the proposed project requires the use of simple and basic hand tools such as hammers, trowels, and shovels, any potential effects to the listed species are expected to be minimal.

FEMA has determined that the proposed coral and mangrove restoration project **may affect but is not likely to adversely affect** the VI tree boa (*Epicrates monensis granti*), or the Antillean Manatee/West Indian manatee (*Trichechus manatus),* provided the following conditions are met.

Conditions:

VI Tree Boas

1. The applicant must contact the VI Division of Fish and Wildlife (VIDFW) for technical assistance: 340-773-1082 ext. 2261. The VIDFW has developed site specific VI boa protocol, and Applicants will be responsible for executing conservation measures recommended by VIDFW. A final project report will be submitted to USFWS.
2. No equipment will be staged at project location sites.
3. For any VI boa sightings (dead or alive), the Applicant must contact the VIDFW and the USFWS. The boa must be allowed to move out of the action area without any harassment or prompting from the Applicant or their contractors. No relocation of VI tree boas is authorized without prior coordination with the VIDFW and the USFWS.

Antillean/WI Manatee

1. The contractor/lead researcher shall instruct all personnel associated with restoration activities of the presence of manatees and the need to avoid collisions with manatees for in-water projects. All restoration personnel will be advised that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Endangered Species Act of 1973 and the Marine Mammal Protection Act of 1972.
2. The project work area shall be visually inspected for the presence of manatees at least one hour before any construction starts.
3. All vessels associated with the project construction will operate at "no-wake/idle" speed at all times while in water within manatee areas and vessels will follow routes of deep water whenever possible.
4. If manatees are found before any in-water project activity starts, the contractor shall wait for the manatee(s) to leave the area without provocation and be at least 100 feet from the project in-water area. Manatees must not be herded or harassed into leaving the area.
5. As the WI manatee is only known as an occasional visitor to the USVI, any sightings of manatees should be promptly reported to the VIDFW and the USFWS. Following project completion, a report summarizing any incidents and sightings will be submitted to the USFWS and the VIDFW.

Reporting Requirements

All reports of VI tree boa sightings and relocation, as well as any sightings, collision and/or injury involving the WI manatee, will be submitted to Marelisa Rivera, Deputy Field Supervisor, U.S. Fish and Wildlife Service, Caribbean Ecological Services Field Office, P.O. Box 491, Boquerón, Puerto Rico 00622, : 340-773-1082 ext. 2261, marelisa_rivera@fws.gov.

Determination

Based on these proposed conditions and in accordance with Section 7 of the ESA and its implementing regulations through 50 CFR Part 402, FEMA has determined that the proposed project, to provide natural shoreline protection through the restoration of corals and mangroves, **may affect, but is not likely to adversely affect** the VI Tree boa and West Indian manatee. FEMA requests your concurrence regarding this determination.

Please send an e-mail with your response to kyle.bartowitz@fema.dhs.gov and copy virginia.corbiere@fema.dhs.gov

Sincerely,

Virginia Corbière
Environmental/Historic Preservation Advisor
FEMA, 4340-DR USVI
202-805-6764, Virginia.corbiere@fema.dhs.gov

Cc: kyle.bartowitz@fema.dhs.gov

Attachments:

Location Maps
Photos

Appendix C, Correspondence C2

USFWS CBRA Consultation

U.S. Department of Homeland Security
FEMA Region II
FEMA-4335/4340-JFO
4500 Sunny Isle Shopping Center
Unit 37, 38
Christiansted, VI 00820

FEMA

August 28, 2020

Marelisa Rivera
Deputy Field Supervisor
US Fish and Wildlife Service
Caribbean Ecological Services Field Office
P. O. Box 491/Road 301, Km 5.1
Boquerón, Puerto Rico, 00622

Subject:	CBRA Consultation
Project:	FEMA Hazard Mitigation Grant Program, DR 4335-0007
Subrecipient:	The University of the Virgin Islands
Project Name:	Expanding Science-based Coral and Mangrove Restoration to Protect Virgin Islands, St. Thomas, VI
Location:	St. Thomas, USVI

Dear Ms. Rivera:

The Federal Emergency Management Agency (FEMA) requests a consultation with the U.S. Fish and Wildlife Service (USFWS) under the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 *et seq.*) regarding FEMA's proposed action to fund a project entitled: "Expanding science-based coral and mangrove restoration to protect Virgin Islands shorelines." The proposed project is located within (or partially within) Unit(s) VI-28, VI-29, VI-30, VI-32, VI-34 and VI-35P of the Coastal Barrier Resources System (CBRS).

