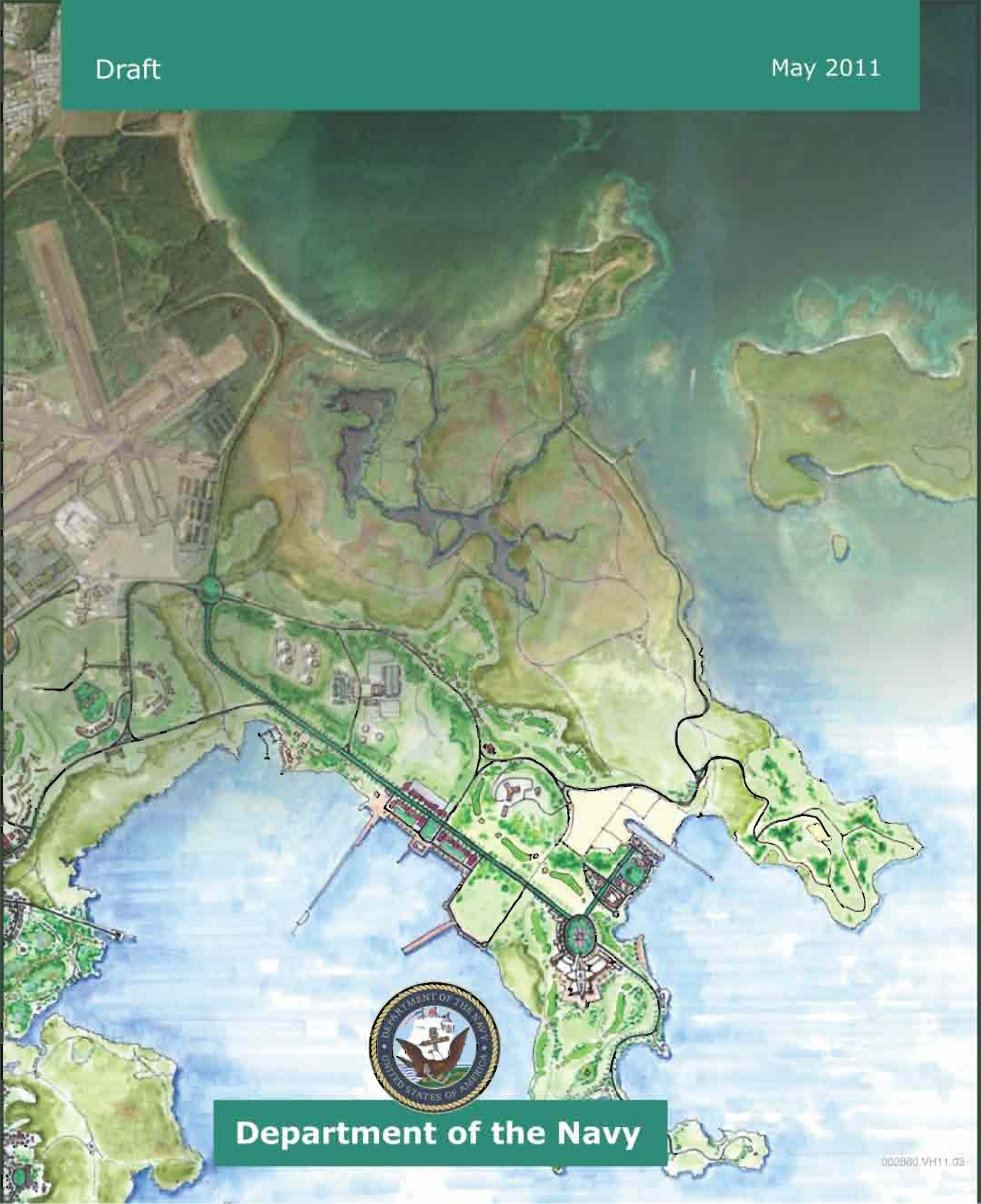


# **Supplemental Environmental Assessment for the Disposal of Naval Activity Puerto Rico (formerly Naval Station Roosevelt Roads)**

Draft

May 2011



**Department of the Navy**

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**Draft**  
**Supplemental Environmental Assessment**  
**for the Disposal of**  
**Naval Activity Puerto Rico**  
**(formerly Naval Station Roosevelt Roads)**

May 2011

Prepared for:

**BRAC Program Management Office SE**  
**Office of the Assistant Secretary of the Navy**  
**Energy, Installations and Environment**

In compliance with Section 102(2)(C)  
of the National Environmental Policy Act of 1969

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Lead Agency:  
Department of the Navy

In accordance with Chief of Naval Operations Instruction 5090.1C

## **Supplemental Environmental Assessment for the Disposal of Naval Activity Puerto Rico, (Formerly Naval Station Roosevelt Roads)**

May 2011

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### **Abstract**

In 2007, the U.S. Department of the Navy (Navy) prepared the *Environmental Assessment for the Disposal of Naval Activity Puerto Rico* (2007 EA) to evaluate the potential environmental impacts associated with the disposal of Naval Activity Puerto Rico (NAPR) in accordance with the Commonwealth of Puerto Rico (Commonwealth) 2004 Reuse Plan. In April 2010, the Commonwealth submitted an addendum to the original 2004 Reuse Plan. This Supplemental Environmental Assessment (SEA) addresses the reuse of the Navy's former NAPR property in accordance with the Commonwealth of Puerto Rico 2004 Reuse Plan, as modified by the Commonwealth's 2010 Reuse Plan Addendum.

The purpose of the Proposed Action in this SEA is to implement Public Law 108-87 requiring the disposal of NAPR. Disposal of the property is necessary to implement the legislation, to provide for the transfer and redevelopment of surplus military property to productive civilian use, and to ensure the Navy does not continue to incur operations and maintenance costs at the facility. The need for the Proposed Action is to achieve the objectives of the 1990 Base Realignment and Closure (BRAC) legislation as amended, which Congress established to improve the efficiency and operational capacities of the U.S. Department of Defense while continuing to maintain skills in support of national defense priorities.

The Proposed Action evaluated in this SEA is the proposed reuse of Parcel III located at NAPR, as identified in the 2010 Reuse Plan Addendum. Two alternatives are analyzed in this document: (1) Preferred Alternative: Reuse of Parcel III property at NAPR as identified in the Commonwealth's 2010 Reuse Plan Addendum, and (2) No-Action Alternative: Disposal of NAPR consistent with the 2004 Reuse Plan in accordance with the Preferred Alternative for Parcel III as identified in the 2007 EA (Finding of No Significant Impacts [FONSI] signed on April 10, 2007).

This SEA analyzes the reasonably foreseeable environmental impacts of the alternatives on land use and coastal zone management; threatened and endangered species and other biological resources; water and marine resources; cultural resources; the regional economy; and environmental management.

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# Executive Summary

## ES.1 Type of Report

This Supplemental Environmental Assessment (SEA) evaluates the environmental consequences of the proposed reuse of the United States Department of the Navy's (Navy) former Naval Activity Puerto Rico (NAPR) property in accordance with the Commonwealth of Puerto Rico (Commonwealth) 2004 Reuse Plan, as modified by the 2010 Reuse Plan Addendum, and adopted by the Commonwealth and the Local Redevelopment Authority (LRA). This SEA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality (CEQ) guidance implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508), and Navy regulations implementing NEPA (32 CFR 775). The Navy is the lead agency for the Proposed Action.

## ES.2 Background

Pursuant to the United States Department of Defense (DoD) Appropriations Act of Fiscal Year 2004 (Public Law 108-87), the Navy closed Naval Station Roosevelt Roads (NSRR) in Puerto Rico in Spring 2004. Accordingly, on March 31, 2004, NSRR ceased operations as a Naval Station. The base was re-designated as Naval Activity Puerto Rico (NAPR) to maintain a Navy presence and associated security during the disposal process.

In 2007, the Navy prepared the *Environmental Assessment for the Disposal of Naval Activity Puerto Rico* (referred to herein as the 2007 EA) that evaluated the potential environmental impacts associated with the disposal of NAPR. To oversee the planning process for future development of NAPR, the Commonwealth created an LRA. In 2004, the LRA developed the *Naval Station Roosevelt Roads Reuse Plan* (Reuse Plan). The potential disposal and reuse of the property, as proposed in the Reuse Plan, was the basis for the evaluation of the potential impacts in the 2007 EA, which was considered consistent with the Puerto Rico Public Environmental Act (Law No. 9).

In April 2010, the Commonwealth, through the LRA, submitted an addendum to the original 2004 Reuse Plan (referred to herein as the 2010 Reuse Plan Addendum, or the Addendum). The SEA herein evaluates the environmental consequences of the proposed reuse of the Navy's former NAPR property in accordance with the Commonwealth's 2004 Reuse Plan, as modified by the 2010 Reuse Plan Addendum, and adopted by the Commonwealth and the LRA. The disposal of the NAPR property will be the responsibility of the Navy; redevelopment will be the responsibility of future owners of the property.

The 2007 EA evaluated the environmental consequences of the 2004 Reuse Plan. This SEA supplements the 2007 EA in accordance with Section 1502.21 of the CEQ regulations implementing NEPA (40 CFR Parts 1500-1508) and analyzes only the effects of those elements of the 2010 Reuse Plan Addendum that are substantially different than those of the original 2004 Reuse Plan.

## ES.3 Description of the Proposed Action

The Proposed Action evaluated in this SEA is the proposed reuse of Parcel III located at NAPR, as identified in the 2010 Reuse Plan Addendum. The 2010 Reuse Plan Addendum is conceptual and focuses on proposed land uses and not on specific developments. The LRA, in conjunction with the Puerto Rico Planning Board (PRPB), has developed a Special Zoning Plan for NAPR based on the 2010 Reuse Plan Addendum. Upon its adoption, this plan would serve as the official zoning of the property.



Any future development projects proposed on former NAPR property would be reviewed by the PRPB to ensure such development is consistent with the Special Zoning Plan. Once detailed engineering and design studies are complete, the specific project sponsor(s) will be responsible for obtaining necessary permits and approvals prior to implementation of redevelopment activities. The components of the Proposed Action are detailed in Section 2.

The 2010 Reuse Plan Addendum categorized the proposed redevelopment into four distinct phases. The impacts associated with the proposed reuse, as defined by Phases I and II, are considered indirect impacts of reuse of the predominantly existing infrastructure of NAPR. CEQ regulations (40 CFR 1508.8[b]) cite growth-inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate and related effects on air and water and other natural systems as examples of indirect impacts. The impacts associated with long-range future redevelopment (Phases III and IV) are based on expansion of the existing infrastructure at NAPR and unforeseen economic factors. This redevelopment and the associated impacts are speculative at present and, therefore, are being considered as cumulative effects of the Proposed Action.

## ES.4 Alternatives

In accordance with CEQ regulations regarding the implementation of NEPA, the alternatives examined should include a range of reasonable alternatives, including the No-Action Alternative. Although the Navy's Proposed Action is reuse of Parcel III of the NAPR property, restrictions imposed on land use by the Navy may affect the long-term redevelopment potential for the property. Thus, the two alternatives analyzed in this document are: (1) reuse of Parcel III property at NAPR as identified in the Commonwealth's 2010 Reuse Plan Addendum, and (2) disposal of NAPR consistent with the 2004 Reuse Plan in accordance with the Preferred Alternative for Parcel III as identified in the 2007 EA (Finding of No Significant Impact [FONSI] signed on April 10, 2007).

### Preferred Alternative

The Preferred Alternative is the reuse of Parcel III located at NAPR, as identified inclusive of Phase II in the 2010 Reuse Plan Addendum. The Addendum includes a tourist destination and commercial strategy that was lacking in the original 2004 Reuse Plan. Phases III and IV of the Addendum remain conceptual and speculative. For example, a cruise terminal and a second marina (300 slips) are anticipated in Phase III, while Phase II utilizes the existing pier and marina facilities. The retail, restaurant, and entertainment development is more intense with the addition of a casino and associated lodging and retail development. To support this, the 2010 Reuse Plan Addendum calls for the construction of approximately 6,000,000 square feet of development, almost double that anticipated by the 2004 Reuse Plan, which focused on a science park/conference center in this area. In addition, total employment under the 2010 Reuse Plan Addendum would likely increase over that anticipated by the 2004 Reuse Plan by almost 50%. While the 2004 Reuse Plan mentioned the possibility of a golf course, the Addendum assures the construction of a premier 18-hole golf course. The university remains a part of the parcel's development, although the physical size of the university is about 50% smaller under the 2010 Reuse Plan Addendum.

As previously described, any future development projects proposed on former NAPR property would be reviewed by the PRPB to ensure that such development is consistent with the Special Zoning Plan developed by the PRPB and the LRA.

### No-Action Alternative

The No-Action Alternative is disposal of NAPR consistent with the 2004 Reuse Plan in accordance with the Preferred Alternative for Parcel III as identified in the 2007 EA. The No-Action



Alternative also establishes a baseline to identify and compare potential environmental consequences from the redevelopment of NAPR as identified for the Preferred Alternative in the 2004 Reuse Plan.

Under the 2004 Reuse Plan, NAPR would be redeveloped to include economic development; public, educational, and institutional uses; residential uses; open space and recreation; conservation; and tourism. The 2004 Reuse Plan is divided into four phases, expected to occur over a 34-year period. For a more detailed description of the 2004 Reuse Plan refer to the 2007 EA.

## ES.5 Environmental Impacts

A Memorandum of Agreement (MOA) between the Navy and the Puerto Rico State Historic Preservation Office is expected to be executed. The MOA details which archaeological sites at NAPR will undergo data recover and to what level. In addition, it specifies the level of documentation needed for respective historic structures or the consultation process needed to establish the level of recordation. Through the execution of an MOA, and by implementing the stipulations of the MOA, the Navy meets their requirements under Section 106 of the National Historic Preservation Act (NHPA).

A further consequence of the reuse of Parcel III of NAPR would be an increase in the private and commercial vessel traffic in the waters surrounding NAPR. Marine waters adjacent to NAPR support sensitive environmental resources such as essential fish habitat (e.g., coral reefs and seagrass beds), as well as threatened and endangered species, including sea turtles, the West Indian manatee (*Trichechus manatus*), and the yellow-shouldered blackbird (*Agelaius xanthomus*). Because of the speculative nature of the Reuse Plan, its full effects on listed species cannot be addressed. However, there are a number of conservation measures that Commonwealth and/or federal resource agencies could/may impose on non-federal owners/developers before development-specific approvals or permits are issued. Implementing these conservation measures would be the responsibility of the new owner/developer, and the respective issuing agency would be responsible for ensuring that these recommendations are instituted. The Navy would no longer retain any ownership or control of these properties.

In consultation with the U.S. Fish and Wildlife Service (USFWS) and NOAA Fisheries Service for the 2007 EA, the Navy prepared development zone-specific conservation guidelines that list species-specific conservation recommendations for future landowners to consider. The 2007 EA identified the conservation guidelines to be provided to new owner(s)/developer(s) to offset potential impacts. It is the Navy's intent to incorporate these 2007 conservation guidelines into this SEA. Currently Section 7 consultation with the USFWS pursuant to the Endangered Species Act (ESA) is ongoing.

With the completion of an MOA under NHPA requirements and with the ongoing consultation with the USFWS on Section 7 requirements under the ESA, implementing the Proposed Action is not anticipated to result in a significant impact to the environment. This SEA, while addressing the specific reuse of Parcel III at NAPR, does not preclude the potential need for future review of specific components of the Reuse Plan Addendum pursuant to federal and Commonwealth laws. All Puerto Rican entities must comply with relevant federal laws and the Commonwealth's planning, zoning, and environmental laws and regulations.

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# Table of Contents

<u>Section</u>	<u>Page</u>
List of Tables .....	xiii
List of Figures .....	xiv
Acronyms and Abbreviations .....	xv
<b>1 Proposed Action .....</b>	<b>1-1</b>
1.1 Introduction.....	1-1
1.2 Background.....	1-3
1.3 Purpose and Need .....	1-5
1.4 Description of the Proposed Action .....	1-5
1.5 Scope of the Supplemental Environmental Assessment .....	1-5
<b>2 Alternatives .....</b>	<b>2-1</b>
2.1 Development of the Reuse Plan and Addendum .....	2-1
2.1.1 Proposed Land Uses.....	2-1
2.1.2 Phasing.....	2-3
2.1.3 Infrastructure Improvements.....	2-7
2.2 Alternative 1: Preferred Alternative.....	2-8
2.3 No-Action Alternative .....	2-9
2.4 Comparison of Environmental Consequences .....	2-12
<b>3 Existing Environment.....</b>	<b>3-1</b>
3.1 Land Use and Aesthetics.....	3-1
3.1.1 NAPR Land Use .....	3-1
3.1.2 Regional Land Use.....	3-3
3.1.3 Parcel III Future Land Use.....	3-3
3.1.4 Easements and Restrictions.....	3-5
3.1.5 Local Land Use Plans and Land Development Regulations.....	3-5
3.1.6 Aesthetics.....	3-6
3.2 Environmental Contamination .....	3-6
3.2.1 Regulatory Overview .....	3-6
3.2.2 Environmental Conditions of Property Report .....	3-8
3.2.3 Installation Restoration Program .....	3-8
3.2.4 Administrative Order on Consent .....	3-11
3.2.5 Identification of Uncontaminated Property .....	3-12
3.2.6 Management of Hazardous Materials and Substances.....	3-12
3.2.7 Lead-Based Paint and Asbestos .....	3-13
3.3 Infrastructure Facilities and Utilities .....	3-13
3.3.1 Potable Water Supply and Distribution .....	3-13
3.3.2 Wastewater Treatment .....	3-14
3.3.3 Piers and Shoreline Infrastructure.....	3-14
3.3.4 Stormwater.....	3-16
3.3.5 Solid Waste .....	3-16

## Table of Contents *(continued)*

<u>Section</u>	<u>Page</u>
3.3.6 Power .....	3-16
3.3.7 Transportation .....	3-17
3.4 Topography, Geology, and Soils .....	3-17
3.4.1 Topography .....	3-17
3.4.2 Geology .....	3-19
3.4.3 Soils .....	3-19
3.5 Hydrology .....	3-22
3.5.1 Surface Water .....	3-22
3.5.2 Groundwater .....	3-25
3.6 Terrestrial Environment .....	3-26
3.6.1 Vegetation .....	3-26
3.6.2 Wildlife .....	3-28
3.7 Marine Environment .....	3-29
3.7.1 Coral Reefs .....	3-29
3.7.2 Fish and Shellfish .....	3-31
3.7.3 Seagrass .....	3-32
3.7.4 Mangroves .....	3-33
3.7.5 Unconsolidated Coarse Sandy Benthic Environments .....	3-34
3.8 Threatened and Endangered Species .....	3-35
3.8.1 Marine Mammals .....	3-36
3.8.2 Reptiles .....	3-38
3.8.3 Birds .....	3-42
3.8.4 Plants .....	3-45
3.9 Socioeconomics .....	3-45
3.9.1 Population .....	3-45
3.9.2 Housing .....	3-45
3.9.3 Economy, Employment, and Income .....	3-46
3.10 Cultural Resources .....	3-50
3.10.1 Historic Buildings .....	3-50
3.10.2 Archaeological Resources .....	3-50
3.11 Coastal Zone Management .....	3-52
<b>4 Environmental Consequences .....</b>	<b>4-1</b>
4.1 Land Use and Aesthetics .....	4-1
4.1.1 Land Use .....	4-1
4.1.2 Historical Land Use .....	4-2
4.1.3 Regional Land Use .....	4-4
4.1.4 Aesthetics .....	4-4
4.2 Environmental Contamination .....	4-5
4.3 Infrastructure and Utilities .....	4-8
4.3.1 Potable Water Supply and Distribution .....	4-8
4.3.2 Wastewater Conveyance and Treatment .....	4-9
4.3.3 Electrical Supply and Distribution .....	4-10
4.3.4 Piers and Shoreline Infrastructure .....	4-10
4.3.5 Stormwater .....	4-11
4.3.6 Solid Waste .....	4-12
4.3.7 Transportation .....	4-12

## Table of Contents *(continued)*

<u>Section</u>	<u>Page</u>
4.4 Topography, Geology, and Soils .....	4-13
4.5 Hydrology and Water.....	4-15
4.5.1 Surface Waters .....	4-15
4.5.2 Groundwater .....	4-18
4.6 Terrestrial Environment .....	4-19
4.6.1 Vegetation .....	4-19
4.6.2 Wildlife .....	4-21
4.7 Marine Environment .....	4-22
4.7.1 Coral Reef .....	4-25
4.7.2 Seagrass .....	4-27
4.7.3 Mangroves .....	4-30
4.7.4 Fish and Shellfish .....	4-33
4.7.5 Suggested Conservation Guidelines for Future Property Owners .....	4-33
4.8 Threatened and Endangered Species .....	4-35
4.8.1 Commonwealth-Listed Species .....	4-37
4.8.2 Federally Listed Species .....	4-37
4.9 Socioeconomics .....	4-49
4.9.1 Population .....	4-49
4.9.2 Housing.....	4-50
4.9.3 Economy, Employment, and Income.....	4-50
4.10 Cultural Resources.....	4-53
4.11 Coastal Zone Management .....	4-53
4.12 Environmental Justice/Protection of Children from Environmental Health Risks .....	4-54
4.13 Irreversible and Irretrievable Commitment of Resources .....	4-54
<b>5 Cumulative Impacts.....</b>	<b>5-1</b>
5.1 Land Use and Transportation.....	5-1
5.2 Vegetation.....	5-2
5.3 Air and Noise .....	5-2
5.4 Terrestrial and Marine Environments and Threatened and Endangered Species.....	5-3
5.5 Socioeconomics .....	5-4
5.6 Environmental Contamination .....	5-5
5.7 Cultural Resources .....	5-5
<b>6 List of Preparers .....</b>	<b>6-1</b>
<b>7 References .....</b>	<b>7-1</b>

