Programmatic Environmental Assessment
Coastal Resiliency in Alabama, Florida, Puerto Rico and the U.S. Virgin Islands

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LIST OF ABBREVIATIONS

ACHP	Advisory Council on Historic Preservation
ADEM	Alabama Department of Environmental Management
AL	Alabama
APE	Area of Potential Effect
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practice
BRIC	Building Resilient Infrastructure and Communities
CATEX	Categorical Exclusion
CBRA	Coastal Barrier Resources Act
CBRS	Coastal Barrier Resources System
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CRCP	Coral Reef Conservation Program
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
CZMP	Coastal Zone Management Plan
DHS	Department of Homeland Security
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EJ	Environmental Justice
EO	Executive Order
ESA	Endangered Species Act
FDEP	Florida Department of Environmental Protection
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FL	Florida
FONSI	Finding of No Significant Impact
GCRMN	Global Coral Reef Monitoring Network
HMA	Hazard Mitigation Assistance
IPaC	Information for Planning and Consultation
JAXBO	U.S. Army Corps of Engineers Jacksonville District's Programmatic Biological Opinion
LMR	Living Marine Resources
MBTA	Migratory Bird Treaty Act
MMPA	Marine Mammal Protection Act
MSA	Magnuson–Stevens Fishery Conservation and Management Act
NEPA	National Environmental Policy Act

NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollution Discharge Elimination System
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
OPA	Otherwise Protected Area
PA	Public Assistance
PBO	Programmatic Biological Opinion
PEA	Programmatic Environmental Assessment
PPA	Prototype Programmatic Agreement
PR	Puerto Rico
PRPB	Puerto Rico Planning Board
PVC	Polyvinyl chloride
REC	Record of Environmental Consideration
RHA	Rivers and Harbors Act
SAV	Submerged Aquatic Vegetation
SHPO	State Historic Preservation Office
SOW	Scope of Work
SSA	Sole Source Aquifer
THPO	Tribal Historic Preservation Office
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
VIDPNR	Virgin Islands Department of Planning and Natural Resources
WOTUS	Waters of the United States

1.0 INTRODUCTION

The Federal Emergency Management Agency (FEMA) makes federal assistance available to state, local, tribal, and territorial governments and certain private nonprofit entities under the Public Assistance (PA) and Hazard Mitigation Assistance (HMA) Programs. These partners are FEMA's recipients and subrecipients. PA grants are used to repair or restore disaster-damaged facilities or make other site improvements and may include mitigation measures along with repair in accordance with Section 406 of the Stafford Act (406 Mitigation). HMA encompasses several grant programs, including Hazard Mitigation Grant Programs under Section 404 of the Stafford Act (404 Mitigation) and the Building Resilient Infrastructure and Communities (BRIC) grant program.

FEMA is required to consider potential environmental impacts of its actions before funding or approving actions and projects. This Environmental Assessment has been prepared in accordance with The National Environmental Policy Act of 1969 (NEPA); [1] the Council on Environmental Quality (CEQ) regulations implementing NEPA; [2] the Department of Homeland Security (DHS) Directive 023-01, Revision 01 and DHS Instruction 023-01-001-01, Revision 01; and FEMA Directive 108-1 and FEMA Instruction 108-1-1. An Environmental Assessment (EA) is a NEPA document to analyze the potential environmental impacts of project alternatives, including a No Action Alternative; and to determine whether or not a federal action has the potential to cause significant environmental impacts. A determination that the action will not have significant environmental impacts will result in a Finding of No Significant Impact (FONSI). A determination that the environmental impacts of a proposed action will be significant will result in an Environmental Impact Statement (EIS). An EA also offers the public an opportunity to be aware of and comment on the federal action during the decision-making process. A Programmatic Environmental Assessment (PEA) assesses environmental impacts of proposed policies, plans, programs, or projects for which subsequent type of similar actions will be implemented either based on the PEA or based on subsequent project-specific NEPA reviews tiered to the programmatic review. CEQ issued guidance for Effective Use of Programmatic NEPA Reviews in 2014.

1.1 Use of this Programmatic Environmental Assessment

FEMA reviews project proposals at the lowest NEPA level appropriate to the action in accordance with 40 CFR 1500 – 1502 and the FEMA Instruction. FEMA evaluates projects under applicable statutory or categorical exclusions first, while also satisfying other applicable compliance reviews. FEMA uses programmatic environmental assessments (PEA) to evaluate types of activities; in

[1] 42 U.S.C. § 4321 et seq.
[2] 40 CFR §§ 1500-1508

advance of receiving complete project applications from subrecipients, to address potential extraordinary circumstances in groups of activities, and to focus on future NEPA concerns that have greater potential impacts. When FEMA has project-specific scopes of work, FEMA evaluates them in similar order of escalating NEPA levels. Those that fall within the limits established in this PEA, will conclude the review process with applicable consultations, documented in a record of environmental consideration as part of the grant package. FEMA evaluates project proposals that otherwise meet this PEA but exceed the impacts or scale summarized in Section 9 and determine if the action requires a focused EA tiered from this PEA or a separate project-specific EA. Projects that cannot be satisfied by statutory or categorical exclusions or an EA may require an environmental impact statement. In accordance with the Sandy Recovery Improvement Act (SRIA) of 2013, as amended (P.L. 113-2), other federal agencies or agencies assuming federal NEPA authority, like Housing and Urban Development (HUD) Responsible Entities (HUD-RE), may choose to adopt this PEA, in whole or in part, according to their respective regulations.

2.0 PURPOSE AND NEED

The purpose of the proposed action is to reduce the potential for loss of life, property and shoreline erosion resulting from storm surge by promoting the resiliency of coastal Living Marine Resources (LMR) in AL, FL, PR, and the USVI. Living marine resources refer to the organisms that use or otherwise rely on marine, estuarine, and both tidal and nontidal riverine resources during all or part of their life cycles.[3] Examples of LMR include mangroves, submerged aquatic vegetation (SAV), and coral species. The need for the proposed action is to reduce the chronic and evolving threats faced by coastal and marine resources due to habitat loss, degradation, and climate change that limit the protective ecosystem services LMR contribute to.

This PEA includes an assessment of actions that promote LMR in coastal areas of AL, FL, PR, and the USVI, as cost-effective mitigation to reduce storm surge, loss of life, and coastal property, critical for regional economic health. This PEA evaluates potential impacts to the human and natural environment resulting from similar types of projects that promote coastal resiliency through LMR. This PEA may be used in the future to evaluate similar FEMA-funded projects, under this programmatic analysis. For this PEA, "FEMA" will mean FEMA Region 2, specifically PR and the USVI, and Region 4, specifically AL and FL. The term "state" in this PEA also includes the Commonwealth of Puerto Rico and the U.S. Virgin Islands.

3.0 BACKGROUND

Nature-based solutions are emerging as important components of disaster response and recovery projects. Coastal and marine resources provide important benefits called, "ecosystem services"

[3] NOAA, June 2015

that impact flood protection, recreational opportunities, and habitat for commercial and recreational fisheries. During Hurricane Sandy, for example, coastal wetlands protected areas of the East Coast from more than $625 million in direct flood damages.[4] The U.S. Geological Survey (USGS) estimated the losses from hurricanes Irma and Maria in 2017 for both Florida and Puerto Rico, projected future losses in Florida alone should coral continue to degrade, and potential gains from coral restoration. See Table 3.0.1 for a summary.

Table 3.0.1: Irma and Maria Estimated Losses

	Flood Risk	**Direct Damage**		**Indirect Damage**
	People	Buildings	Cost ($M)	Cost ($M)
2017 Damages	4,300	1,800	$57.2	$124.3
Projected Losses (FL)	7,300	1,400	$385.4	$438.1
Restoration Gains	3,100	890	$124.2	$148.7

Potential benefits of coral reef restoration in Puerto Rico could prevent $40 million in economic damages annually; the greater benefits would be seen near shore with limited protection anticipated from deeper water restoration.

The ecosystem services provided by the nation's coastal and marine resources also provide mitigation measures that dissipate destructive wave action, thereby reducing the impacts of storm surge. Meta-analyses reveal that coral reefs provide substantial protection against natural hazards by reducing wave energy by an average of 97%.[5] Similarly, mangrove roots, trunk, and canopy can dissipate storm surge and reduce up to 66% of wave energy in the first 100 meters of mangrove forest width.[6] The restoration of coastal habitats, including coral reefs, can reduce risks by decreasing the exposure of coastal communities to flooding hazard.[7] However, the loss of coastal and marine resources such as mangrove canopies, SAV, and coral reefs means less protection for coastal communities from the impact of storm surge. According to a U.S. Fish and Wildlife Service (USFWS) study, the coastal watersheds of the lower 48 states lose 80,000 acres of coastal wetlands each year to erosion, subsidence, sea-level rise, development, and drainage.[8] Similarly, coral reefs are adversely impacted by anthropogenic pressures such as warming ocean temperatures, ocean acidification, and land-based pollution such as input of nutrients and sediments. Coral bleaching events since 1998 have collectively accounted for a 22% reduction in the world's corals according to the Global Coral Reef Monitoring Network (GCRMN) sixth status report of corals reefs of the

[4] Narayan et al., March 2017
[5] Ferrario et al., May 2014
[6] Menéndez et al., March 2020
[7] Storlazzi, et al., 2021
[8] USFWS, 2009

world, funded in part by the United Nations.[9] Nature-based solutions that address the compounding stressors on coastal and marine resources also help to reduce the risk of loss of life and property caused by the impacts of storm surge. Projects that promote these cost-effective mitigation measures are evaluated further in this PEA for sites within AL, FL, PR and the USVI.

3.1 FEMA Implementation Changes

FEMA funding programs are increasingly considering nature based solutions as "infrastructure" as well as their contribution to risk reduction and resiliency strategies. Considerations have extended into partnerships with groups like The Nature Conservancy and other federal partners posessing greater experience and data to understand the financial and risk reduction potential.[10] In November 2014, DHS published a Federal Register Notice changing FEMA's implementation of NEPA to align with other DHS components which were fully implemented in August 2016. FEMA and DHS have categorically excluded from higher levels of NEPA review, actions that repair, protect, or upgrade existing facilities in upland and coastal areas. For example, FEMA CATEX Category E includes guidance on actions related to construction, installation, and demolition activities; CATEX E2 provides for actions related to new construction or improvement of land. However, it does not readily apply to submerged land. Other Category E CATEXs are limited to actions related to DHS component-owned or managed land. CATEX N12 relates to federal assistance for planting of indigenous vegetation but is primarily focused on upland species. CATEX N19 is related to federal assistance for clean-up and other actions to restore environmental resources to pre-existing conditions. However, the intent of CATEX N19 is to support projects such as the clean-up of releases from petroleum storage tanks that affect nearby water bodies or wetlands. The administrative record for CATEXs N12 and N19 do not address proposals that promote coastal resiliency. Appendix A includes excerpted CATEX language. Further, the actions evaluated in this PEA may include the handling of threatened or endangered coral and seagrass species and may involve actions within designated critical habitat and essential features for other species. FEMA initiated this PEA in September 2021, but had to put the initiative on pause in mid-2022 due to increased prioritization of the energy grid in Puerto Rico within Washington D.C., further exacerbated by Hurricane Fiona and associated response. FEMA returned to the initiative in March 2023 to finalize the PEA for distribution and public comment.

3.2 Existing Resources

FEMA considered existing NEPA evaluations completed by National Oceanic and Atmospheric Administration (NOAA) for actions that promote coastal LMR resiliency. Specifically, FEMA considered two Programmatic EISs prepared by NOAA Restoration Center to assess the

[9] GCRMN, 2021
[10] A.E. Stovall, et al., 2022

environmental impacts of proposed NOAA actions, to fund or otherwise implement through its existing programmatic framework and related procedures for coastal habitat restoration activities, and for NOAA's Coral Reef Conservation Program (CRCP).[11] FEMA is incorporating analysis from these NOAA documents into this PEA by reference in accordance with 40 CFR Section 1501.12. FEMA prepared this PEA, in coordination with NOAA, to similarly evaluate coastal resiliency actions and to streamline current and future project reviews.

FEMA is committed to expediting and unifying interagency environmental and historic preservation compliance review processes to facilitate its mission and ensure compliance with applicable laws in accordance with Section 429 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended by the Sandy Recovery Improvement Act of 2013. FEMA Region 2 and Region 4 have executed programmatic documents that support compliance with the Endangered Species Act (ESA) and National Historic Preservation Act (NHPA) and function congruently with this PEA.

FEMA has developed a Prototype Programmatic Agreement (PPA) in coordination with the Advisory Council on Historic Preservation (ACHP), to create a framework for FEMA in developing agreements to improve and expedite Section 106 compliance for disaster recovery activities. The ACHP's Chairman designated the FEMA PPA on December 17, 2013, in accordance with 36 CFR Part 800.14(b)(4). FEMA regions routinely negotiate renewals of such agreements prior to expiration. The following Programmatic Agreements are active for AL, FL, PR, and the USVI pursuant to 36 CFR Section 800.14(b)(4)

- Programmatic Agreement Among The Federal Emergency Management Agency, The Alabama Historical Commission, The Alabama Emergency Management Agency, and Participating Tribes, executed on March 8, 2021, and is due to expire on March 8, 2026.

- Programmatic Agreement Among The Federal Emergency Management Agency, The Florida State Historic Preservation Office, The Florida Division of Emergency Management, and Alabama Coushatta Tribe of Texas, Choctaw Nation of Oklahoma, Mississippi Band of Choctaw Indians; and The Advisory Council on Historic Preservation due to expire on September 10, 2025.

- Second Amendment to Programmatic Agreement Among The Federal Emergency Management Agency, The Puerto Rico State Historic Preservation Officer, and The Puerto Rico Central Office for Recovery, Reconstruction and Resiliency, executed on May 5, 2023.

[11] NOAA, July 17, 2020

- Programmatic Agreement Among The Federal Emergency Management Agency; The Virgin Islands State Historic Preservation Officer; and The Virgin Islands Territorial Emergency Management Agency, executed on June 20, 2023.

- The NOAA National Marine Fisheries Service (NMFS) Programmatic Environmental Impact Statement for habitat restoration activities implemented throughout the coastal United States issued in 2015.[12]

- The U.S Army Corps of Engineers (USACE) Jacksonville District's Programmatic Biological Opinion (JAXBO)[13] issued in 2017 includes the NOAA National Marine Fisheries Service (NMFS) Programmatic Biological Opinion associated with 10 categories of minor in-water activities, including some actions described in this PEA. USACE will determine when JAXBO is applicable to streamline ESA consultation with NOAA NMFS for actions included in this PEA.

- Endangered Species Act Consultation Matrix for Puerto Rico and U.S. Virgin Islands implemented by FEMA and the U.S. Fish and Wildlife Service Puerto Rico Field Office in 2019 and updated in 2020.

4.0 ALTERNATIVES

NEPA guidance requires that federal agencies explore and objectively evaluate reasonable alternatives for proposed actions. NEPA guidance also requires evaluation of a No Action Alternative as a benchmark to evaluate other actions. The identified Proposed Action Alternative presents a range of potential actions that meet the purpose and need of this PEA. Subrecipients may determine that a specific proposal may require one or more of the potential actions, evaluated collectively as the Preferred Alternative in this PEA.

4.1 Alternative 1: No Action Alternative

Under the No Action Alternative, FEMA would continue to rely on the existing FEMA and DHS CATEX categories to interpret whether individual coastal LMR resiliency projects limits rise above the level of a categorically excluded action under NEPA. FEMA reviewers would continue to interpret current CATEXs with respect to coastal LMR resiliency projects on a project-by-project basis. This approach to regulatory interpretation increases the risk of unpredictability for project proponents and may result in project-specific environmental assessments or FEMA choosing to not fund an action. For the purposes of this PEA, the no action means no FEMA action

[12] NOAA NMFS, 2015
[13] USACE, 2017

or funding for coastal resiliency projects thus requiring case by case decisions on the project level which may include project-specific environmental assessments.

4.2 Alternative 2: Proposed Action Alternative (Preferred Alternative)

FEMA has identified the Proposed Action Alternative as the Preferred Alternative. Under the Preferred Alternative, FEMA proposes the use of federal assistance to fund coastal LMR resiliency actions that promote cost-effective mitigation measures to reduce the risk of loss of life and property caused by the impacts of storm surge.

Potential actions that promote coastal LMR resiliency evaluated in this PEA include, but are not limited to, creating or re-creating reef structure through transplant and re-attachment of coral fragments, reef rubble, or coral reef substrate as attachment sites for corals. Propagating coral fragments may occur in onshore or offshore nurseries. Coral development can also be implemented using settlement tents that attract coral larvae to suitable, restored substrate, thereby enhancing natural recruitment to the restoration site. Coral reef substrate or structures take many forms, including, but not limited to, natural materials such as oyster shells or limestone, artificial materials such as concrete, wire mesh, polyvinyl chloride (PVC), or metal, and other structures such as sunken vessels or engineered reef blocks. Coral nursery designs are typically limited to two general types: coral fragments attached to hard structure such as cement, limestone, wire, or rebar substrate or coral fragments suspended on lines in the water column. Specific configurations and deployments are site-specific, dependent on a variety of local conditions. Appendix B includes photographic examples of coastal LMR projects in the USVI.

In addition, potential actions that promote coastal LMR resiliency adjacent to coral reefs with submerged and terrestrial vegetation are evaluated in this PEA as cost-effective mitigation measures to dampen wave energy, stabilize sediments, and improve water quality for coral reefs. Potential actions that promote coastal terrestrial vegetation include, but are not limited to, the planting of mangrove propagules or other coastal herbaceous species at a site to allow for the natural regeneration of coastal terrestrial vegetation communities over time. Potential actions that promote SAV include, but are not limited to, the transplanting or seeding nearshore or subtidal habitats in bays and estuaries with native SAV, installing bird perches as a source of nutrients to SAV beds in areas where waters are nutrient deficient where they are allowed by permitting or regulatory agencies, or installing signage at a restoration site. In general, these types of actions provide the structure and favorable conditions that allow recruitment, growth, and survival of coastal LMR resources.

5.0 AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS

This section discusses the potential impacts of the No Action and the Preferred Alternative. In accordance with NEPA, the affected environment includes the physical, biological, cultural, and

human use contexts in which the activities will occur. This PEA presents an evaluation of various resource areas informing an overall finding of significant impacts or a finding of no significant impact. Consequently, resource areas for which impacts are not expected or are expected to be negligible were eliminated from further analysis. When possible, quantitative information is provided to establish potential impacts, otherwise the potential qualitative impacts are evaluated based on the criteria listed in Table 5.0.1.

Table 5.0.1: Impact Significance and Evaluation Criteria for the Affected Environment

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 impacts that would have adverse or beneficial impacts be slight and local. Impacts would be well below regulatory standards, as applicable.
Minor	Adverse or beneficial 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 impacts.
Moderate	Adverse or beneficial 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 impacts.
Major	Adverse or beneficial 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 impacts would be required to reduce impacts, though long-term changes to the resource would be expected.

Direct impacts occur within the same time and place as project construction, such as vegetation removal, vehicle emissions, and erosion control actions. Indirect, occur at a later time or place than the project construction such as the reduction in erosion potential or improvements to water quality. Cumulative impacts are effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of who conducts it. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time, such as transportation projects funded by other federal sources. Table 5.0.2 provides further context for the duration of impacts evaluated in this PEA.

Table 5.0.2: Impact Duration for the Affected Environment

Impact Duration Terminology	Definition
Temporary	Impacts and recovery occurring only during the construction period.
Short-Term	Impacts and recovery occurring during a limited, predictable amount of time up to three years, roughly corresponding to FEMA grant periods of performance.
Long-Term	Impacts and recovery occurring over time period longer than three years but into the reasonably foreseeable future.

Resource areas or specific regulations relating to resource areas were eliminated from further analysis in this PEA if no impacts were anticipated from the No Action or Preferred Alternative. Table 5.0.3 presents the resource areas or regulation eliminated from further evaluation and a brief discussion of the rationale.