Purpose of Project

The University of the Virgin Islands is proposing to enhance its coral and mangrove restoration operations and develop a restoration-oriented citizen science program in order to provide natural coastline at various sites around the island of St. Thomas, USVI. The proposed project has two specific goals:

> Goal 1. Expand nursery operations for corals and mangroves to include more coral species, provide science-driven identification of stress-resistant genotypes and restoration sites. and track out-plantings.

Goal 2. Formalize a citizen-science program that is focused on nursery efforts in order to engage the public and provide for sustainability of the program.

Description of the Proposed Action or Project

Goal 1:
Goal 1 of the Proposed Project is to expand nursery operations for corals and mangroves. The Proposed Project includes two (2) separate Actions: Coral-focused and Mangrove-focused. These actions will include increasing coral and mangrove species; providing science-driven identification of stress-resistant genotypes and restoration sites; and tracking of out-planted species (Photos 1 – 4). The Coral-focused and Mangrove-focused Actions are detailed below.

Coral-focused Actions
These actions include increasing the number of coral "trees" at each of two (2) existing nurseries which are located off the coast of St. Thomas. The number of trees will increase from 10 to 20, and an on-land nursery component will be added to include five (5) seawater tables located at CMES on the St. Thomas campus. The nurseries were established by The Nature Conservancy (TNC) but are now managed by the Center for Marine and Environmental Studies (CMES) at the University of the Virgin Islands (UVI) with input and assistance from TNC.

The species stocked in both the on-land nurseries and in-water will increase from *Acropora cervicornis* to also include other species such as *A. palmata*, *Orbicella annularis*, *O. faveolata*, *O. franksi* and *Dendrogyra cylindrus*. Corals will be tracked and genotyped by the Baums Laboratory at Pennsylvania State University (Penn State). Coral fragments will be collected opportunistically. Fragments that have grown to a large enough size will be out-planted to sites determined to be critical to shoreline protection. These sites will be selected in consultation with the Virgin Islands Division of Coastal Zone Management (CZM) and using coastal vulnerability maps produced for TNC. Coral out-planting sites will be monitored for growth and mortality, with the goal of identifying resilient genotypes.

Mangrove-focused Actions
These actions include increasing the number of seawater tables at CMES from 1 to 10 tables. The seawater tables are dedicated to cultivating red mangrove (Rhizophora mangle) seedlings and will be managed by the Virgin Islands Marine Advisory Service (VIMAS) along with CMES. The genetic identity of each seedling will be catalogued by the Stanford Lab at UVI and individuals will be tagged and tracked to out-planting. Seedlings will be out-planted quarterly to sites vulnerable to coastal storm impacts and amenable to mangrove growth. As with corals, sites will be selected in consultation with CZM and using coastal vulnerability maps from TNC. Nursery seedlings and out-planted trees will be monitored for growth and mortality to determine which genotypes exhibit the fastest growth.

Goal 2:
The Virgin Islands will create a Reef Response Citizen Science program (VI Reef Response) which will provide participants with opportunities to engage in authentic scientific investigations

relevant to the restoration of coastal habitats in the USVI. This program will be in partnership with researchers and scientists from UVI and Penn State.

Project Location

Coral-focused activities – The current in-water nurseries are located at West Cay and Flat Cay on St. Thomas. Out-planting sites will be located in the nearshore coastal areas around St. Thomas, as determined by scoping surveys and coastal risk modeling.

Mangrove-focused activities – The current mangrove nursery is located at the MacLean Marine Science Center on the St. Thomas campus of the University of the Virgin Islands. Restoration sites will be coastal areas of St. Thomas as determined by scoping surveys. See attached maps.