## Appendices

- A Draft Memorandum of Understanding
- B Agency Correspondence

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## List of Tables

<u>Table</u>	<u>Page</u>
1-1 Comparison of Pertinent Resources Analyzed in the 2007 EA and the 2011 SEA .....	1-8
2-1 Proposed 2004 Reuse Plan Phasing Program .....	2-2
2-2 2010 Reuse Plan Addendum Summary, Parcel III Properties .....	2-5
2-3 2010 Reuse Plan Addendum Reuses for Parcel III, Phase I and II .....	2-7
2-4 Comparison of Environmental Consequences (Phase II Build-Out) .....	2-13
3-1 Zoning Descriptions for Parcel III Properties .....	3-6
3-2 Summary of Environmental Sites within Parcel III .....	3-10
3-3 Reef Habitat Types Present in Waters Surrounding Naval Activity Puerto Rico .....	3-29
3-4 Federally and Commonwealth-Listed Species on NAPR .....	3-35
3-5 Number of Nests Recorded on NAPR Beaches in 2002 and 2004 During Weekly Beach Surveys.....	3-40
3-6 Populations for Puerto Rico, and the San Juan and Fajardo/Ceiba Regions.....	3-46
3-7 Retail Sales by Region .....	3-47
3-8 2009 Employment by Sector.....	3-49
3-9 Unemployment Rates .....	3-49
3-10 Individually Eligible Buildings/Structures Located Outside Historic Districts .....	3-51
4-1 Parcel III Proposed Land Uses through Phase II (2014 – 2020) of the 2010 Reuse Plan Addendum.....	4-4
4-2 Vegetative Communities Associated with Landscape Rendered Zones Within Parcel III Properties .....	4-21
4-3 Presence or Absence of Suitable Habitat for Federally Listed Species by Zone Number .....	4-36
4-4 Conservation Measures for the Yellow-Shouldered Blackbird .....	4-38
4-5 Conservation Measures for the Puerto Rican Boa .....	4-40
4-6 Conservation Measures for the Virgin Islands Tree Boa .....	4-41
4-7 Conservation Measures for Sea Turtles .....	4-46
4-8 Trade Area Population Projections for 2015 .....	4-50
4-9 Phased Sales and Rental Volume Projections .....	4-51
4-10 Phased Employment Projections (Direct and Indirect) .....	4-52
4-11 Projected Direct Job Creation .....	4-52
4-12 Average per Capita Income in the Trade Area.....	4-52



## List of Figures

<u>Figure</u>	<u>Page</u>
1-1 General Location Map, Naval Activity Puerto Rico.....	1-2
1-2 Naval Activity Puerto Rico and Vicinity .....	1-4
1-3 Parcel III Properties at Naval Activity Puerto Rico .....	1-6
2-1 2010 Reuse Plan Addendum Phase II, Parcel III, Naval Activity Puerto Rico.....	2-4
2-2 2004 Reuse Plan, Naval Activity Puerto Rico .....	2-10
2-3 Phase II 2004 Reuse Plan, Naval Activity Puerto Rico .....	2-11
3-1 Historic Land Uses, Naval Activity Puerto Rico .....	3-2
3-2 Environmental Contamination Sites within Parcel III, Naval Activity Puerto Rico.....	3-9
3-3 Existing Infrastructure, Naval Activity Puerto Rico.....	3-15
3-4 Topography, Naval Activity Puerto Rico .....	3-18
3-5 Soil Classifications, Naval Activity Puerto Rico .....	3-21
3-6 Drainage and Floodplains .....	3-23
3-7 Vegetative Communities and Land Cover, Naval Activity Puerto Rico.....	3-27
3-8 Marine Habitat, Naval Activity Puerto Rico.....	3-30
3-9 Historical Manatee Sightings, Naval Activity Puerto Rico .....	3-37
3-10 Cumulative Sea Turtle Sightings from March 1984 through March 1995 Obtained from Weekly Aerial Surveys of the Former Naval Station Roosevelt Roads, Naval Activity Puerto Rico .....	3-39
3-11 Potential Turtle Nesting Sites .....	3-41
4-1 Overlay of Parcel III Properties and Landscape Rendered Zones/In Water Structures .....	4-20

## Acronyms and Abbreviations

2004 Reuse Plan	Naval Station Roosevelt Roads Reuse Plan (2004); also Reuse Plan
2006 BA	<i>Biological Assessment for Land Transfer of Naval Station Roosevelt Roads, Puerto Rico</i>
2007 EA	<i>Environmental Assessment for the Disposal of Naval Activity Puerto Rico</i>
2010 Addendum	the addendum to the original 2004 Reuse Plan; also the Addendum
ACHP	Advisory Council on Historic Preservation
ACM	asbestos-containing materials
Addendum	the addendum to the original 2004 Reuse Plan; also the 2010 Addendum and 2010 Reuse Plan Addendum
AOC	Area of Concern
AQCR	air quality control region
BMP	best management practice
BRAC	Base Closure and Realignment
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental, Response, Compensation, and Liability Act
CERFA	Community Environmental Response Facilitation Act
CES	Control of Erosion and Prevention of Sedimentation
CFMC	Caribbean Fisheries Management Council
CFR	Code of Federal Regulations
CGP	Construction General Permit
CNO	Chief of Naval Operations
Commonwealth	Commonwealth of Puerto Rico
Consent Order	Resource Conservation and Recovery Act Section 7003 Administrative Order on Consent
CZMP	Coastal Zone Management Program
DERP	Defense Environmental Restoration Program
DoD	United States Department of Defense
DRMO	Defense Reutilization and Marketing Office
DU	dwelling units
EA	Environmental Assessment
ECP	Environmental Conditions of Property

**Acronyms and Abbreviations (*continued*)**

EDC	Economic Development Conveyance
EFH	essential fish habitat
ELG	Effluent Limitations Guideline
EQB	(Puerto Rico) Environmental Quality Board
ER Program	Environmental Restoration Program
ESA	Endangered Species Act
FMP	fishery management plan
FONSI	Finding of No Significant Impact
GDP	gross domestic product
HWAA	hazardous waste accumulation area
IR Program	Installation Restoration Program
ITP	incidental take permit
km	kilometer(s)
kV	kilovolt(s)
kVA	kilovolt-ampere(s)
LBP	lead-based paint
LRA	Local Redevelopment Authority
LST	landing ship tank
m	meter(s)
MARAD	Maritime Administration
mgd	million gallons per day
MNA	Monitored Natural Attenuation
MOA	Memorandum of Agreement
MS4	Municipal Separate Storm Sewer System
MSGP	Multi-Sector General Permit
MSL	mean sea level
NAPR	Naval Activity Puerto Rico
NAVFAC LANTDIV	Naval Facilities Engineering Command Atlantic Division
Navy	United States Department of the Navy
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Agency
NHPA	National Historic Preservation Act
NOAA Fisheries Service	National Oceanic and Atmospheric Administration's National Marine Fisheries Service; formerly NMFS

**Acronyms and Abbreviations (*continued*)**

NPDES	National Pollutant Discharge Elimination System
NRDA	Natural Resources Damage Assessment
NRHP	National Register of Historic Places
NRHP	National Register of Historic Places
NSRR	Naval Station Roosevelt Roads
PBC	Public Benefit Conveyance
PCBs	polychlorinated biphenyls
POL	petroleum, oil, and lubricants
PRASA	Puerto Rico Aqueduct and Sewer Authority
PREPA	Puerto Rico Electric Power Authority
PRPA	Puerto Rico Port Authority
PRPB	Puerto Rico Planning Board
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
REA	Rapid Ecological Assessment
Reuse Plan	Naval Station Roosevelt Roads Reuse Plan (2004); also 2004 Reuse Plan
RFI	Resource Conservation and Recovery Act (RCRA) Facility Investigation
SAA	satellite accumulation (storage) area
SARA	Superfund Amendments and Reauthorization Act
SEA	Supplemental Environmental Assessment
SF	square feet
SHPO	State Historic Preservation Office
SWMU	solid waste management unit
SWP3	Storm Water Pollution Prevention Plan
SWPPP	stormwater pollution prevention plan
TCE	trichloroethylene
THMs	trihalomethanes
U.S.C.	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	underground storage tank
WTP	water treatment plant
WWTP	wastewater treatment plant

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# 1 Proposed Action

## 1.1 Introduction

Pursuant to the United States Department of Defense (DoD) Appropriations Act of Fiscal Year 2004 (Public Law 108-87), the United States Department of the Navy (Navy) closed Naval Station Roosevelt Roads (NSRR) in Puerto Rico (Figure 1-1) in Spring 2004. Section 8132 (a) of Public Law 108-87 states, “Notwithstanding . . . any other provision of law, the Secretary of the Navy shall close Naval Station Roosevelt Roads, Puerto Rico, no later than 6 months after enactment of this Act.” Accordingly, on March 31, 2004, NSRR ceased operations as a Naval Station. The base was re-designated as Naval Activity Puerto Rico (NAPR) to maintain a Navy presence and associated security during the disposal process. Public Law 108-87, Section 8132(b) further states, “The closure provided for in subsection (a), and subsequent disposal, shall be carried out in accordance with the procedures and authorities contained in the Defense Base Closure and Realignment Act of 1990 (title XXIX of Public Law 101-510; 10 U.S.C. 2687 note).”

In 2007, the Navy prepared the *Environmental Assessment for the Disposal of Naval Activity Puerto Rico* (referred to herein as the 2007 EA) that evaluated the potential environmental impacts associated with the disposal of NAPR. To oversee the planning process for future development of NAPR, the Commonwealth of Puerto Rico (the Commonwealth) created a Local Redevelopment Authority (LRA). In 2004, the LRA developed the *Naval Station Roosevelt Roads Reuse Plan* (Reuse Plan). The potential disposal and reuse of the property, as proposed in the Reuse Plan, was the basis for the evaluation of the potential impacts in the 2007 EA, which was considered consistent with the Puerto Rico Public Environmental Act (Law No. 9).

In April 2010, the Commonwealth, through the LRA, submitted an addendum to the original 2004 Reuse Plan (referred to herein as the 2010 Reuse Plan Addendum, or the Addendum). The Supplemental Environmental Assessment (SEA) herein evaluates the environmental consequences of the proposed reuse of the Navy’s former NAPR property in accordance with the Commonwealth’s 2004 Reuse Plan, as modified by the 2010 Reuse Plan Addendum, and adopted by the Commonwealth and the LRA.

The environmental consequences of the 2004 Reuse Plan were evaluated in the 2007 EA. This SEA supplements the 2007 EA in accordance with Section 1502.21 of the Council on Environmental Quality (CEQ) regulations implementing the National Environmental Policy Act (NEPA) (40 Code of Federal Regulations [CFR] Parts 1500-1508). The SEA analyzes only the effects of those elements of the 2010 Reuse Plan Addendum that are substantially different than those of the original 2004 Reuse Plan. On January 27, 2011, pursuant to 42 U.S.C. 4321 et seq., the Commonwealth of Puerto Rico requested designation of the Puerto Rico Environmental Quality Board (EQB) as a Cooperating Agency, as authorized by 40 CFR 1501.6, with respect to any environmental impact analyses undertaken pursuant to NEPA for NAPR.

This SEA provides the basis for required environmental documentation in accordance with:

- The NEPA of 1969;
- The CEQ regulations implementing NEPA (40 CFR Parts 1500-1508);
- Chief of Naval Operations (CNO) Instruction 5090.1C, Chapter 5, Environmental and Natural Resources Program Manual;



Source: Geo-Marine, 2005; ESRI, 2004

**Figure 1-1**  
**General Location Map**  
**Naval Activity Puerto Rico**



- CNO Supplemental Environmental Planning Policy letter N45/N4U732460 of September 23, 2004;
- Navy Base Closure and Realignment (BRAC) Implementation Guidance; and
- All appropriate Executive Orders.

The analysis presented in the 2007 EA is referenced as appropriate throughout the document to support the environmental resource evaluation.

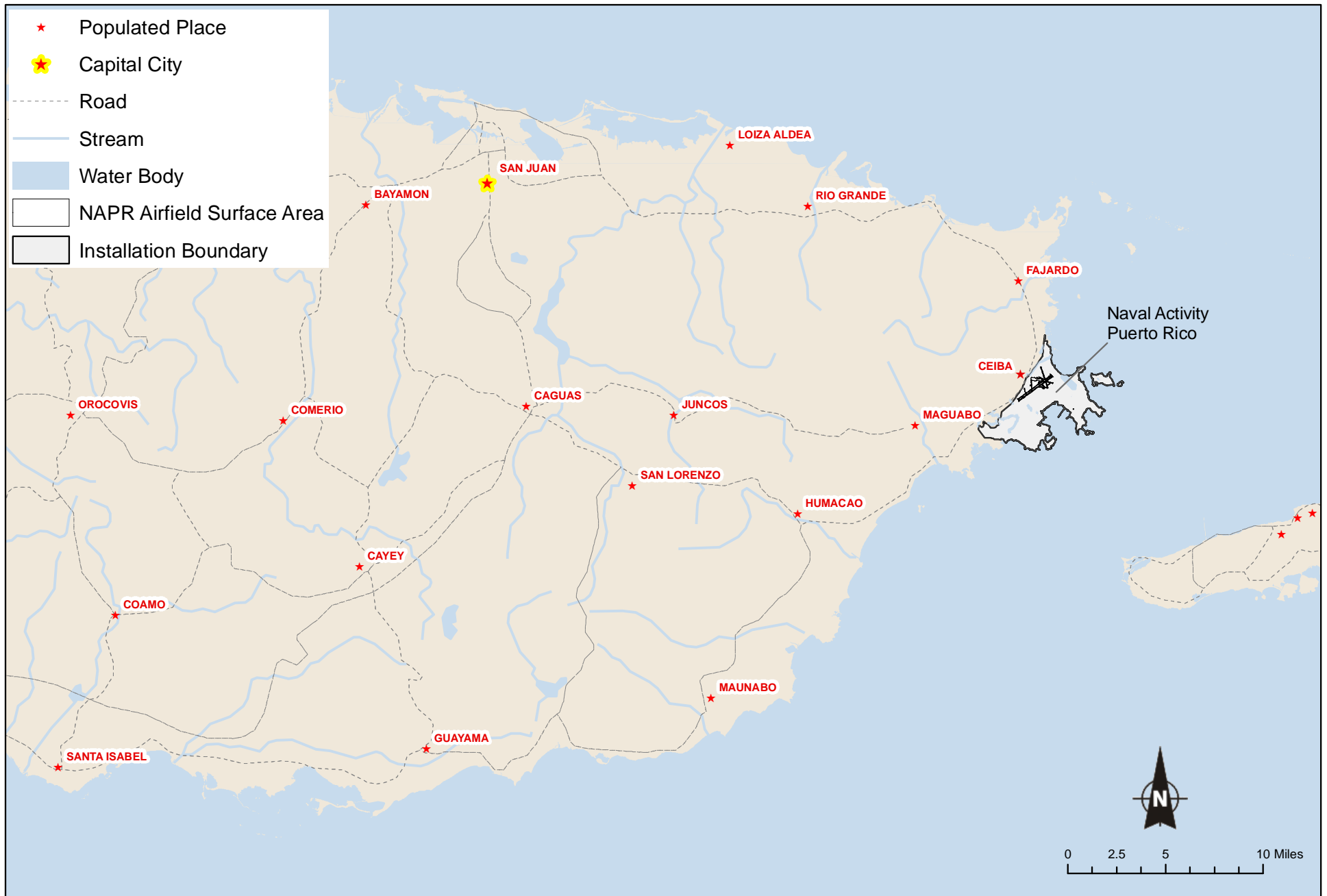
This SEA describes the Proposed Action, the purpose and need for the Proposed Action, and reasonable alternatives to accomplish the purpose of and satisfy the need for the project. It discusses the existing environment that may be affected by the project alternatives and provides an analysis of direct, indirect, and cumulative impacts.

## 1.2 Background

The former NSRR, now NAPR, was used by the Navy beginning in the early 1940s to support Naval activities in the Atlantic Ocean and Caribbean Sea, as well as for communications and other activities and support services for the Atlantic Fleet Weapons Training Facility on the island of Vieques. Subsequent to the transfer of the Atlantic Fleet Weapons Training Facility to the United States Department of the Interior in 2003, Congress enacted Public Law 108-87 on September 30, 2003, charging the Navy with closure and disposal of NSRR in Puerto Rico. As described in Section 1.1, NSRR was re-designated as NAPR to maintain a Navy presence and associated security during the disposal process.

NAPR is located on approximately 8,654 acres on the eastern end of the island of Puerto Rico (Figure 1-1). This region of the island is predominantly rural with large sections of rangeland. El Yunque Caribbean National Forest is located approximately 15 miles northwest of NAPR. The most developed areas in the immediate vicinity of NAPR are the community of Ceiba, with a population of approximately 18,500, and the community of Naguabo, with a population of approximately 23,750 (U.S. Census Bureau 2010), both located directly west and adjacent to NAPR. The city of Fajardo, with a population of approximately 40,700 (U.S. Census Bureau 2010), is 5 miles northwest of NAPR along Route 3. NAPR includes the nearby islands of Piñeros and Cabeza de Perro, which are located approximately 0.5 mile east of NAPR in the Caribbean Sea (Figure 1-2).

As previously described, the Commonwealth created an LRA to oversee the planning process for future private development of NAPR. The LRA is composed of representatives from Commonwealth agencies and led by the Puerto Rico Department of Economic Development and Commerce and the Puerto Rico Planning Board (PRPB). The LRA developed the 2004 Reuse Plan to serve as a guideline for potential future private development of NAPR. Comparison of the 2010 Reuse Plan Addendum with the original 2004 Reuse Plan indicates that, of the parcels sought by the LRA under an Economic Development Conveyance (EDC), Parcel III is the only portion of the site where redevelopment is sufficiently different in type or intensity of use to warrant further NEPA analysis. This SEA analyzes only the changes in the proposed reuses for EDC Parcel III of the NAPR property.



Source: Geo-Marine, 2005; ESRI, 2004

**Figure 1-2**  
**Naval Activity Puerto Rico and Vicinity**

## 1.3 Purpose and Need

The purpose of the Proposed Action is to implement Public Law 108-87 requiring the disposal of NAPR, as described in Section 1.1. Disposal of the property is necessary to implement the legislation, to provide for the transfer and redevelopment of surplus military property to productive civilian use, and to ensure the Navy does not continue to incur operations and maintenance costs at the facility. The need for the Proposed Action is to achieve the objectives of the 1990 BRAC legislation as amended, which Congress established to improve the efficiency and operational capacities of the DoD while continuing to maintain skills in support of national defense priorities.

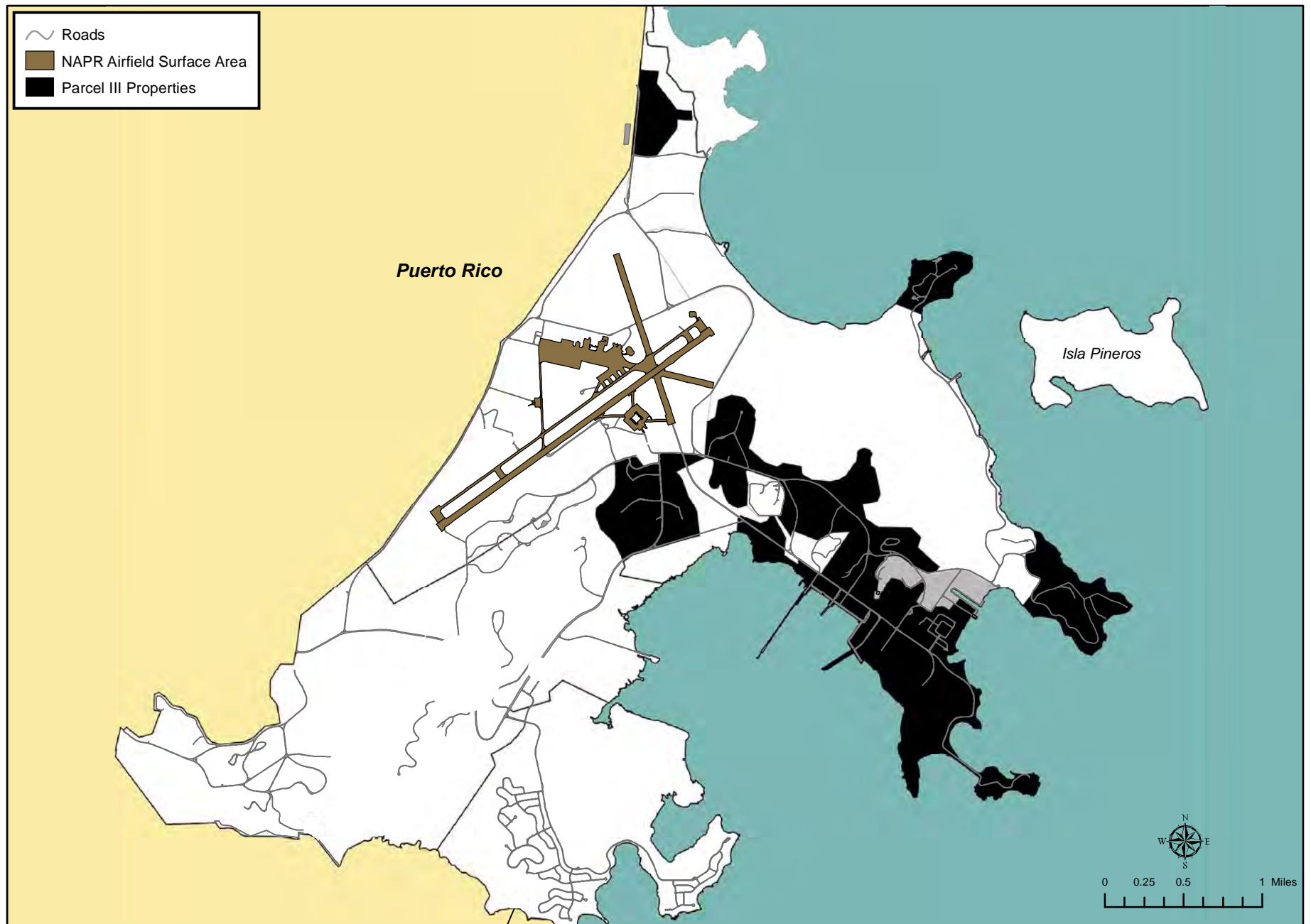
## 1.4 Description of the Proposed Action

The Proposed Action evaluated in this SEA is the proposed reuse of Parcel III located at NAPR, as identified in the 2010 Reuse Plan Addendum. The 2010 Reuse Plan Addendum is conceptual and focuses on proposed land uses and not on specific developments. The LRA, in conjunction with the PRPB, is developing a Special Zoning Plan for NAPR based on the 2010 Reuse Plan Addendum. Upon its adoption, this plan would serve as the official zoning of the property. Any future development projects proposed on former NAPR property would be reviewed by the PRPB to ensure such development is consistent with the Special Zoning Plan. Once detailed engineering and design studies are complete, the specific project sponsor(s) will be responsible for obtaining necessary permits and approvals prior to implementation of redevelopment activities. The components of the Proposed Action are detailed in Section 2.

## 1.5 Scope of the Supplemental Environmental Assessment

A supplemental NEPA document review is required if changes or new information/circumstances result in previously unidentified significant adverse impacts from a project or if they increase the adverse environmental impacts with additional new significant impacts. Despite some changes, the entire development in the 2010 Reuse Plan Addendum for the sale of Parcel I is equal to or slightly less than the 2004 Reuse Plan. For Parcel II, the 2010 Reuse Plan Addendum recommendations vary only slightly from the 2004 Reuse Plan. The Residential development appears to be slightly less dense than under the Addendum, and overall, there is no real difference in impacts associated with the changes. Therefore, the scope of analysis in the 2007 EA is adequate to support disposal of Parcels I and II under the Finding of No Significant Impact (FONSI).