Table 5.0.3: No Impact Anticipated

Resource Area or Regulation Eliminated	Rationale
Land Use and Planning	The NOAA PEIS determined impacts to be generally localized and minor to moderate beneficial with some minor adverse impacts.[14] FEMA does not anticipate further impacts to land use or planning actions in this PEA.
Noise	FEMA does not anticipate noise impacts from actions evaluated in this PEA as coastal LMR planting methods are typically done by hand and do not require heavy equipment.
Public Services and Utilities	FEMA does not anticipate impacts to electrical, water, gas, telecom, or other public utilities from actions evaluated in this PEA.
Public Health and Safety	FEMA does not anticipate impacts to public health and safety services, such as police, fire, medical emergency response, and similar from actions evaluated in this PEA.
Transportation	FEMA does not anticipate impacts to transportation infrastructure or traffic patterns from actions evaluated in this PEA. If a future project is consistent with the scope described in this PEA but creates impacts to maritime transportation facilities, then FEMA will prepare an EA or tier from this PEA.
Farmland Protection Policy Act of 1981	FEMA does not anticipate impacts to prime or unique farmlands from actions evaluated in this PEA as the actions would be primarily in coastal or submerged areas.

[14] NOAA NMFS, 2015

Resource Area or Regulation Eliminated	Rationale
Wild and Scenic Rivers Act of 1968	FEMA does not anticipate impacts to protected wild, scenic, or recreational river segments in AL, FL, and PR from actions evaluated in this PEA. There are no wild and scenic reivers designated in the USVI.[15] Actions evaluated in this PEA occur in marine/estuarine waters or at coastal shorelines, downstream from potential protected river segments.
Safe Drinking Water Act of 1974	FEMA does not anticipate impacts to Sole Source Aquifers (SSAs) from actions evaluated in this PEA. Three SSAs occur in Florida, no SSAs occur in AL, PR or the USVI.[16] Actions evaluated in this PEA are not anticipated to involve storage, transport of hazardous, toxic, or pathogenic materials such as solvents, road salt, manure, petroleum products or sewage.

Additional resources areas or specific regulations relating to resource areas were eliminated from further analysis if anticipated impacts were considered either non-detectable or, if detected, would have impacts that would be slight and local. However, subsequent environmental reviews for coastal resiliency projects tiered from this PEA will include assessments for site-specific considerations when applicable or otherwise appropriate. Table 5.0.4 presents the resource areas or regulation eliminated from further evaluation based on anticipated negligible impact and a brief discussion of the rationale.

Table 5.0.4: Negligible Impact Anticipated

Resource Area or Regulation Eliminated	Rationale
Air Quality	FEMA anticipates negligible impacts to air quality from actions evaluated in this PEA. Actions evaluated in this PEA may involve the burning of fossil fuels associated with vehicle trips, equipment, and the potential for watercraft operations. However, the impacts to air quality are expected to be negligible when compared to the No Action Alternative.
Geology, Topography, and Soils	FEMA does not anticipate impacts to geology and anticipates negligible impacts to topography from actions evaluated in this PEA. Negligible impacts to seafloor topography may occur from newly created submerged rock reefs, hard substrate features, or coral reefs. The potential for beneficial impacts related to mitigation of shoreline erosion of coastal sediment are evaluated in the floodplains and coastal resources sections of this PEA.
Hazardous Materials	FEMA anticipates negligible impacts with hazardous materials from actions evaluated in this PEA. Actions evaluated in this PEA may involve the

[15] USFWS National Wild and Scenic Rivers System Mapper
[16] USEPA Map of Sole Source Aquifer Locations

Resource Area or Regulation Eliminated	Rationale
	handling, storage, or creation of hazardous materials in regulatory reportable quantities. Future projects are not anticipated to occur at sites impacted by hazardous waste.

5.1 Water Quality

Water resources refer to the occurrence, availability, and physical, chemical, and biological characteristics of surface water and groundwater, including hydrologic properties and water quality for aquatic communities and public water supplies. Water bodies include aquifers, springs, streams, rivers, lakes, reservoirs, estuaries, and near-shore and off-shore marine water. Water quality encompasses the level of pollutants that affect the suitability of water for a given use. Water use classifications generally include public water supply, recreation, propagation of fish and other aquatic life, agricultural use, and industrial use. A discussion of applicable water quality regulations is included in this section to define the regulatory framework for this PEA.

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** (CWA) in 1977 (33 USC §§1251 et seq.). The CWA regulates discharge of pollutants into water with sections falling under the jurisdiction of the USACE and the U.S. Environmental Protection Agency (USEPA), these jurisdictional waters are called "Waters of the United States" (WOTUS). Certain WOTUS are considered "special aquatic sites" under the CWA because they are recognized as having a particular ecological value. Such sites include sanctuaries and refuges, mudflats, wetlands, vegetated shallow, eelgrass beds, coral reefs, and riffle and pool complexes. Special aquatic sites are defined in the CWA and may be afforded additional consideration in the USACE permit process for a project.

Under section 303(d) of the CWA, states are required to compile a list of impaired waters that fail to meet any of their applicable water quality standards. States develop a Total Maximum Daily Load plan to identify the maximum pollutant load that a listed water body can receive each day and still maintain water quality standards.

Section 404 of the CWA establishes the USACE permit requirements for discharging dredged or fill materials into WOTUS and traditional navigable waterways. The USACE issues two types of 404 permits, General Permits, and Individual Permits. General Permits are issued on a state, regional, and nationwide basis and cover a variety of activities, including minimal individual and cumulative adverse effects. These permits fit into specific categories established by the USACE. Individual Permits are issued for a case-specific activity. USACE may also issue emergency

authorizations or emergency general permits that streamline repairs following a storm or flooding event.

Section 401 of the CWA specifies that states must certify that any activity subject to a permit issued by a federal agency, such as a USACE General or Individual Permit, meets all state water quality standards. Section 401 of the CWA allows delegated states to set standards for water quality certification that may exceed USACE's permit conditions; these become state-specific regional conditions for projects authorized by USACE in a given state.

The USEPA has delegated authority to the Alabama Department of Environmental Management (ADEM) and the Florida Department of Environmental Protection (FDEP) to issue National Pollution Discharge Elimination System (NPDES) permits in AL and FL, respectively. The USEPA retains NPDES permit authority in PR. In the USVI, the Virgin Islands Department of Planning and Natural Resources (VIDPNR) administers the Virgin Islands' Territorial Pollutant Discharge Elimination System which regulates the discharge of pollutants into waters of the Virgin Islands. Point source discharges requiring a permit include permanent industrial, agricultural, or municipal facility discharges, as well as construction activities for projects that disturb more than one acre of ground. Non-point source pollutants that can be carried by diffuse stormwater and consist of substances such as; pesticides, pathogens, sediments, oil and grease, salt, and nutrients, including phosphorus and nitrogen.

Section 10 of the **Rivers and Harbors Act** (RHA) of 1899 requires authorization from the USACE for the construction of any structure in, over, or under any navigable water of the United States, the excavation/dredging or deposition of material in these waters, or any obstruction or alteration in a navigable water (33 USC § 401 et seq.). The definition of "navigable waters of the United States" under the RHA is different from the definition of WOTUS. The term "navigable waters of the United States" under the RHA includes tidally influenced waterbodies such as oceans and estuaries and/or those that may be used in their natural condition or by reasonable improvement to transport interstate or foreign commerce such as rivers, canals, harbors, etc. Structure or work outside the limits defined for navigable WOTUS requires a Section 10 permit if the structure or work affects the course, location, condition, or capacity of the water body. Section 10 of the RHA and CWA Section 404 overlap in some activities involving wetlands. Permits for activities regulated under both are processed simultaneously by the USACE.

5.1.1 Existing Conditions

CWA: Water quality in AL, FL, PR, and the USVI is directly and indirectly affected by point and nonpoint source pollution from agricultural and stormwater runoff and wastewater discharge. Nutrient runoff and sedimentation associated with land-based activities, have been associated with the degradation of marine water quality and coastal LMR. Due to their location, AL, FL, PR, and the USVI are regularly affected by hurricanes, tropical storms, and tropical depressions. Frequent storm events contribute to an ongoing pattern of coastal erosion, sediment pollution and further

coastal erosion. The Caribbean region represents only 1% of Earth's marine surface but hosts 10% of the world's coral reefs, according to the 2020 Global Coral Reef Monitoring Network (GCRMN) coral status report.

Coral reefs are among the most vulnerable ecosystems on the planet to anthropogenic pressures, including global threats from climate change and ocean acidification, and local impacts from land-based pollution such as input of nutrients and sediments from agriculture, marine pollution, and overfishing and destructive fishing practices. The GCRMN coral status report notes the frequency of large-scale coral bleaching; the 1998 coral bleaching event alone killed 8% of the world's coral. Subsequent coral bleaching events, occurring between 2009 and 2018 have killed 14% of the world's coral. Further, the report notes a 20% increase in algae on the world's coral reefs in 2019 than in 2010. The increase of algae is recognized as indicator of stress on coral reefs, and are associated with declines in the amount of hard coral.

5.1.2 Affected Environment

No Action Alternative
CWA & RHA: FEMA anticipates taking no programmatic action on LMR projects would result in minor adverse impacts to water resources based on the No Action Alternative. The No Action Alternative would result in FEMA continuing to make project-by-project evaluations which may include project-specific environmental assessments, missing work windows while selecting appropriate courses of action, or inconsistent determinations between projects. The No Action Alternative does not meet the purpose and need of this PEA and would be inconsistent with FEMA's growing consideration of nature based solutions to risk reduction and climate related impacts. Further, the NOAA CRCP EIS indicates that direct, short-term, and long-term adverse impacts to water resources are not reduced through a no action response.

Preferred Alternative
This PEA presents a range of potential actions that reduce shoreline erosion resulting from storm surge by promoting the resiliency of coastal LMR. The NOAA CRCP EIS indicates that direct and indirect, short, and long-term, beneficial impacts to water quality are realized through a range of actions that stabilize sediments. This PEA presents actions like those evaluated in the NOAA CRCP EIS.

The planting of SAV and mangroves may improve water quality in coastal environments in AL, FL, PR, and the USVI. SAV and mangroves contribute to the damping of waves, slowing of currents, and increases sediment stability through the accumulation of organic and inorganic material, thus reducing erosion. Mangrove and SAV communities also facilitate nutrient cycling, trapping nutrient-rich sediments and maintaining high rates of organic matter fixation, further reducing sediment.

In the short-term, the Preferred Alternative has the potential to cause minor adverse impacts to water quality due to the potential for increased turbidity at project sites during site preparation and placement of LMR. In the long-term, FEMA anticipates minor beneficial impacts to water quality based on the potential of the Preferred Alternative to improve reduce coastal erosion and marine sedimentation pollution from individual actions.

CWA & RHA: Placement of submerged coastal LMR may require USACE permitting under the CWA and RHA. Section 10 of the RHA and CWA Section 404 overlap in some activities involving wetlands. FEMA subrecipients will incorporate conditions from applicable permits to minimize adverse impacts.

The subrecipients will use BMPs and incorporate conditions from applicable permits to minimize impacts. Other permit conditions are discussed in Section 6. Section 9 summarizes resource-specific impact thresholds and conditions for project-specific tiering from this PEA.

5.2 Floodplain and Wetlands

Floodplains and wetlands may or may not overlap in location, but they have similar, and often mutually dependent natural functions that provide similar benefits. They possess characteristics that are both aquatic and terrestrial, stemming from hydrological connections between floodplain or wetland and surface water. They provide stormwater storage and conveyance, groundwater recharge, soil development and transport, water quality improvement, nutrient regulation, and habitat support for plants and animals.

The Cowardin wetland classification system includes five types of wetlands.[17] Marine wetlands consist of open ocean and high-energy coastlines. Estuarine wetlands consist of tidal areas that often are partially enclosed by land; riverine wetlands include areas within a river channel. Lacustrine wetlands are large freshwater, non-tidal wetlands associated with lakes, dammed rivers, and topographical depressions. Palustrine wetlands encompass smaller wetlands adjacent to other types of wetlands or surrounded by upland areas.

Actions potentially impacting floodplains and wetlands are regulated under the CWA, Executive Orders (EO) 11988, 11990, and state and local government regulations. EO 11988, Floodplain Management, applies to federal actions that take place in floodplains. EO 11990 Wetlands Management applies to federal actions that take place in or adjacent to wetlands. The EOs require federal agencies to avoid funding activities that directly or indirectly support occupancy, modification, or development of floodplains or wetlands whenever there are practicable alternatives. FEMA uses an 8-Step decision-making process to evaluate potential effects on, and mitigate impacts to, wetlands and floodplains. This process, like NEPA, requires the evaluation of

[17] Cowardin, et al., 1979

alternatives prior to funding the action. FEMA's regulations on conducting the 8-Step decision-making process are contained in 44 CFR Part 9.

5.2.1 Existing Conditions

Coastal floodplains and marine and estuarine wetlands in AL, FL, PR, and the USVI are impacted by chronic and evolving threats such as alternation, degradation or loss of wetlands, changes in waterway courses or flood controls, sea level rise, and extreme weather events resulting in more intense floods and increased flood risk. During a flood, sediment, pollution, nutrients, scour, and debris from the floodplain can be uplifted and transported to coastal areas, which can decrease water quality, increase turbulence, and block rivers, streams, estuaries, freshwater wetlands, and other water bodies.

Coastal floodplains and wetlands in AL, FL, PR and the USVI are adversely impacted by both the development of coastal areas and by severe weather such as tropical depressions, tropical storms, and hurricanes. Table 5.2.0 presents tropical cyclones, including tropical depressions, tropical storms, or hurricanes total for AL, FL, PR, and the USVI from 1980 to 2021.[18] Table 5.2.0 also includes data from NOAA's National Centers for Environmental Information indicating the percentage of tropical cyclones with damages/costs reached or exceeded $1 billion, adjusted for consumer price index.[19] The ecosystem services provided by the healthy functioning of coastal floodplains and wetlands provide mitigation measures that dissipate destructive wave action, thereby reducing the overall cost of severe storms. Inversely, the loss of coastal floodplains and wetlands may increase the overall cost of severe storms.

Table 5.2.0: Tropical Cyclone Event Totals and Percentage of Events with Billion Dollar Damages

State or Territory	Total tropical cyclone events (1980 -2021)	Percentage of events with damage costs at or exceeding 1 billion USD
Alabama	50	50%
Florida	109	26.6%
Puerto Rico	35	20%
US Virgin Islands	34	14.7%

Sources: NOAA Digital Coast, Hurricane Tracts website and NOAA National Centers for Environmental Information website

[18] NOAA Digital Coast, Historical Hurricane Tracts website
[19] NOAA National Centers for Environmental Information website

Floodplains: FEMA anticipates some projects identified under this PEA will be located in the coastal floodplain of AL, FL, PR, and the USVI. FEMA produces Flood Insurance Rate Maps (FIRMs) that map floodplains and are used to determine if an action is located in the floodplain. FIRMs depict calculated locations of the 1 percent (100-year) and the 0.2 percent (500-year) floodplains, coastal high hazard areas, special flood hazard areas, and base flood elevation levels.

Coastal Wetlands: Between 1922 and 1954, approximately 642,200 acres of coastal wetlands were lost in the contiguous United States. Between the 1950s and the late 1990s, an estimated 385,000 acres of estuarine vegetated wetlands were lost. These figures amount to an average rate of estuarine and coastal wetland loss of 13,696 acres per year between 1922 and the late 1990s, the total loss was roughly 1,027,200 acres for the entire period. In USFWS and NOAA NMFS's most recent trends report, they estimate that 71% of the losses in coastal wetlands between 2004 and 2009 were from the Gulf of Mexico coasts; this report does not include the Caribbean, however. The small gains in non-vegetated wetlands such as shoals, flats, and bars fell behind losses in vegetated estuaries and deep, open saltwater habitat. In this time period, all saltwater wetlands declined 2.8% in the Gulf of Mexico but changes along the Atlantic Coast are statistically unreliable. Between the 1998 to 2004 and the 2004 to 2009 reporting periods, the Services note that coastal wetland losses increased 25%. Restoration of coastal wetlands face additional challenges compared to upland wetlands including sea level rise, coastal storms, and development limiting suitable habitat. Coastal wetlands, like coral reefs and rainforests, are among the most productive ecosystems and important to nearly 45% of the wetland-dependent threatened and endangered species.[20]

FEMA anticipates some projects identified under this PEA will be located in marine or estuarine wetlands of AL, FL, PR, and the USVI. FEMA uses the USFWS National Wetlands Inventory (NWI), the only national-level wetland inventory, state-specific mapping tools, and on-site surveys to identify wetlands.[21] USFWS and USACE use different criteria to identify wetlands, and there is no national inventory of wetland acreage based on the USACE definition [33 CFR 328.3(c)(16)]. The USACE may require delineation of wetlands to issue a jurisdictional determination or permits for project specific evaluation.

Applications for projects impacting wetlands in Alabama and the USVI are made directly to USACE, pursuant to Section 404 of the CWA. Applications for projects impacting wetlands in Florida are permitted by the USACE Jacksonville District and the FDEP. A Joint Coastal Permit is required by the FDEP for activities that extend onto sovereign submerged lands of Florida seaward of the mean high-water line and are likely to have a material physical effect on the coastal system or natural beach and inlet. In PR, projects impacting wetlands are permitted by USACE.

[20] T.E. Dahl and S.M. Stedman 2013

[21] USFWS National Wetland Inventory website

The USFWS and the Puerto Rico Department of Natural and Environmental Resources also regulate activities in PR wetlands. Projects that may affect or are within a floodplain require coordination with and approval from a Puerto Rico Planning Board (PRPB) Certified Floodplain Manager. In the USVI, projects that may affect or are within a floodplain require a joint application to both USACE and VIDPNR and approval from a VIDPNR Certified Floodplain Manager.

5.2.2 Affected Environment

No Action Alternative
FEMA anticipates taking no programmatic action on LMR projects would result in minor to moderate adverse impacts to floodplains and wetlands based on the No Action Alternative. The No Action Alternative would result in FEMA continuing to make project-by-project evaluations which may result in delayed or inconsistent implementation of projects. Communities would remain vulnerable to storm surge events and coastlines would remain subject to erosion. The No Action Alternative does not meet the purpose and need of this PEA and would be inconsistent with FEMA's growing consideration of nature based solutions to risk reduction and climate related impacts. Further, the NOAA CRCP EIS indicates that direct, short-term, and long-term adverse impacts to floodplain and wetlands are not reduced through a no action approach.

Preferred Alternative
This PEA presents a range of potential actions that reduce shoreline erosion resulting from storm surge by promoting the resiliency of coastal LMR. The NOAA CRCP EIS indicates that direct and indirect, short, and long-term, beneficial impacts are realized through actions that reduce sedimentation and erosion in terrestrial, aquatic, wetland, and floodplain habitats, and restore flood storage capacity of wetlands and floodplains. Similar actions to those evaluated in the NOAA CRCP PEIS are presented in this PEA.

In the short-term, the Preferred Alternative has the potential to cause minor to moderate adverse impacts to floodplains and wetlands due to the potential for increased turbidity at project sites during site preparation and placement of LMR. In the long-term, FEMA anticipates minor beneficial impacts to floodplains and wetlands based on the Preferred Alternative and an increased capacity to mitigate for future storm surges. The NOAA CRCP PEIS found beneficial impacts up to moderate, however FEMA anticipates that the scale of projects for FEMA funding may be smaller in extent or function than NOAA actions considering differences in agency missions.

The subrecipients will use BMPs and follow permit requirements to minimize these impacts. Other permit conditions are discussed in Section 6. FEMA will apply the 8-Step decision-making process as required, to consider site-specific impacts of proposed projects. Section 9 summarizes resource-specific impact thresholds and conditions for project-specific tiering from this PEA.

5.3 Coastal Resources

The Coastal Zone Management Act (CZMA) of 1972, is administered by states with shorelines in coastal zones requiring those states to have a Coastal Zone Management Plan (CZMP) to manage coastal development. State CZMPs are approved by NOAA. Under the CZMA 16 U.S.C. Section 1453(4), the term "state" includes the Commonwealth of Puerto Rico and the U.S. Virgin Islands. Projects falling within designated coastal zones must be evaluated to ensure they are consistent with the state CZMPs. The consistency determinations ensures that federal actions with reasonably foreseeable effects on coastal uses and resources must be consistent with the enforceable statutes of a state's approved CZMPs. Projects receiving federal assistance must follow the procedures outlined in the CZMA implementing regulations at 15 CFR 930.90 – 930.101 for federal coastal zone consistency determinations.