The proposed action or project is located within (or partially within)
Unit(s) VI-28, VI-29, VI-30, VI-32, VI-34 and VI-35P of the Coastal Barrier Resources System (CBRS).

Applicable Exception(s) under 16 U.S.C. 3505(a)

Identify the appropriate exception(s) for the action or project under the CBRA (16 U.S.C. 3505(a)).

Specific Exceptions

These exceptions must also be consistent with all three purposes of the CBRA (see "Justification" section below).

☒ 16 U.S.C. 3505(a)(6)(A): **Projects for the study, management, protection, and enhancement of fish and wildlife resources and habitats**, including acquisition of fish and wildlife habitats, and related lands, stabilization projects for fish and wildlife habitats, and recreational projects.

☐ 16 U.S.C. 3505(a)(6)(B): Establishment, operation, and maintenance of **air and water navigation aids** and devices, and for access thereto.

☐ 16 U.S.C. 3505(a)(6)(C): Projects under the **Land and Water Conservation Fund Act** of 1965 (16 U.S.C. 4601-4 through 11) and the **Coastal Zone Management Act** of 1972 (16 U.S.C. 1451 et seq.).

☒ 16 U.S.C. 3505(a)(6)(D): **Scientific research**, including aeronautical, atmospheric, space, geologic, marine, fish and wildlife, and other research, development, and applications.

☐ 16 U.S.C. 3505(a)(6)(E): Assistance for **emergency actions essential to the saving of lives and the protection of property and the public health and safety**, if such actions are performed pursuant to sections 5170a, 5170b, and 5192 of title 42 **and are limited to actions that are necessary to alleviate the emergency.**

☐ 16 U.S.C. 3505(a)(6)(F): Maintenance, replacement, reconstruction, or repair, but not the

expansion (except with respect to United States route 1 in the Florida Keys), of **publicly owned or publicly operated roads, structures, and facilities.**

☐ 16 U.S.C. 3505(a)(6)(G): **Nonstructural projects for shoreline stabilization** that are designed to mimic, enhance, or restore a natural stabilization system.

Justification for Exception(s)

It is FEMA's determination that the project encourages the conservation of hurricane prone, biologically rich coastal barriers, supports scientific research, and enhances fish and wildlife resources and habitats, In accordance with Section 6 of CBRA (16 U.S.C. § 3505) it meets all three of the purposes of the CBRA: to minimize the loss of human life; wasteful expenditure of federal revenues; and the damage to fish, wildlife, and other natural resources associated with coastal barriers.

FEMA requests your concurrence with this determination of CBRA within thirty (30) calendar days. Should you have any questions or need to discuss this project in greater detail, please contact me at 202-805-6764.

Please send an e-mail with your response to kyle.bartowitz@fema.dhs.gov and copy virginia.corbiere@fema.dhs.gov.

Sincerely,

Virginia Corbière
Environmental/Historic Preservation Advisor
FEMA, 4340-DR USVI
Virginia.corbiere@fema.dhs.gov
202-805-6764

Cc: kyle.bartowitz@fema.dhs.gov
shenelle.dore@fema.dhs.gov

Attachments:

Location Maps
Tables depicting location latitudes/longitude

From:	Rivera, Marelisa
To:	Corbiere, Virginia
Cc:	Felix, Laticia; Yrigoyen, Jaime; Bartowitz, Kyle; Azizi, Sharla; Dore, Shenelle
Subject:	Re: [EXTERNAL] CBRA Consultation 20200828 USFWS_CBRA _4335-VI-HMGP_0007Coral and Mangrove Restoration
Date:	Monday, August 31, 2020 7:58:22 AM
Attachments:	image002.png

Dear Colleagues:

Due to many competing priorities, the Service is unable to provide an opinion on the applicability of the CBRA's exceptions to this action/project at this time. The FEMA may elect to proceed with the action/project if it has determined that the action/project is allowable under the CBRA. Please note that any new commitment of Federal funds associated with this action/project or a related future project is subject to the CBRA's consultation requirement.