The actions proposed by the 2010 Reuse Plan Addendum for Parcel III, however, differ sufficiently from the 2004 Reuse Plan to warrant a supplemental analysis of the environmental impacts that may result from disposal of Parcel III consistent with the Addendum (Figure 1-3). The 2010 Reuse Plan Addendum includes a tourist destination and commercial development strategy not included in the 2004 Reuse Plan. For example, a cruise terminal and a second marina are anticipated additions. The retail, restaurant, and entertainment development is more intense with the addition of a casino and associated lodging and retail development. To support this, the 2010 Reuse Plan Addendum calls for the construction of approximately 6,000,000 square feet of development, almost double that anticipated by the 2004 Reuse Plan, which focused on a science park/conference center in this area. In addition, under



**Figure 1-3**  
**Parcel III Properties**  
**Naval Activity Puerto Rico**

the Addendum, total employment would likely increase by approximately 50% over that anticipated by the 2004 Reuse Plan.

The Proposed Action is substantially and significantly different than that of the 2007 EA, and, therefore, the 2007 EA is not adequate to support a decision in accordance with the 2010 Reuse Plan Addendum; therefore, this SEA addresses the environmental impacts associated with the change in the proposed reuse for Parcel III, as identified in the 2010 Reuse Plan Addendum.

Parcel III includes the parcels previously identified by the LRA as a Community College (Zone 7 of the 2010 Reuse Plan Addendum), acreage the Navy intended for public sale on the eastern portion of NAPR, a portion of the Port Public Benefit Conveyance (Port PBC-waterfront) parcel, Punta Medio Mundo, and one parcel located in the Los Machos Beach Area of NAPR. Parcel III is approximately 1,370 acres.

## Baseline Conditions

The baseline conditions for this SEA are the impacts associated with the reuse of NAPR as evaluated under the Preferred Alternative in the 2007 EA. The Navy will coordinate the necessary approvals pertaining to the disposal action from the appropriate regulatory agencies. The Navy will conduct, or cause to be conducted, environmental cleanup of the property to a level consistent with its historic use, to be protective of human health, and to meet the United States Environmental Protection Agency's (USEPA's) approval. Future landowners could expand the level of cleanup to allow for different land uses; however, they will be responsible for this additional cleanup as well as coordination with, and approvals by, the appropriate regulatory agencies (USEPA, Puerto Rico EQB, etc.), as required after transfer as a result of the Navy action.

This SEA focuses on the resource areas potentially impacted by the modifications to the 2004 Reuse Plan as amended by the Commonwealth. Some of the natural resources evaluated in the 2007 EA are not substantially affected by the proposed change in reuse. These include:

- **Climate and Air Quality.** Since the proposed changes identified in the Reuse Plan Addendum are conceptual in nature and spread out over a 35-year planning horizon, a quantifiable air emissions analysis for each proposed reuse change is not feasible at this time. NAPR is located within the Caribbean northeast trade wind belt and within the single air quality control region (AQCR) that covers Puerto Rico, including Vieques. Based on ambient monitoring data collected mainly in the vicinity of San Juan by the Puerto Rico EQB, the USEPA classifies the AQCR as *in attainment* for all criteria pollutants (USEPA 2007). Therefore, air pollutant concentrations are considered to be below National Ambient Air Quality Standards (NAAQS) for all criteria pollutants and construction impacts to air quality from the proposed changes in reuse are not expected.
- **Noise.** The vast majority of the 8,654-acre NAPR property is currently vacant. Noise associated from the planned redevelopment of Parcel III at NAPR would be sufficiently shielded through natural buffers to have no significant impact on the nearby communities of Ceiba and Naguabo. Impact on the human environment from noise emitted from redevelopment activities at Parcel III of NAPR is not expected.

Pertinent resource areas evaluated in this SEA are identified in Table 1-1.

<b>Table 1-1</b> <b>Comparison of Pertinent Resources</b> <b>Analyzed in the 2007 EA and the 2011 SEA</b>		
<b>Resource</b>	<b>2007 EA</b>	<b>2011 SEA</b>
Land Use	✓	✓
Environmental Contamination	✓	✓
Infrastructure and Utilities	✓	✓
Topography, Geology, and Soils	✓	✓
Hydrology and Water Quality	✓	✓
Climate and Air Quality	✓	
Noise	✓	
Terrestrial Environment	✓	✓
Marine Environment	✓	✓
Threatened and Endangered Species	✓	✓
Socioeconomics	✓	✓
Cultural and Archeological Resources	✓	✓
Coastal Zone Management	✓	✓

Recognizing that some type of reuse of NAPR – no matter how speculative at present – will take place, this EA provides the decision-makers and the public with the information required to understand the potential future environmental consequences of NAPR’s reuse. Potential impacts that could result from redevelopment of the property pursuant to the 2010 Reuse Plan Addendum and those actions that may be required to mitigate the potential impacts are identified in the SEA. It is not the intent of the Navy to endorse or authorize a particular reuse scenario, only to identify potential impacts and reasonable mitigation measures that may be required.

Information and data were obtained by review of existing documents including literature, maps, and planning documents; and a tour of the project site.

## 2 Alternatives

This section presents a brief description of the Preferred Alternative and the No-Action Alternative. For this SEA, the Preferred Alternative is the Proposed Action as derived from the 2010 Reuse Plan Addendum (see Section 1.4) and is described in Section 2.2. The No-Action Alternative is the Action Alternative as identified in the 2007 EA and is described in Section 2.3. Alternatives for the disposal of NAPR were identified by the Navy in the 2007 EA and in this SEA based on Navy policies regarding base closure and disposal actions. To provide a basis for understanding how the Proposed Action and Preferred Alternative as presented in this SEA were derived, Section 2.1 describes the development of the Reuse Plan.

### 2.1 Development of the Reuse Plan and Addendum

The LRA developed the 2004 Reuse Plan in the context of three key guiding policies. These policies emerged from site visits and analysis, community values expressed at public hearings with the LRA and within the LRA, and from entities that submitted Notices of Interest for potential Public Benefit Conveyances (PBCs). The three guiding policies for the 2004 Reuse Plan are:

1. Support for the economic wellbeing of Puerto Rico;
2. Recognition of existing needs of the communities adjacent to NAPR; and
3. Emphasis on water-oriented uses.

The 2010 Reuse Plan Addendum builds on these policies. In early 2010, the LRA solicited community input during three workshops held in the communities of Naguabo and Ceiba. Following the public participation process, the LRA revised certain land uses for Parcel III of NAPR to better reflect the identified community needs, the changing world economics, and current market pressures.

#### 2.1.1 Proposed Land Uses

The 2010 Reuse Plan Addendum for NAPR was the result of the LRA's comprehensive analysis of the site's regional context; its existing natural conditions; existing infrastructure, facilities, and land uses; and the market demand for alternative uses, as well as consideration of community input regarding uses and services that could be accommodated at NAPR. Preparation of the plan was driven by a primary goal of lessening the immediate negative economic impact of the base closure on the surrounding region while creating a dynamic reuse plan that would lead to the socioeconomic development of the region and the Commonwealth.

The proposed uses incorporated into the 2004 Reuse Plan (see Table 2-1) maximize the potential reuse of existing infrastructure and encompass six broad categories:

1. Economic development;
2. Public, educational, and institutional uses;
3. Residential uses;
4. Open space and recreation;



5. Conservation; and
6. Tourism.

<b>Table 2-1</b> <b>Proposed 2004 Reuse Plan Phasing Program</b>			
Zone	Land Use	Square Feet	Comments
<b>Phase I (Years 1 and 2; i.e., 2004 and 2005)</b>			
Property transfer via Economic Development Conveyance (EDC) and Public Benefit Conveyances (PBCs) completed and public sale process initiated.			
<b>Phase II (Years 3 to 10; i.e., 2006 to 2013)</b>			
1. Airport	Airport		Commercial and general aviation and cargo.
	Industrial/ Manufacturing/ Distribution	1,000,000	Includes space for lease and owner occupied.
2. Bundy	Moderate Lodging		±400 rooms.
	Residential		±300 dwelling units.
	Government/ Training Center	70,000 to 120,000	
3. Golf Course	Public Golf Course		Expand to 18 holes.
4. Downtown	Mixed Use	100,000	During early years of Phase II some reuse of existing buildings while the developer formulates a master plan for this area; includes reuse of 150 new dwelling units in Sub-zone 4E.
	University Campus	200,000	Occupancy of classrooms, laboratories, and dormitories during Phase II.
	Public School		Reuse of existing elementary school.
5. Residential	Residential		±500 dwelling units (DU) averaging 62 DU per year (assuming 50 per year for 4 years followed by 75 per year).
	Private School		Reuse of existing middle / high school.
6. Port	Marina		Utilized existing slips.
	Ferry Terminal, Light Cargo, and related uses		Operation of ferry terminal by Port Authority.
	Hospital		
	Fuel Tank Farm		Continued operation.
7. Science Park	Research and Development (Science Park)	100,000	100,000-square foot initial phase to accommodate potential users who have already expressed interest.
		250,000	Additional 50,000 square feet per year for Years 6 through 10.
8. North Entrance	Open space, beach and recreation		
9. Conservation	Conservation Areas		
<b>Phase III (Years 11 to 20; i.e., 2014 to 2023)</b>			
1. Airport	Industrial/ Manufacturing/ Distribution	2,500,000	163,000 square feet per year, plus three large users at 300,000 square feet each.
	Highway Commercial Retail	200,000	If allowed by Federal Aviation Administration.
4. Downtown	Mixed Use		±365 dwelling units.
	Mixed Use	300,000	Back office, call center, professional office, retail.
	University Campus	400,000	Additional occupancy of classrooms, laboratories, and dormitories.
5. Residential	Residential		±700 dwelling units.
	Golf Course		18-hole private course (optional)
6. Port	Waterfront Commercial	180,000	

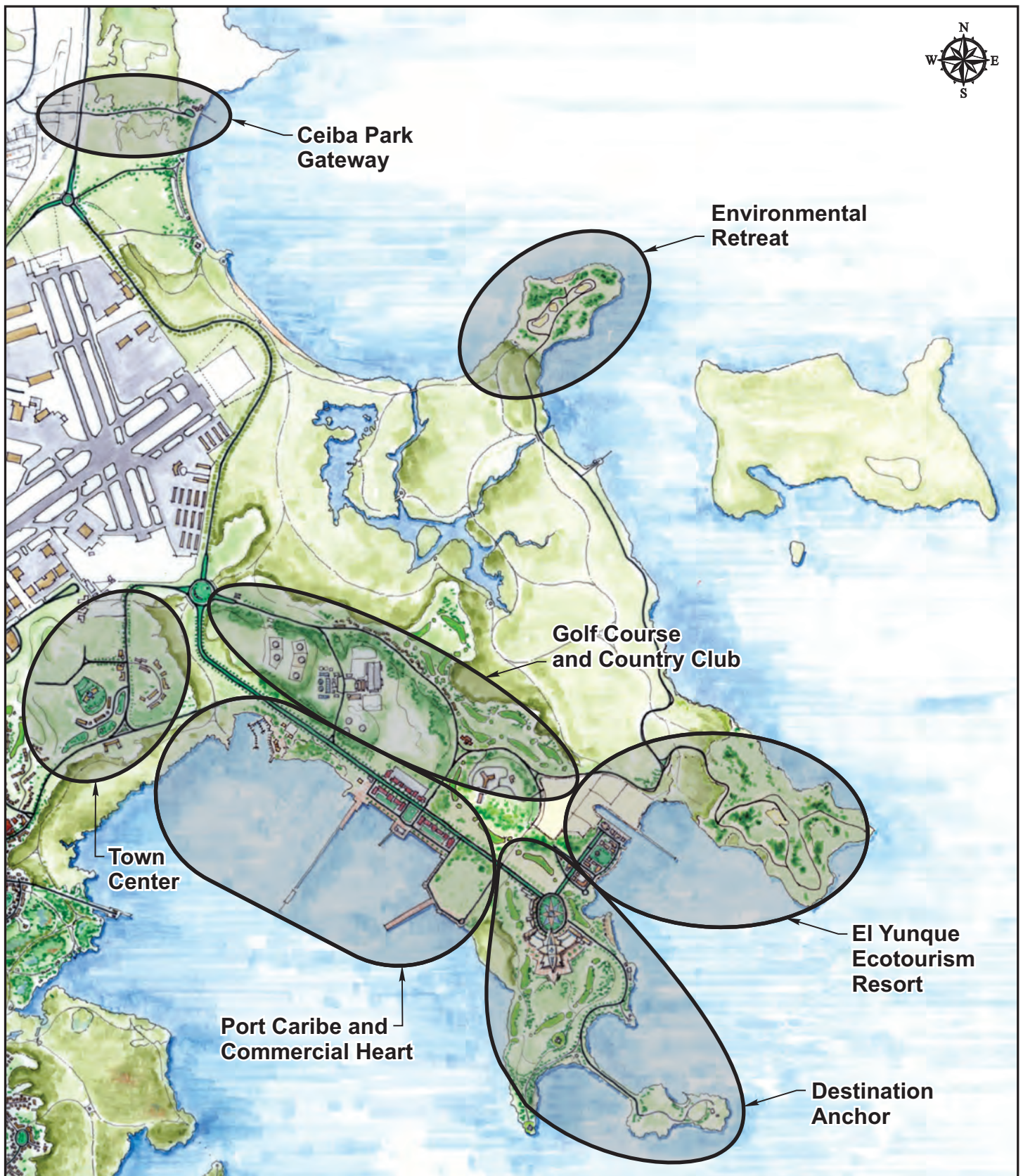
Table 2-1 Proposed 2004 Reuse Plan Phasing Program			
Zone	Land Use	Square Feet	Comments
7. Science Park	Research and Development (Science Park)	750,000	Additional 75,000 square feet per year for Years 11 through 20.
	Conference Center	250,000	±250 rooms, plus meeting facilities, open space, passive park, or golf course.
<b>Phase IV (Years 21 to 34; i.e., 2024 to 2037)</b>			
1. Airport	Industrial/ Manufacturing/ Distribution	3,500,000	14 years at 250,000 square feet per year.
	Highway Commercial Retail	300,000	If allowed by Federal Aviation Administration.
4. Downtown	Mixed Use	500,000	Back office, call center, professional office, retail.
	University Campus	300,000	Additional occupancy of classrooms, laboratories, and dormitories.
6. Port	Waterfront Commercial/ Small Cruise Ships	180,000	
7. Science Park	Research and Development (Science Park)	1,250,000	Approximately 100,000 square feet per year for 13 years.
Sources: CB Richard Ellis <i>et al.</i> 2004.			

## 2.1.2 Phasing

The 2010 Reuse Plan Addendum divides the proposed NAPR land use map for Parcel III into zones (see Figure 2-1). The proposed land uses, acreages, and development program (e.g., number of residential dwelling units, hotel rooms, building square footage, etc.) for each zone are presented in Table 2-2. Table 2-2 also provides preliminary estimates of total jobs (14,119) and total gross square footage of development (4,550,000) based upon a full 36 years of build-out for Parcel III properties.

Because NAPR's redevelopment is proposed to occur over a 36-year period, the 2010 Reuse Plan Addendum, just like the 2004 Reuse Plan, is divided into four phases. Phase I (years 2011 through 2013) would consist of the public sale and disposal of the NAPR property. Phase I would include transferring property via the EDC and PBCs. The public sales process would be initiated, predevelopment tasks would be completed, and the first phase of construction would include temporary reuse of facilities and associated infrastructure.

During Phase II (years 2014 through 2020), the existing infrastructure would be utilized to the maximum extent possible (see Table 2-3), while providing maximum use and the potential of future expansion. In Zone 1, which includes Port Caribe-The Commercial Heart, commercial development would be initiated; an existing recreational marina would be reused; and existing facilities and slips would be renovated to include public moorings and fishing piers. In Zone 2, the Caribbean Riviera-Destination Anchor, the casino and casino hotel would be built in two phases. This construction would include retail, restaurants, and entertainment. Zone 3, El Yunque, a premier eco-tourism resort, would contain retail, restaurants, an entertainment village, and approximately 70 dwelling units. Zone 4, the Marsh Vista Country Club, would contain an 18-hole golf course with a clubhouse. Zone 7 would be the Main Street and Town Center, including the Community College; and Zone 11 would be Ceiba Park, which is planned to include concessions and collateral development.



**Figure 2-1**  
**2010 Reuse Plan Addendum Phase II, Parcel III**  
**Naval Activity Puerto Rico**



Table 2-2 2010 Reuse Plan Addendum Summary, Parcel III Properties									
Projected Use	Proposed Development Area (GSF)	Assumptions / Description	Job Creation (Direct and Induced)		Unit Cost (\$/ SF)	Order of Magnitude Development Cost	2010 Addendum Comparison with 2004 Reuse Plan <sup>(a)</sup>		
							Zone in 2004 Plan	Projected Use	Development Area (GSF)
Commercial Heart									
Retail/ Restaurants/ Entertainment District	200,000	tourism retail		670	\$200	\$40,000,000	6B,C,D,E	Marina	25,000
Hospital	130,000	up to 300 bds		650	\$300	by others	7A	Water-oriented commercial	60,000
Office	50,000	second floor		125	\$150	7,500,000		Ferry Terminal	300,000
Marina	25,000	primarily locals		50	\$140	3,500,000		Hospital	280,000
International Cruise Terminal	150,000			40	\$130	19,500,000		Science Park	1,100,000
Support / Back of House	50,000	ferry / cruise / airport related		50	\$80	4,000,000			
Ferry Terminal	50,000			10	\$130	6,500,000			
Zone Total	655,000			1,595		\$81,000,000		Zone Total	1,765,000
Destination Anchor									
Casino	210,000	130K SF gaming floor		2,800	\$700	\$147,000,000	7B,C	Science Park Conference Center	112,500
Casino Hotel	2,000,000	1,000 SF / room	2,000 rooms	3,750	\$300	600,000,000			
Retail/ Restaurants/ Entertainment	200,000	casino entertainment		670	\$200	40,000,000			
Zone Total	2,410,000			7,220		\$787,000,000		Zone Total	112,500
El Yunque Eco-Tourism Resort									
Hotels - "Lodge"	120,000	800 SF / room; multiple bldgs	150 rooms	225	\$300	\$36,000,000	7D	Science Park Conference Center	Incl in 7B
Eco Museum/ Visitor's Center	50,000	Brand name JV		50	\$130	6,500,000			
Office	30,000			75	\$100	3,000,000			
Retail/ Restaurants/ Entertainment "Village"	100,000			340	\$130	13,000,000			
Residential Villas	450,000	2,200 SF / du; villas and village	200 du	20	\$150	67,500,000			
Marina	25,000	transient / excursion		50	\$140	3,500,000			
Water Taxi Terminal/ Pier	20,000			5	\$140	2,800,000			
Zone Total	795,000			765		\$132,300,000		Zone Total	-
Golf Course									
18 hole Golf Course and Clubhouse	35,000			100	\$1,300,000	\$23,400,000	7E,F	Gateway to Conference Center	1,250,000
Residential	250,000	2,000 SF / unit	125 du	10	\$150	37,500,000		Science Park Conference Center	Incl in 7B
Zone Total	285,000			110		\$60,900,000		Zone Total	1,250,000
Environmental Retreat									
Dining/ Conference	25,000	dining hall		20	\$185	\$4,625,000	NA	Not in 2004 plan	
Lodging	100,000	hostel, cabana, campsite	100	75	\$100	10,000,000			
Office/ Research	25,000			15	\$130	3,250,000			
Zone Total	150,000			110		\$17,875,000		Zone Total	-
Town Center									
Community College	200,000	"college town"		200	\$130	26,000,000		Educational Facilities	985,000
Zone Total	200,000			200		\$26,000,000		Office	650,000
								Mixed Use Commercial	150,000
								Residential	1,035,000
								Zone Total	2,820,000
Gateway									
Concessions	10,000			30	\$130	\$1,300,000	NA	Not in 2004 plan	
Office	20,000			50	\$130	2,600,000			
Pier	25,000			5	\$130	3,250,000			
Zone Total	55,000			85		\$7,150,000		Zone Total	-
GRAND TOTALS									
	4,550,000			10,085		\$1,112,225,000			5,947,500
				1.4	(Multiplier)				
				14,119	(Total Jobs Created)				
Note: (a) This is an estimated program and approximate allocation for comparative purposes with the 2010 Reuse Plan Addendum. Source: LRA 2010a.									

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Phase III (years 2021 through 2023) and Phase IV (years 2024 through 2037) propose redevelopment at a higher density and intensity than the existing land uses. Anticipated full build-out of the proposed redevelopment would occur by 2045.

The proposed reuse scenario at the time of full build-out is, by necessity, illustrative and would vary depending on actual market conditions, availability and commitment of funding, policy and permitting decisions by the Commonwealth, and the level of interest and commitment by private sector developers, investors, and users. CEQ regulations (40 CFR 1508.8[b]) cite growth-inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate and related effects on air and water and other natural systems as examples of indirect impacts. The impacts associated with long-range future redevelopment (Phases III and IV) are based on expansion of the existing infrastructure at NAPR and unforeseen economic factors. This redevelopment and associated impacts are speculative at present and, therefore, are being considered as cumulative effects of the Proposed Action.

### 2.1.3 Infrastructure Improvements

The 2010 Reuse Plan Addendum assumes that during Phases I and II, existing infrastructure capacities would be adequate with only minor reconfigurations needed. Substantial infrastructure improvements would be needed to support the 2010 Reuse Plan Addendum through the completion of Phases III and IV, including significant road improvements and utility upgrades (water, sanitary sewer, storm drainage, electricity, and telecommunications).