The Coastal Barrier Resources Act (CBRA) of 1982, the Coastal Barrier Improvement Act of 1990, the Coastal Barrier Resources Reauthorization Action of 2000, the Coastal Barrier Resources Reauthorization Act of 2005, and the Strengthening Coastal Communities Act of 2018 are administered through the USFWS. The three purposes of the CBRA are to (1) minimize loss of human life by discouraging development in high-risk areas; (2) reduce wasteful expenditure of federal resources; and (3) protect the natural resources associated with coastal barriers. The CBRA designated two types of Coastal Barrier Resources Systems (CBRS): System Units and Otherwise Protected Areas (OPA). System Units consist of areas that were relatively undeveloped at the time of their designation. OPAs are generally lands held by a qualified organization primarily for wildlife refuge, sanctuary, recreational or natural resource conservation purposes. The USFWS maintains the online Coastal Barrier Resources System Mapper showing both types.

Federal funding for disaster relief may not be used for projects or actions that promote or provide for expanded development or services within the CBRS, such as replacement of non-public roads, dredging of new navigation channels; providing structural beach or shoreline stabilization; or expansion of publicly owned or operated roads, structures, or facilities. However, Section 6 of CBRA (16 U.S.C. Section 3505(a)(6)) includes some exceptions for certain actions in System Units if those actions are also consistent with the three purposes of the CBRA. Exceptions are permitted for emergency actions essential to the saving of lives and the protection of property and the public health and safety. Certain exceptions are also permitted for permanent restoration assistance. One such exception includes nonstructural projects for shoreline stabilization that are designed to mimic, enhance, or restore a natural stabilization system. The only federal funding prohibition within OPAs is on federal flood insurance.

5.3.1 Existing Conditions

Coastal resources are continually stressed by human-caused threats such as coastal development, dredging, dams, and coastal engineering and modification, and these threats can be exacerbated by

natural forces such as storms, climate, and tides. Human activities such as recreational overuse and coastal development can alter coastal resources through physical damage.

Federal consistency reviews are completed to ensure that federal actions with reasonably foreseeable effects on coastal uses and resources are consistent with the enforceable statutes of a state's approved CZMPs. In AL, FL, PR, and the USVI, federal consistency reviews are overseen by the ADEM, the Florida State Clearinghouse, the PRPB, and the VIDPNR, respectively.

In AL, 10 CBRS are present in Baldwin and Mobile counties, including four System Units and six OPAs. In FL, 137 CBRS are present in 33 counties, including 70 System Units and 67 OPAs. In PR, 70 CBRS are present in 30 municipalities, including 41 System Units and 29 OPAs. In the USVI, 37 CBRS are present in St. John, St. Thomas, and St. Croix, including 24 System Units and 13 OPAs.

FEMA's regulations require consultation with the USFWS at the regional level before approving any action involving permanent restoration actions on or attached to a System Unit. For some activities, FEMA's implementation of CBRA through 44 CFR Part 206 may be more stringent than USFWS.

5.3.2 Affected Environment

No Action Alternative
FEMA anticipates taking no programmatic action on LMR projects would result in minor to moderate adverse impacts to the coastal resources based on the No Action Alternative. The No Action Alternative would result in FEMA continuing to make project-by-project evaluations which may coastal area vulnerable to continued erosion or storm surge until a course of action is selected. Taking no action programmatically may also encourage more traditional "grey" infrastructure such as bulkheads which tend to be more familiar and expedient to engineers and regulatory bodies. The No Action Alternative does not meet the purpose and need of this PEA and would be inconsistent with FEMA's growing consideration of nature based solutions to risk reduction and climate related impacts.

Preferred Alternative
This PEA presents a range of potential actions that reduce the potential for loss of life, property, and shoreline erosion resulting from storm surge by promoting the resiliency of coastal LMR in AL, FL, PR, and the USVI. As stated in Section 4.2, the range of potential actions that promote coastal LRM include, but are not limited to, propagating coral fragments, creating, or re-creating reef structure through transplant and re-attachment of coral fragments, reef rubble, or coral reef substrate as attachment sites for corals, and planting of SAV. The NOAA CRCP EIS indicates that direct and indirect, short, and long-term, beneficial impacts to coastal resources are realized through these actions.

In the short-term, the Preferred Alternative has the potential to cause minor adverse impacts to coastal resources due to the potential for increased turbidity at project sites during placement of coastal LMR. In the long-term, FEMA anticipates minor beneficial impacts to coastal resources based on the Preferred Alternative and an increased capacity to mitigate for future storm surges, thereby expediting economic recovery after a storm.

The subrecipients will use BMPs and follow permit requirements to minimize these impacts. Other permit conditions are discussed in Section 6. Section 9 summarizes resource-specific impact thresholds and conditions for project-specific tiering from this PEA.

CZMA: FEMA anticipates projects effectively tiered from this PEA will require federal consistency determination. Subrecipients in AL, FL, PR, and the USVI, are required to coordinate with the ADEM, the Florida State Clearinghouse, the PRPB, and the VIDPNR, respectively, to determine consistency with the state's CZMA statutes. FEMA and the respective agencies may implement general consistency agreements to streamline obligation of funding to support subrecipients in developing detailed scopes of work.

CBRA: The Preferred Alternative meets the stated purpose of the CBRA to protect the natural resources associated with coastal barriers. All projects located in CBRS units require consultation with USFWS, even for proposals that appear to meet exceptions and would be eligible for federal funding. USFWS opinion is advisory, and FEMA may elect to proceed with funding a project even if USFWS does not concur with FEMA's evaluation. Privately funded projects may take place in CBRSs at the developers' own risk.

5.4 Protected Species and Habitat

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 the ESA are the USFWS and NOAA 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. The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to engage in any such conduct. (16 U.S.C. Section 1532(19))

The Migratory Bird Treaty Act (MBTA) of 1918 provides a program for the conservation of migratory birds that fly through the United States. The lead federal agency for implementing the MBTA is USFWS. 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 migratory birds or result in the destruction or adverse modification of designated critical habitat of such species. The law

makes it illegal for anyone to “take,” possess, import, export, transport, sell, purchase, barter or offer for sale, purchase, or barter, any migratory bird, or their parts, feathers, nests, or eggs.

The Bald and Golden Eagle Protection Act (BGEPA), enacted in 1940, prohibits anyone without a permit issued by the Secretary of the Interior, from "taking” bald and golden eagles, including their parts, nests, or eggs. Like the MBTA, the law makes it illegal for anyone to “take,” possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any bald or golden eagle, or their parts, feathers, nests, or eggs.

The Magnuson–Stevens Fishery Conservation and Management Act (MSA) of 1976, as amended, provides a critical role in sustaining life stages of fisheries and the persistence of fish and shellfish species. It places a high priority on the aesthetic, recreational and commercial value of fishery resources that are dependent on Essential Fish Habitat (EFH). Federal agencies are required to assess the potential impacts that proposed actions and alternatives may have on EFH. Federal agencies that fund, permit or carry out activities that may adversely impact EFH are required to consult with NMFS regarding potentially adverse effects of their actions and respond in writing to NMFS and Fishery Management Council recommendations. NMFS is further directed to comment on any state agency activities that may potentially impact EFH.

The Marine Mammal Protection Act (MMPA) established a national policy to prevent marine mammal species and population stocks from declining such that they cease to be significant functioning elements of ecosystems. The MMPA is administered by the USFWS and NMFS. USFWS has jurisdiction over manatees, dugongs, sea otters, walruses, and polar bears; NMFS has jurisdiction over whales, dolphins, porpoises, seals, and sea lions. Some marine mammals are protected under both the MMPA and the ESA. Section 3 of the MMPA, prohibits the “take” of protected marine mammals, defined as to “harass, hunt, capture, or kill, or attempt to” engage in any of these activities. Harassment is defined as any act of pursuit, torment or annoyance which has the potential to either injure a wild marine mammal or marine mammal stock or disturb a wild marine mammal or marine mammal stock by disrupting behavior patterns to include “migration, breathing, nursing, breeding, feeding, or sheltering” Section 101(a)(5) provides for activities that may result in take that is not intentional but also not unexpected, known as incidental take.

EO 13112 Invasive Species, as amended, requires federal agencies to use relevant agency programs and authorities to prevent the introduction, establishment, and spread of invasive species, including strengthening associated regulatory frameworks, and providing for the restoration of native species, ecosystems, and other assets impacted by invasive species. Invasive species are any non-indigenous species or viable biological material, including seeds, eggs, and spores, that are transported into an ecosystem and cause economic or environmental harm or harm to human health when they colonize a new area. States and other jurisdictions also have laws, regulations, or other requirements designed to accomplish similar purposes to EO 13112. Some states have adopted their own quarantines, which could require a permit to transport certain types of materials out of a

quarantine zone, an inspection of products that could harbor invasive species prior to their being moved out of the quarantine zone, or a ban on moving potentially infested material from a quarantined area to a non-quarantined area.

5.4.1 Existing Conditions

ESA: Coastal AL, FL, PR, and the USVI includes diverse and critical habitats that host rare, threatened, and endangered species, including fish, whales, turtles, sharks, coral species, and one species of seagrass protected under the ESA.[22,23] Coastal wetlands, like coral reefs and rainforests, are among the most productive ecosystems and important to nearly 45% of the wetland-dependent threatened and endangered species.[24] The seven threatened coral species known to exist in the project area include staghorn coral (Acropora *cervicornis*), elkhorn coral (Acropora *palmata*), pillar coral (Dendrogyra *cylindrus*), rough cactus coral (Mycetophyllia *ferox*), lobed star coral (Orbicella *annularis*), mountainous star coral (Orbicella *faveolata*), and boulder star coral (Orbicella *franksi*). The threatened seagrass species, Johnson's seagrass, occurs off the southeast coast of Florida. Critical habitat for threatened or endangered species are located in AL, FL, PR and the USVI.

MBTA and BGEPA: The USFWS and its partners manage migratory birds based on a variety of factors including bird populations and conservation status, important habitats needed for various life stages, bio-geo-political boundaries, and status as game or non-game species. Over 90% of bird species are designated as non-game species. Migratory birds that can legally be hunted are managed based on four administrative routes, the Atlantic, Mississippi, Central and Pacific Flyways. Alabama is within the Mississippi Flyway, and FL, PR and the USVI are within the Atlantic Flyway.[25] Bald eagles are found year-round in AL and FL. The USVI and PR are not located within the Bald and Golden eagle range.

MMPA: Marine mammals protected under the MMPA including manatees, whales, dolphins, and porpoises inhabit coastal and estuarine areas in AL, FL, PR, and the USVI. Species protected under both the ESA and the MMPA also occur in coastal waters of AL, FL, PR or the USVI including six species of endangered whales and the West Indian Manatee (Trichechus *manatus*). Under the MMPA, the USFWS has jurisdiction over manatees and NOAA NMFS has jurisdiction over protected whale species.

MSA: Coastal and estuarine areas in AL, FL, PR, and the USVI include mapped EFH.[26] The NMFS manages the EFH Mapper website that shows EFH locations nationwide that have been

[22] USFWS IPaC
[23] NOAA NMFS Online Threatened and Endangered Species Directory
[24] T.E. Dahl and S.M. Stedman 2013
[25] USFWS Flyway Zones Map
[26] NOAA NMFS Essential Fish Habitat Mapper

mapped using geographic information system data. The maps are a generalized interpretation of the textual definition of EFH; they do not fully represent the complexity of the habitats described in the designation. The textual description of EFH within the EFH Mapper is always determinative of the presence or absence of EFH for the species.

EO 13112: Coastal and marine ecosystems in AL, FL, PR, and the USVI are impacted by invasive species. Invasive species impact native terrestrial and aquatic species through predation, competition for food and space, and hybridization, as well as the introduction of pathogens and parasites.

The U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine Program and state plant health agencies regulate the shipment of nursery and greenhouse stock in an effort to minimize the spread of harmful insects, diseases, and other pests. In AL, FL, PR and the USVI, pest detection, regulatory activities, and coordination of survey activities between government agencies are conducted by the Alabama Department of Agriculture and Industries, the Florida Department of Agriculture and Consumer Services, the Puerto Rico Department of Agriculture, and the Virgin Islands Department of Agriculture.

5.4.2 Affected Environment

No Action Alternative
FEMA anticipates adverse minor to moderate impacts to protected species and habitat based on the No Action Alternative. The No Action Alternative would result in FEMA continuing to make project-by-project evaluations on LMR resiliency with potentially inconsistent or unpredictable determinations. Habitat degradation in potential project areas would continue until FEMA determines appropriate course of action and conducts project-specific reviews which could lose time important to stabilizing or reducing habitat loss and coastal restoration and resiliency efforts. Ongoing, unstable coastal erosion may contribute to turbidity that would be detrimental to protected species within the coastal areas of AL, FL, PR, and the USVI. Further, the NOAA CRCP EIS indicates that direct, short-term, and long-term adverse impacts to protected species are not reduced through a no action response. The No Action Alternative does not meet the purpose and need of this PEA and would be inconsistent with FEMA's growing consideration of nature based solutions to risk reduction and climate related impacts.

Preferred Alternative
This PEA presents a range of potential actions that promote the resiliency of coastal LMR, including potentially handling, propagating, and transplanting protected coral and SAV species. The NOAA CRCP EIS indicates that direct and indirect, short and long-term beneficial impacts to protected species are realized through a range of actions that stabilize sediments. Similar actions to those evaluated in the NOAA CRCP EIS are presented in this PEA.

In the short-term, the Preferred Alternative has the potential to cause minor to moderate impacts to protected species and habitat during site preparation and coastal LMR placement, as turbidity at marine and estuarine project sites may temporarily increase during these activities. In the long-term, FEMA anticipates minor to moderate beneficial impacts to protected species and habitat based on the Preferred Alternative and an increased capacity to mitigate for current species and habitat loss.

The subrecipients will use BMPs and follow permit requirements to minimize these impacts. Other permit conditions are discussed in Section 6. Section 9 summarizes resource-specific impact thresholds and conditions for project-specific tiering from this PEA.

ESA: FEMA will analyze the project location, site characteristics, USFWS's Information for Planning and Consultation (IPaC), and NOAA NMFS Species Directory, as appropriate, for any action that may have an impact on a protected species or critical habitat. In addition, FEMA will consult the threatened Caribbean corals PBO, JAXBO, and ESA Matrix referenced in Section 3 for conservation measures or other project conditions, as applicable. The USACE permitting process may also apply to projects with ESA consultations in FL. A summary of the NOAA NMFS PBO on effects of research, restoration, and relocation of threatened Caribbean corals is included in Appendix C. A summary of the JAXBO is included in Appendix C and includes the authorization of ten categories of minor in-water activities in AL, FL, PR, and the USVI and applicable conservation measures.

FEMA will consult with USFWS and NOAA NMFS for actions that exceed a "no effect" determination. FEMA may make a determination of "may affect or not likely to adversely affect" a threatened or endangered species or critical habitat with one or more project-specific conditions. If USFWS and NOAA NMFS concur with FEMA's determination, agency concurrence and project conditions are recorded in the REC.

MBTA and BGEPA: For each future proposed action, FEMA will determine the level of effect. For actions that exceed a "no effect," FEMA will consult with USFWS and/or NOAA NMFS either formally or informally based on the level of potential impact. Depending on the proposed activities and potentially affected species, FEMA may require one or more project-specific conditions. If USFWS and NOAA NMFS concur with FEMA's determination, the agency's concurrence and project conditions are recorded in the REC.

MMPA: FEMA will consult with USFWS or NMFS, as appropriate, for any project that may have an impact on a protected species under the MMPA.

MSA: If a project area is within or adjacent to EFH, FEMA would determine whether the action would cause adverse physical, chemical, or biological changes to the EFH. FEMA will follow and comply with the MSA process for EFH coordination and consultation with NMFS. If NOAA

NMFS concurs with FEMA's determination, the concurrence and any required project conditions are recorded in the REC.

EO 13112: FEMA actions could result in identification of actions that could result in the introduction or spread of invasive species. Potential projects involving planting SAV, or mangroves could introduce invasive species through viable biological material such as seeds, eggs, and spores. Equipment or vehicles that have been used for work in waters can transport aquatic invasive species to other water bodies if proper "Clean, Drain, Dry" procedures have not been followed. Clean, Drain, Dry requirements are enforceable by law in many states and are a Regional Condition of USACE permits in watersheds where invasive species have been reported. Permit conditions and design considerations may include site restoration, seasonal restrictions, compensatory mitigation, habitat enhancements, and erosion and sedimentation control BMPs. Such measures, including seeding or vegetative stabilization using native species, will mitigate long-term impacts to terrestrial and aquatic wildlife and habitats due to construction activity but will not reduce impacts entirely.

5.5 Cultural Resources

Cultural resources include historic properties, sacred sites, archaeological sites, and other resources of cultural significance to a community. Section 106 of the National Historic Preservation Act (NHPA), as amended, and implemented by 36 CFR Part 800 requires federal agencies to consider the effects of their actions on historic properties. It provides the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on federal projects that may have an effect on historic properties. Historic properties include districts, buildings, structures, objects, landscapes, archaeological sites, and traditional cultural properties that are listed on or eligible for listing on the National Register of Historic Places (NRHP). Eligibility criteria can be found at 36 CFR Part 60. Section 106 consultation as detailed in 36 CFR Part 800 must take place prior to the approval of the expenditure of federal funds on an action, known as an 'undertaking' under NHPA. FEMA consults with the State Historic Preservation Office (SHPO), Tribal Historic Preservation Offices (THPOs), the public, and other consulting parties throughout the Section 106 process. Under 36 CFR 800.16, the Area of Potential Effects (APE) is defined as the geographic area(s) within which the undertaking may directly or indirectly affect cultural resources. The APE may also include a site's viewshed within a historic district or landscape, or visible between a project site and a historic structure or district.

5.5.1 Existing Conditions

In accordance with 36 CFR Part 800.14, FEMA has executed Programmatic Agreements that are applicable to projects in AL, FL, PR, and the USVI. These Programmatic Agreements, noted in Section 3.0, stipulate roles and responsibilities, exempt certain undertakings from Section 106 review, establish protocols for consultation, facilitate identification and evaluation of historic properties, and streamline the assessment and resolution of adverse effects.

Coastlines may be associated with historic or prehistoric settlements, military, trade, and navigation activities. NRHP-eligible or contributing resources may include shipwrecks, seawalls, and lighthouses. Shorelines and stream banks and the upland areas around them are often archeologically sensitive, with a high likelihood of prehistoric resources in undisturbed soil.

5.5.2 Affected Environment

No Action Alternative
FEMA anticipates negligible to major adverse impacts to cultural resources based on the No Action Alternative in the absence of a programmatic approach. The No Action Alternative would result in FEMA continuing to make project-by-project evaluations for coastal resiliency projects in AL, FL, PR, and the USVI. This approach may delay courses of action that could protect cultural resources or encourage more familiar "grey" infrastructure such as bulkheads which may present their own impacts to cultural resources. Depending on project location, ongoing coastal erosion may cause damage to historic structures or lead to the permanent loss of archeological resources. The No Action Alternative does not meet the purpose and need of this PEA and would be inconsistent with FEMA's growing consideration of nature based solutions to risk reduction and climate related impacts.

Preferred Alternative
The Preferred Alternative has the potential to cause negligible to moderate impacts to cultural resources as coastal LMR placement may be visible from a historic property and may affect the aesthetic character or viewshed of a site. Placement of LMR has the potential to disturb archeological resources based on staging or planting activities that disturbs previously undisturbed soils. If archaeological sites are present, Phase I or Phase II archaeological testing may be warranted to determine the site boundaries and assess the NHRP eligibility.

FEMA would identify historic properties that may be affected by the undertaking and if a culturally significant site exists within the APE, FEMA Historic Preservation staff will determine if a project SOW has the potential to affect the resource. If the scope meets allowances outlined in the Programmatic Agreements, FEMA will determine if the project is within compliance with Section 106 of NHPA and the review process will be complete. If the proposed SOW does not fall within an allowance, FEMA will follow the standard Section 106 review process and initiate consultation with the respective SHPO and appropriate consulting parties. These consultations will be included in the individual project reviews and will include measures appropriate to the sites to minimize potential impacts.