Marelisa Rivera
Deputy Field Supervisor
U.S. Fish and Wildlife Service
Caribbean Ecological Services Field Office
P.O. Box 491 / Road 301, Km 5.1
Boquerón, Puerto Rico 00622

(787) 851-7297 x 206 (direct)
(787) 851-7440 (fax)
(787) 510-5207 (mobile)
Email: marelisa_rivera@fws.gov
OFFICE HOMEPAGE: https://www.fws.gov/southeast/caribbean/
FACEBOOK: https://www.facebook.com/USFWSCaribbean
FLICKER: https://www.flickr.com/photos/usfwssoutheast/sets/72157626859158391/

_____
There are three constants in life...change, choice and principles.
Stephen R. Covey

NOTE: This email correspondence and any attachments to and from this sender is subject to the Freedom of Information Act (FOIA) and may be disclosed to third parties.

From: Corbiere, Virginia <Virginia.Corbiere@fema.dhs.gov>
Sent: Friday, August 28, 2020 4:22 PM
To: Rivera, Marelisa <marelisa_rivera@fws.gov>
Cc: Felix, Laticia <laticia.felix@fema.dhs.gov>; Yrigoyen, Jaime <jaime_yrigoyen@fws.gov>; Bartowitz, Kyle <kyle.bartowitz@fema.dhs.gov>; Azizi, Sharla <sharla.azizi@fema.dhs.gov>; Dore, Shenelle <shenelle.dore@fema.dhs.gov>
Subject: [EXTERNAL] CBRA Consultation 20200828 USFWS_CBRA _4335-VI-HMGP_0007Coral and Mangrove Restoration

Marelisa

Please find attached FEMA's CBRA consultation for UVI's Coral and Mangrove Restoration project. If you need more information, please don't hesitate to call me or Kyle Bartowitz.
Thank you

Virginia

Virginia Corbière
Environmental and Historic Preservation Advisor
DR-4335 and 4340-USVI | St. Croix, USVI
virginia.corbiere@fema.dhs.gov
Mobile: 202-805-6764

Federal Emergency Management Agency
fema.gov

FEMA

Appendix C, Correspondence C3

VI Division of Coastal Zone Management CZMA Consultation

U.S. Department of Homeland Security
FEMA Region II
DR-4335-4340-VI
Joint Field Office
4500 Sunny Isle Unit 37, 38
St. Croix, Virgin Islands 00820

FEMA

August 28, 2020

Marlon Hibbert, Director
VI Department of Planning and Natural Resources (DPNR)
Division of Coastal Zone Management (CZM)
Charles Wesley Turnbull Regional Public Library
4607 Tutu Park Mall
St. Thomas, VI 00802

Subject:	Federal Consistency Determination
FEMA Project:	FEMA Hazard Mitigation Grant Program DR4335-F007
Sub-Applicant:	University of the Virgin Islands, St. Thomas
Project Title:	Expanding science-based coral and mangrove restoration to protect Virgin Islands shorelines (GPS: See Map attached for all sites)

Dear Mr. Hibbert:

In accordance with the requirements of the Coastal Zone Management Act of 1972 (15 CFR Part 930), FEMA is requesting consistency concurrence from your office for the following project entitled: "Expanding science-based coral and mangrove restoration to protect Virgin Islands shorelines." The sub-applicant, the University of the Virgin Islands (UVI), is requesting FEMA funding through the Hazard Mitigation Grant Program (HMGP) which is authorized under the Robert T. Stafford Disaster Relief and Emergency Assistance Act, P.L. 93-288, as amended, in response to major Disaster Declaration FEMA- 4340-DR-USVI, dated September 20, 2017.

The proposed project is located within the Coastal Zone Management area. Based on our review of the project scope of work and VI Coastal Policies, FEMA has determined that this project is consistent with VI Coastal policies.

Purpose of Project

The University of the Virgin Islands is proposing to enhance its coral and mangrove restoration operations and develop a restoration-oriented citizen science program in order to provide natural

coastline at various sites around the island of St. Thomas, USVI. The proposed project has two specific goals:

Goal 1. Expand nursery operations for corals and mangroves to include more coral species, provide science-driven identification of stress-resistant genotypes and restoration sites. and track out-plantings.