<b>Table 2-3</b>			
<b>2010 Reuse Plan Addendum Reuses for Parcel III, Phases I and II</b>			
<b>Phase I: Years 1 through 3 (2011 – 2013)</b>			
Phase 1 would include the following: Transfer property via Economic Development Conveyance (ECD) and Public Benefit Conveyances (PDCs); initiate public sales process; complete predevelopment tasks; start first phase construction including temporary reuse of facilities and associated infrastructure improvements.			
<b>Phase II: Years 4 through 10 (2014 – 2020)</b>			
	<b>Individual Features</b>	<b>Description</b>	<b>Square Footage</b>
Zone 1 Port Caribe - Commercial Heart	Retail, Restaurants, Entertainment District	Initial commercial development	75,000
	Offices	Located above retail space	25,000
	Marina	Reuse of existing recreational marina; renovate existing facilities and slips; to include public moorings and fishing piers	15,000
	International Cruise Port and Terminal		
	Support Infrastructure		20,000
	Ferry Terminal	Reuse of existing pier for ferry facility	25,000
	<b>Total for Zone 1</b>		<b>160,000</b>
Zone 2 Caribbean Riviera - Destination Anchor	Casino	Built in two phases	210,000
	Casino Hotel	Approximately 1,000 rooms built in two phases (500 rooms each phase)	1,000,000
	Retail, Restaurants, Entertainment	Related casino amenities	100,000
	<b>Total for Zone 2</b>		<b>1,310,000</b>

**Table 2-3**  
**2010 Reuse Plan Addendum Reuses for Parcel III, Phases I and II**

Individual Features		Description	Square Footage
Zone 3 El Yunque - Premier Eco- Tourism Resort	Retail, Restaurants, Entertainment Village	Waterfront retail village	45,000
	Residential Villas	Approximately 70 dwelling units	150,000
	Marina	Harbor front service and retails (no slips)	20,000
	Total for Zone 3		215,000
Zone 4 Marsh Vista – Country Club Amenity	18 Hole golf course	Clubhouse included	35,000
	Residential	Approximately 50 units	110,000
	Total for Zone 4		145,000
Zone 7 Main Street – Town Center	Community College/Institutional	Facility reuse and expansion	100,000
	Total for Zone 7		100,000
Zone 11 Ceiba Park	Concessions	Collateral development with Ceiba	10,000
	Total for Zone 11		10,000
	Total for Parcel III Development During Phase II		1,940,000
Source: LRA 2010a.			

## 2.2 Alternative 1: Preferred Alternative

As previously stated, the primary goal of the 2010 Reuse Plan Addendum is to lessen the immediate, negative economic impact of the base closure on the surrounding region. For this to occur, redevelopment must be completed in a timely fashion and avoid extensive delays associated with agency permitting requirements and site remediation activities. To that end, the LRA developed a reuse and phasing scenario that intends to maximize existing infrastructure at NAPR while avoiding or accommodating areas constrained by significant natural resources, historic properties, and cleanup sites.

The Preferred Alternative is the reuse of Parcel III located at NAPR, as identified inclusive of Phase II in the 2010 Reuse Plan Addendum. The Addendum includes a tourist destination and commercial strategy that was lacking in the original 2004 Reuse Plan. Phases III and IV of the Addendum remain conceptual and speculative. For example, a cruise terminal and a second marina (300 slips) are anticipated in Phase III, while Phase II utilizes the existing pier and marina facilities. The retail, restaurant, and entertainment development is more intense with the addition of a casino and associated lodging and retail development. To support this, the 2010 Reuse Plan Addendum calls for the construction of approximately 6,000,000 square feet of development, almost double that anticipated by the 2004 Reuse Plan, which focused on a science park/conference center in this area. In addition, total employment under the 2010 Reuse Plan Addendum would likely increase over that anticipated by the 2004 Reuse Plan by almost 50%. While the 2004 Reuse Plan mentioned the possibility of a golf course, the Addendum assures the construction of a premier, 18-hole golf course. The university remains a part of the parcel's development, although the physical size of the university is about 50% smaller under the 2010 Reuse Plan Addendum. The specific proposed reuses for each development zone for Parcel III are listed in Table 2-3.

## 2.3 No-Action Alternative

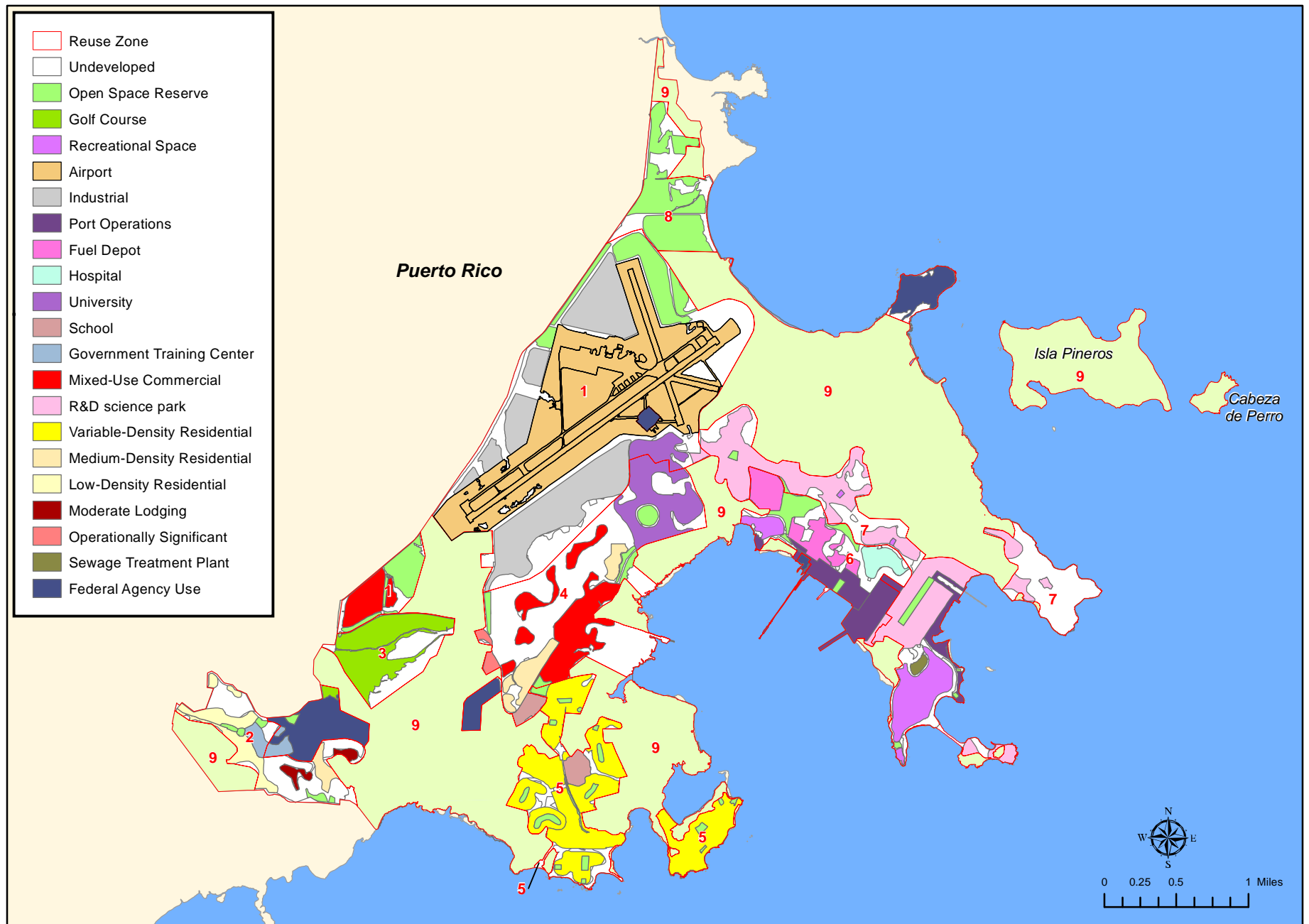
The No-Action Alternative is disposal of NAPR consistent with the 2004 Reuse Plan in accordance with the Preferred Alternative for Parcel III as identified in the 2007 EA (FONSI, signed on April 10, 2007). The No-Action Alternative also establishes a baseline to identify and compare potential environmental consequences from the redevelopment of NAPR as identified for the Preferred Alternative in the 2004 Reuse Plan.

Under the 2004 Reuse Plan, NAPR would be redeveloped to include economic development; public, educational, and institutional uses; residential uses; open space and recreation; conservation; and tourism. The 2004 Reuse Plan is divided into four phases, expected to occur over a 34-year period. For a more detailed description of the 2004 Reuse Plan refer to the 2007 EA.

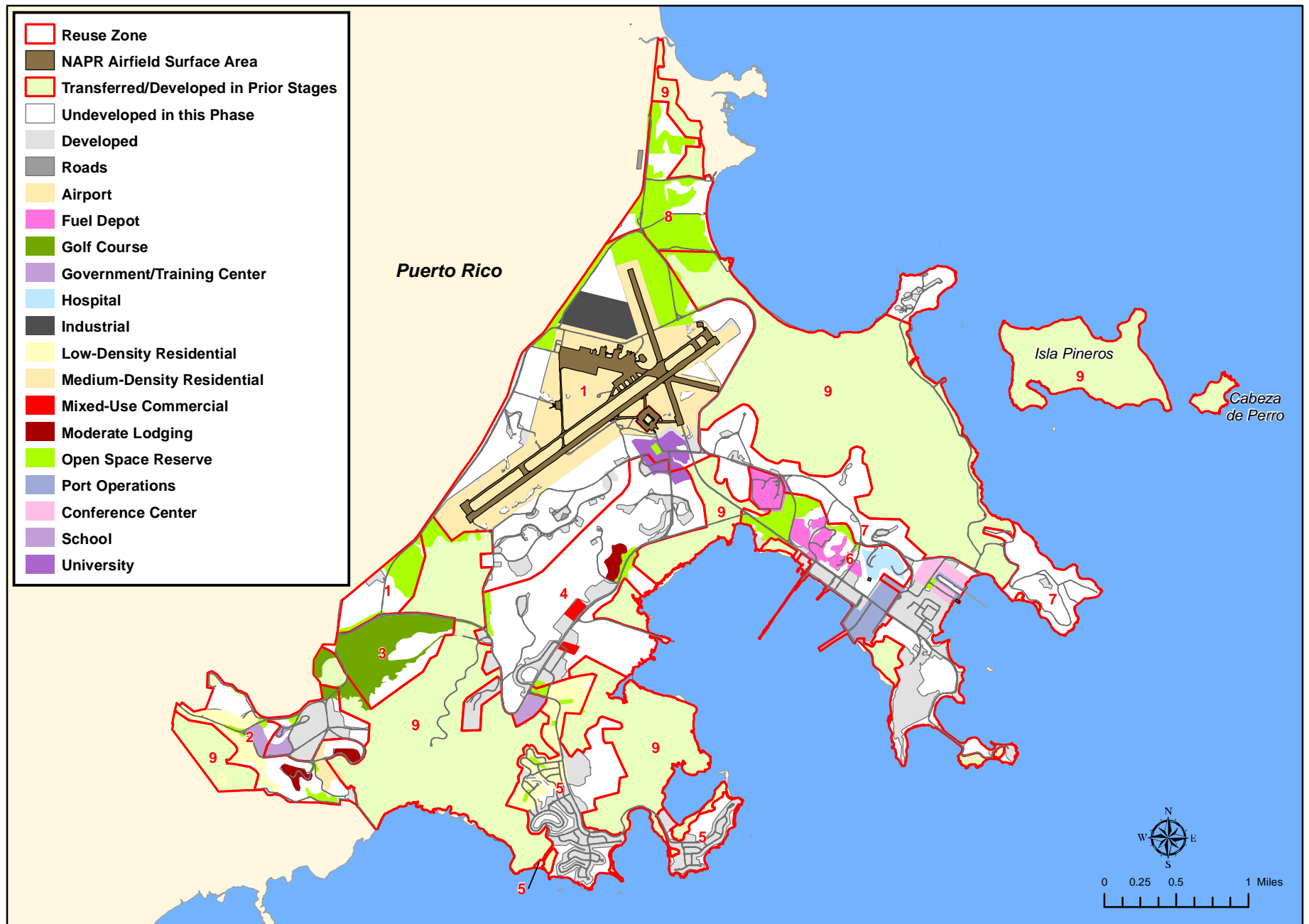
Figure 2-2 presents a conceptual site plan for Phase II of the 2004 Reuse Plan, and Figure 2-3 presents the full build-out of the 2004 Reuse Plan, which includes the following primary elements:

- **Industrial/Manufacturing/Distribution.** This area is designated for commercial and general aviation, which includes space for lease and ownership.
- **Residential/Government.** This area initially would include 400 temporary lodging rooms and approximately 300 dwelling units for residential use, with a maximum of about 700 residential dwelling units at the completion of development. This component also would support the government and training center.
- **Public Golf Course.** The public golf course would be expanded to 18 holes.
- **University Campus.** The campus would include classrooms, laboratories, and dormitories; there would also be a public school, a reuse of the existing elementary school.
- **Mixed Use.** This would include the reuse of existing buildings while the developer formulates a master plan for the area, including professional offices and retail in the downtown area.
- **Marina/Port.** This area would include the marina, ferry terminal, light cargo, related uses, as well as a hospital and fuel tank farm. This would allow for waterfront commercial use, as well as the docking of small cruise ships.
- **Research and Development.** This area would include the Science Park and Conference Center.
- **Conservation Areas.** Approximately 3,000 acres would be used for open space and conservation.





**Figure 2-2**  
**2004 Reuse Plan**  
**Naval Activity Puerto Rico**



**Figure 2-3**  
**Phase II 2004 Reuse Plan**  
**Naval Activity Puerto Rico**

## 2.4 Comparison of Environmental Consequences

Table 2-4 summarizes the environmental consequences associated with the Proposed Action's alternatives of this SEA and the 2007 EA. More detailed information on environmental consequences is provided in Section 4.

Table 2-4 Comparison of Environmental Consequences (Phase II Build-Out)		
Resource	The Proposed Action (2010 Reuse Plan Addendum)	The No-Action Alternative (2007 EA/Preferred Alternative)
Land Use and Zoning	No significant adverse impacts with the PRPB's adoption of the 2010 Reuse Plan Addendum NAPR Zoning Plan.	No significant adverse impacts with the PRPB's adoption of the 2005 NAPR Zoning Plan.
Environmental Contamination	The USEPA chose to convert the regulation of corrective action requirements from the permit to a RCRA Section 7003 Administrative Order on Consent (Consent Order) prior to property transfer. The Navy and the USEPA voluntarily entered into a Consent Order in January 2007. Property subject to cleanup requirements under the Consent Order may be transferred prior to completion of cleanup under CERCLA early transfer authority, pursuant to the Governor's approval of the early transfer. Upon property transfer, LUCs appropriate to individual sites would be imposed as necessary to ensure protection of human health and the environment.	The USEPA chose to convert the regulation of corrective action requirements from the permit to a RCRA Section 7003 Administrative Order on Consent (Consent Order) prior to property transfer. The Navy and the USEPA voluntarily entered into a Consent Order in January 2007. Property subject to cleanup requirements under the Consent Order may be transferred prior to completion of cleanup under CERCLA early transfer authority, pursuant to the Governor's approval of the early transfer. Upon property transfer, LUCs appropriate to individual sites would be imposed as necessary to ensure protection of human health and the environment.
Socioeconomics	Reuse of the Parcel III properties is expected to have a positive economic impact through direct funding, job creation, and tax revenue over the short- and long-term implementation of all phases of the 2010 Reuse Plan Addendum	Disposal and reuse of NAPR consistent with the 2004 Reuse Plan is expected to have a positive economic impact through direct funding, job creation, and tax revenue over the short- and long-term implementation of all phases of the Reuse Plan.
Transportation	<p>No significant adverse impacts on the land transportation system are expected. The existing road system at NAPR has been well maintained since base closure in 2004 and the Navy would transfer roadway easements to the LRA consistent with the MOA for most of the main roadways servicing the Parcel III properties to support the planned build-out.</p> <p>Implementation of the Proposed Action would not result in any significant adverse impacts to the marine transportation network. The reuse of the existing port facilities and infrastructure to enhance the regional waterway network is consistent with historical use and an improvement in terms of waterfront infrastructure capacity and condition. The Navy would assume no further responsibility for any significant upgrades to piers or other waterfront infrastructure associated with marine transportation. Any such actions with the potential for adverse impacts to surface waters would require consultations and permits consistent with the requirements of the applicable Commonwealth and federal regulations.</p>	<p>Disposal and reuse of NAPR consistent with the 2004 Reuse Plan is not expected to result in significant impacts on the land transportation system. Existing developed areas at NAPR are fragmented throughout the property and are connected by a network of mostly two-lane roads. Since the Navy's facilities were spread throughout the property, roadways currently extend into each zone considered for reuse; therefore, there is no immediate need to construct new roads to access development sites.</p> <p>Phase II of the 2004 Reuse Plan includes the reuse of the recently upgraded Pier 3 at the northeast portion of Enseñada Honda as a new passenger and light cargo ferry terminal with service to Vieques, Culebra, and the U.S. Virgin Islands. The ferry would likely be operated by the PRPA. A modern passenger ferry terminal on the NAPR property would represent a major improvement to the island's transportation infrastructure. The USACE has previously issued construction and use permits for the existing facilities along the waterfront at NAPR. Therefore, changes to uses that include intensity and operations would require users to obtain a new permit from USACE.</p>
Utilities and Infrastructure	The water supply, wastewater treatment facilities, and base electrical distribution system would be transferred to the LRA to assume control and operational responsibility for these on-site utility systems. Existing systems have the capacity to accommodate Phase II development.	The water supply, wastewater treatment facilities, and base electrical distribution system would be transferred to the LRA to assume control and operational responsibility for these on-site utility systems. Existing systems have the capacity to accommodate Phase II development.
Topography, Geology and Soils	Construction, maintenance, and operation of redevelopment of NAPR through Phase II of the Reuse Plan Addendum would have minimal potential impacts on local topography, geology, and soils. The majority of construction activity associated with Phase II would be either a) redevelopment and facility reuse and expansion or b) new construction that would occur within previously developed areas.	Construction, maintenance, and operation of redevelopment of NAPR through Phase II of the 2004 Reuse Plan would have minimal potential impacts on local topography, geology, and soils since the proposed reuses maximize the use of existing infrastructure.
Hydrology and Water Resources	<p>Clearing and grading during future redevelopment of NAPR through Phase II of the 2010 Reuse Addendum could create minor short-term impacts on surface water.</p> <p>Potential impacts could be minimized or mitigated through the use of BMPs during construction; through development and implementation of SWPPPs for development; and through appropriate treatment prior to discharge of contaminants.</p> <p>Redevelopment of NAPR through Phase II of the 2010 Addendum is not expected to result in significant adverse impacts on groundwater.</p>	With implementation of BMPs and stormwater treatment measures, construction and operation of the facilities proposed through Phase II of the 2004 Reuse Plan are not expected to result in significant adverse impacts on water resources
Terrestrial Resources	<p>Potential impacts to terrestrial vegetation as result of the Proposed Action would include temporary and permanent conversion of natural ecological communities to urban development. Impacts on terrestrial vegetation would be minimized by using previously developed areas and by siting new development within these areas or immediately adjacent to previously developed areas.</p> <p>No long-term adverse impacts on general terrestrial wildlife due to the construction, maintenance, and operation of future redevelopment of NAPR through Phase II of the 2010 Addendum is expected.</p>	Terrestrial wildlife species are closely associated with vegetative communities. For this reason, the loss of vegetation and modifications to land use would affect the wildlife communities at NAPR. Potential impacts on terrestrial wildlife would be primarily from destruction of habitat due to clearing and grading during construction and maintenance of future development projects. Potential impacts would range from minor temporary impacts associated with displacement to long-term impacts associated with loss or alteration of habitat.

Table 2-4 Comparison of Environmental Consequences (Phase II Build-Out)		
Resource	The Proposed Action (2010 Reuse Plan Addendum)	The No-Action Alternative (2007 EA/Preferred Alternative)
Marine Resources	<p>While the future potential impacts on marine environments are not quantifiable without specific site designs, the Navy has determined that existing federal laws and Commonwealth rules, regulations, and laws for both waterfront and upland development, as well implementation of managerial and structural BMPs for waterfront work and adherence to the required USACE permits, NPDES permits, CES permits, and Special Zoning that would be established by the PRPB would provide adequate protection such that implementation of the 2010 Reuse Plan Addendum would not result in an significant adverse effect on the marine environment.</p> <p>Mangroves could be directly and indirectly affected by the development planned under the 2010 Reuse Plan Addendum. Direct impacts to mangroves also would occur during modification and/or expansion of arterial roads that traverse mangrove forests.</p> <p>Potential adverse impacts on mangroves resulting from increased human activities in marine areas around NAPR could be avoided by mitigation measures that could be implemented by future property owners or Commonwealth agencies to minimize any potential impacts on mangroves as a result of future development.</p>	<p>An EFH assessment, including field surveys, characterization of the sites, effects of the Proposed Action, and recommended mitigation as a follow-on action by future land owners and Commonwealth agencies, was conducted for the NAPR property (Geo-Marine, Inc. 2005b). The disposal of NAPR property to non-federal property owners, would not in and of itself adversely affect EFH. While the future potential impacts on EFH are not quantifiable, the Navy has determined that existing federal laws and Commonwealth rules, regulations, and laws, as well as the Special Zoning which would be established by the PRPB, would provide adequate protection such that the disposal of NAPR to the Commonwealth and other non-federal entities would not result in an adverse direct or indirect effect on EFH.</p>
Threatened and Endangered Species	<p>Implementation of the redevelopment of NAPR through Phase II of the 2010 Addendum would not in and of itself adversely affect any listed threatened species. However, following completion of the Proposed Action, future land-use changes may affect listed species and designated critical habitat. Potential impacts to threatened and endangered species could result from loss of habitat associated with construction clearing or waterfront demolition, construction, and repair; surface water pollution caused by increased stormwater runoff from an increase in impervious surfaces; increased turbidity caused by sedimentation and erosion into surface waters; and inadvertent ancillary anthropogenic impacts due to increased human activity in the redevelopment zones that could harm protected species or their habitat (i.e., boat strikes, trampling of seagrass or coral reefs, increases in inadvertently discarded solid waste, disturbance of sea turtle nests, entanglement or ingestion of fishing gear and nets or refuse, etc.).</p> <p>The Navy has determined that the conservation measures previously approved for the 2004 Reuse and Special Zoning Plans remain applicable to the 2010 Addendum because the species, required habitat, and designated EFH/critical habitat impacted by the previous (i.e., 2004 Reuse Plan) and current (i.e., 2010 Addendum) reuse scenarios are similar. Therefore, the Navy proposes that the previously approved species conservation measures be carried forward as part of the 2010 Reuse Special Zoning Plan to provide the same level of protective assurances which were conveyed in the previous Special Zoning Plan.</p>	<p>In consultation with the USFWS, the Navy has developed parcel-specific conservation guidelines that list species-specific conservation recommendations for future land owners to consider. The 2007 EA identifies the conservation guidelines to be provided to new owner(s)/developer(s) to offset potential impacts. Accordingly, during Section 7 consultation pursuant to the ESA, the USFWS based their determination for “not likely to adversely affect” on future landowners/developers implementing conservation measures included in the Special Zoning Plan.</p>
Cultural and Archeological Resources	<p>In accordance with Section 106 of the NHPA, the Navy entered into consultation with the Puerto Rico SHPO during the 2007 EA process (letter dated 10 May 2005). As part of implementing the original Proposed Action, an MOA between the Navy and the Puerto Rico SHPO was executed on 23 January 2007. The MOA detailed which archaeological sites would undergo data recovery and to what level. In addition, it specified the level of documentation needed for respective historic structures or the consultation process needed to establish the level of recordation.</p> <p>Through execution of a new MOA, and by implementing the stipulations provided therein, the Navy will fulfill their responsibilities under Section 106 of the NHPA (Draft MOA provided in Appendix A). The MOA will ensure protection of historic and archaeological resources at NAPR and be finalized through the Section 106 process.</p>	<p>In accordance with Section 106 of the NHPA, the Navy entered into consultation with the Puerto Rico SHPO during the 2007 EA process (letter dated 10 May 2005). As part of implementing the original Proposed Action, an MOA between the Navy and the Puerto Rico SHPO was executed on 23 January 2007. The MOA detailed which archaeological sites would undergo data recover and to what level. In addition, it specified the level of documentation needed for respective historic structures or the consultation process needed to establish the level of recordation.</p>
<p>Key: 2007 EA = Environmental Assessment for the Disposal of Naval Activity Puerto Rico BMPs = best management practices. CERCLA = Comprehensive Environmental, Response, Compensation, and Liability Act. CES = Control of Erosion and Prevention of Sedimentation. EFH = Essential Fish Habitat. ESA = Endangered Species Act. LRA = Local Redevelopment Authority LUCs = land use controls. MOA = Memorandum of Agreement NAPR = Naval Activity Puerto Rico.</p> <p>Navy = United States Department of the Navy. NHPA = National Historic Preservation Act. NPDES = National Pollutant Discharge Elimination System. PRPA = Puerto Rico Port Authority. PRPB = Puerto Rico Planning Board. RCRA = Resource Conservation and Recovery Act. SHPO = State Historic Preservation Office. SWPPP = stormwater pollution prevention plan. USACE = U.S. Army Corps of Engineers. USEPA = United States Environmental Protection Agency. USFWS = United States Fish and Wildlife Service.</p>		

## 3 Existing Environment

This section discusses the existing physical, natural, and human environments for Parcel III and the broader NAPR property, as appropriate. The following resource descriptions are based in part on information presented in the Environmental Conditions of Property (ECP) assessment for NAPR (U.S. Navy 2005), which provided detailed descriptions of local environmental conditions. Other key source documents include the 2010 Reuse Plan Addendum (LRA 2010a); the Roosevelt Roads Redevelopment Authority Economic Development Conveyance Application and Business Plan (LRA 2010b); the *Biological Assessment for Land Transfer of Naval Station Roosevelt Roads, Puerto Rico* (Naval Facilities Engineering Command Atlantic Division [NAVFAC LANTDIV] 2006; referred to herein as the 2006 BA); and various economic reports associated with the proposed redevelopment project (Estudios Tecnicos, Inc. 2010; C.H. Johnson Consulting, Inc. 2010). Additional information was obtained by field reconnaissance, including personal interviews with involved agencies and historical information provided by various local, Commonwealth, and federal agencies, and maintained by the environmental staff at the NAPR Public Works Department.