5.6 Environmental Justice

Executive Order 12898, "*Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*" and accompanying Presidential Memorandum issued on February 11, 1994 direct each federal agency to incorporate achieving environmental justice

(EJ) into its mission by "identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low-income populations." DHS Directive 023-04, subsection 1-101 establishes policy related to integrating environmental justice into FEMA programs, policy, and activities. FEMA also follows USEPA's guidelines to assess disproportionately high and adverse human health or environmental effects.

Executive Order 14008, "*Tackling the Climate Crisis at Home and Abroad*", directs agencies to make achieving environmental justice part of their missions by developing programs, policies, and activities to address the disproportionately high and adverse human health, environmental, climate-related, and other cumulative impacts on disadvantaged communities, as well as the accompanying economic challenges of such impacts. The EO also established the Justice40 Initiative, a whole-of-government effort to ensure that Federal agencies work with states and local communities to deliver at least 40 percent of the overall benefits from Federal investments in climate and clean energy to disadvantaged communities.

5.6.1 Existing Conditions

Low income and minority communities impacted by environmental justice concerns are located in AL, FL, PR and the USVI; many of those communities are concentrated at the coast. According to NOAA's Office for Coastal Management, 76.5% of Florida's population, 11.9% of Alabama's population, 66.7% of Puerto Rico's population, and 100% of the USVI population live in coastal areas.[27] Table 5.6.1 presents the percentage of low income and minority populations living in regulated coastal zones of AL, FL, PR and the USVI. Appendix D includes maps depicting percentiles of low-income populations, minority populations, and Census defined urban areas overlaying coastal zones in AL, FL, PR, and the USVI. Appendix D also includes a narrative of the methodology used to generate the data presented in Table 5.6.1.

Table 5.6.1.0: Percentage of Low Income and Minority Populations Living in Regulated Coastal Zone

State or Territory	Percentage of Low Income Population in Coastal Zone	Percentage of Minority Population in Coastal Zone
Alabama	72%	29%
Florida	58%	34%

[27] NOAA Digital Coast website

Puerto Rico	48%	65%
U.S. Virgin Islands	45%	43%

Sources: U.S. Census Bureau and Environmental Protection Agency EJSCREEN, Version 2.0

Low-income and minority populations living in coastal areas of AL, FL, PR, or the USVI may face an inequity of protection from storm surge due to limitations such as housing built under older building codes, lack of transportation to evacuate, and incomes that limit their ability to afford temporary lodging, relocation, or housing improvements. These communities may also disproportionally bear the accompanying negative economic challenges in the aftermath of large storm events. Overall, factors such as proximity to coastal areas, low-income, and minority status may perpetuate a disproportionate vulnerability to loss of life or property from storm surge and reduce the capacity of communities to prepare for future storms.

FEMA uses the best available data, including Census Block Group and EPA's Environmental Justice Screening and Mapping Tool (EJSCREEN) Version 2.0 to identify minority populations and low-income populations. Where there is a potential for disproportionately high or adverse impacts based on the proposed action, FEMA consults with USEPA and incorporates recommendations for mitigating those impacts.

5.6.2 Affected Environment

No Action Alternative
FEMA does not anticipate direct disproportionately high or adverse human health or environmental effects to minority or low-income populations based on the No Action Alternative. The No Action Alternative would result in FEMA continuing to make project-by-project evaluations. This approach may delay actions to address minor to moderate adverse impacts to resources that relate to storm surge protection such as, floodplains, wetlands, and coastal resources. The No Action Alternative does not meet the purpose and need of this PEA and would be inconsistent with FEMA's growing consideration of nature based solutions to risk reduction and climate related impacts. Therefore, FEMA anticipates minor to moderate adverse impacts to minority and low-income populations under this alternative.

Preferred Alternative
FEMA does not anticipate disproportionately high or adverse human health or environmental effects to minority or low-income populations based on the Preferred Alternative. Subsequent environmental reviews for coastal LMR resiliency projects tiered from this PEA will include an assessment for site-specific considerations related to environmental justice. For each project location, FEMA will consider the SOW and location to identify potential impacts to identified EJ communities. FEMA will consult with USEPA in cases where a project has the potential to adversely impact an EJ community. FEMA anticipates negligible to minor beneficial impacts to

communities impacted by environmental justice issues, based on actions that improve coastal resiliency, reduce wave energy, and address existing disproportionate vulnerabilities to the impacts of storm surge.

5.7 Cumulative Effects

In accordance with NEPA, this PEA considers the overall cumulative impacts of known or reasonably foreseeable actions that are related in terms of time or proximity. Cumulative impacts are incremental and when combined with past, present, and reasonably foreseeable actions can have individually minor but collectively significant actions over time. In addition, the CWA, CAA, Section 106 of the NHPA, and Section 7 of the ESA require an evaluation of cumulative effects as the Alternatives apply to their respective resources. FEMA is predominantly a grant reimbursement agency funding projects proposed by state, local, Tribal, and territorial partners making programmatic review of cumulative impacts challenging. FEMA funds many projects in coastal areas, especially after hurricanes and coastal storms, many of which simply restore the damaged areas to pre-disaster condition and function. FEMA programs such as BRIC or hazard mitigation funding have been starting to fund nature-based solutions on their own and as components of larger projects in recent years. Other federal agencies, like HUD, USACE, and others fund, authorize, or conduct projects in coastal areas may also overlap actions in this PEA.[28]

The PEIS that NOAA prepared notes that most NOAA Restoration Center projects are short-term in nature, limiting cumulative effects and their geographic scale. NOAA Restoration Center has restored thousands of acres of habitat per year since 2003 and projected similar in their PEIS for future years. Three quarters of NOAA projects have taken less than five years including design and construction, limiting direct impacts; many projects typically required no more than one to two weeks of construction activities. NOAA indicates no substantial contributions to cumulative effects from development, pollution, climate change, and other activities evaluated in their PEIS. NOAA does anticipate net benefits from restoring coral, arresting coastal erosion and the associated sedimentation in coral and related off-shore habitat. NOAA does anticipate adverse indirect impacts related to the effects of climate change on LMR and the ability to naturally recover from discrete impacts, such as storms or boat groundings.

FEMA anticipates that the actions included in this PEA will likely be smaller in scale and less frequent than those considered by the NOAA Restoration Center under current funding and as the agency considers more coastal LMR project proposals. FEMA Region 9 has funded studies to evaluate the feasibility of coral restoration in Hawaii[29] and FEMA Region 2 evaluated a coral and

[28] NOAA NMFS, 2016

[29] A.E. Stovall, et al., 2022

mangrove project for the University of the Virgin Islands with a project-specific EA in late 2020.[30] FEMA anticipates that the nature of coastal resiliency with LMR will be an overall net benefit when implemented using best practices and science. Short-term impacts of individual projects will normally be limited through routine consultation and coordination with the Services and through applicable permitting and regulatory requirements.

5.7.1 Climate Change

The CEQ recommends federal agencies consider climate change in NEPA evaluations in guidance issued, revised, rescinded, and reissued since 2010. As of the writing of this PEA, new rules for implementing measures to evaluate and address climate change are out for public comment. FEMA anticipates that there will be agency-specific guidance for project evaluations once finalized and once DHS develops guidance for sub-components, like FEMA. In the absence of such, this PEA considers general trends and impacts as recommended by interim guidance.[31]

The Intergovernmental Panel on Climate Change, Sixth Assessment report expects that temperature change, in mean and extremes, will increase and relative sea level rise will continue with high confidence; projected temperature increases in the Caribbean are lower than mean global change. Relative sea level rise also increases the frequency and severity of coastal storms which will increase coastal erosion throughout the 21st century. The report has high confidence that sea level rise may also threaten aquifers with saltwater intrusion, exacerbated by storm surge. Tropical storms are expected, with medium confidence, to become more extreme in the area. However, observed droughts are expected to increase with high confidence in the Caribbean too, associated with higher evapotranspiration with warmer temperatures. Both ocean acidification and marine heatwaves are expected to increase with at least high confidence; marine heatwaves have roughly doubled since the 1980s and along with acidification, oxygen levels in the upper ocean have declined.[32]

6.0 PERMITS AND PROJECT CONDITIONS

The subrecipients are responsible for obtaining all applicable federal, state, and local permits and other authorizations and adhering to permit conditions for project implementation prior to construction. Subrecipients are responsible for providing copies of permits to the recipients and FEMA prior to project closeout and should do so upon obtaining them. Any substantive change to the approved SOW will require reevaluation by FEMA for compliance with NEPA, other laws,

[30] FEMA 2020
[31] CEQ 2023
[32] IPCC 2021

and EOs. The Subrecipients must not exceed the thresholds described in Section 9 of this PEA during project implementation without first notifying FEMA in advance.

The subrecipients must also adhere to project-specific conditions as documented on the REC during project implementation and observe the below conservation recommendations. FEMA expects the following conditions are applicable to all project scopes of work covered by this PEA. Failure to comply with grant conditions may jeopardize federal funds:

1. The subrecipients are responsible for completing state and local environmental and land-use reviews in accordance with state and local regulations.

2. The work may be authorized by USACE permits. The subrecipients are responsible for obtaining all necessary permits and complying with all conditions of the permit including but not limited to notification and signature requirements to insure validation of permits.

3. The subrecipients may be required to obtain NPDES permits prior to construction, if applicable to the project.

4. Subrecipients must comply with any requirements and avoidance measures pursuant to Section 7 of the ESA identified during FEMA consultation with USFWS or NOAA NMFS consultation. If protected species are observed during construction, activities that could result in harm or disturbance must stop immediately and the subrecipient must notify the recipient and FEMA.

5. The subrecipients must follow the conditions resulting from FEMA consultation with the SHPO and Tribal Nations. If unexpected archaeological resources are encountered during construction, the subrecipient must stop work and notify the recipient and FEMA. FEMA will determine what additional consultation with the SHPO and the Tribal Nations are required, and what additional conditions or avoidance measures may apply.

7.0 AGENCY COORDINATION AND PUBLIC INVOLVEMENT

FEMA coordinated with the NOAA Restoration Center during the preparation of this PEA. This PEA will be made available for agency and public review and comment for a period of 30 days. The public process will include information about the actions in a public notice distributed electronically by FEMA to the four jurisdictions. Additionally, the public notice and this PEA will be available for download at https://www.fema.gov/emergency-managers/practitioners/environmental-historic/nepa-repository and posted to the following platforms:

- The Alabama Emergency Management Agency website at https://ema.alabama.gov/
- The Florida Division of Emergency Management website at https://www.floridadisaster.org/
- The FEMA Puerto Rico Facebook page at https://www.facebook.com/FEMAPuertoRico/

- The Puerto Rico Recovery Program, COR3 website at https://recovery.pr.gov/en/document-library
- The FEMA USVI Facebook page at https://www.facebook.com/FEMAUSVirginIslands
- The FEMA website for the Hurricane Maria Disaster in the USVI, News and Media tab at https://www.fema.gov/disaster/4340/news-media

This PEA reflects the evaluation and assessment of the federal government, the decision maker for the federal actions; 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 comments on the PEA via email or by mail. Comments pertaining to PR or the USVI may be emailed to FEMAR2COMMENT@fema.dhs.gov or mailed to Department of Homeland Security, FEMA Region 2, Attn: Environmental Planning and Historic Preservation, 26 Federal Plaza, New York, NY, 10278. Comments pertaining to Florida may be emailed to FEMA-R4EHP-FLORIDA@fema.dhs.gov, and comments pertaining to Alabama may be emailed to FEMA-R4EHP@fema.dhs.gov.

If no substantive comments are received, the PEA will be adopted as final, and FEMA will issue a FONSI. If FEMA receives substantive comments, they will be evaluated, and FEMA will address them as part of the FONSI documentation, or in a Final PEA, withdraw the PEA, or initiate a Programmatic EIS if significant.

8.0 LIST OF PREPARERS

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THRESHOLDS FOR PREPARING A TIERED EA

Resource Area or Regulation	Action Covered by this PEA	Tiered Site-Specific Environmental Assessment Required
Water Quality	The proposed action would have no, negligible, or minor impacts to water resources and would be at or below water quality standards or criteria. Localized and short-term alterations in water quality and hydrologic conditions relative to historical baseline may occur. or The proposed action results in moderate impacts that are mitigated by regulatory permit conditions and resource agency consultations to reduce the impacts below the level of significance. and The proposed action does not require an individual permit from USACE. The proposed action is in compliance with all permit conditions, notification and reporting requirements for applicable nationwide permits, regional general permits, emergency authorizations, programmatic general permits or other USACE-issued general permit. and The subrecipient has received a written waiver from USACE for projects that exceed permit thresholds.	The proposed action would cause or contribute to existing exceedances of water quality standards resulting in violation of state water quality criteria. or The proposed action requires an individual permit from USACE. or The subrecipient has not demonstrated compliance with applicable permit conditions, notifications, or application procedures.

Floodplains and Wetlands	The action complies with all state, federal and local permit conditions, regulations, and authorizations, including CWA, state floodplain and wetland laws, and local floodplain codes. and The proposed action will not increase levels, frequency or duration of floods and will not alter hydrological connectivity. and FEMA completes an 8-Step decision-making process and has determined that the proposed action is the most practicable alternative.	Proposed action requires an individual permit from USACE because of impacts to a wetland. or The proposed action would result in adverse effects to the floodplain or wetlands, including an increase in flood levels, significant changes to flood frequency, conveyance and duration that increase flood risk at locations upstream, downstream, or adjacent to the project site.
Coastal Resources	Proposed action in a coastal zone receives consistency determination or complies with state-issued permits, and the proposed action would have no, negligible, or minor impacts to coastal resources. or The proposed action is located within a Coastal Barrier Resources System Unit and FEMA receives concurrence from USFWS that it qualifies as an exception under Section 3505.a.6 of the CBRA and is consistent with CBRA. or The proposed action results in moderate impacts that are mitigated by regulatory permit conditions and resource agency consultations to reduce the impacts below the level of significance.	Proposed action is located within a Coastal Barrier Resources System Unit and USFWS does not concur that it qualifies as an exception under Section 3505.a.6 of the CBRA. or For work subject to CZMA consistency review, proposed action has not received concurrence from AL, FL, PR, or the USVI. or Proposed action includes beach renourishment and does not meet conditions for FEMA CATEX.
Protected Species and Habitat	The effects of the action can be resolved through the applicable PBOs. The proposed action would have no effect on threatened or endangered species or critical habitat for those species. or	Projects that that cannot be resolved using the applicable PBOs and exceed a "May affect, Not Likely to Adversely Affect" determination to a species listed as federally threatened or endangered. or

	The proposed action results in potential moderate impacts that are mitigated via resource agency consultations. FEMA makes a "May affect, Not Likely to Adversely Affect" determination and USFWS or NMFS concurs. or Proposed action includes mitigation measures to reduce the level of impacts to species and habitats protected by MBTA, BGEPA MSA, and MMPA below the level of significance. or Proposed action discourages spread of invasive species by implementing BMPs according to state and federal guidance.	Projects that result in the loss or adverse modification of designated critical habitat for a listed species. or Projects that are determined to likely result in the take of birds protected under the MBTA or BGEPA or marine mammals protected under the MMPA. or Projects having adverse impacts to Essential Fish Habitat that cannot be mitigated through consultation with the NOAA. or Proposed action does not implement BMPs consistent with state and federal guidance to reduce the spread of invasive species EO 13112 Invasive Species.
Cultural Resources	The effects of the action can be resolved through the Programmatic Agreement or standard consultation.	FEMA makes an "Adverse Effect" determination with concurrence from SHPO/THPO that cannot be resolved using measures outlined in state programmatic agreements or negotiated through a standard project-specific Memorandum of Agreement. or Projects that that result an "Adverse Effect" determination on a National Historic Landmark.
Environmental Justice	There would be no disproportionately high and adverse environmental or health effects to low-income and/or minority populations. or Mitigation measures are used to reduce the level of impacts below the level of significance.	For each project location, FEMA will consider the SOW and location to identify potential impacts to identified EJ communities. FEMA will consult with USEPA in cases where a project has the potential to adversely impact an EJ community.

Transportation	The proposed action would have no impact to transportation infrastructure or traffic patterns. or Regulatory permit conditions or resource agency consultations reduce the impacts of the proposed action to maritime transportation facilities such as ferries, ports, shipping, dock, piers, etc., are mitigated to below the level of significance.	The proposed action conflicts with USACE permits or encroaches on maintained shipping routes. or The subrecipient has not demonstrated compliance with applicable permit conditions, notifications, or application procedures.

IMPACT SUMMARY

Table 5.0.2 and Table 5.0.3 present resource areas for which impacts are not expected and negligible impacts, respectively. Resource areas and regulations presented in Tables 5.0.2 and 5.0.3 were not evaluated in this PEA. Table 10.0.1 presents a summary of potential impacts to resource areas evaluated under this PEA resulting from the No Action Alternative and Preferred Alternative.

Table 10.0.1: Impact Summary

Resource Area	No Action Alternative	Preferred Alternative
Water Quality	Minor adverse	Short-term minor adverse Long-term minor beneficial
Floodplains and Wetlands	Minor to moderate adverse	Short-term minor to moderate adverse Long-term minor to moderate beneficial
Coastal Resources	Minor to moderate adverse	Short-term minor adverse Long-term minor beneficial
Protected Species and Habitat	Minor to moderate adverse	Short-term minor to moderate adverse Long-term minor to moderate beneficial
Cultural Resources	Negligible to major adverse	Negligible to moderate adverse
Environmental Justice	Minor to moderate adverse	Negligible to minor beneficial

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APPENDIX A: CATEX LANGUAGE

E2 New construction upon or improvement of land where all of the following conditions are met:

a) The structure and proposed use are compatible with applicable federal, tribal, state, and local planning and zoning standards and consistent with federally-approved state coastal management programs,

b) The site is in a developed area and/or a previously-disturbed site,

c) The proposed use will not substantially increase the number of motor vehicles at the facility or in the area,

d) The site and scale of construction or improvement are consistent with those of existing, adjacent, or nearby buildings, and,

e) The construction or improvement will not result in uses that exceed existing support infrastructure capacities (roads, sewer, water, parking, etc.).

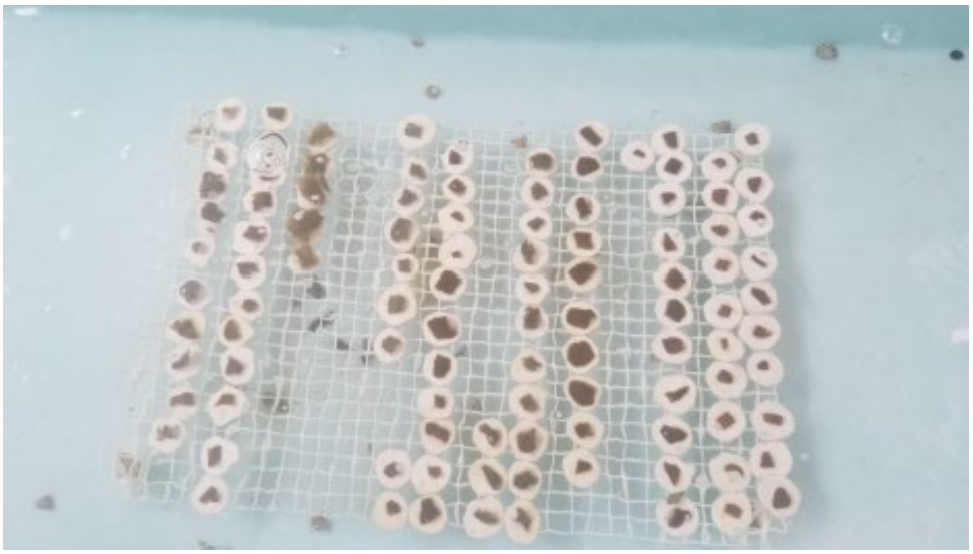
N12 Federal Assistance for Planting of Indigenous Vegetation. Additional discussion of CATEX. This CATEX is the same as defunct FEMA CATEX (xi). FEMA has funded numerous projects involving the planting of indigenous vegetation, such as planting of grasses for dune and bank stabilization, and planting of vegetative buffers for fire hazard reduction purposes. A range of large-scale and small-scale projects have met criteria for this CATEX and FEMA has determined that an acreage limit is not appropriate.