Goal 2. Formalize a citizen-science program that is focused on nursery efforts in order to engage the public and provide for sustainability of the program.

Description of the Proposed Action or Project

Goal 1:
Goal 1 of the Proposed Project is to expand nursery operations for corals and mangroves. The Proposed Project includes two (2) separate Actions: Coral-focused and Mangrove-focused. These actions will include increasing coral and mangrove species; providing science-driven identification of stress-resistant genotypes and restoration sites; and tracking of out-planted species (Photos 1 – 4). The Coral-focused and Mangrove-focused Actions are detailed below.

Coral-focused Actions
These actions include increasing the number of coral "trees" at each of two (2) existing nurseries which are located off the coast of St. Thomas. The number of trees will increase from 10 to 20, and an on-land nursery component will be added to include five (5) seawater tables located at CMES on the St. Thomas campus. The nurseries were established by The Nature Conservancy (TNC) but are now managed by the Center for Marine and Environmental Studies (CMES) at the University of the Virgin Islands (UVI) with input and assistance from TNC.

The species stocked in both the on-land nurseries and in-water will increase from *Acropora cervicornis* to also include other species such as *A. palmata*, *Orbicella annularis*, *O. faveolata*, *O. franksi* and *Dendrogyra cylindrus*. Corals will be tracked and genotyped by the Baums Laboratory at Pennsylvania State University (Penn State). Coral fragments will be collected opportunistically. Fragments that have grown to a large enough size will be out-planted to sites determined to be critical to shoreline protection. These sites will be selected in consultation with the Virgin Islands Division of Coastal Zone Management (CZM) and using coastal vulnerability maps produced for TNC. Coral out-planting sites will be monitored for growth and mortality, with the goal of identifying resilient genotypes.

Mangrove-focused Actions
These actions include increasing the number of seawater tables at CMES from 1 to 10 tables. The seawater tables are dedicated to cultivating red mangrove (Rhizophora mangle) seedlings and will be managed by the Virgin Islands Marine Advisory Service (VIMAS) along with CMES. The genetic identity of each seedling will be catalogued by the Stanford Lab at UVI and individuals will be tagged and tracked to out-planting. Seedlings will be out-planted quarterly to sites vulnerable to coastal storm impacts and amenable to mangrove growth. As with corals, sites will be selected in consultation with CZM and using coastal vulnerability maps from TNC. Nursery

seedlings and out-planted trees will be monitored for growth and mortality to determine which genotypes exhibit the fastest growth.

Goal 2:
The Virgin Islands will create a Reef Response Citizen Science program (VI Reef Response) which will provide participants with opportunities to engage in authentic scientific investigations relevant to the restoration of coastal habitats in the USVI. This program will be in partnership with researchers and scientists from UVI and Penn State.

Project Location

The Applicant has identified multiple proposed project locations for both the Coral-focused Actions and the Manatee-focused Actions. Specific GPS coordinates are listed in Tables 1 and 2, with a brief discussion of the proposed locations below.

Coral-focused Actions
Proposed coral out-planting sites will occur in the nearshore coastal areas around St. Thomas, and potentially, Great and Little St. James. Sites will be determined by scoping surveys, coastal risk modeling, and coastal vulnerability maps from TNC; and will be selected in consultation with the Virgin Islands CZM. Specific locations on St. Thomas have been identified at Brewers Bay, Hull Bay, Flat Cay, Triangle
Rocks, Buck Island, East End, and Coki Point (Table 1 and Figure 1).

Table 1. Coral restoration sites

Coral Restoration Locations	Latitude	Longitude
Brewers Bay	18.341857	-64.979342
Hull Bay	18.370816	-64.954674
Flat Cay	18.316614	-64.988521
Triangle Rocks	18.316205	-64.919965
Buck Island (St. Thomas)	18.279245	-64.895240
East End	18.315937	-64.843997
Great and Little St. James	18.304290	-64.827810
Coki Point	18.350591	-64.864182

Currently, no specific locations have been identified on Great and Little St. James. Existing in-water nurseries are located at West Cay and Flat Cay on St. Thomas.