The 2010 Reuse Plan Addendum (LRA 2010a) provides a consistent measure for the evaluation of reuse impacts and is therefore used to guide the content of the Existing Environment discussion in this section. In some cases, however, historical capacities or usage requirements are cited as data sources for years previous to the full closure of NSRR. The Addendum is not intended to replace the 2004 Reuse Plan, but rather to redirect the focus of the planned development. More specifically, the Addendum altered the nature of redevelopment plans for Parcel III at NAPR such that the findings of the 2007 EA require a supplemental analysis to determine the potential for significant impacts to the man-made and natural environment.

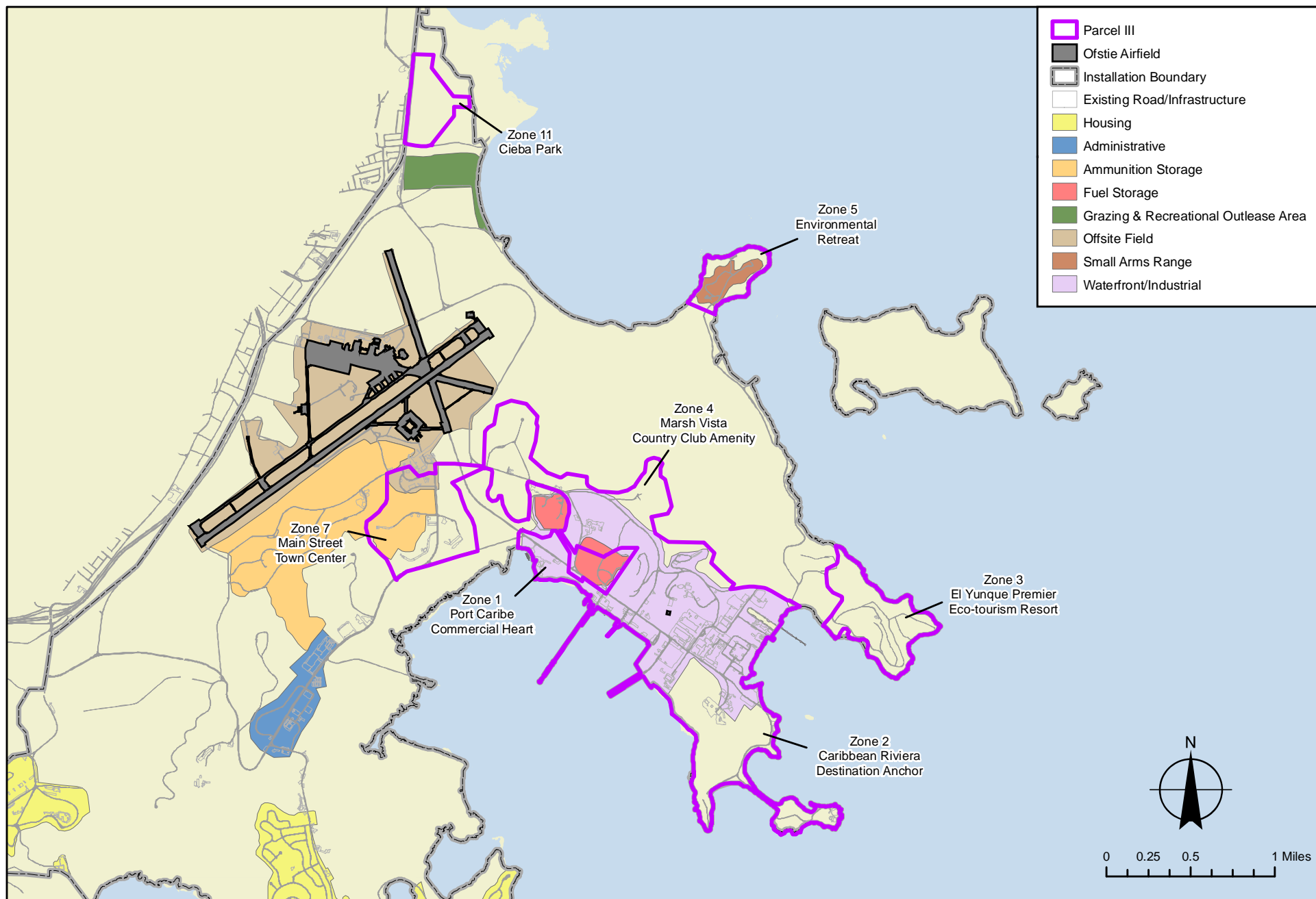
This SEA evaluates reuse of the Parcel III properties or those redevelopment plans that were not known and, therefore, not captured by previous NEPA documentation. The baseline resources described herein reflect the reuse zones and associated land uses put forth by the 2010 Reuse Plan Addendum; however, some of the resources analyzed in this SEA pertain not only to specific reuse zones, but to the broader existing environment, in which case resource descriptions are provided to support the analyses in Section 4 “Environmental Consequences.”

### 3.1 Land Use and Aesthetics

#### 3.1.1 NAPR Land Use

The total land area encompassed by NAPR is approximately 8,654 acres, of which, 8,365 acres are located on the eastern coast of mainland Puerto Rico (see Figure 1-3). This property is located within the communities of Naguabo and Ceiba and in close proximity to Fajardo, approximately 45 miles east of San Juan. Land uses at NAPR can be classified into three broad categories: improved, semi-improved, and unimproved. Residential, commercial, industrial/military, recreational, institutional, infrastructure, and open space uses are found within these general land use categories. Figure 3-1 illustrates the historical land uses at NAPR.





Source: Geo-Marine, 2005

**Figure 3-1**  
**Historic Land Uses**  
**Naval Activity Puerto Rico**

Improved land includes areas that have been intensively developed and maintained for mission and operational or aesthetic needs. Approximately 30% of NAPR is improved lands. Housing and administrative areas, the airfield, Camp Moscrip, the waterfront area, and the downtown area are included in the improved land use category. Infrastructure improvements commonly associated with improved land (i.e., roads, wastewater treatment plants, utilities, etc.) also are part of this land use category. (U.S. Navy 2004)

Semi-improved lands are characterized as areas that require regular maintenance (although not to the same extent as improved lands) due to operational considerations. Approximately 17% of the total land area at NAPR is semi-improved lands. Included in this land use category are an agricultural out-lease area, some operations areas (e.g., ammunition storage area, small arms range, and fuel storage areas), and infrastructure improvements associated with these areas. (U.S. Navy 2004)

Unimproved land at NAPR primarily consists of open areas comprising marine habitat, coastlines, mangroves, upland forests, wetlands, and infrastructure improvements associated with these areas (primarily utility rights-of-way). Unimproved lands account for the largest amount of land at NAPR, encompassing approximately 53% of NAPR's land mass. (U.S. Navy 2004)

### 3.1.2 Regional Land Use

Eastern Puerto Rico's economy is in part based on resort tourism and has several resort developments in various stages of growth and development. For example, the Palmas del Mar resort in Humacao is approximately 18 miles south of NAPR. This residential community contains over 3,500 housing units and has experienced steady growth since its initiation over 30 years ago. Similar resort developments reside to the north of NAPR in Fajardo (LRA 2010b). The areas surrounding NAPR are more rural in nature with large sections used as rangeland. Ceiba and Naguabo are the communities nearest to NAPR; to the west, Ceiba is adjacent to NAPR, and Naguabo is located directly southwest of NAPR (see Figure 1-2). Formerly agricultural towns, residential, and small-scale retail and institutional facilities are now more commonplace, while industry continues to decline. The city of Fajardo, located approximately 10 miles north of NAPR along Route 3 (see Figure 1-2), represents the most urbanized area with proximity to installation lands. San Juan, the capital of Puerto Rico, is located approximately 45 miles to the northwest (Department of the Navy 2007).

### 3.1.3 Parcel III Future Land Use

Parcel III consists of the initial core redevelopment areas that total approximately 1,370 acres. These discrete and non-contiguous properties, the majority of which are located at the waterfront and part of the former industrial section of the base, also include former housing and personnel support facilities. Parcel III properties also include two peninsulas, one of which was used as a small arms range, and an undeveloped parcel on the north side of the base on the airport access road. One 2.3-acre parcel outside of Parcel III, the former base bowling alley located in Parcel I, is part of the EDC for the Parcel III properties and is therefore analyzed as part of this SEA (LRA 2010b).

The 2010 Reuse Plan Addendum puts forth an up-to-36-year development program for the former NSRR footprint. Induced, long-term economic growth and increased emphasis on tourism development are central tenets of the revised development program, and implementation will be phased from 2011 to 2037 with full build-out anticipated for 2045. Phase I (2011 to 2013) includes the land conveyance; the public sales process; and the start of construction, including the temporary reuse of facilities and associated infrastructure improvements. Phase I focuses on pre-development activities; however, completion of the first property components and realization of revenue from land leases would not begin until 2014 or at least three years after the land conveyance. Phase II (2014 to 2020) would continue to



implement the development program through new construction, facility renovation, and infrastructure upgrades. Phase II plans are intended to maximize opportunities with respect to the selected reuse and site potential of the Parcel III properties. Phases III (2021 to 2023) and IV (2024 to 2037), which are analyzed as cumulative impacts in this SEA, propose higher density developments that would not be supported by historical (i.e., existing) resources or conditions on the base (LRA 2010b).

Future land uses planned for the NAPR property include conservation, commercial/entertainment, residential, educational/institutional, recreation, and light industrial. The nine reuse zones from the 2004 Reuse Plan have been replaced by the 11 reuse zones described in the 2010 Reuse Plan Addendum (see Figure 2-1); however, for certain zones, redevelopment plans remain the same as those put forth in the 2004 Reuse Plan. This SEA addresses only those redevelopment plans or reuse zones that were not fully evaluated in the 2007 EA for the NAPR disposal action. Land use features within these select reuse zones are briefly discussed below.

- **Zone 1: Port Caribe – “The Commercial Heart.”** Port Caribe is planned as a waterfront hub for tourism and commerce. This reuse zone has an estimated development footprint of approximately 160,000 square feet and includes a variety of waterfront ship berths and industrial use areas. Reuse plans within Zone 1 include office space, retail, and dining/entertainment establishments. Existing facilities and infrastructure in Zone 1 include a fuel pier and tank farm, a cargo pier, a small-boat marina, port operations buildings, the former base hospital, and various other industrial and commercial buildings. The planned development is envisioned as a regional gateway for an increasing Caribbean island tourism market. For example, an upgraded ferry terminal would provide regional water connectivity throughout the region.
- **Zone 2: Caribbean Riviera – “The Destination Anchor.”** An entertainment resort, the Caribbean Riviera, is planned for development southeast of Zone 1. This reuse zone is envisioned as a gaming district supported by the visual appeal of the coastline. The estimated development footprint for Zone 2 is approximately 1,310,000 square feet and would include a casino, a casino hotel, a golf course, and related amenities. Road access to this zone would be provided by passage through Port Caribe (Zone 1).
- **Zone 3: El Yunque Grande – “The Premiere Eco-Tourism Resort.”** Zone 3 consists of the waterfront lands northeast of Zone 1 (i.e., Port Caribe) and north to northeast of Zone 2 (i.e., the Caribbean Riviera). The 2010 Reuse Plan Addendum notes this reuse zone as planned for an eco-tourism resort that caters to water-based recreational activities. For example, the harbor edge would support small-scale fishing and sailing retail amenities. The planned development is intended to be consistent with, and supported by, the adjacent El Yunque National Forest and other local conservation lands. The estimated development footprint totals 215,000 square feet of mixed use development to include retail, lodging, and residential land uses.
- **Zone 4: Marsh Vista – “The Golf/Country Club Amenity.”** Zone 4 would create a buffer between the Port Caribe and the El Yunque Grande in the form of an 18-hole golf course. As with Zone 3 above, the proposed golf course would highlight and protect the local conservation lands located to the north of the property. The approximately 145,000-acre redevelopment also would include limited residential units in select locations adjacent to the golf course.
- **Zone 5: Eco-Outpost Base Camp – “The Environmental Retreat.”** The Zone 5 property is a former shooting range characterized by several distinct plateaus that collectively form a small peninsula opposite the island of Pineros in northeast Puerto

Rico. The property was originally planned for federal conveyance, but is now under consideration as a campsite. Zone 5 abuts local conservation lands to the southwest (inland) and is otherwise surrounded by the ocean.

- **Zone 7: Community Education.** Zone 7 provides a central location for the Roosevelt Roads redevelopment plan (i.e., the Main Street corridor) and contains a mix of development suitable for adaptive reuse. The approximately 200-acre site includes existing structures to support residential, commercial, academic, retail, research and development, and entertainment land use types. For example, the Navy Lodge hotel is envisioned as a central feature of this reuse zone which also would include a new university and community college totaling approximately 100,000 square feet of new development.
- **Zone 11: Ceiba Park – “The Gateway.”** Ceiba Park is planned to be the “gateway” to the numerous amenities provided by the reuse plan for NAPR. As a seaside portal to a number of leisure and tourism opportunities to the east and southeast, this reuse zone would offer commercial, recreational, and entertainment services from the local community. The 73-acre property provides for public access to Ceiba Beach and a small fish market at the waterfront.

In total, the Parcel III conveyance and development would consist of approximately 4,420,000 square feet, 44% of which would be completed by 2020 (LRA 2010a and LRA 2010b).

### 3.1.4 Easements and Restrictions

Road and utility easements or use agreements may be required after transfer of Parcel III properties to accommodate certain operations, such as provision of utilities, site access, security, and effective maintenance and operations. One such example is the NSRR Tank Farm parcels and the fuel pier that are being proposed as a PBC with the Maritime Administration (MARAD) as the sponsoring federal agency. The Navy may also require road easements or use agreements to access environmental remediation sites on NAPR. In addition, transient institutional controls or land use restrictions may be applied to remediation sites for the duration of all clean-up activities (Department of the Navy 2007). More detailed information regarding site contamination and potential restrictions is provided in Sections 3.2 and 4.2.

### 3.1.5 Local Land Use Plans and Land Development Regulations

Under Puerto Rico Law Number 75 of June 1975, known as the “Planning Board Law,” responsibility is assigned to the PRPB to guide development on the island in a way that promotes the general health, security, and well-being of the current and future residents of Puerto Rico. In accordance with this law, the PRPB and the Permits and Regulations Administration review proposed development projects on Puerto Rico to ensure that such projects are consistent with established zoning classifications and in compliance with applicable permit requirements. The law also provides the PRPB with the authority to adopt land use plans prepared by government agencies.

The Municipal Reform of 1991 was adopted to decentralize the decision-making process from the central government to local municipalities. Law 81 of the Municipal Reform requires that each municipality prepare a Land Use Plan, subject to approval by the PRPB and the governor. Once a plan is approved, the law allows the municipality to solicit the transfer of planning and permitting processes in its territory from the PRPB and the Permits and Regulations Administration, respectively. None of the communities surrounding NAPR (i.e., Ceiba, Fajardo, Naguabo) currently have land use plans in place,

which are required before a municipality can implement zoning regulations. Furthermore, none of these communities are expected to develop land use plans or implement zoning regulations in the near future due to a lack of staffing. For the purposes of this SEA, the definitions for all land classifications and qualifications are taken from the Planning Board Joint Regulation for Construction Works and Land Uses in Puerto Rico – “Reglamento Conjunto” – which was enacted in 2010 (LRA 2010c). Table 3-1 shows the applicable zoning classifications through Phase II of the proposed development program.

<b>Table 3-1</b>		
<b>Zoning Descriptions for Parcel III Properties</b>		
<b>Abbreviation</b>	<b>Classification</b>	<b>Description</b>
UR	Urbanizable Land	Areas approved for urban expansion.
C-L	Commercial (Light)	Commercial use with limited residential.
I-P	Industrial (Heavy)	Heavy industrial use.
DT-G	Institutional	Mixed use to include cultural, civic, public service, infrastructure, and recreation.
RT-1	Residential – Tourism (Intermediate)	Tourism related residential use such as hotels and services.
CT-1	Commercial – Tourism (Intermediate)	Tourism related commercial establishments.
DTS	Selective Tourism Development	Eco-tourism uses with limited residential and commercial use.
PR	Preservation (Resources)	Preservation of wetlands and mangroves.
Source: LRA 2010b.		

### 3.1.6 Aesthetics

Aesthetics with respect to Parcel III vary substantially between the developed and undeveloped portions of the property. The large amount of undeveloped land on NAPR, which includes unique natural communities, rolling topography, and extensive stretches of pristine coast, substantially contribute to the overall aesthetic value of the area. Developed areas are cleared and relatively utilitarian in appearance and any open space is generally maintained in turf grasses. From offshore, NAPR appears as a set of functionally grouped structures, including piers, buildings, and roadways, set amidst a background of dense vegetation and mountainous terrain. Buildings used for administration, housing, and operations are generally low horizontal structures of one or two stories, whereas the larger hangars and maintenance structures are taller and more visible (Department of the Navy 2007).

## 3.2 Environmental Contamination

This section discusses ongoing environmental management and restoration programs at NAPR and describes existing conditions regarding potential environmental contamination that could be sources of releases to the environment. Management, investigation, and cleanup activities are ongoing; therefore, this section presents the latest data available at the time of preparation.

### 3.2.1 Regulatory Overview

NAPR is managing hazardous wastes, hazardous materials and substances, and is remediating any contamination resulting from past operations in accordance with the requirements of the regulatory programs described below.

### 3.2.1.1 Resource Conservation and Recovery Act

Promulgated by the USEPA in 1976, the Resource Conservation and Recovery Act (RCRA) regulates treatment, storage, transportation, handling, labeling, and disposal of hazardous waste. RCRA requires that permits be obtained for owners and operators of treatment, storage, and disposal facilities. The Hazardous and Solid Waste Amendments of 1984 added the requirement for treatment, storage, and disposal facilities with permits issued after November 8, 1984, to include corrective actions. Under these amendments, the USEPA can issue administrative orders requiring corrective actions to remediate releases of hazardous waste or hazardous waste constituents from solid waste management units (SWMUs).

### 3.2.1.2 Ongoing Regulatory Compliance Program

NAPR is required to manage hazardous materials and hazardous substances, including materials stored in tanks and oil-water separators, asbestos-containing materials (ACM), lead-based paint (LBP), polychlorinated biphenyls (PCBs), radon, and pesticides and herbicides.

### 3.2.1.3 Comprehensive Environmental Response, Compensation, and Liability Act

Passed in 1980, the Comprehensive Environmental, Response, Compensation, and Liability Act (CERCLA) created the legal mechanism for cleaning up abandoned or uncontrolled hazardous waste sites. CERCLA requires federal agencies to conduct any needed response actions to clean up contamination from past releases of hazardous substances causing an unacceptable risk to human health and the environment. Under the provisions of CERCLA §120(h), any transfer of federal real property owned by the United States to non-federal entities is subject to the following requirements:

- A notice of hazardous substance activity must be given to the grantee;
- A covenant must be included in the deed that “all remedial action necessary to protect human health and the environment with respect to any such substance remaining on the property has been taken before the date of such transfer;”
- The deed covenant also must include a provision that the federal government will return and perform any additional response action that may be required in the future; and
- The government retains a perpetual right of access necessary to do such additional response actions.

### 3.2.1.4 Superfund Amendments and Reauthorization Act

Passed in 1986 by Congress, the Superfund Amendments and Reauthorization Act (SARA) mandates that the DoD follow the same cleanup regulations that apply to private entities. The SARA also established the Defense Environmental Restoration Program (DERP), under which the DoD conducts environmental restoration activities at sites on active installations, installations undergoing BRAC, and formerly utilized defense sites.

### 3.2.1.5 Environmental Restoration Program

The Environmental Restoration (ER) Program was established by the Navy to reduce the risk to human health and the environment from past waste disposal operations and hazardous substance spills at Navy activities. The program goal is to provide cost-effective and timely site assessment, planning, and remediation of identified releases consistent with DERP requirements.