N19 Federal Assistance for Clean-up and Other Actions to Restore Environmental Resources. Federal assistance for clean-up and other actions to restore environmental resources to pre-existing conditions when resource contamination or damage results from a disaster event and when the clean-up and associated actions are not exempt from NEPA. Examples include the clean-up of underground storage tank releases and above ground releases that affect nearby water bodies or wetlands.

APPENDIX B: PHOTOGRAPHS

Photograph B1 – PVC coral tree near Flat Cay in the USVI with many fragments of Staghorn coral.

Photograph B2 – Installation of coral fragments to PVC coral tree with nylon wire.



Photograph B3 – Coral fragments epoxied to tiles in a seawater table at the University of Virgin Islands. The coral fragments will be transplanted to a coral tree nursery site once large enough for transport.

Photograph B4 – Mature Staghorn coral fragment transplanted to a reef using a two-part underwater epoxy.

Photograph B5 – Mangrove seedlings propagated in a land-based mangrove nursery at the University of the Virgin Islands.

APPENDIX C: SUMMARY OF THREATENED CARIBBEAN CORALS PBO AND USACE JACKSONVILLE DISTRICT PBO

SUMMARY OF THREATENED CARIBBEAN CORALS PBO

A memorandum on the initiation of the PBO on effects of research, restoration, and relocation on Threatened Caribbean Corals was issued by the NOAA NMFS Southeast Regional Office, Protected Resources Division in October 2016. The memorandum documents ESA Section 7(a)(2) and 7(d) determinations that during consultation, the continuing research, restoration, and relocation activities on threatened corals, conducted by NMFS and the co-action agencies, will not jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of any designated critical habitats for threatened or endangered species within the action area.

The scope of the PBO includes research, restoration, and relocation activities directed at the seven threatened Caribbean corals. The terms are defined as:

- Research: Activities that result in take of threatened corals for the purpose of studying the species.
- Restoration: Activities that result in take of threatened corals for the purposes of preventing injury or mortality and recovering the species. These activities may be conducted to promote recovery of the corals (general) or in response to an unplanned event (emergency).
- Relocation: Collection of threatened corals from one location and placement in another appropriate location for the purpose of preventing injury or mortality.

The PBO is limited to only these three specific activities directed at threatened corals and, as such, will not analyze the effects of other action agency activities, such as construction, that may trigger the need to relocate listed threatened corals. For example, the USACE has the authority to permit dredge and fill activities under the Clean Water Act. Threatened corals may be in the action area of a proposed project and affected by the proposed activity. In most cases, threatened corals can be successfully relocated out of the action area prior to conducting the proposed dredge or fill activity, resulting in prevention of injury or mortality. The intent is to include the relocation of threatened corals in this PBO, but not the dredge and fill activity. That action will require separate consultation.

Several federal action agencies conduct, fund, or authorize activities that result in the "take" of threatened corals. The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct (16 USC Section 1532(19)). These activities involve some manipulation of the coral so the taking is not always simply incidental to

another activity. For *Acropora palmata* and *A. cervicornis*, the prohibitions against "take" exclude research and restoration work, subject to certain conditions (50 CFR 223.208(c)). For the five additional Caribbean coral species listed as threatened in 2014 (*Orbicella annularis, O. faveolata, O. franksi, Dendrogyra cylindrus, and Mycetophyllia ferox*), there are no prohibitions addressing take. Even without take prohibitions, however, Section 7 of the ESA requires consultation and an evaluation of the effects of the taking that will occur during federal actions. The NOAA NMFS Southeast Regional Office, Protected Resources Division is the lead agency for the consultation. Because the net intent and impact of these activities are beneficial to the threatened corals (e.g., conducting research to aid recovery, relocating a colony to prevent mortality), these activities warrant streamlined, programmatic consultation to allow for ease of execution.

The research, restoration, and relocation actions of several other federal agencies are included in this consultation. FEMA is listed as a funding agency in the PBO with emergency restoration and relocation activities related to the direct take of threatened corals. FEMA provides funds for the repair, replacement, relocation, and/or the execution of alternate projects of public infrastructure (e.g., docks, bridges) in the coastal zone under the Hazard Mitigation Assistance and the Public Assistance programs. These activities may result in the need to relocate corals should they be present within the project area. In some cases, these activities may need to be conducted in the immediate aftermath of the hazardous event and result in emergency restoration activities.

Restoration activities may include collection of coral fragments and colonies, propagation, and reattachment back on the reef. Fragments for use in propagation and population enhancement may be collected from attached colonies using hand tools, as described for research above, or from loose fragments, termed "corals of opportunity." If fragments are collected for propagation, they are transported to coral nurseries. Fragments are grown to larger sizes in the nurseries and refragmented to produce more colonies. This process is repeated to increase the number of colonies available for restoration.

Coral nurseries may be located in the ocean or on land. Nurseries on land usually consist of recirculating or flow-through containment systems using treated or artificial seawater. Nurseries in the ocean are located over unconsolidated substrate (sand or rubble) and consist of various types of structures to hold the corals. Nursery structures currently in use include cinder blocks, concrete structures, metal frames, and floating structures including PVC trees and lines strung between rigid frames. Floating nursery structures are generally anchored to the seafloor and are held upright and rigid in the water column by floating buoys. Corals are generally attached to structures using epoxy, cement, cable ties, or fishing line. Corals are periodically taken from the nursey and attached (outplanted) back to the reef at restoration sites. Colonies may be attached to the reef using epoxy, cement, or nails. Sometimes faster growing species (*Acropora* spp.) may be wedged into cracks or holes in the reef to promote natural attachment to the reef. The goal of propagation

and outplanting is to increase overall survivorship and enhance populations of coral species experiencing decline and typically results in net positive gains for individuals and local populations of a species.

Restoration activities may be conducted to promote recovery of the corals (general) or in response to an unplanned event (emergency). For restoration resulting from unplanned events, such as a vessel grounding, loose colonies or fragments may be collected and reattached in place or transported to a temporary holding area to recover from damage before being reattached to the reef. Coral reattachment methods are the same as described above for outplanting of nursery corals. Some colonies may experience partial or total colony mortality after transplantation, usually due to some other stressor that compounds the stress that may be caused by transplantation. Occasionally colonies become unattached due to insecure attachment to the reef. Because the purpose of restoration from planned and unplanned events is to reduce or prevent injury or mortality, these activities have a net positive impact on the species that would suffer greater harm by leaving coral colonies in place.

Relocation of corals involves collection of corals from one location and placement in another appropriate location for the purpose of preventing injury or mortality from a planned event. Relocation differs from restoration in that it only occurs because of a planned event that would result in the coral's death if it were not relocated. Corals may be relocated to another site or to a coral nursery, and reattachment methods are the same as described above for outplanting of nursery corals. Because the purpose of relocation is to reduce or prevent injury or mortality, this activity has a net positive impact on the species that would suffer greater harm by leaving coral colonies in place.

Section 7(a)(2) of the ESA requires that each federal agency shall insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat. The Section 7(a)(2) analysis below is only applicable to the research, restoration, and relocation activities described above by NMFS and the co-action agencies during the consultation period and does not address any of these agencies' long-term Section 7(a)(2) obligation. Only with the completion of a new opinion can a Section 7(a)(2) analysis be completed for the long-term, foreseeable future.

During the consultation period, all of the federal action agencies described above are prohibited from making any irreversible or irretrievable commitment of resources that would prevent implementation of any reasonable and prudent alternatives that might be provided at the conclusion of this consultation. This prohibition is in force until the full requirements of Section 7(a)(2) are satisfied. Section 7(d) does not prohibit all aspects of an agency action from proceeding during

consultation; rather, non-jeopardizing activities may be implemented if doing so would not violate Section 7(d). All of the action agencies that are a part of this consultation have discretion to change how they conduct these activities and may do so at any time, subject to the Administrative Procedure Act, National Environmental Policy Act, and other applicable laws.

SUMMARY OF USACE PBO

The U.S. Army Corps of Engineers Jacksonville District's Programmatic Biological Opinion, termed JAXBO, was issued on November 20, 2017. JAXBO represents NOAA NMFS's biological opinion based on NMFS review of impacts associated with 10 categories of in-water activities that the USACE's Jacksonville District authorizes under Section 10 of the Rivers and Harbors Act of 1899, and Section 404 of the Clean Water Act throughout Florida and the U.S. Caribbean, including PR and the USVI. The 10 categories of activity evaluated under the JAXBO include:

1. Shoreline stabilization (e.g., installation, repair, and removal of structures).
2. Pile-supported structures.
3. Dredging.
4. Water-management outfall structures.
5. Scientific survey devices (e.g., installation, repair, and removal of structures).
6. Boat ramps.
7. Aquatic enhancement, including constructing oyster reefs on unvegetated bottom in tidal waters; constructing living shorelines, including using vegetative plantings and fill material to construct breakwaters parallel to the shore; enhancing or establishing submerged aquatic vegetation; constructing artificial reefs; and filling in areas to restore natural contours or improve water quality.
8. Transmission/ utility lines.
9. Marine debris removal.
10. Temporary platforms, fill and cofferdams.

FEMA anticipates projects tiered from this PEA will align with Activity 7, aquatic enhancement. The JAXBO includes an evaluation of effects determinations for the following categories of protected species and critical habitat:

- Sea turtles (loggerhead, leatherback, Kemp's ridley, hawksbill, and green),
- Smalltooth sawfish,
- Nassau grouper,
- Scalloped hammerhead shark,
- Johnson's seagrass,
- Sturgeon (Gulf, shortnose, and Atlantic),
- Corals (elkhorn, staghorn, boulder star, mountainous star, lobed star, rough cactus, and pillar),

- Whales (North Atlantic right whale, sei, blue, fin, and sperm), and
- Designated critical habitat for Johnson's seagrass; smalltooth sawfish; sturgeon (Gulf and Atlantic); sea turtles (green, hawksbill, leatherback, loggerhead); North Atlantic right whale; and elkhorn and staghorn corals.

Project-specific review requirements are stipulated in the JAXBO and satisfy obligations under the ESA for the above-listed species and critical habitats within the NOAA NMFS purview. However, it should be noted that the JAXBO does not apply to projects that may affect, directly or indirectly, ESA-listed corals. A separate ESA consultation would be required for such projects. Further, projects occurring within in the Florida Keys National Marine Sanctuary may require separate consultation or authorization from NOAA.

The JAXBO Project Design Criteria (PDC) stipulate conditions to ensure effects from the 10 activities are minimal in nature and do not result in adverse effects to listed species or to essential features of designated critical habitat. USACE may conduct a project-specific review to ensure that PDCs and applicable conservation measures and conditions are included for each project tiered from this PEA. The excerpted PDC specific to Activity 7, aquatic enhancement, is included below. However, the JAXBO should be consulted in its entirety for a comprehensive list of applicable exclusions, conservation measures, and conditions for each project.

JAXBO PDC Specific to Activity 7 for Aquatic Habitat Enhancement, Establishment, and Restoration Activities:

A7.1. Only native plant species can be planted.

<u>Additional Conditions for living shoreline and oyster habitat on unvegetated bottom in tidal waters:</u>

A7.2. Oyster reef materials shall be placed and constructed in a manner that ensures that materials will remain stable and that prevents movement of materials to surrounding areas (e.g., oysters will be contained in bags or attached to mats and loose cultch must be surrounded by contained bagged oysters or another stabilizing feature).

A7.3. Oyster reef materials must be placed in designated locations only (i.e., the materials shall not be indiscriminately or randomly dumped or allowed to spread outside of the reef structure).

A7.4. Living shorelines can only be constructed in unvegetated, nearshore water along shorelines to create tidal marshes or mangrove habitat for the purpose of shoreline erosion control or aquatic habitat enhancement. Native plants can be placed along the shoreline or between the shoreline and the living shoreline structure.

A7.5. Living shoreline structures and permanent wave attenuation structures can only be constructed out of the following materials: oyster breakwaters (described above in the project description and A7.2), clean limestone boulders or stone (sometimes contained in metal baskets or cages to contain the material), small mangrove islands, biologs, coir, rock sills, and prefabricated structures made of concrete and rebar that are designed in a manner so that they do not trap sea turtles, smalltooth sawfish, or sturgeon. Reef balls or similar structures that are not open on the bottom, open-bottom structures with a top opening of at least 4 ft, and reef discs stacked on a pile are prefabricated structures are designed in a manner so that they do not trap sea turtles. Other materials may be used for living shorelines if pre-approved by NMFS to ensure that they are stable and not an entanglement risk to listed species. The approval process to use other materials is described in the Section 2.3 (Project-Specific Review).

A7.6. Both living shoreline and oyster reefs must have 5 ft gaps at least every 75 ft in length, as measured parallel to the shoreline and at the sea floor, to allow for tidal flushing and species movement.

Additional Conditions for the establishment or restoration of submerged aquatic vegetation:

A7.7. The placement of loose or bagged sediment suitable for the project site in blowholes/dredge holes or in prop scars, and berm redistribution or sod replacement in excavations, must be to an elevation level with or otherwise consistent with the adjacent area.

A7.8. This Opinion covers leveling submerged spoil piles or berms if necessary to level the restoration area to match the elevation of adjacent seagrass beds.

A7.9. Exclusion cages may be used around seagrass restoration areas if necessary to allow the seagrass beds to establish themselves to the point where they are sustainable after the cages are removed. Exclusion cages can only be used on a temporary basis, for a period not to exceed 4 months. Each exclusion cage must be securely fastened to the substrate so that it does not become detached. All cages must be constructed of firm, taut materials and cannot include any loose mesh, thin twistable wire, or rope that could twist or become entangled or present an entanglement risk to species.

A7.10. Seagrass transplantation and harvesting from the donor site may occur only by hand. Donor sites could include (i) upland seagrass farms, (ii) areas with seagrasses that would be impacted by another project, or (iii) existing seagrass beds, as long as the seagrass is removed in a manner that is not detrimental to the existing seagrass bed. Transplantation methods may include, but are not limited to, plugging devices, manual transplant, peat pellets, peat pots, and coconut fiber mats. No in-water machinery (e.g.,

marsh buggies, track hoe) may be used in harvesting or transplanting the seagrasses. The selection of and harvesting from seagrass donor sites shall be coordinated with NMFS Habitat Conservation Division. This Opinion does not cover transplantation of the invasive seagrasses (e.g., *Halophila stipulacea*).

A7.11. In Florida, this Opinion covers installation of stakes to attract birds, if necessary or appropriate for the project. Bird stakes should not be used in areas where additional nutrients may be detrimental to the seagrass. Bird stakes are not authorized in the U.S. Caribbean.

A7.12. This Opinion covers installation of signage (supported on piles or anchored) if the signs are necessary to prevent motorized boats from entering the area and anchoring. Signs must be sized and placed in a manner that prevents the loss of native seagrasses from sign shading.

Additional conditions for the installation of artificial reefs from the placement of man-made materials:

A7.13. Artificial reef materials shall be clean and free from asphalt, creosote, petroleum, other hydrocarbons and toxic residues, loose free-floating material, or other deleterious substances.

A7.14. New reef sections are limited to 1 reef section measuring ¼- by ¼-nmi area (40 ac) in size with a distance of 500 ft between each section. Offshore reefs shall maintain a minimum vertical clearance of twice the height of the structure from the top of the deployed material relative to the MLW at all times.

A7.15. Reauthorization of existing reefs is limited to the previously permitted size. Approved materials defined in PDC A7.19 can be added to the existing reef area.

A7.16. No artificial reef materials shall be deployed until a benthic assessment of the bottom conditions has been accomplished by diver or submersible video camera. The inspection of the deployment area may occur at the time of deployment but no more than 1 year prior to deployment. The permittee shall maintain a deployment buffer of at least 200 ft from any submerged aquatic resources, including seagrasses, macroalgae, hard or soft coral (including coral reefs), sponges, oysters, or hard bottom when placed in areas of sand. If materials are off-loaded from a barge or placed in areas that may generate turbidity (e.g., areas with fines or muck), a 500 ft buffer is required.

A7.17. This Opinion does not cover the use of mid-water fish aggregation devices.

A7.18. All reefs must be cleaned annually to remove marine debris and derelict fishing line in

areas safely accessible to recreational SCUBA divers. Cleanup efforts shall follow the PDCs for Activity 9, marine debris removal, and all pertinent general PDCs.

Additional conditions for reef materials:

A7.19. Individual reef units or modules must weigh at least 500 pounds. Reef materials shall be clean and free from asphalt, petroleum, other hydrocarbons, and toxic residues, as well as loose, free-floating material, or other deleterious substances. All artificial reef materials and/or structures will be selected, designed, constructed, and deployed to create stable and durable marine habitat. Only the following reef materials may be used under this Opinion:
A7.19.1. Prefabricated artificial reef modules composed of ferrous and/or aluminum-alloy metals, concrete, rock, or a combination of these materials.
A7.19.2. Natural rock boulders and pre-cast concrete material, such as culverts, stormwater junction boxes, power poles, railroad ties, jersey barriers, or other similar concrete material.
A7.19.3. Clean steel and concrete bridge or large building demolition materials such as slabs or piles with all steel reinforcement rods cut at the base of the concrete so no rebar or metal protrudes from the concrete.

A7.20. Reef structures, materials, and installation methods shall be designed and deployed to prevent entanglement and entrapment of listed species. Open-bottom prefabricated reef modules may not be used unless the module also has a top opening sufficiently large to allow a turtle to escape. Approved open-bottom modules include:
A7.20.1. Three-sided modules where each side of the tope opening is at least 36-in in length along its edge.
A7.20.2. Four or more sided modules where each side of the top opening is at least 40-in in length along its edge.
A7.20.3. Modules with a round opening with a diameter of at least 40-in (oval openings are not allowed unless a 40-in diameter circle space can fit within the oval).
A7.20.4. Modules that are approved by the FWS Artificial Reef Program as being turtle friendly. FWS is currently working on developing this list.

No open-bottom modules are allowed that include additional modules, discs, or other materials stacked or placed on or immediately adjacent to the top opening, as they may prevent turtles from easily escaping.

A7.21. This Opinion does not cover projects that use explosives to deploy reef material.

A7.22. If pile placement is required in the construction of a reef, such placement must comply

with the PDCs for Activity 2, pile-supported structures, and all applicable general PDCs.

Fill to restore natural contours or improve water quality:

A7.23. Fill of scars or ruts caused by vessel groundings or similar activities must match the surrounding natural elevation.

A7.24. This Opinion covers fill of deep holes or canal bottoms that are determined to be hypoxic (i.e., that have critically low dissolved oxygen levels).

Additional PDCs for Activity 7 applicable in critical habitat:

In addition to the PDCs above, the project must be designed to meet the following PDCs if the project occurs in the critical habitat, as described below.

A7.25. Smalltooth sawfish critical habitat: Oyster reefs, living shorelines, and artificial reefs cannot be placed in waters containing the shallow, euryhaline essential feature. Fill to restore natural contours or improve water quality and seagrass restoration can occur in waters containing the shallow, euryhaline essential feature, as long as the activity meets the PDCs for Activity 7 and all pertinent general PDCs. No aquatic habitat enhancement, establishment, or restoration activities are allowed in areas identified as smalltooth sawfish limited exclusion zones (Section 2.1.1.1).

A7.26. Gulf sturgeon critical habitat: Oyster reefs, living shorelines, and seagrass restoration in Gulf sturgeon critical habitat are restricted to areas that are in water depths shallower than -6 ft (-2 m) MHW (i.e., between the shoreline and -6 ft deep). Artificial reef structures cannot be placed in Gulf sturgeon critical habitat. Fill to restore natural contours or improve water quality can occur in Gulf sturgeon critical habitat, regardless of project depth. Living shorelines, oyster reefs, and artificial reefs cannot be placed in Gulf sturgeon critical habitat migratory restriction zones, defined in Section 2.1.1.2.