Mangrove-focused Actions
Proposed mangrove seeding will occur in coastal areas of St. Thomas as determined by scoping surveys, coastal risk modeling, and coastal vulnerability maps from TNC; and will be selected in consultation with the Virgin Islands CZM. Specific locations have been identified at Magen's Bay, Mandahl Bay, Red Hook, St. Thomas East End Reserve (STEER), Range Cay, and Perseverance Bay (Table 2 and Figure 2).

Table 2. Mangrove restoration sites

Mangrove Restoration Locations	Latitude	Longitude
Magen's Bay	18.362399	-64.923228
Mandahl	18.360383	-64.894540
Red Hook	18.323073	-64.853535
STEER (St. Thomas East End Reserves)	18.312937	-64.873037
Range Cay	18.339432	-64.977119
Perseverance Bay	18.352338	-64.995615

The current mangrove nursery is located at the MacLean Marine Science Center on the St. Thomas campus of the University of the Virgin Islands.

FEMA requests your concurrence with this determination of consistency with Coastal Zone Management Policy in order to provide federal funding for the proposed project. Should you have any questions or need to discuss this project in greater detail, please contact me at (202-805-6764). Please send an e-mail with your response to kyle.bartowitz@fema.dhs.gov and copy virginia.corbiere@fema.dhs.gov.

Sincerely,

Virginia Corbière
Environmental/Historic Preservation Advisor
FEMA, 4340-DR USVI
Virginia.corbiere@fema.dhs.gov
202-805-6764

Cc: kyle.bartowitz@fema.dhs.gov

Attachments: Location Maps

Appendix C, Correspondence C4

VI SHPO NHPA Section 106 Consultation
(sensitive information redacted)

U.S Department of Homeland Security
FEMA Region II
FEMA 4335/4340-JFO
4500 Sunny Isles Shopping Center
Units 37,38
Christiansted, VI 00820

FEMA

August 31, 2020

Sean L. Krigger
Director/Deputy State Historic Preservation Officer
Department of Planning and Natural Resources
Virgin Islands State Historic Preservation Office
5064 Forts Straede 1, Kongens Quarter
Charlotte Amalie, Virgin Islands 00802

Section 106 Consultation: FEMA-4335-DR-USVI
Project Number: HMGP-4335-F007
Subrecipient: University of the Virgin Islands
Undertaking: Mangrove and Coral Restoration
Location: Coastal regions of St. Thomas, USVI

Dear Mr. Krigger,

The Federal Emergency Management Agency (FEMA) proposes to provide funds through the Hazard Mitigation Grant Program (HMGP) program which is authorized under the Robert T. Stafford Disaster Relief and Emergency Assistance Act, P.L. 93-288, as amended, in response to major Disaster Declaration FEMA-4340-DR-USVI, dated September 20, 2017. FEMA is conducting Section 106 consultation for the above referenced Undertaking in accordance with 36 CFR Part 800 and Stipulation II.D Standard Project Review of FEMA's Virgin Islands Programmatic Agreement executed on July 14, 2016.

Undertaking

The University of the Virgin Islands proposes to expand coral and mangrove restoration operations on St. Thomas, and possibly Great and Little St. James, by increasing nursery operations for corals and mangroves to sites vulnerable to coastal storm impacts. The restoration of coral reefs and mangroves will help mitigate the severity of storm surge in future storm events.

Coral Restoration Methodology
Coral restoration activities will include increasing the number of coral "trees" at each of two existing nurseries located off the coasts of St. Thomas, and between Great and Little St. James, that were initiated by The Nature Conservancy (TNC), but are now managed by CMES of the University of the Virgin Islands (UVI) with input and assistance from TNC. Methodology includes driving a 10 cm anchor into the sand/bedform to a depth of 0.5 m to anchor each new coral tree in place. Anchors are driven into the sand using a steel rod and hammer. The steel rod is then removed leaving the anchor line (Photo 2-3). Ten (10) new coral trees with anchors will be installed at the Great St. James nursery location and no (0) new anchors will be installed at the Flat Cay nursery location since anchors for 20 trees already exist. No anchors will be replaced at any site, only hand tools will be used for installing the coral tree anchors, and therefore, no staging of equipment is required. Coral nursery trees are completely submerged and there is no expected visibility from shore.