### 3.2.1.6 Installation Restoration Program

The ER Program is organized into three program categories, one of which is the Installation Restoration (IR) Program, the program for military bases to manage inactive hazardous waste sites and hazardous material spills in compliance with CERCLA. The IR Program addresses releases of hazardous substances, pollutants, or contaminants that pose toxicological risks to human health or the environment. NAPR is cleaning up areas of potential soil and groundwater contamination associated with past operations, as well as petroleum contamination from releases associated with former underground storage tanks (USTs). Cleanup of past contamination from USTs and corrective actions for past contamination of RCRA sites also could be part of the IR Program.

## 3.2.2 Environmental Conditions of Property Report

In order to identify known areas of contamination, the Navy conducted an ECP assessment. The results of the assessment are documented in the *Final Phase I/II Environmental Condition of Property Report, Former U.S. Naval Station Roosevelt Roads, Ceiba, Puerto Rico* (U.S. Navy 2005). The ECP report summarizes significant ECP information available from a number of existing information sources.

The purpose of the ECP effort was to document existing environmental conditions of the property subsequent to the closure of Naval Station Roosevelt Roads on March 31, 2004, but prior to disposal. The ECP report discloses available factual and environmentally relevant information gathered during this effort regarding the condition of the property. The ECP effort focused on available information pertaining to current and past uses of the property, specifically focusing on activities that might pertain to the use, storage, release, or disposal of hazardous substances and petroleum products or their derivatives.

The ECP assessment reviewed available information in all environmental compliance program areas and identified 23 new sites where activities may have resulted in spills or other releases to the environment. These 23 sites were not previously included in any investigation or remediation programs. Based on the ECP investigation, sites were either retained for further investigation and proposed for addition to the IR Program (16 of the 23 sites) or were proposed for no further action. The status of the 10 ECP sites within Parcel III is as follows:

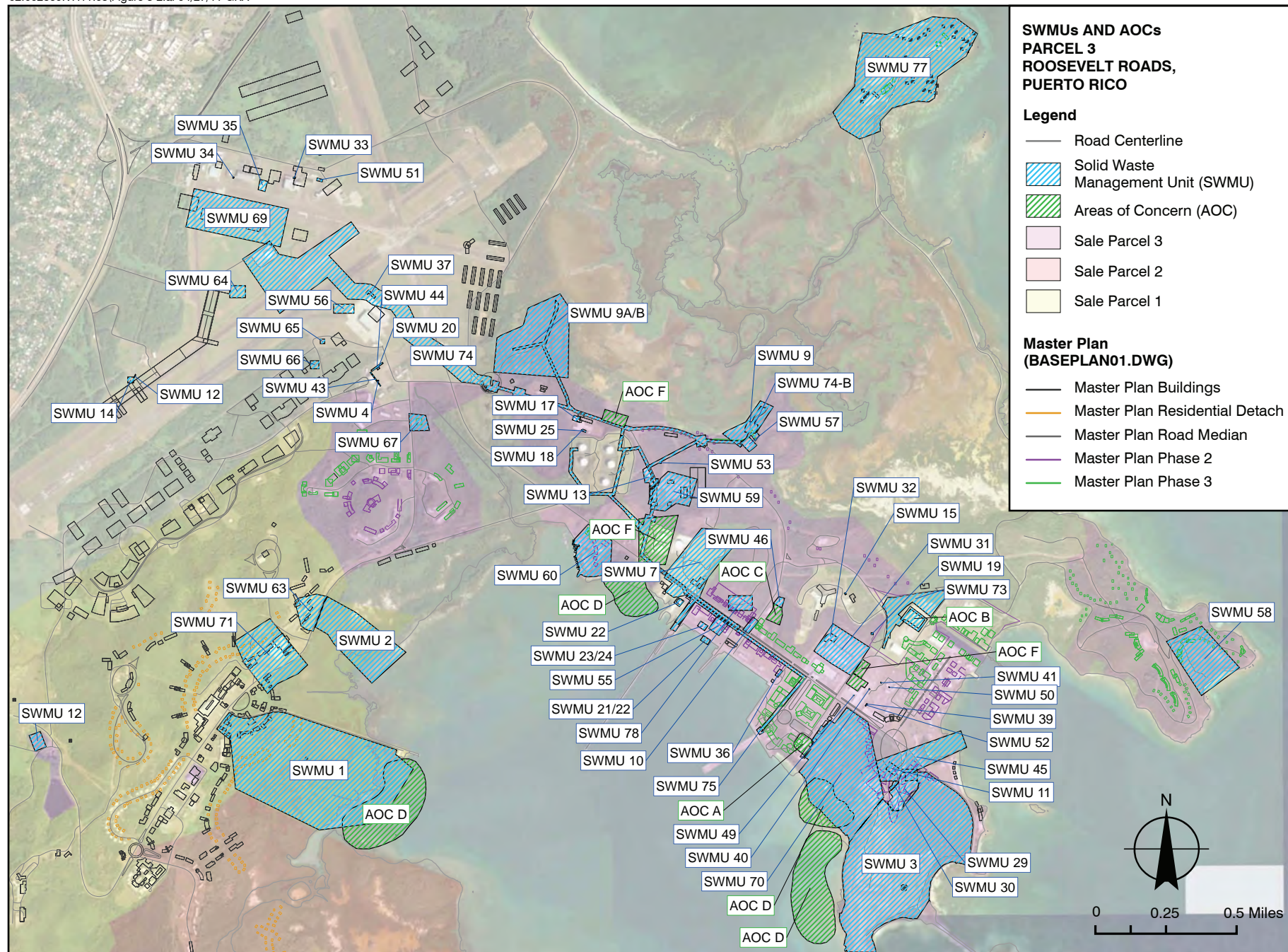
- Nine sites: Sampling results confirmed release; further action is required; or proposed for addition to the IR Program (ECP Sites 3, 5, 6, 13, 16, 19, 20, 23, and Area of Concern [AOC] F); and
- One site: Sampling found no evidence of release; or proposed for no further action (ECP Site 4).

Status details of these 10 sites are provided in Table 3-2.

## 3.2.3 Installation Restoration Program

The ECP report identified a mature IR Program at the facility administered under a RCRA Part B permit specifying corrective action, previously issued by the USEPA on October 20, 1994. The final 1994 permit addressed 55 SWMUs and four AOCs (Figure 3-2). The sites addressed in the previous permit are in various stages of study and cleanup, ranging from preliminary investigation to remedial action complete. Current status of the 20 existing IR Program sites (17 SWMUs and three AOCs) within Parcel III is provided in Table 3-2.





Source: EDC, 2010

**Figure 3-2**  
**Environmental Contamination Sites within Parcel III**  
**Naval Activity Puerto Rico**

**Table 3-2**  
**Summary of Environmental Sites within Parcel III <sup>(a)</sup>**

Site Number	Site Name	2010 Status
<b>Installation Restoration (IR) Program Sites</b>		
Site 3	Station Solid Waste Landfill	Landfill closed but not capped; corrective measures implementation plan expected December 2012. Long-term groundwater monitoring expected through 2036.
Site 9	Tanks 212-217 Sludge Burial Pits	Site under investigation; additional data collection and investigation recommended. Corrective measures implementation plan or closeout report expected February 2016.
Site 10	Substation 2/Building 90	Corrective action complete, with no further action required; <i>land use controls (LUCs) in place.</i>
Site 11	Old Power Plant/ Building 38	Building closed and fenced. Corrective measures study underway.
Site 13	Old Pest Control Shop/ Building 258	Corrective action complete, with no further action required; <i>LUCs in place.</i>
Site 19	Building 121 – Pesticide Storage	Corrective action complete, with no further action required.
Site 23	Oil Spill Oil/Water Separator Tanks	Corrective action complete, with no further action required; <i>LUCs in place.</i>
Site 24	Oil Spill Oil/Water Separator and Adjoining Pad	Corrective action complete, with no further action required.
Site 25	Defense Reutilization and Marketing Office (DRMO) Storage Yard	Corrective action complete, with no further action required; <i>LUCs in place.</i>
Site 29	Wastewater Treatment Plant (WWTP) Sludge Drying Pits	Site under investigation, expected results September 2013.
Site 30	Former Incinerator Area	Corrective action complete, with no further action required; <i>LUCs in place.</i>
Site 31	Waste Oil Collection Area/ Building 31 and 2022	Corrective measures implementation in place (asphalt cap over contaminated soils). Interim LUCs in place.
Site 32	Public Works Department Storage Yard/Battery Collection Area	Corrective measures implementation in place (asphalt cap over contaminated soils). Interim LUCs in place.
Site 39	Building 3158/Former Battery Drain Area	Corrective action complete, with no further action required; <i>LUCs in place.</i>
Site 45	Polychlorinated Biphenyls (PCB) Spill Area/Old Power Plant	
Site 46	Pole Storage Yard Covered Pad	Corrective action complete, with no further action required; <i>LUCs in place.</i>
Site 53	Building 64 – Malaria Control Building	Corrective action complete, with no further action required; <i>LUCs in place.</i>
Site 55	Potential Source Area and Associated Trichloroethylene (TCE) Plume at Tow Way Fuel Farm	Long term groundwater monitoring in place (since July 2009) as part of corrective measures implementation.
AOC B	Former Building 25 Area	Corrective action complete, with no further action required.
AOC C	Transformer Storage Pads near Building 2042	Corrective measures implemented, revised closeout report underway.
AOC D	Sediments	Corrective action complete, with no further action required.

**Table 3-2**  
**Summary of Environmental Sites within Parcel III <sup>(a)</sup>**

Site Number	Site Name	2010 Status
<b>Environmental Conditions of Property (ECP) Sites</b>		
ECP 3 (SWMU 57)	Facility No. 278 – Petroleum, Oil, and Lubricants (POL) Drum Storage Area	Phase I RCRA Facility Investigation (RFI) initiated JAN 2010; corrective action measures expected January 2014. LUCs anticipated.
ECP 4	Rifle Range at Punta Puerca	Corrective action not required.
ECP 5 (SWMU 59)	Former Vehicle Maintenance and Refueling Area	Corrective measures study underway, expected May 2014.
ECP 6 (SWMU 60)	Former Landfill at Marina	Phase I RFI submitted August 2009; corrective action measures expected September 2014. LUCs anticipated.
ECP 13 (SWMU 67)	Former Gas Station	Draft Phase I RFI underway. Corrective measures implementation expected December 2014; LUCs anticipated.
ECP 16 (SWMU 70)	Disposal Area Northwest of Landfill	Draft RFI Full Work Plan submitted July 2010. Corrective measures implementation expected February 2015; LUCs anticipated.
ECP 19 (SWMU 73)	Defense Reutilization and Marketing Office (DRMO) scrap metal recycling yard	Draft corrective measures study report submitted April 2010. Corrective measures implementation expected January 2013; LUCs anticipated.
ECP 20 (SWMU 74)	Jet propellant (JP)-5 (jet fuel) and DFM (diesel fuel-marine) pipelines and aircraft hydrant refueling lines and pits	Revised Final Phase I corrective measures implementation plan submitted July 2010. Corrective measures implementation expected July 2015; LUCs anticipated.
ECP 23 (SWMU 77)	Small Arms Range	Phase I RFI Draft Sampling and Analysis Plan and field work complete. Corrective measures implementation expected January 2015.
AOC F	Monitored Natural Attenuation (MNA) areas 124, 1738, and 2824B	Long-term monitoring in place, expected through 2016.
SWMU 78	Transformer Storage Yard (Pole Yard)	Draft RFI work plan submitted April 2010; corrective action measures underway.
Note: Shaded sites require no further action. Key: RCRA = Resource Conservation and Recovery Act. SWMU = Solid Waste Management Unit.		

### 3.2.4 Administrative Order on Consent

A RCRA Part B permit renewal application submitted in 2004 proposed updated actions based on progress to date. However, following base closure, installation operations requiring a RCRA Part B Permit ceased. Regulated units are undergoing closure according to permit requirements. Since base closure, the Navy and the USEPA have been negotiating the terms of a §7003 Administrative Order on Consent (Consent Order) to set out the Navy's remaining corrective action obligations. The USEPA and the Navy voluntarily entered into a Consent Order on January 29, 2007. The Consent Order reflects the most current information as of the date it was issued and sets out the Navy's corrective action obligations under RCRA, superseding the 1994 permit as the document regulating the remaining corrective actions at NAPR. The ECP report findings were used by the USEPA to determine corrective action obligations for inclusion in the Consent Order.

ECP Sites 1 through 23, identified during the ECP process, were added to the order as SWMUs 56 through 77 and AOCs E and F. Since the Consent Order was signed, an additional site (SWMU 78) was designated by the USEPA after the discovery of the release of potential hazardous constituents from a transformer storage pad at NAPR, and official notification was sent by the Navy.



### 3.2.5 Identification of Uncontaminated Property

The Community Environmental Response Facilitation Act (CERFA) stipulates the federal government must identify uncontaminated property prior to transfer. Uncontaminated property is defined as “real property on which no hazardous substances and no petroleum products or their derivatives were known to have been released or disposed of” [42 U.S.C. 9620 (h)(4)(A)]. The law stipulates specific steps that must be taken in order to determine which property is uncontaminated. The ECP effort was designed to meet these statutory requirements for the identification of uncontaminated property. The CERFA Identification of Uncontaminated Property must be submitted to the appropriate state official, in this case the Puerto Rico EQB, for concurrence. The Navy submitted the Identification of Uncontaminated Property to the Puerto Rico EQB on 21 March 2005. Comments from the Puerto Rico EQB on the CERFA Uncontaminated Property report were received in May 2005.

### 3.2.6 Management of Hazardous Materials and Substances

Historically, NAPR used a wide variety of hazardous materials for routine and specialized use relating to vehicle maintenance, ship maintenance, aircraft maintenance, weapons systems maintenance, facility maintenance, and equipment maintenance. Materials used included fuels, oils and lubricants, solvents, cleaning compounds, paints, thinners, corrosives, and antifreeze. Materials were distributed in limited quantities to various work centers throughout the installation.

NAPR has historically been classified as a RCRA large-quantity hazardous waste generator. A large-quantity generator is defined as a facility generating more than 2,200 pounds of hazardous waste, or over 2.2 pounds of acutely hazardous waste per month (USEPA 1996). NAPR records identify three types of hazardous waste storage areas utilized at the installation:

- Hazardous Waste Storage Facilities, which are permitted storage facilities where hazardous waste is stored prior to offsite transport and disposal;
- Short-term work center hazardous waste accumulation areas (HWAAs) where more than 55 gallons can be stored for up to 90 days prior to treatment or disposal; and
- Work center satellite accumulation areas (SAAs) where up to 55 gallons can be stored indefinitely.

### Tank Management Program and Petroleum Spills

Operation of USTs is regulated under 40 CFR Part 280 (Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks) and 40 CFR Part 281 (Approval of State Underground Storage Tank Programs). The territory of Puerto Rico’s UST program is approved under 40 CFR § 282.102, Puerto Rico State-Administered Program, subtitle I of RCRA.

The ECP assessment identified eight storage tank sites where monitored natural attenuation (MNA) activities are ongoing, as required by the Storage Tank Management Division of the Puerto Rico EQB. Four of the eight sites are included within Parcel III.

Aside from the MNA sites, other fuel spills/releases are being addressed under the IR Program. In addition to both the tank management program and the IR Program, a jet propellant (JP)-5 jet fuel spill in 1999 resulted in impacts to a mangrove area located in the vicinity of Tow Way Drive and Enseñada Honda. Given the limited accessibility of the area, little cleanup was possible. A Natural Resources Damage Assessment (NRDA) for the impacted areas was conducted in 2002 and mitigation efforts are ongoing (U.S. Navy 2004).

### 3.2.7 Lead-Based Paint and Asbestos

ACM and abatement and LBP products are regulated under Title II of the Toxic Substances Control Act (Asbestos Hazard Emergency Response), which authorized the USEPA to determine the extent of the risk to human health posed by asbestos and lead in public and commercial buildings and the means to respond to any risk. Asbestos was used in the building construction industry (e.g., roofing shingles, ceiling and floor tiles, cement, textiles, coatings, etc.) (USEPA 2011d).

As part of the ECP effort, detailed surveys of the installation were performed to document the current status of LBP and ACM within installation facilities. These surveys were performed in accordance with applicable regulations and industry standard practices. Three separate reports document this work conducted in support of the ECP effort and are incorporated into the ECP document by reference:

- Final Asbestos Inspection Report for Non-Residential Buildings, Naval Activity Puerto Rico, July 1, 2005 (includes bachelor housing);
- Final Asbestos Inspection Report for Military Family Housing, Naval Activity Puerto Rico, July 1, 2005; and
- Final Lead-Based Paint/Risk Assessment Report for Military Family Housing, Naval Activity Puerto Rico, July 1, 2005.

## 3.3 Infrastructure Facilities and Utilities

### 3.3.1 Potable Water Supply and Distribution

Potable water is obtained from the Rio Blanco River. According to an agreement between the Navy and the Commonwealth of Puerto Rico, the Navy can withdraw up to 7 million gallons of raw water per day from two intake points on the Rio Blanco, approximately 10 miles west of NAPR. However, these water rights will cease once the Navy no longer has a presence at NAPR. The average amount of water withdrawn from the Rio Blanco River by the Navy over a nine-month period has been recorded at 1.012 million gallons per day (mgd) (CB Richard Ellis *et al.* 2004).

The existing potable water treatment system (WTP) on base draws water from intakes on the Rio Blanco River. The raw water is then gravity conveyed through an 11-mile, 27-inch reinforced concrete pipe to a 46.1-million gallon reservoir to the west of FDR Drive. The raw water is treated at the WTP on Langley Drive, just north of the reservoir, using a variety of settling basins and filters for treatment.

The plant's maximum rated capacity is 4.0 mgd. The water treatment plant is operated as a conventional, rapid sand filter plant. The potable water distribution system at NAPR is extensive, including approximately 68 miles of distribution pipes, seven pump stations, and five storage tanks with a combined storage volume of 2.6 million gallons. The water treatment facility, reservoir, and distribution system were originally constructed in the 1940s. Major repairs and facility upgrades were completed at the treatment plant in 1976 and 1986 (U.S. Navy 2004).

The WTP currently operates at low demand conditions producing an estimated 550,000 gallons per day. The water treatment system at NAPR is currently meeting all applicable regulations for finished water quality as mandated by the Puerto Rico Department of Health. Available water quality data indicate that the tested parameters on the raw water do not exceed the USEPA's limits for drinking water. No previous or ongoing violations have been reported for the water treatment system (U.S. Navy 2004); however, the WTP does not currently comply with the Puerto Rico Aqueduct and Sewer Authority

(PRASA) and Puerto Rico EQB design rules for a single conventional WTP with a current production capacity estimated at 1.2 mgd (LRA 2010b).

### 3.3.2 Wastewater Treatment

Wastewater generated at NSRR was collected and conveyed to one of three wastewater treatment plants (WWTPs) on the property for treatment and final disposal:

- Bundy WWTP (permitted capacity of 0.65 mgd);
- Capehart WWTP (permitted capacity of 1.13 mgd); and
- Forrestal WWTP (permitted capacity of 1.01 mgd).

The current peak capacity and permitted capacity are unknown (LRA 2010b). Each WWTP provides tertiary treatment before the treated effluent is discharged into the ocean via outfalls (U.S. Navy 2004). The Forrestal (southeast) WWTP serves the Parcel III properties (LRA 2010b). When NSRR was an active military base, the combined average daily treated flow from the three plants was approximately 1.3 mgd (Garcia 2004). Together, the WWTPs currently treat and discharge approximately 160,000 gallons per day to the ocean under a National Pollutant Discharge Elimination System (NPDES) permit (LRA 2010b).

The wastewater collection system at NAPR consists of approximately 32.5 miles of gravity lines, 9.5 miles of force mains, approximately 906 manholes, and 28 pump stations. The wastewater system at NAPR also includes eight septic tanks that were installed in remote areas of NAPR where extension of the sewer system was not considered to be economically feasible (U.S. Navy 2004).

### 3.3.3 Piers and Shoreline Infrastructure

The majority of piers and related shoreline infrastructure are located between the natural peninsulas at Bahia de Puerca (Figure 3-3). For example, the former submarine drydock/wetslip facility has an approximate width of 140 feet, an approximate length of 1,100 feet, and a recorded berth depth of 40 feet; however, berth space has been affected by fill and sedimentation with some areas reduced to approximately 25 feet in depth. Although the drydock/wetslip facility shows signs of deterioration, it remains in relatively good condition for infrastructure roughly 50 years old. The customs pier, adjacent to the drydock/wetslip facility to the south, is approximately 184 feet in width and 35 feet in length.

The 55-year old Enseñada Honda pier (Pier 3) resides approximately 10 feet above mean water level (MWL) and contains two berths with 40-foot depths on the north side, and 44-foot depths south side. A concrete deck of approximately 120 square feet supports seven mooring stations on each side of Pier 3 (14 stations in total). The utility and fuel lines connected to Pier 3 are outdated and in poor condition. Pier 2 also is located at Enseñada Honda and has an assumed water depth of approximately 38 feet. This pier is serviced by telecommunications, sanitary sewer, water, and electrical connections; however, evidence shows deterioration adjacent to the bulkhead.

There is an existing small craft marina equipped with 75 boat slips, 12 feet in width each, and 25 mooring locations along its adjacent bulkhead. The individual boat slips are assumed to have an approximate draft of 6 to 8 feet. Service connections to these finger piers include potable water and electricity. The infrastructure provided by the small craft marina remains in use and is well maintained.





Source: World Imagery, 2009

**Figure 3-3**  
Existing Infrastructure  
Naval Activity Puerto Rico

The bulkhead system extends approximately 4,974 linear feet between piers and maintains an adjacent depth of 35 to 40 feet. For the Parcel III properties, the bulkhead system is comprised of non-continuous sections. The drydock/wetslip pier commences the bulkhead system for the Parcel III properties and extends approximately 250 feet to the west of the former customs pier at Camp Moscrip (LRA 2010b).

### 3.3.4 Stormwater

There are more than 80 stormwater outfalls in the mangrove areas and surrounding bays at NAPR. These outfalls receive flow from a system of drop inlets, drainage ditches, culverts, and pipes from both developed (industrial and residential) and undeveloped areas and sheetflow from both paved and unpaved areas. The vast majority of these outfalls are not regulated under the USEPA's Multi-Sector General Permit program because they receive stormwater from non-industrial activities or via sheetflow from non-industrial areas (U.S. Navy 2004).

Six outfalls at NAPR are regulated under the USEPA's Multi-Sector General Permit program. NSRR obtained initial permit coverage in 1995 and reapplied for the permit in 2000, which became effective upon submittal (U.S. Navy 2004). Recent inspections conducted under NAPR's Storm Water Pollution Prevention Plan (SWP3) did not identify any significant sources of potential environmental contamination associated with stormwater discharges, outfalls, or storm ditches on the property.