A7.27. North Atlantic right whale critical habitat: All artificial reefs must meet specifications below. Oyster reefs, living shorelines, seagrass restoration, and fill to restore natural contours or improve water quality can occur in North Atlantic right whale critical habitat, as long as those activities meet the PDCs for Activity 7 and any pertinent general PDCs, as described above.

A7.27.1. No artificial reefs can be placed in water shallower than 30 ft deep

A7.27.2. The maximum reef height off the sea floor is 20 ft

A7.27.3. The maximum footprint of new reefs shall be 1 square nautical mile (nmi^2). If a new reef is added to an existing artificial reef, the total footprint of the combined reefs must not exceed 1 nmi^2.

A7.27.4. Density of newly permitted reefs shall not exceed 2 reefs (old or new) per 10

nmi^2

A7.27.5. All effort should be made to avoid placing reef material during North Atlantic right whale calving season (November 15 through April 15). If reef material has to be placed during North Atlantic right whale calving season, then the following additional measures are required:

- The maximum speed for all vessels involved in placing the reef material is 10 knots.
- Deployments cannot be conducted at any time when lighting or weather or sea conditions (e.g., darkness, rain, fog, sea state) prevent visual monitoring of the project area.
- Deployment activities will not commence until the protected species observer reports that no marine mammals or sea turtles have been sighted for at least 60 minutes.
- Deployment activities will cease immediately if sea turtles or marine mammals are sighted within the project area.
- Deployment activities will not recommence until the protected species observer reports that no marine mammals or sea turtles have been sighted for at least 60 minutes.

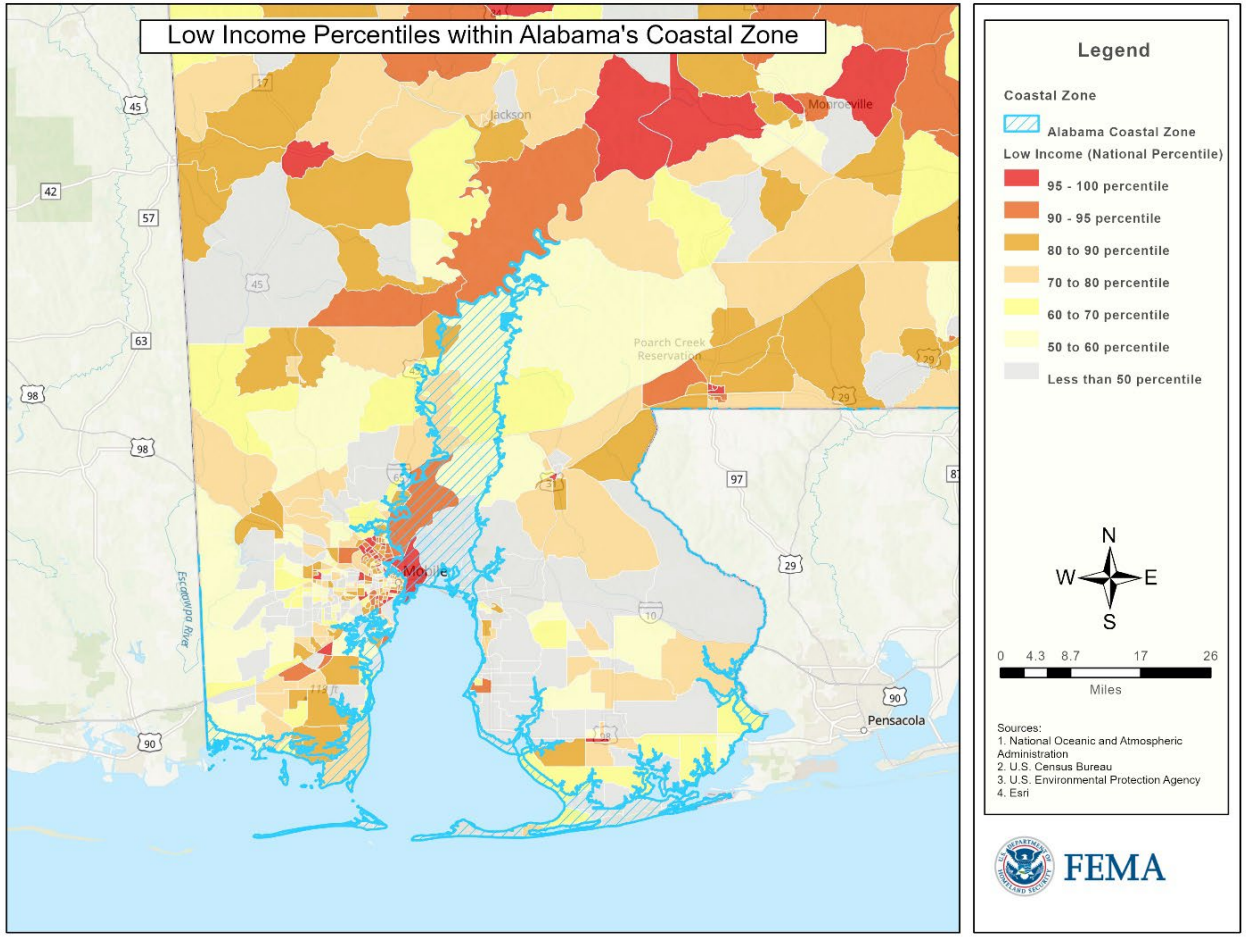
A7.28. Acropora critical habitat: This Opinion does not cover any aquatic habitat enhancement, establishment, or restoration activities in Acropora critical habitat where the essential feature is present.

A7.29. Johnson's seagrass critical habitat: Living shorelines, oyster reefs, and artificial reefs cannot be placed in waters shallower than -13 ft MHW within the geographic boundaries of Johnson's seagrass critical habitat. Seagrass restoration and fill to restore natural contours or improve water quality can occur in Johnson's seagrass critical habitat regardless of depth, as long as those activities meet the PDCs for Activity 7 and any pertinent general PDCs, as described above.

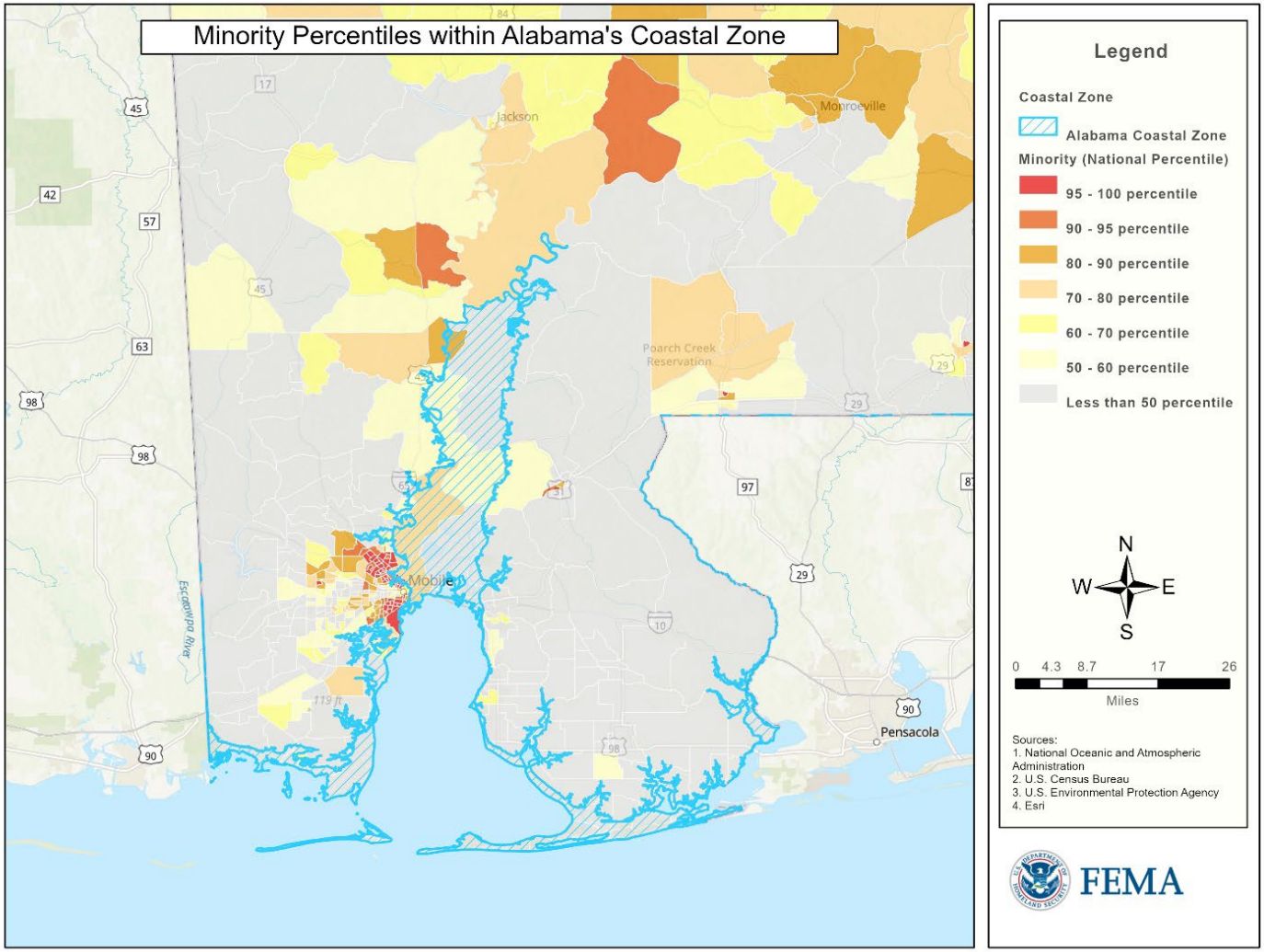
A7.30. Loggerhead critical habitat: Living shorelines, oyster reefs, and artificial reefs cannot be placed in nearshore reproductive habitat of loggerhead critical habitat. Seagrass restoration and fill to restore natural contours or improve water quality can occur in nearshore reproductive habitat of loggerhead critical habitat, as long as those activities meet the PDCs for Activity 7 and any pertinent general PDCs, as described above.

A7.31. U.S. Caribbean Sea Turtle Critical Habitat (NA DPS of green, hawksbill, and leatherback sea turtle critical habitat): No aquatic enhancement activities (living shorelines, oyster reefs, artificial reefs, seagrass restoration, and fill to restore natural contours or improve water quality) can occur within sea turtle critical habitat in the U.S. Caribbean.

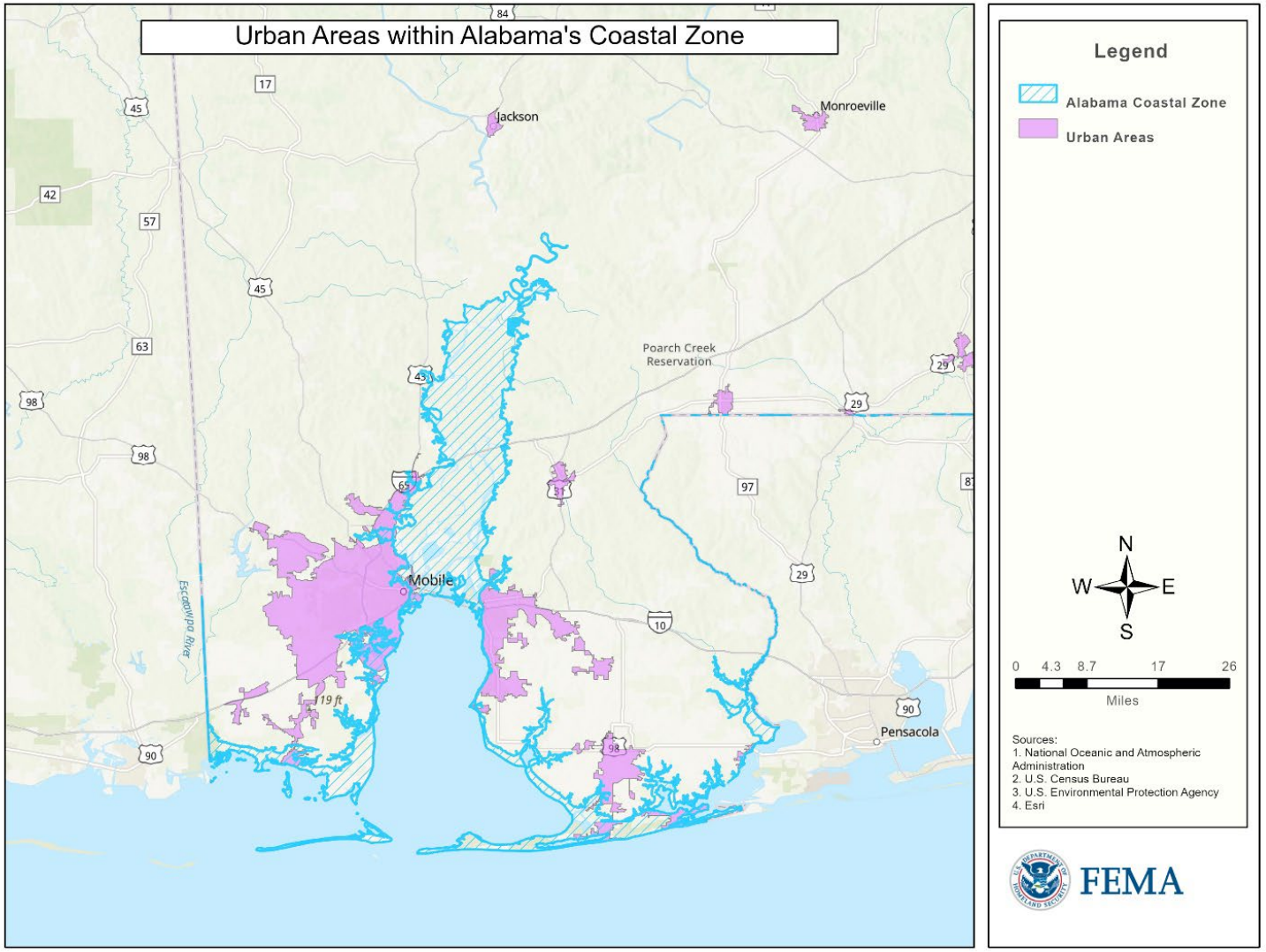
APPENDIX D: MAPS



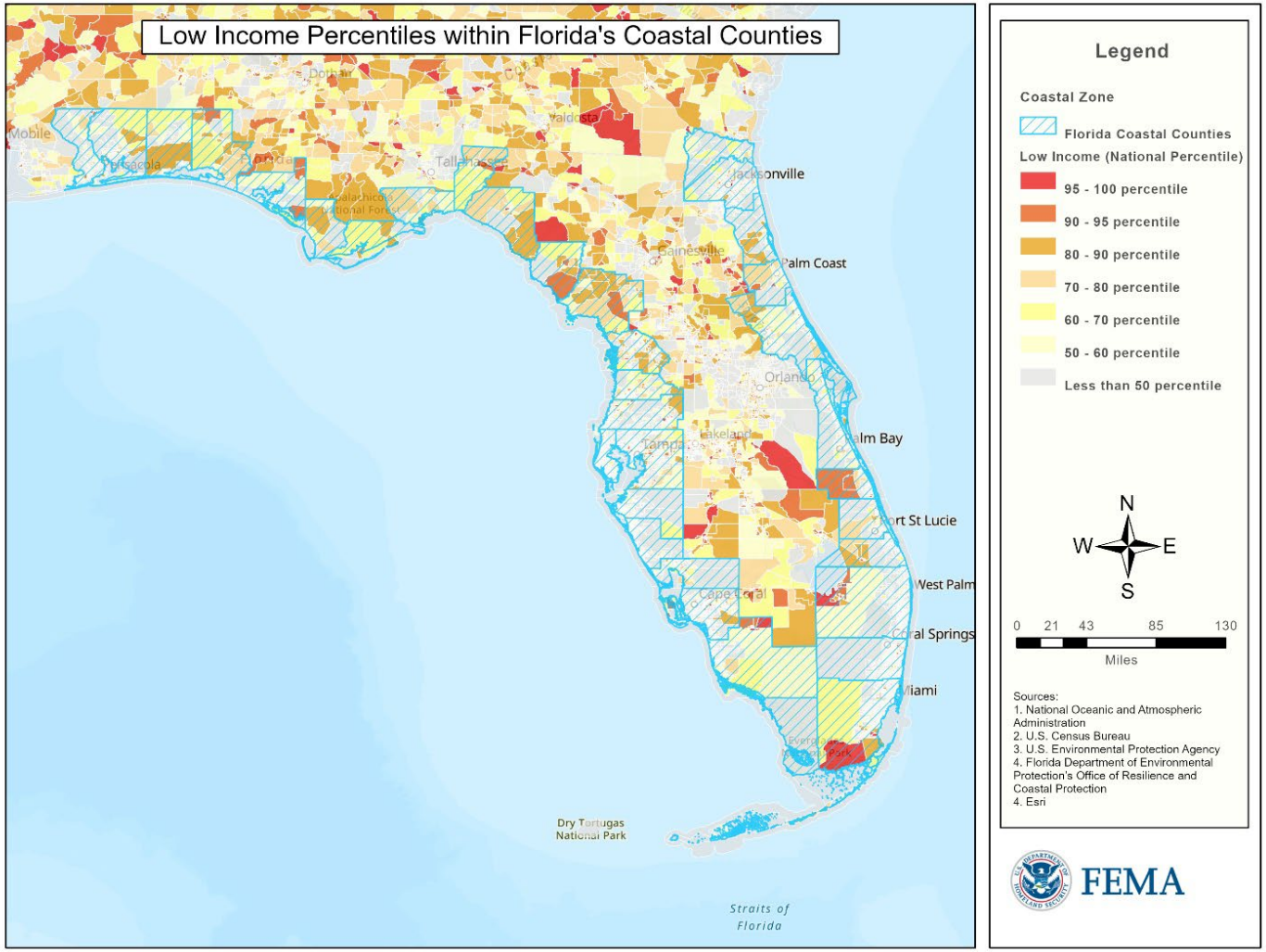
Map 1. Map depicting the regulated coastal zone boundary in Alabama overlain with low income percentiles ranging from the less than 50 percentile, shaded in grey, to the 95-100 percentile, shaded in red.



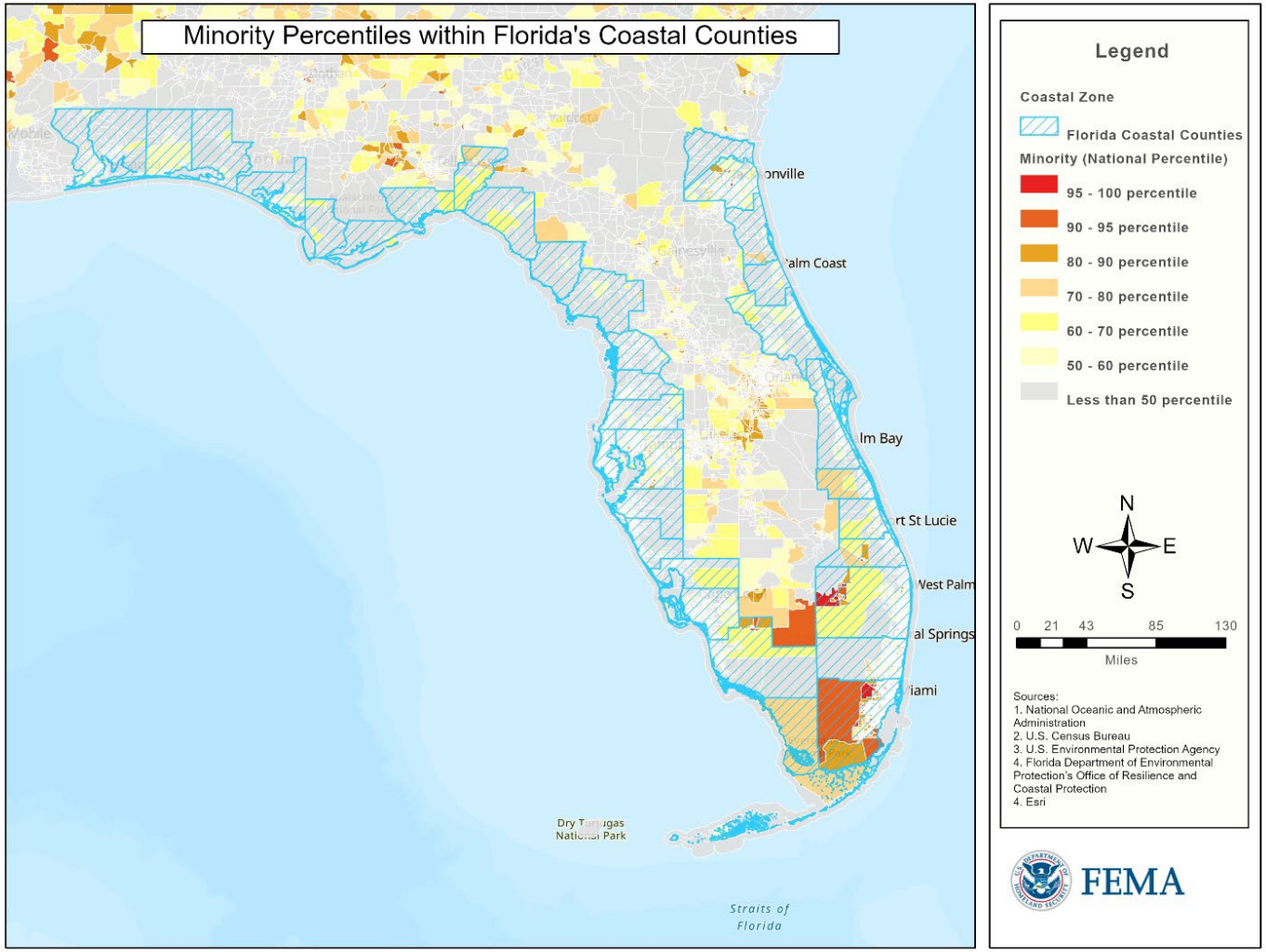
Map 2. Map depicting the regulated coastal zone boundary in Alabama overlain with minority percentiles ranging from the less than 50 percentile, shaded in grey, to the 95-100 percentile, shaded in red.