Mangrove Restoration Methodology
Mangrove seedlings will pe propagated on seawater tables at the Center for Marine and Environmental Studies (CMES) dedicated to cultivating red mangrove (Rhizophora mangle). These tables will be managed by the Virgin Islands Marine Advisory Service (VIMAS) and CMES. The genetic identity of each seedling will be catalogued by the Stanford lab at UVI, and individuals will be tagged and tracked through to out-planting (Photo 1). Seedlings will be out-planted quarterly to sites vulnerable to coastal storm impacts and amenable to mangrove growth. Out-planting sites will be located within the nearshore coastal areas around St. Thomas, as determined by scoping surveys and coastal risk modeling. Restoration will target existing mangrove shorelines that were heavily damaged by the 2017 storms; this is not expected to be different than the existing groves. Mangrove planting depth will be 15-25 cm. Mangroves will be planted using basic hand tools (e.g., shovels, trowels). Only hand tools will be used for planting; no staging of equipment is required.

Area of Potential Effects (APE)

Pursuant to 36 CFR 800.4(a)(1), the Area of Potential Effects (APE) is defined as the geographic area(s) within which the undertaking may directly or indirectly affect historic resources. Currently, there are no specific APE footprints identified for either the mangrove or coral out-plantings. However, general coordinates are provided in Tables 1 and 2 below, and maps of proposed project areas are provided in in Figures 1 and 2 in the Attachments. Specific APE footprints for each out-planting will be identified during the fieldwork planning stage for each upcoming season, therefore, further consultations with the VISHPO will be required prior to beginning each field season as specific coral and mangrove restoration APEs are defined.

Coral restoration activities are proposed at Brewers Bay, Hull Bay, Flat Cay, Triangle Rocks, Buck Island (St. Thomas), East End, Great and Little St. James, and Coki Point (Figure 9-16). Table 2 provides GPS coordinates for each proposed Coral restoration area and existing nursery site.

Table 1. General Coral Restoration Locations

Location	Latitude	Longitude
Brewers Bay	18.341857	-64.979342
Hull Bay	18.370816	-64.954674
Flat Cay	18.316614	-64.988521
Triangle Rocks	18.316205	-64.919965
Buck Island (St. Thomas)	18.279245	-64.895240
East End	18.315937	-64.843997
Great and Little St. James	18.304290	-64.827810
Coki Point	18.350591	-64.864182

Mangrove restoration activities are proposed at Magen's Bay, Mandahl Bay, Red Hook, St. Thomas East End Reserves (STEER), Range Cay, and Perseverance Bay (Figure 3-8). Table 1 provides GPS coordinates for each proposed Mangrove restoration area.

Table 2. General Mangrove Restoration Locations

Location	Latitude	Longitude
Magen's Bay	18.362399	-64.923228
Mandahl Bay	18.360383	-64.894540
Red Hook	18.323073	-64.853535
STEER	18.312937	-64.873037
Range Cay	18.339432	-64.977119
Perseverance Bay	18.352338	-64.995615

As stated above, further consultations will be submitted to VISHPO prior to beginning each field season as project areas are further refined.

Identification and Evaluation

Six of the fourteen proposed project areas contain 38 known cultural resources located within ½ mile that could be affected by project activities. Those six proposed project areas include Magens Bay, Perseverance Bay, Brewers Bay, Hull Bay, Triangle Rocks, and Buck Island (Table 3).

Architecture
Historic standing structures are located within ½ mile of four of the proposed project areas: Magen's Bay, Perseverance Bay, Brewers Bay, and Hull Bay. See Table 3 in Attachments.

FEMA has determined there will be no effect to historic resources with standing structures as all the work would occur either in the water or at near-shore locations, not at higher elevations where the historic standing structures are located.