### 3.3.5 Solid Waste

Landfill Technologies, Inc. currently manages municipal solid waste for a population of approximately 187,185, including the municipalities of Fajardo, Ceiba, and Naguabo (LRA 2010b). The NSRR 2001 *Final Solid Waste Study* shows 1999 and 2001 estimates of total annual station generation of non-hazardous solid waste—before notification of station closure—at 13,582 tons. Before station closure and downsizing of station activities, solid waste was handled and transported by station personnel and private contractors within and from NSRR. Wastes that were recoverable or resalable, as well as oversized wastes, were collected by the Transportation Division and by various public works shops. Private contractors handled all recoverable wastes such as waste oil, dirtied fuels, batteries, tires, and scrap metals. The Defense Logistics Agency handles resalable wastes. Since 1999, when a new cell at the landfill became operational, all other solid waste was disposed in the station's landfill. (Department of the Navy 2007)

### 3.3.6 Power

NAPR purchases electricity from the Puerto Rico Electric Power Authority (PREPA), which transfers electrical power to the property at two delivery points: two 38-kilovolt (kV) circuits and a single 38-kV circuit at the airfield. The 38-kV circuits serve 11 substations on the property and those substations in turn serve loads in their vicinity at 13.2 kV, 4.16 kV, and 480 kV (CB Richard Ellis *et al.* 2004). All loads on the distribution circuits can be fed from more than one substation.

The Daguao and Airport stations, both located outside of Parcel III, receive the transmission and distribute to several substations, four of which service Parcel III. In 2001, the maximum demand for the Daguao Service was estimated at approximately 15,788 kilovolt-amperes (kVA). Annual consumption was estimated at approximately 95,496 megawatts per hour. The airfield had a maximum demand of approximately 1,462 kVA and annual consumption of approximately 7,682 megawatts (LRA 2010b).



### 3.3.7 Transportation

NAPR may be accessed from the west via PR-3, which begins at an intersection with PR-1 in San Juan where it functions as a four-lane, grade-separated boulevard and continues to Fajardo as a divided highway. In Fajardo, PR-53 begins and PR-3 becomes a one-lane per direction rural road. Both roads extend in a southwest to northeast direction along the western boundary of the property. Primary roads within NAPR include Tarawa Drive, Forrestal Drive, Langley Drive, FDR Drive, Bennington Drive, and Boxer Drive. These roads are two lanes wide, paved, and allow access to nearly all areas of the property.

Entry to NAPR is restricted to two gates:

- Gate 1 is at the north end of the property at the intersection of Tarawa Drive and Boxer Drive and is accessed via PR-3; and
- Gate 3 is south of the airfield at the east end of Bennington Road and can be accessed by both PR-3 and PR-53.

With respect to Parcel III, the road system comprises approximately 87,548 linear feet while paved parking areas total approximately 468,240 square feet (LRA 2010b).

## 3.4 Topography, Geology, and Soils

### 3.4.1 Topography

The regional topography of NAPR consists of an interrupted, narrow, coastal plain with small valleys extending from the Sierra de Luquillo range. Elevations within NAPR range from sea level to approximately 297 feet above mean sea level (MSL). Immediately west of NAPR, the hills rise abruptly to heights of 800 to 1,500 feet above MSL. The tallest peak is approximately 1.2 miles west of the NAPR boundary (Department of the Navy 2007).

Two ridges on NAPR are within or in the vicinity of the properties that make up Parcel III: one that comprises the central ridge of the Delicias Hills, and a second that runs the length of the northern peninsula. Along the shoreline, relief is low and characterized by lagoons, tidal wetlands, and mangroves (see Figure 3-4).

#### **Port Caribe (Zone 1), Caribbean Riviera (Zone 2), El Yunque (Zone 3), and Marsh Vista (Zone 4)**

The area that encompasses Zones 1 through 4 is generally flat with steeper slopes encircling the Bahía de Puerca. The central ridge that runs the length of the northern peninsula at NAPR (where the proposed Marsh Vista would be located) forms a natural division between the hills and the proposed Port Caribe located to the southwest and the Los Machos Forest located to the north, east, and south. The area elevation ranges from less than 10 to 204 feet above MSL (see Figure 3-4). Topography has not been a constraint on industrial development in the port-waterfront area (Department of the Navy 2007).



**Figure 3-4  
Topography  
Naval Activity Puerto Rico**



### **Environmental Retreat (Zone 5)**

The Los Machos Forest consists of low-lying, nearly continuous undeveloped mangrove forests and wetlands on the mainland NAPR property. Within this area, an existing sand and gravel road (i.e., Lake Chamberlain Road) traverses across the southern portion of the Los Machos Forest, just north of Punta Puerca and then veers north, along the coastline on the east side of Los Machos forest (see Figure 3-3). Lake Chamberlain Road provides access between the former NAPR waterfront/industrial area and the small arms range. As discussed in Section 3.1.4 (also see Appendices J and Q of the EDC Application and Business Plan [LRA 2010b]), this road will be transferred via a PBC to provide access to the proposed Environmental Retreat from the proposed Port Caribe/Caribbean Riviera areas. Along this existing road, the topography ranges from approximately 10 to 30 feet above MSL (see Figure 3-4). Northeast of this area at Punta Media Mundo, where the proposed Environmental Retreat would be located, wetlands and mangroves give way to a rise in elevation from sea level to 133 feet above MSL (see Figure 3-4).

### **Community College (Zone 7)**

Zone 7 encompasses portions of the Delicias Hills, an undulating elevated ridge that would buffer airport activity from the central portion of the proposed Main Street/Town Center area. Elevations in Zone 7 range from 30 to 130 feet above MSL (see Figure 3-4). Development in the area is restricted to the hilltops and the foothill areas. Although the tops of the hills and foothills have been cleared and leveled to accommodate past construction, the hillsides are sloped significantly enough to limit development (Department of the Navy 2007).

### **Ceiba Park (Zone 11)**

The area within the proposed Ceiba Park consists of low-lying pastures and wetland areas with area elevation ranges from 0 feet to 15 feet above MSL (see Figure 3-4).

## **3.4.2 Geology**

The island of Puerto Rico is part of the Caribbean tectonic plate. An east-west trending spine of mountains (the Cordillera Central) forms the backbone of the island. These mountains are volcanic in origin, and the oldest rocks are Jurassic agglomerates (Department of the Navy 2007).

Puerto Rico is located within a seismically active zone. Earthquakes affecting the island are usually low to moderate-focus events; however, three destructive earthquakes have occurred on the island within the past 120 years. Seismically active areas characterize the ocean floor east, west, and north of the island. NAPR is located in Seismic Zone 3, which presents a moderate earthquake hazard (Zone 4 is the maximum seismic risk zone) (Department of the Navy 2007).

## **3.4.3 Soils**

The soils at NAPR are primarily sediments of mixed origin or residuum from volcanic rocks. Soil depths range from shallow (less than 1 foot) to deep (more than 6 feet). In general, the soils are nearly level to strongly sloping; poorly drained in low-lying areas and well drained on side slopes; and susceptible to erosion where slopes exceed 5%. Many soils of the area have a high shrink-swell potential (Department of the Navy 2007).



### **Port Caribe (Zone 1)**

Port Caribe is primarily composed of developed urban areas near the waterfront. The remaining small, undeveloped portions are located away from the shoreline and are underlain by Descalabrado Clay Loam, 20 to 40% eroded (see Figure 3-5).

### **Caribbean Riviera (Zone 2)**

The proposed Caribbean Riviera area is primarily composed of developed urban areas. Small undeveloped areas near the mainland shoreline are underlain by Descalabrado Clay Loam, 5 to 12% slopes, eroded, and Rock Land. The Isla Cabras is underlain by Descalabrado Clay Loam, 20 to 40% slopes, eroded, and Tidal Swamp (see Figure 3-5).

### **El Yunque (Zone 3)**

The portion of Zone 3 that lies along the north side of the Bahía de Puerca (i.e., where the proposed Harborfront Village would be located) is composed of developed urban areas. The portion of Zone 3 located on Punta Puerca is predominantly underlain by Descalabrado Clay Loam, 20 to 40% slopes, eroded and Descalabrado-Rock Land Complex, 40 to 60% slopes, with smaller areas of Descalabrado and Guayama Soil, 20 to 60% slopes, eroded and urban development (see Figure 3-5).

### **Marsh Vista (Zone 4)**

Zone 4 is primarily underlain by Descalabrado Clay Loam, 20 to 40% slopes, eroded and Jacana Clay, 5 to 12% slopes, eroded. Smaller areas of urban development are also located within this area (see Figure 3-5).

### **Environmental Retreat (Zone 5)**

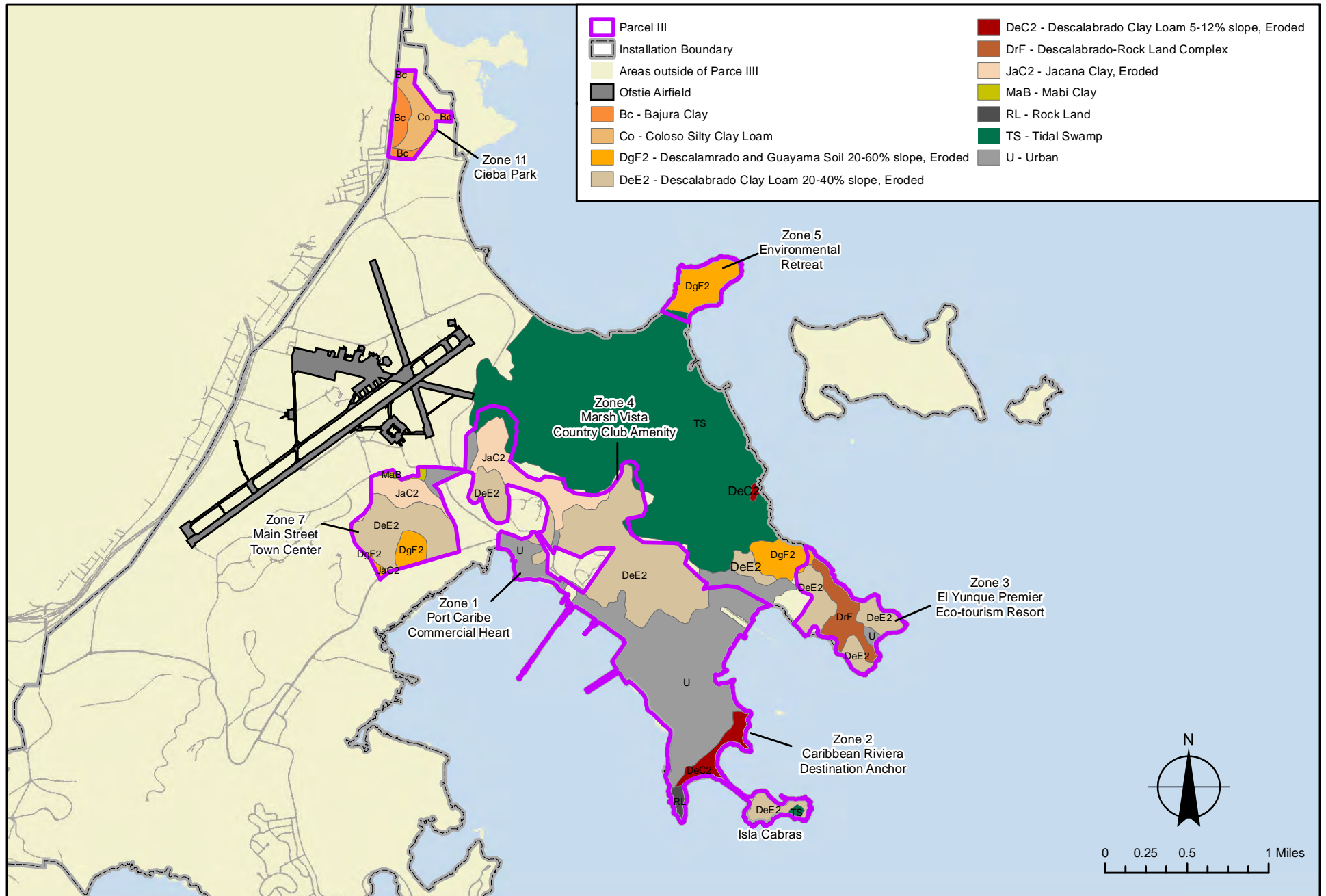
The area for the proposed Environmental Retreat is underlain by Descalabrado and Guayama Soil, 20 to 60% slopes, eroded and a small area of Tidal Swamp on the western boundary. The Lake Chamberlain Road is underlain primarily by Tidal Swamp and smaller areas of Descalabrado Clay Loam, 5 to 12% slopes, eroded, Descalabrado Clay Loam, 20 to 40% slopes, eroded, and Descalabrado and Guayama Soil, 20 to 60% slopes, eroded (see Figure 3-5).

### **Community College (Zone 7)**

Zone 7 is primarily underlain by Descalabrado Clay Loam, 20 to 40% slopes, eroded and smaller areas of Jacana Clay, 5 to 12% slopes, eroded; Descalabrado and Guayama Soil, 20 to 60% slopes, eroded; and Mabi Clay, 0 to 5% slopes (see Figure 3-5).

### **Ceiba Park (Zone 11)**

Zone 11 is underlain by Bajura Clay, Frequently Flooded, and Colosa Silty Clay Loam, Occasionally Flooded (see Figure 3-5).



Source: NRCS 2005

**Figure 3-5**  
**Soil Classifications**  
**Naval Activity Puerto Rico**

## 3.5 Hydrology

### 3.5.1 Surface Water

Surface waters within NAPR are part of the Puerto Medio Mundo to Playa Sardinera Coastal Watershed and Bahia Algodones to Enseñada Honda Coastal Watershed (United States Geological Survey [USGS] 2010).

Several streams that originate in the foothills northwest of NAPR flow through NAPR and drain the lands that make up NAPR. The three main drainage systems in these watersheds include the Rio Daguao, Quebrada Aquas Clara, and Quebrada Ceiba (see Figure 3-6). These waterways serve as an important source of freshwater flow and nutrients to estuaries and mangrove forests within the area. The stream systems draining NAPR are subject to dramatic flooding at any time of the year, but especially during the rainy season (May to November). Moreover, development and changes in land use in upstream areas outside of NAPR as well as changes on NAPR lands directly affect the drainage systems flowing through NAPR (Department of the Navy 2007).

#### 3.5.1.1 Rio Daguao Drainage System

The Rio Daguao is the largest river system that flows through NAPR. Its drainage basin covers about 4,380 acres. The system is part of the Bahia Algodones to Enseñada Honda Coastal Watershed (USGS 2010). An extensive area in the southwest portion of NAPR associated with Rio Daguao and its tributaries is mapped as 100-year flood zone (see Figure 3-6).

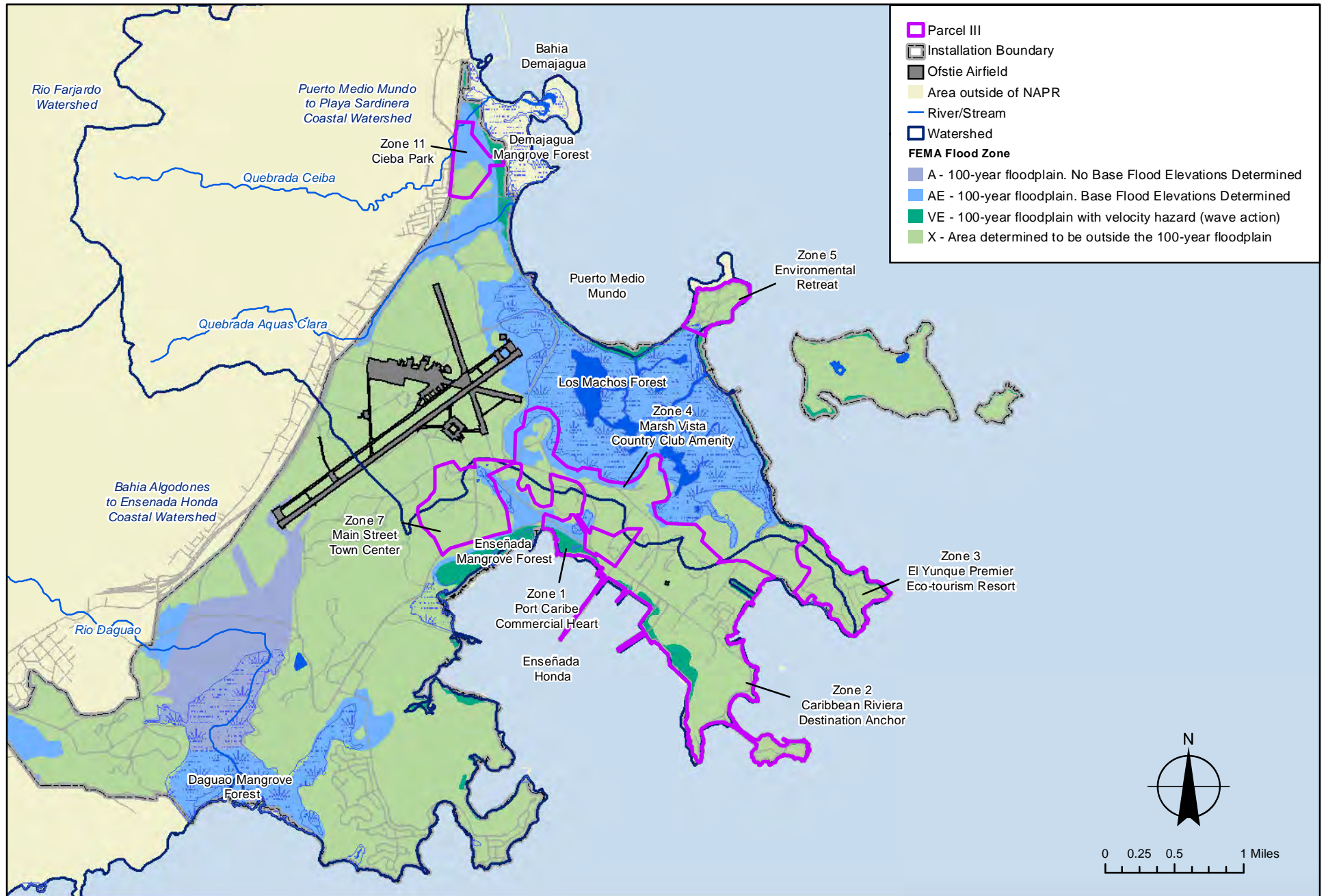
The Rio Daguao originates in the hills northwest of NAPR, flows past the Ward of Daguao, enters NAPR in the western portion of the installation west of the proposed Community College area (Zone 7), and flows south to the Daguao Mangrove Forest (see Figure 3-6). The main channel of Rio Daguao is fed by small intermittent streams that drain steep hillsides, many of which have soils prone to rapid runoff and side slopes of 30% or greater. Gutters, ditches, and paved areas within the Ward of Daguao and land cleared for pasture and development within the watershed contribute to accelerated runoff (Department of the Navy 2007).

#### 3.5.1.2 Quebrada Aquas Clara Drainage System

The Quebrada Aquas Clara drainage system is part of the Puerto Medio Mundo to Playa Sardinera Coastal Watershed and flows through the northern portion of NAPR (USGS 2010). The system drains approximately 1,320 acres of land and includes an extensive area located within Los Machos Forest designated as a 100-year floodplain (see Figure 3-6).

This drainage system has been significantly altered from its natural course. Quebrada Aquas Clara originally flowed southeast through the central portion of NAPR to Enseñada Honda. In association with the construction of Ofstie Airfield, Quebrada Aquas Clara was rerouted to flow through the northern portion of NAPR and empty into Puerto Medio Mundo (Department of the Navy 2007).

Quebrada Aquas Clara originates in the hills southwest of the community of Ceiba and flows northeast to the boundary of NAPR, then continues northeast along the north side of Boxer Drive before flowing through the Demajagua Mangrove Forest and into Puerto Medio Mundo. Rapid runoff from the steep slopes, and roadbeds, ditches, storm drains, and agricultural activities in the Ward of Aquas Claras cause stream flow to concentrate quickly (Department of the Navy 2007).



Source: National Hydrology Dataset 2009, FEMA 2009

**Figure 3-6**  
**Drainage and Floodplains**  
**Naval Activity Puerto Rico**



### **3.5.1.3 Quebrada Ceiba Drainage System**

The Quebrada Ceiba drainage system comprises approximately 1,575 acres of land, including 50 acres at NAPR (Department of the Navy 2007). Quebrada Ceiba is part of the Puerto Medio Mundo to Playa Sardinera Coastal Watershed (USGS 2010) and originates in the hills west of Santa Macia, flows east through Santa Macia, and enters NAPR near the intersection of Route 979 and Los Machos Road. It continues northeast across the northernmost portion of NAPR through the Demajagua Mangrove Forest and into Bahia Demajagua. The majority of the drainage basin is civilian land west of NAPR and includes steep slopes and densely developed valley areas (Department of the Navy 2007). The land at NAPR is within the 100-year floodplain, and land use within the civilian areas contributes to flooding.

### **3.5.1.4 Other Drainages**

Smaller drainages collect water from NAPR lands and channel it into the Los Machos Forest and mangroves along Enseñada Honda. Drainage from the northeast portion of Ofstie Airfield flows east via multiple channels into the Los Machos Forest. Additional improved channels direct drainage from the central portion of Ofstie Airfield (taking advantage of the original channel for Quebrada Aguas Clara; see Section 3.5.1.2) and from the existing NAPR downtown area, southeast into mangroves along Enseñada Honda. Areas associated with these drainages and with the Los Machos Mangrove Forest and mangroves along Enseñada Honda are mapped as 100-year floodplain (see Figure 3-6).

### **Port Caribe (Zone 1)**

Port Caribe is within the Bahia Algodones to Enseñada Honda Coastal Watershed (USGS 2010) (see Figure 3-6).

### **Caribbean Riviera (Zone 2)**

The proposed Caribbean Riviera area is within the Bahia Algodones to Enseñada Honda Coastal Watershed (USGS 2010) (see Figure 3-6).

### **El Yunque (Zone 3)**

El Yunque is within the the Puerto Medio Mundo to Playa Sardinera Coastal Watershed and Bahia Algodones to Enseñada Honda Coastal Watershed (USGS 2010) (see Figure 3-6).

### **Marsh Vista (Zone 4)**

The proposed Marsh Vista area is within the Puerto Medio Mundo to Playa Sardinera Coastal Watershed and Bahia Algodones to Enseñada Honda Coastal Watershed (USGS 2010) (see Figure 3-6).

### **Environmental Retreat (Zone 5)**

The proposed Environmental Retreat area is within the Puerto Medio Mundo to Playa Sardinera Coastal Watershed. Lake Chamberlain Road is within the Puerto Medio Mundo to Playa Sardinera Coastal Watershed and Bahia Algodones to Enseñada Honda Coastal Watershed (USGS 2010) (see Figure 3-6).

### **Community College (Zone 7)**

The proposed Community College area is within the Puerto Medio Mundo to Playa Sardinera Coastal Watershed and Bahia Algodones to Enseñada Honda Coastal Watershed (USGS 2010) (see Figure 3-6).