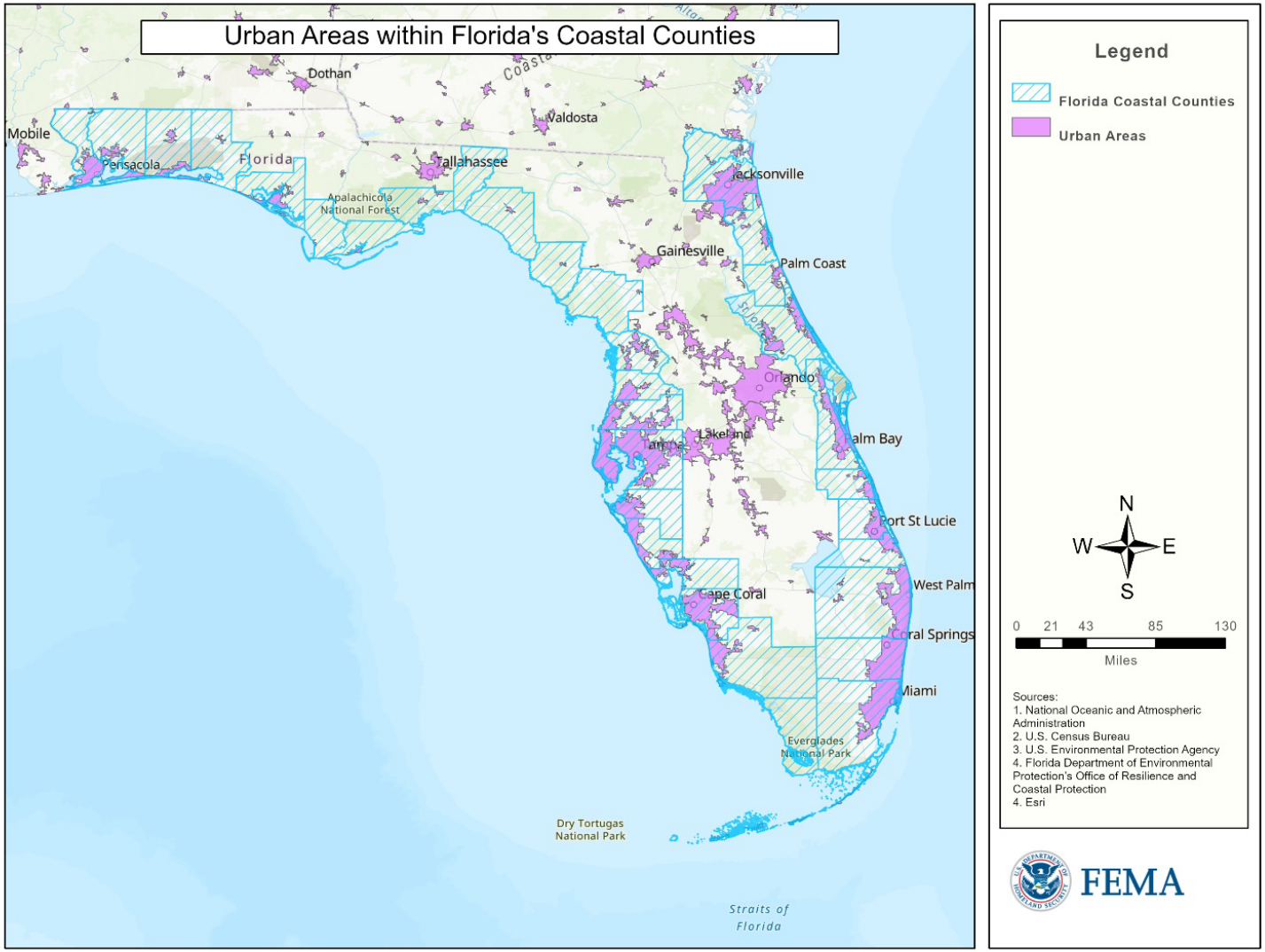
Map 3. Map depicting the regulated coastal zone boundary in Alabama overlain with Census-defined Urban Areas, shaded in pink.



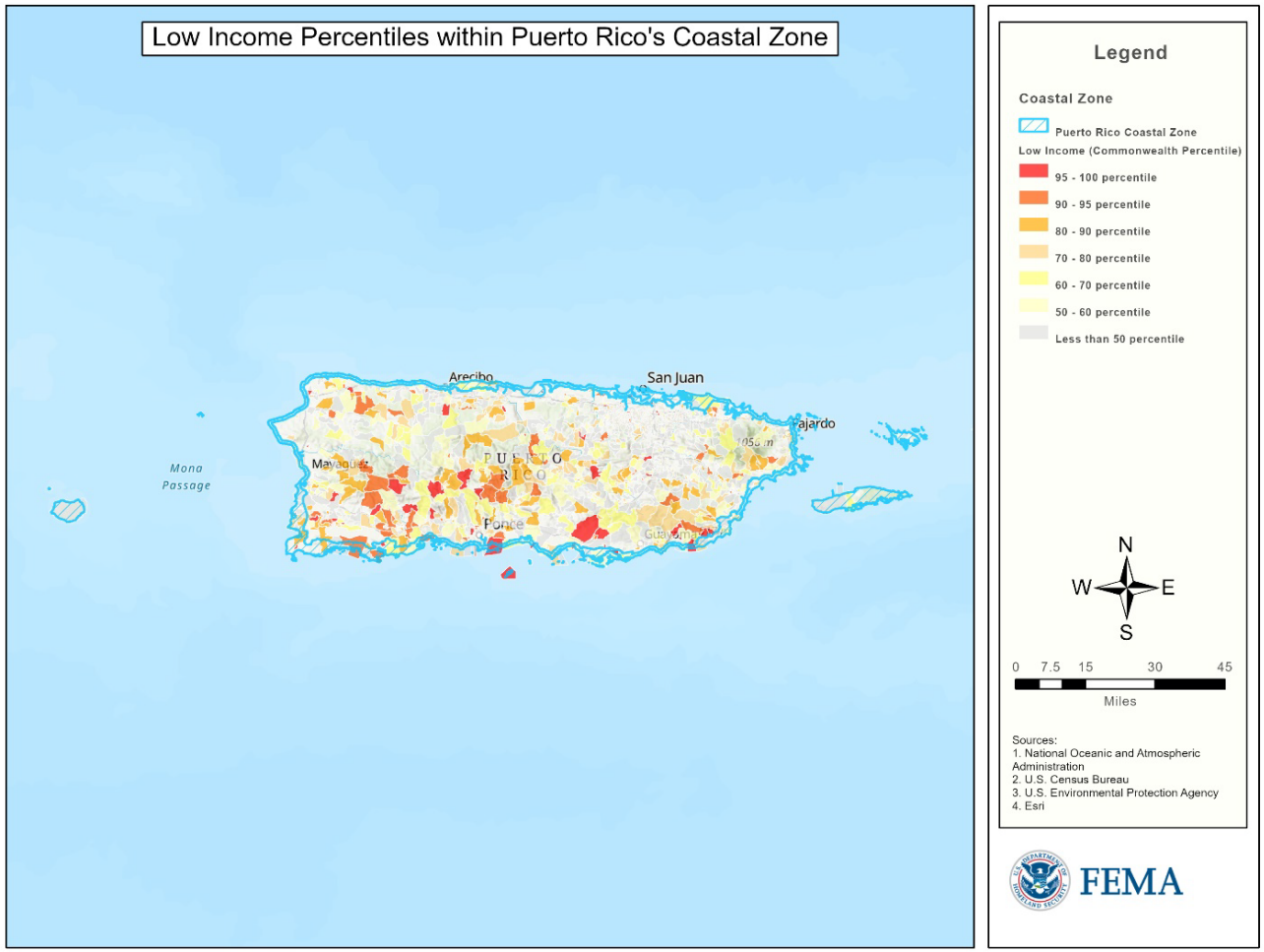
Map 4. Map depicting the regulated coastal zone boundary in Florida overlain with low income percentiles ranging from the less than 50 percentile, shaded in grey, to the 95-100 percentile, shaded in red.



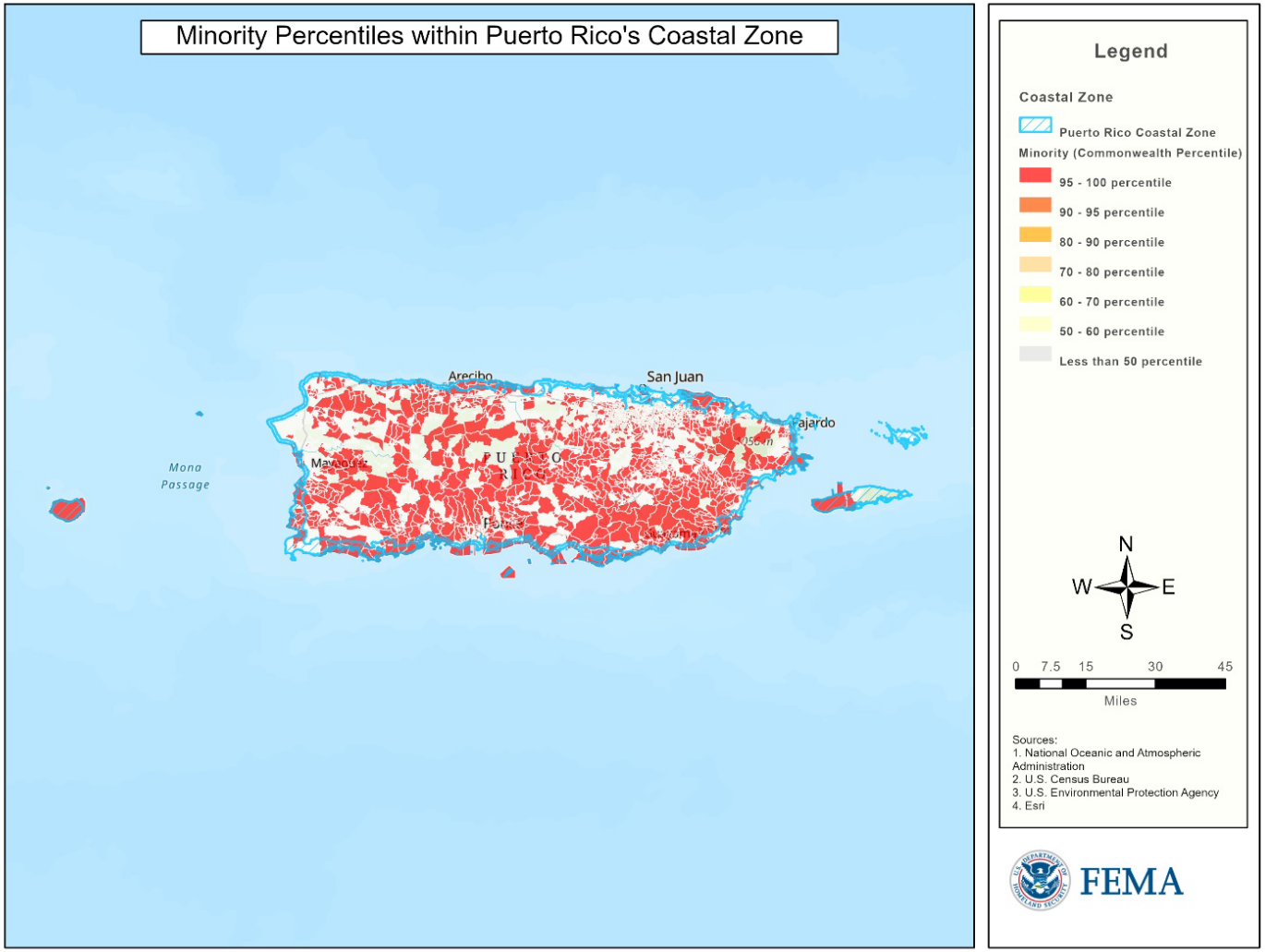
Map 5. Map depicting the regulated coastal zone boundary in Florida overlain with minority percentiles ranging from the less than 50 percentile, shaded in grey, to the 95-100 percentile, shaded in red.



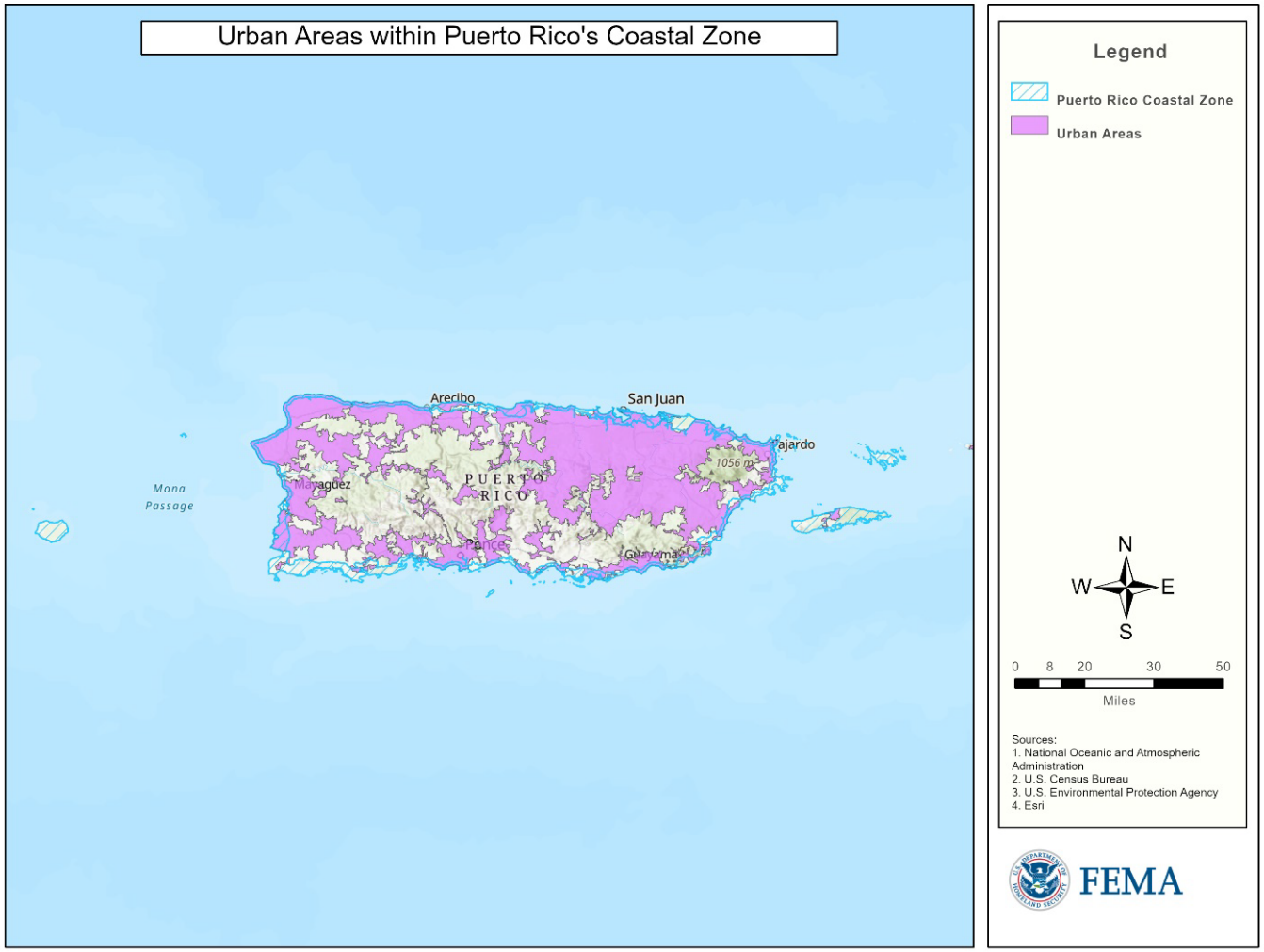
Map 6. Map depicting the regulated coastal zone boundary in Florida overlain with Census-defined Urban Areas, shaded in pink.



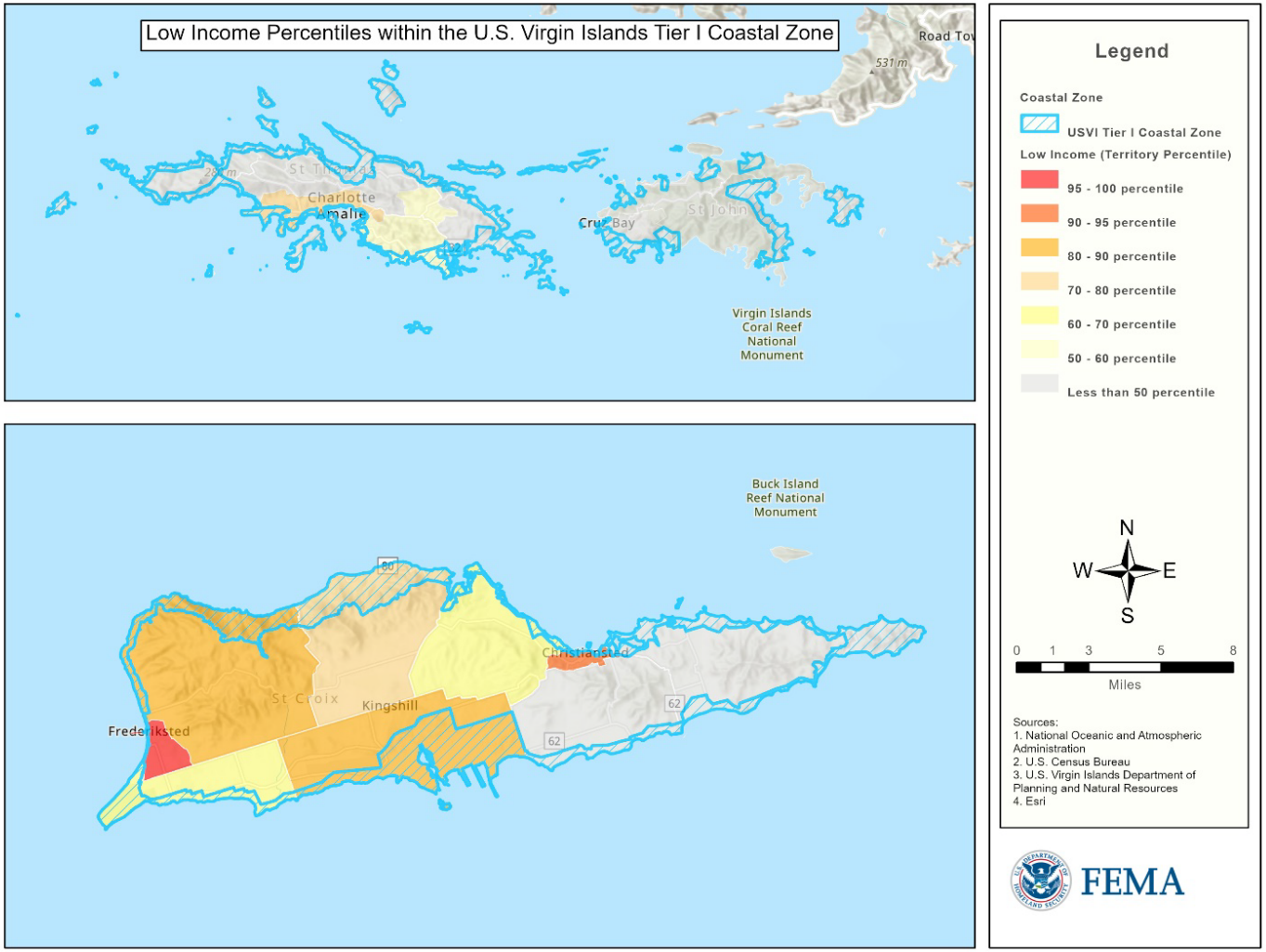
Map 7. Map depicting the regulated coastal zone boundary in Puerto Rico overlain with low income percentiles ranging from the less than 50 percentile, shaded in grey, to the 95-100 percentile, shaded in red.