Archaeology
Known historic and prehistoric archaeological sites are located within ½ mile of five of the proposed project areas: Magens Bay, Brewers Bay, Hull Bay, Triangle Rocks, and Buck Island.

<< ***SENSITIVE CULTURAL RESOURCES INFORMATION REDACTED*** >>

Soils

The USDA Web Soil Survey describes the soils for the following terrestrial components of project APEs for mangrove planting activities. No soil data is available for coral relocation areas since they are not located on land.

Magens Bay soils are classified as Sandy Beaches and Juacas sand with 0 to 5 percent slopes. Progressing inland from the mean water line soils change to Solitude gravelly fine sandy loam with 0 to 2 percent slopes. Mandahl Bay soils are characterized as Ponded Salt Flats with inshore areas Solitude gravelly fine sandy loam with 0 to 2 percent slopes, frequently flooded. Red Hook soils are Sandy Point and Sugar Beach Soils with 0 to 2 percent slopes that are also frequently flooded. The inshore area is Solitude gravelly fine sandy loam with 0 to 2 percent slopes, frequently flooded. STEER soils are Sandy Point and Sugar Beach soils with 0 to 2 percent slopes, frequently flooded. Soils at Range Cay are Southgate-Rock outcrop complex with 40 to 60 percent slopes. Perseverance Bay soils are characterized as Ponded Salt flats progressing inshore to Sandy Point Sugar Beach soils with 0 to 2 percent slopes. Inshore soils are Solitude gravelly fine sandy loam with 0 to 2 percent slopes that are frequently flooded.

All soils within the proposed project APEs have been subjected to storm and tidal erosion associated with hurricanes Irma and Maria, as well as other storm events. Therefore, there is a medium to low probability that tree planting activities may disturb intact archaeological resources, especially if activities are confined to augmenting previously inhabited mangrove groves.

Determination of Effect

FEMA has determined there is the potential for an adverse effect to archaeological resources during mangrove restoration activities at Magens Bay; and during coral restoration activities at Brewers Bay, Hull Bay, Triangle Rocks, and Buck Island (St. Thomas). During mangrove relocation all work will occur near the shoreline, no heavy equipment staging will be required, and all work will be completed using simple hand tools, therefore, the potential for adverse effect is expected to be minimal. During coral relocation all work will occur in the water, no heavy equipment staging will be required, and all work will be completed using simple hand tools. As a result, the potential for adverse effect is also expected to be minimal.

Therefore, FEMA has determined that the proposed undertaking involving Mangrove and Coral restorations will result in **No Adverse Effect to Historic Properties** with the following condition:

> **Further consultations will be submitted to VISHPO prior to beginning each field season as specific project areas are further refined.**

Should you have questions or need additional information, please contact Rebecca Johnson, Historic Preservation Specialist (rebecca.a.johnson@fema.dhs.gov or call 202-769-6008), or

Virginia Corbiere, Environmental-Historic Preservation Advisor (virginia.corbiere@fema.dhs.gov or call 202-805-6764).

Sincerely,

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Cc: Eboni Powell, Administrative Specialist, VI SHPO
David M. Brewer, Senior Archaeologist, VI SHPO

VISHPO CONCURRENCE: Mangrove and Coral Restoration
Section 106 Consultation: FEMA-4335-DR-USVI
Project Number: HMGP-4335-F007
Subrecipient: University of the Virgin Islands
Undertaking: Mangrove and Coral Restoration
Location: Coastal regions of St. Thomas, USVI

FEMA's Determination of Effect: No Adverse Effect to Historic Properties with the following condition:
Condition:
Further consultations will be submitted to VISHPO prior to beginning each field season as specific project areas are further refined.

Date: September 14, 2020

As proposed, VISHPO **X** concurs ___ does not concur with FEMA's determination of effect. If no consulting parties object to this finding within the 30-day review period (per Stipulation I.D.2.c. of USVI Programmatic Agreement), the project may proceed as proposed unless resources are discovered during project implementation, pursuant to 36 CFR 800.13.

Sean L. Krigger
Director/Deputy State Historic Preservation Officer
Department of Planning and Natural Resources
Virgin Islands State Historic Preservation Office