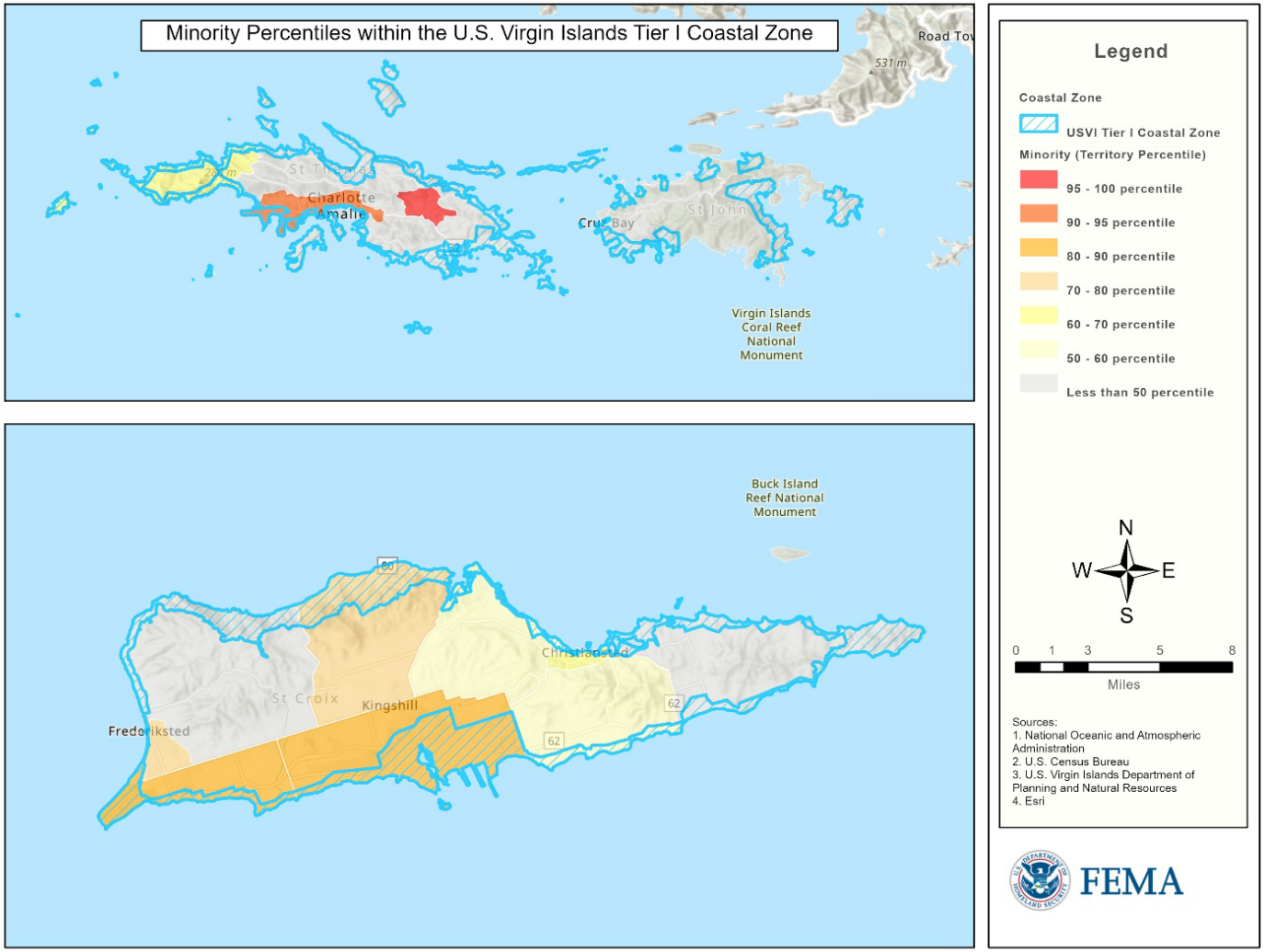
Map 8. Map depicting the regulated coastal zone boundary in Puerto Rico overlain with minority percentiles ranging from the less than 50 percentile, shaded in grey, to the 95-100 percentile, shaded in red.



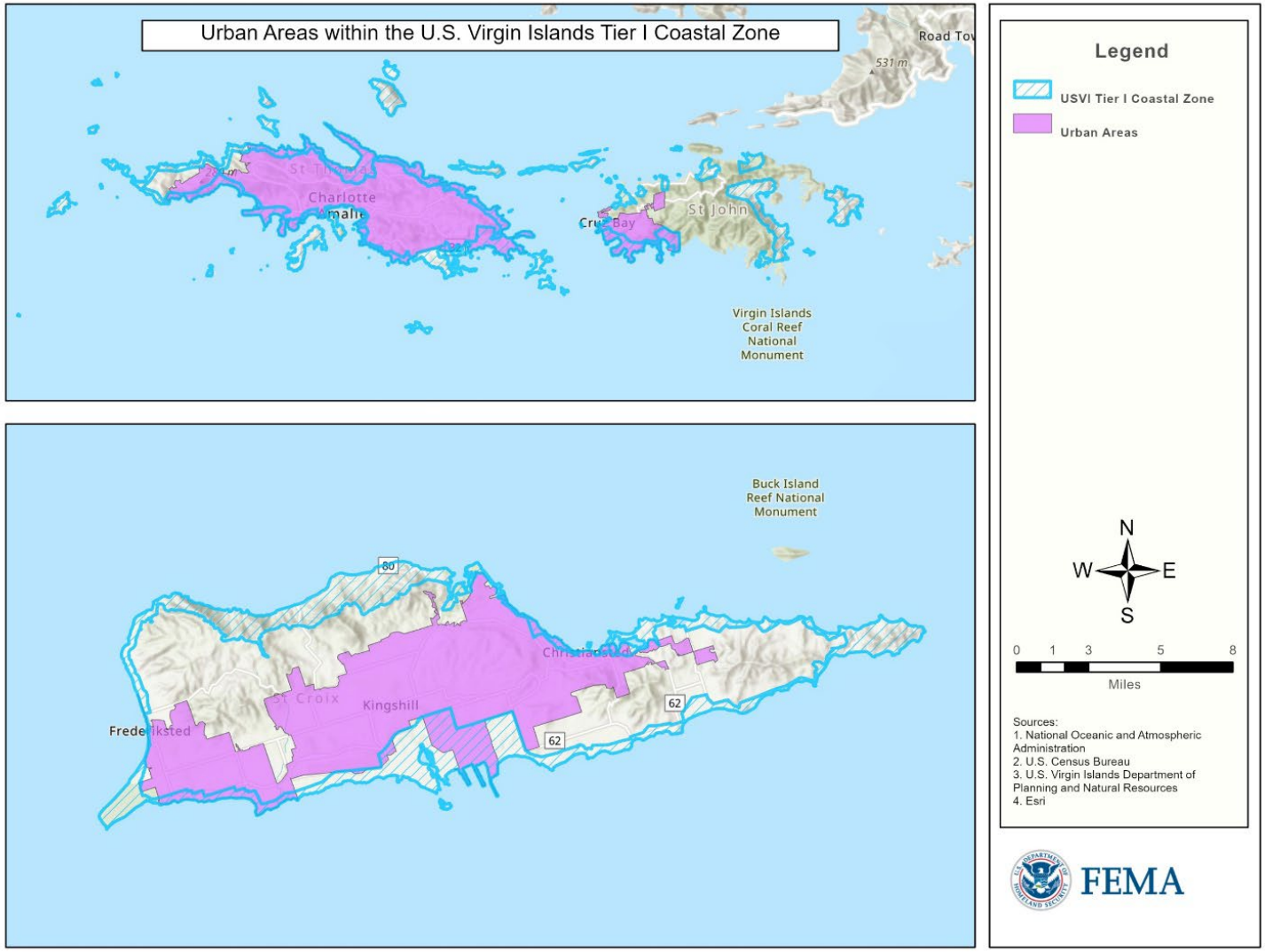
Map 9. Map depicting the regulated coastal zone boundary in Puerto Rico overlain with Census-defined Urban Areas, shaded in pink.



Map 10. Map depicting the regulated coastal zone boundary in the USVI overlain with low income percentiles ranging from the less than 50 percentile, shaded in grey, to the 95-100 percentile, shaded in red.



Map 11. Map depicting the regulated coastal zone boundary in the USVI overlain with minority percentiles ranging from the less than 50 percentile, shaded in grey, to the 95-100 percentile, shaded in red.



Map 12. Map depicting the regulated coastal zone boundary in the USVI overlain with Census-defined Urban Areas, shaded in pink.

APPENDIX D: MAPPING METHODOLGY

For Puerto Rico and Alabama, the regulated coastal zone was sourced directly from the (NOAA) Coastal Zone Management Act Boundary representing the extent of the nation's coastal zone, as defined by the individual states and territories under the Coastal Zone Management Act of 1972 (CZMA).

Within this dataset, however, the entirety of Florida and the U.S. Virgin Islands is located within the coastal zone. Therefore, boundaries considered for these two jurisdictions went a level deeper to define the coastal area of interest based on the official coastal tiers applied by each.

In Florida, only coastal cities and counties that include, or are contiguous to, state water bodies are eligible to receive coastal management funds, so only these jurisdictions, as defined by the Florida Department of Environmental Protection's Office of Resilience and Coastal Protection, were considered. In the U.S. Virgin Islands, the comprehensive coastal zone permit system is focused on proposals in their Tier I boundary, as defined by the U.S. Virgin Islands Department of Planning and Natural Resources, so only Tier I was considered.

Percentage of Regulated Coastal Zone Containing Geographic Features of Concern

Jurisdiction	Wetlands	SFHA	CBRA/OPA
U.S. Virgin Islands	6%	25%	9%
Puerto Rico	25%	35%	10%
Florida	43%	45%	1%
Alabama	81%	93%	5%

Sources: U.S. Fish and Wildlife Service and FEMA

Percentage of Regulated Coastal Zone Containing Sociodemographic Features of Concern

Jurisdiction	Urban Area	Low Income	Minority
U.S. Virgin Islands	30%	45%	43%
Puerto Rico	44%	48%	65%
Florida	18%	58%	34%
Alabama	8%	72%	29%

Sources: U.S. Census Bureau and Environmental Protection Agency (EJSCREEN)

SOCIODEMOGRAPHIC DATA USED

Note that all of EJSCREEN's demographic data for low-income and minority communities come from the latest annual update of the five-year average ACS estimates (updated June 2021), with some lag time from publication by Census to inclusion in EJSCREEN. For this analysis, all percentiles over 50 were considered.

In Florida, Alabama, and Puerto Rico, EJSCREEN data were used to determine the percentage of overlap between the defined coastal zones and the sociodemographic areas of interest. In Florida and Alabama, percentile data for low-income and minority communities was determined in relation to national percentiles whereas Puerto Rico's percentiles were determined in relation to the Commonwealth itself. Due to a lack of current data availability, 2010 Census data was considered "best available" for the U.S. Virgin Islands during initial analysis and mapping. Like Puerto Rico, percentiles were determined in comparison to the Territory rather than in relation to the rest of the U.S.

Factors for low income were considered differently for the U.S. Virgin Islands based on information available. Low income for Puerto Rico, Alabama, and Florida was based on the percent of individuals whose ratio of household income to poverty level in the past 12 months was less than 2 (as a fraction of individuals for whom ratio was determined) within a census block group; for the U.S. Virgin Islands, these percentages were based on the percent of individuals in a subdistrict below the poverty level. Minority populations were considered similarly across all jurisdictions as the percent of individuals in a block group (or subdistrict for the U.S. Virgin Islands) who list their racial status as a race other than white alone and/or list their ethnicity as Hispanic or Latino.

It is important to highlight the limitations of data for the U.S. Virgin Islands and how this shapes the outcome of this analysis, especially for low-income communities. Per EJSCREEN, many studies in various fields use 2x poverty, while many others use 1x poverty to define "low income." Since 2x poverty was used for all jurisdictions except for U.S. Virgin Islands (where 1x poverty was used), the threshold for what is considered low income in the U.S. Virgin Islands was lower. If 2x poverty was available for the U.S. Virgin Islands, it would define a larger percent of the population as low income and may present a different outcome for the percent of low-income communities found within the Tier I coastal zone.

As of the drafting of this document, 2020 census data for the U.S. Virgin Islands was not available in EJSCREEN and only some census data was available in tabular form. The U.S. Census bureau released 2020 data on population and housing counts in October 2021 and updated it with Demographic Profile data in October 2022; additional data is projected July 2023 with detailed cross tabulations projected for a future release date. Total population change in USVI reflects a drop of 18.1% from 2010 to 2020; with two exceptions, all household income cohorts decreased with the greatest decline in the $15,000 to $24,999 range. Households earning less than $2,500 increased in proportion by 15% and those earning more than $100,00 grew by 18% suggesting a widening income gap in USVI households.[33]

[33] United States Census Bureau, 2022

USVI 2010 to 2020 Income by Household

Dataset	DECENNIALVI2010	DECENNIALDPVI2020	Change	
Table ID	PBG46	DP3		
Total Households	43,214	39,642	(3,572)	-9%
Less than $2,500	2,317	2,740	423	15%
$2,500 to $4,999	897	750	(147)	-20%
$5,000 to $9,999	2,649	2,261	(388)	-17%
$10,000 to $14,999	2,977	2,607	(370)	-14%
$15,000 to $19,999	2,832	2,210	(622)	-28%
$20,000 to $24,999	3,379	2,461	(918)	-37%
$25,000 to $29,999	2,769	2,453	(316)	-13%
$30,000 to $39,999	4,909	4,144	(765)	-18%
$40,000 to $49,999	3,895	3,276	(619)	-19%
$50,000 to $59,999	3,456	2,985	(471)	-16%
$60,000 to $74,999	3,834	3,423	(411)	-12%
$75,000 to $99,999	4,033	3,872	(161)	-4%
$100,000 or more	5,267	6,460	1,193	18%

Note: One line per data set combined to match income cohorts between the 2010 and 2020 data.

APPENDIX E: SPANISH TRANSLATION OF THE EXECUTIVE SUMMARY

RESUMEN EJECUTIVO

De acuerdo con la Ley Nacional de Política Ambiental (NEPA, por sus siglas en inglés), las reglamentaciones del Consejo de Calidad Ambiental (CEQ, por sus siglas en inglés) quienes implementan la NEPA, y las directivas de la NEPA del Departamento de Seguridad Nacional (DHS, por sus siglas en inglés), la Agencia Federal para el Manejo de Emergencias (FEMA, por sus siglas en inglés) ha preparado esta Evaluación Ambiental Programática (PEA, por sus siglas en inglés) para evaluar los impactos potenciales de la acción propuesta en las alternativas del proyecto sobre los ambientes humanos. La acción propuesta en esta PEA puede ser llevada a cabo por los beneficiarios o sub-beneficiarios de subvenciones de FEMA en Alabama (AL), Florida (FL), el Estado Libre Asociado de Puerto Rico (PR) y las Islas Vírgenes de los Estados Unidos (USVI). El propósito de la acción propuesta es reducir el potencial de pérdida de vidas, propiedades y la erosión costera resultante de la marejada ciclónica, al promover la resiliencia de los recursos marinos vivos (LMR, por sus siglas en inglés) costeros en AL, FL, PR y USVI. LMR se refiere a los organismos que usan o dependen de alguna manera de los recursos marinos, estuarinos, y fluviales, tanto en ambientes mareales como no mareales, durante todo o parte de sus ciclos de vida. Los servicios ecosistémicos provistos por LMR proporcionan medidas de mitigación que disipan la acción destructiva de las olas, lo que a su vez reduce los impactos de las marejadas ciclónicas. La restauración de los hábitats costeros, en particular los arrecifes de coral, puede reducir los riesgos al disminuir la exposición de las comunidades costeras al peligro de inundaciones. Sin embargo, las amenazas crónicas y en evolución con el potencial de afectar la función y la sostenibilidad de estos recursos, reducen su capacidad para mitigar futuras marejadas ciclónicas. La necesidad de la acción propuesta está vinculada a las amenazas crónicas y en evolución que enfrentan los recursos costeros y marinos debido a la pérdida de hábitat, la degradación y el cambio climático en AL, FL, PR y USVI.

FEMA incorporó por referencia el análisis de dos Declaraciones Programáticas de Impacto Ambiental completadas por la Administración Nacional Oceánica y Atmosférica para acciones similares que promueven la resiliencia costera de LMR. FEMA evaluó dos alternativas de proyecto en este PEA: la alternativa de no acción, evaluada como base de referencia, y la alternativa preferida evaluada como un rango de acciones potenciales que promueven los servicios ecosistémicos provistos por LMR costeros en la mitigación de las marejadas ciclónicas. El rango de acciones potenciales identificadas colectivamente como la alternativa preferida incluye, pero no se limita a: crear o restaurar formaciones de arrecifes mediante el trasplante y reinserción de fragmentos de coral, la ubicación de caricoche de arrecifes (*reef rubble*) o sustrato de arrecifes de coral como sitios de trasplante para corales; la propagación de fragmentos de corales en viveros en tierra o mar; y el trasplantar o sembrar propágulos de manglares y vegetación acuática sumergida en hábitats cercanos a la costa o submareales.

La alternativa preferida tiene impactos en los recursos en el corto plazo, los cuales en su mayoría son impactos menores, pero en algunos casos pueden ser hasta moderados principalmente relacionados con la colocación inicial de LMR. Los impactos moderados son medibles a nivel local o regional, positivos o negativos, y donde sean negativos, los impactos se limitarán con medidas de mitigación en conformidad con los permisos aplicables. FEMA espera que la alternativa preferida tenga impactos positivos en el largo plazo en las planicies inundables y humedales en función de su potencial para aumentar la capacidad de

mitigar daños causados por marejadas ciclónicas futuras. Las medidas de mitigación incluyen, pero no se limitan a: siguiendo las condiciones del permiso, restricciones estacionales de perturbaciones en la costa, usar controles de erosión y sedimentación y sembrar vegetación subacuática usando especies nativas. Cualquier proyecto que supere los impactos evaluados en esta PEA requerirá una evaluación adicional y podría incluir una mayor participación pública.

Esta PEA estuvo disponible para la revisión y comentarios de la agencia y del público durante un período de 30 días después de la publicación del aviso público. El proceso público incluyó información sobre las acciones en un aviso público distribuido electrónicamente por FEMA a los condados de AL, FL, PR y USVI. Esta PEA también estaba disponible para su descarga en la página web de FEMA https://www.fema.gov/emergency-managers/practitioners/environmental-historic/nepa-repository.