## **Ceiba Park (Zone 11)**

The proposed Ceiba Park is within the Puerto Medio Mundo to Playa Sardinera Coastal Watershed (USGS 2010) (see Figure 3-6).

### **3.5.1.5 Water Quality Classifications, Uses, and Standards-Surface Water**

The Puerto Rico EQB designates water quality classifications for Puerto Rico's coastal and estuarine waters, and surface waters pursuant to the Environmental Public Policy Law (PR Law 416, Title 12 Sections 1121-1127). Water quality designations are specified in the Puerto Rico Water Quality Standards Regulation, as amended.

Coastal and estuarine waters at NAPR are designated as Class SB (Puerto Rico Water Quality Standards Regulation, as amended). Class SB waters are defined in Section 3.2.2(A) of the regulation as "coastal waters and estuarine waters intended for use in primary and secondary contact recreation, and for propagation and preservation of desirable species, including threatened or endangered species."

Surface waters at NAPR are designated Class SD (Puerto Rico Water Quality Standards Regulation, as amended, on March 2003). Class SD waters are defined in Section 3.4.4(A) of the regulation as "surface waters intended for use as a raw source of public water supply, propagation and preservation of desirable species, including threatened or endangered species, as well as primary and secondary contact recreation." Primary contact recreation may be excluded in streams or stream segments that do not comply with standards for this classification.

### **3.5.2 Groundwater**

The majority of residents in Puerto Rico obtain their water supply from six surface water reservoirs. Similarly, potable water at NAPR is not obtained from groundwater; it is obtained from two intake points on the Rio Blanco River, located approximately 10 miles west of NAPR (see Section 3.3.1). Although only about 16% obtain potable water from groundwater, the natural chemical quality of water in these aquifers is suitable for most uses. Groundwater is generally a calcium magnesium bicarbonate type, which causes the water to be very hard (Department of the Navy 2007).

The principal aquifer in the NAPR area is an alluvial valley aquifer, consisting of beds of clay, sand, and gravel, and rock fragments to a depth of 98 feet or less. Yields of wells in the alluvium are commonly 50 to 150 gallons per minute (Department of the Navy 2007).

Volcaniclastic, igneous, and sedimentary aquifers of Cretaceous and Tertiary age also are present in the area. Compared to the alluvial aquifers, these are of minor importance and yield because water is stored and transmitted in fractures in the rock. Wells completed in these aquifers typically yield less than 10 gallons per minute (Department of the Navy 2007).

### **Water Quality Classifications, Uses, and Standards-Ground Water**

The EQB designates water quality classifications for Puerto Rico's groundwater pursuant to the Environmental Public Policy Law (PR Law 416, Title 12 Sections 1121-1127). Water quality designations are specified in the Puerto Rico Water Quality Standards Regulation.

Groundwater at NAPR is designated SG2 (Department of the Navy 2007). As defined in Section 2.3.1.2 of Puerto Rico Water Quality Standards Regulation, as amended, Class SG2 waters "include groundwaters which due to high total dissolved solids concentration (concentrations greater than 10,000 mg/L [milligrams per liter]) are not fit as a source of drinking water supply even after treatment."



## 3.6 Terrestrial Environment

Of the approximately 1,300 acres contained within Parcel III, approximately 41% is developed and currently maintained while the remaining 59% consists of undeveloped terrestrial and marine communities. Terrestrial vegetation is described in Section 3.6.1, while wildlife is discussed in Section 3.6.2. The marine environment is discussed in Section 3.7.

### 3.6.1 Vegetation

The coastal area of Puerto Rico near Ceiba, including NAPR, is classified as a subtropical dry forest ecological life zone (Department of the Navy 2007). Historical land use of the property, which has included grazing and development associated with NAPR, has led to the replacement of the historic climax upland community with scrub/forest communities (Department of the Navy 2007).

The majority of the undeveloped terrestrial areas at NAPR are characterized as coastal scrub forest communities. The secondary growth of thick scrub is dominated by leadtree (*Leucaena* spp.), box briar (*Randia aculeate*), sweet acacia (*Acacia farnesiana*), and Australian corkwood tree (*Sesbania grandiflora*) that grew in areas that were cleared for grazing prior to acquisition by the Navy. Tree species include ucar (*Bucida buceras*), sandbox (*Hura crepitans*), figs (*Ficus* sp.), flamboyant tree (*Delonix regia*), Puerto Rican royal palm (*Roystonea borinquena*), ginep (*Melicoccus bijugatus*), and Indian almond (*Terminalia catappa*) (Department of the Navy 2007). Tree heights rarely exceed 50 feet and the vegetation has minimal commercial value, but it does provide erosion protection and promotes groundwater recharge, providing valuable watershed protection (Department of the Navy 2007).

Terrestrial freshwater wetland environments at NAPR include wet meadows and marshes dominated by cattails (*Typha* spp.) and grasses (*Panicum* spp. and *Paspalum* spp.) and wet coastal scrub forests (Department of the Navy 2007). These freshwater wetlands serve as habitat for birds and reptiles, act as filters to trap sediments that could otherwise harm coral reefs and seagrass beds, and buffer the impact of flash flooding that results from steep slopes, torrential rains, and land use outside NAPR (Department of the Navy 2007).

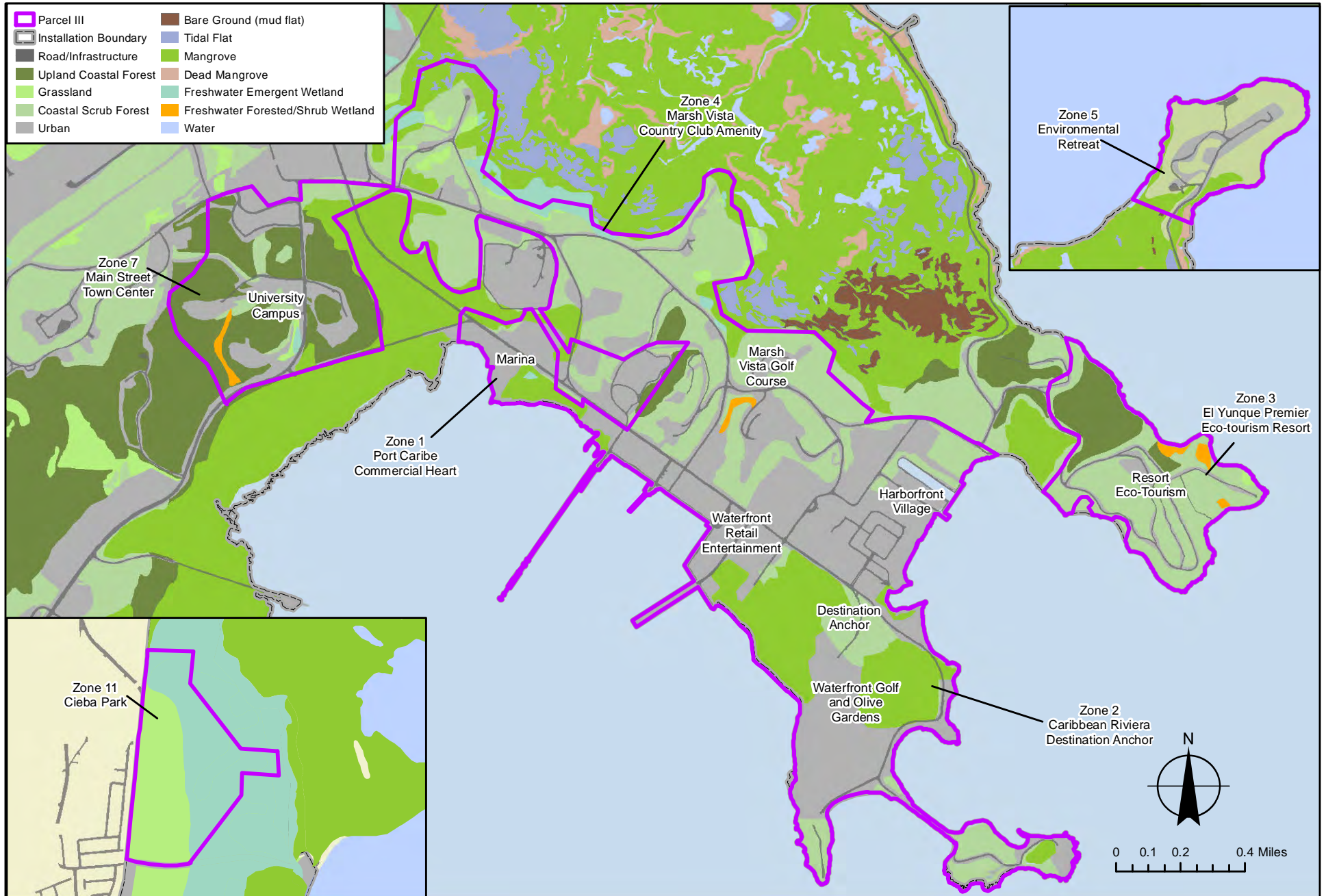
The terrestrial vegetation found within undeveloped areas of each proposed zone in Parcel III is described below and illustrated on Figure 3-7.

#### **Port Caribe (Zone 1)**

The majority of the Port Caribe area consists of developed areas associated with the waterfront area bordering Enseñada Honda. Undeveloped areas include a small area of coastal scrub forest, and several small mangroves along the east side of Enseñada Honda. Currently no buffer exists between existing developed areas and the mangroves and Enseñada Honda (site visit conducted by Ecology and Environment, Inc., October 26, 2010). No freshwater wetlands lie within or adjacent to the Port Caribe area. The vegetative communities in Zone 1 are illustrated on Figure 3-7.

#### **Caribbean Riviera (Zone 2)**

Undeveloped areas within the proposed Caribbean Riviera area consist of coastal scrub forest and mangroves. No freshwater wetlands lie within or adjacent to the Caribbean Riviera area. Mangroves associated with Enseñada Honda lie along the western and southeastern boundary of the Caribbean Riviera area and an additional mangrove area lies within Isla Cabras. The vegetative communities in Zone 2 are illustrated on Figure 3-7.



Source: Geo-Marine, 2005; NWI, 2010

**Figure 3-7**  
**Vegetative Communities and Land Cover**  
**Naval Activity Puerto Rico**

### **El Yunque (Zone 3)**

The portion of Zone 3 which lies along the north side of the Bahía de Puerca (i.e., where the proposed Harborfront Village would be located) is composed almost entirely of developed urban areas with a few small areas of coastal scrub forest. The undeveloped areas within El Yunque on Punta Puerca consist primarily of coastal scrub forest, and upland coastal forest. Small freshwater forested/shrub wetlands exist along the northern edge of Punta Puerca. The vegetative communities in Zone 3 are illustrated on Figure 3-7.

### **Marsh Vista (Zone 4)**

Undeveloped areas within the Marsh Vista area consist primarily of coastal scrub forest, upland coastal forest and grassland. Shallow tidal flats, mangroves, freshwater emergent wetlands, and open water lie along this zone's northern boundary which is adjacent to the Los Machos Forest, a tidal wetland complex that includes mangroves, tidal flats, mud flats, and open water environments. To the west of Marsh Vista are mangroves associated with Enseñada Honda. The vegetative communities in Zone 4 are illustrated on Figure 3-7.

### **Environmental Retreat (Zone 5)**

The proposed Environmental Retreat is located on Punta Media Mundo. Undeveloped areas consist of coastal scrub forest communities. Punta Medio Mundo has an elevation of approximately 40 m and is surrounded by mangroves and tidal wetlands (see further discussion in Section 3.7.4) associated with the Los Machos Forest and Puerto Medio Mundo. Lake Chamberlain Road traverses coastal scrub forest along the southern portion Los Machos Forest, and mangrove and dead mangrove communities along the coastline. The vegetative communities in Zone 5 are illustrated on Figure 3-7.

### **Community College (Zone 7)**

Undeveloped areas within the proposed Community College area include primarily upland coastal forest, coastal scrub forest, and small areas of mangroves in the extreme northeast corner and north of Marina Bypass Road; along the southern boundary of the parcel boundary. Two small freshwater wetlands lie within the Community College area. These wetlands are located along the southern boundary of the Community College area just north of Langley Drive. Mangroves associated with Enseñada Honda lie to the southern and eastern boundaries. Currently undeveloped forested and scrub vegetation in the Community College area act as a buffer zone for adjacent freshwater, tidal, and marine ecosystems. Vegetation slows surface water movement during storm events and allows excess surface water to infiltrate to groundwater. This infiltration provides protection against erosion on the slopes and protects the existing residential and commercial area at the foot of the slopes from potential flooding (Department of the Navy 2007). The vegetative communities in Zone 7 are illustrated on Figure 3-7.

### **Ceiba Park (Zone 11)**

Undeveloped areas within the Ceiba Park area include a mix of grassland, and freshwater emergent wetlands, the majority of which are currently used for grazing (Department of the Navy 2007). Freshwater emergent wetlands are located along the eastern half of the Ceiba Park area (see Figure 3-7).

## **3.6.2 Wildlife**

Wildlife at NAPR comprises multiple native reptile, amphibian, and avian species as well as a host of introduced mammal species. Six species of snakes are known to occur at NAPR, including the Puerto Rican boa (*Epicrates inornatus*), Virgin Island tree boa (*Epicrates monesisi granti*), Puerto Rican

racers (*Alsophis portoricensis*), Puerto Rican garden snake (*Arrhyton exiguum*), Virgin Island blindsnake (*Typhlops richardi*), and Puerto Rican wetland blindsnake (*Typhlops rostellatus*) (Department of the Navy 2007). A large mongoose population has reduced the reptile population.

Multiple terrestrial and seabird species use the beach strand, grassland, upland forest, and mangrove forest habitats at the station. Numerous species of frogs and toads occur, including the coqui, a small tree frog. The mammal population is predominantly made up of introduced species that include mongoose, dogs, cats, Norway and grey-bellied rats, and mice (Department of the Navy 2007).

## 3.7 Marine Environment

The marine environment adjacent to NAPR is typical of tropical, shallow, coastal waters. Such waters are characterized by warm temperatures (i.e., 75 to 84 degrees Fahrenheit); stable salinities of 35 parts per thousand or slightly higher; moderately high physical energy from waves, currents, and tides; clear water that allows deep light penetration; lower concentrations (relative to temperate waters) of dissolved nutrients; and a high diversity of habitats and species (Department of the Navy 2007). Marine habitats in the vicinity of NAPR include open water, coral reefs, seagrass beds, sandy beaches, mangroves, and unconsolidated coarse sandy benthic environments.

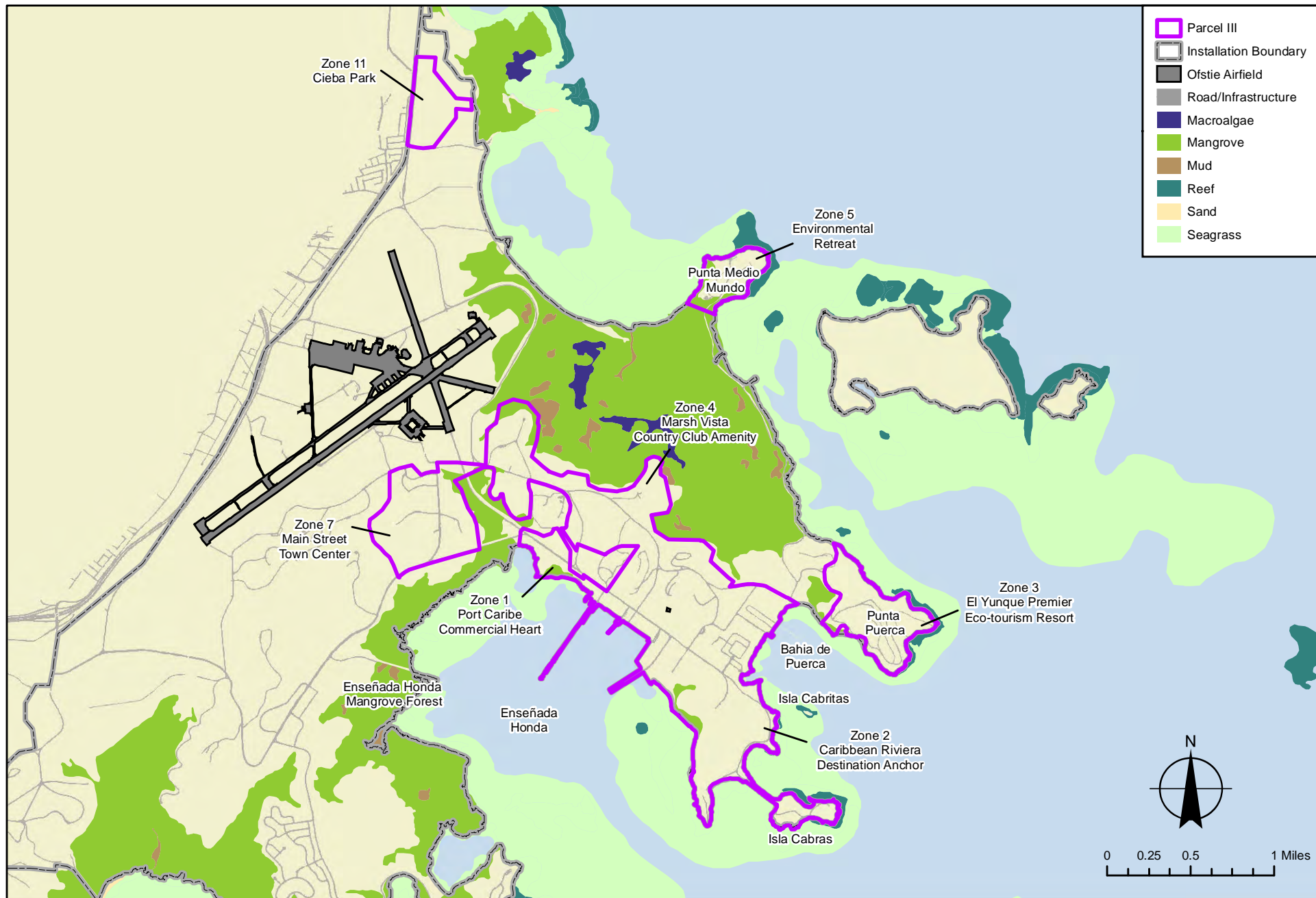
### 3.7.1 Coral Reefs

The total reef area located within the territorial waters (waters within 3 nautical miles of mainland Puerto Rico) is approximately 193 square miles (Department of the Navy 2007). Most of the coral reefs near NAPR are relatively small patch reefs (see Figure 3-8). A joint 1994-1995 USGS and Navy project, the Sirenia Project, mapped the nearshore habitats along the eastern coast of Puerto Rico near NAPR. Table 3-3 lists all coral reef types within the waters surrounding NAPR and their associated acreage cover.

<b>Table 3-3</b> <b>Reef Habitat Types Present in Waters</b> <b>Surrounding Naval Activity Puerto Rico</b>		
<b>Reef Habitat Type</b>	<b>Area (square feet)</b>	<b>Area (acres)</b>
Colonized Bedrock	11,601,651.34	266.34
Linear Reef	3,640,369.31	83.57
Patch Reef (Aggregated)	6,363,618.51	146.09
Patch Reef (Individual)	7,603,479.80	174.55
Scattered Coral-Rock	227,937.18	5.23
<b>Total</b>		<b>675.78</b>
Source: Department of the Navy 2007.		

Coral reef habitats are along the majority of shoreline around Isla Cabras where the Caribbean Riviera (Zone 2) would be located; along the southeastern and northeastern coast of Punta Puerca, where El Yunque (Zone 3) would be located; and along the northeastern, eastern and southeastern coast of Punta Medio Mundo where the Environmental Retreat (Zone 5) would be located (see Figure 3-8). In addition, coral reefs are located within approximately 0.25 mile of the shoreline of Port Caribe (Zone 1), the Caribbean Riviera, El Yunque, the Environmental Retreat, and Lake Chamberlain Road (see Figure 3-8).





Source: Geo-Marine, 2005

**Figure 3-8**  
**Marine Habitat**  
**Naval Activity Puerto Rico**

Under Executive Order 13089 (Coral Reef Protection of June 11, 1998), U.S. federal agencies must identify actions that may affect U.S. coral reef ecosystems, use programs and authorities to protect and enhance the conditions of such ecosystems and, to the extent permitted by law, ensure that any authorized or funded actions will be carried out so as to not degrade the conditions of such ecosystems. U.S. coral reef ecosystems in Puerto Rico have been designated as Essential Fish Habitat (EFH) by the Caribbean Fisheries Management Council (CFMC) pursuant to the requirements of the Magnuson-Stevens Fishery Conservation and Management Act.

A Rapid Ecological Assessment (REA) of NAPR's nearshore area (Geo-Marine, Inc. 2005a) summarized the results of a study that evaluated the benthos at five underwater sites in the vicinity of NAPR, four of which are near Parcel III properties evaluated in this SEA including EFH Site 1 located off Punta Puerca where El Yunque (Zone 3) would be located; and EFH Sites 2 through 4 located off of Isla Cabritas, Isla Cabras, and the northern peninsula of Enseñada Honda, respectively, where the Caribbean Riviera (Zone 2) would be located. EFH Site 2 is also proximal to the northern portion of the Bahía de Puerca, proximal to where the proposed Harborfront Village for Zone 3 will be located. The REA concluded that the reefs along NAPR were in poor condition as characterized by low coral cover, low coral diversity, high turf algae cover, high macroalgae cover, abundant occurrence of diseased and moribund sea fans (*Gorgonia ventalina*), abundant coral mortality (skeletons of *A. palmata* and *M. faveolata*, and *M. annularis*), a very limited fish population, and the presence of very few echinoids (Geo-Marine, Inc. 2005a). The major source of impact to coral reef environments is exposure to both the local and the regional runoff and associated sedimentation and turbidity (Geo-Marine, Inc. 2005a).

### 3.7.2 Fish and Shellfish

The coastal waters of the Caribbean contain a diversity of fish. Approximately 350 species of fish are known to occur in the waters around Puerto Rico (Department of the Navy 2007). In general, the fish can be divided into three different associations, based on their preferred habitat. These associations include fish inhabiting the seagrass beds and sandflats, those inhabiting coral reefs and open water, or pelagic fish.

The Puerto Rico Department of Natural and Environmental Resources (DNER) is responsible for managing fisheries in the coastal waters of Puerto Rico under Commonwealth Law No. 278 (November 29, 1998) and associated fisheries regulations and Administrative Orders. Pursuant to the 1996 reauthorization of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 et seq., Public Law 104-208) and Department of Commerce regulations (50 CFR 600.905-930), all activities or proposed activities, authorized, funded, or undertaken by a federal agency must consider adverse impacts on EFH. The Act defines EFH as the waters and substrate necessary to fish for spawning, breeding, feeding, and growth to maturity. An adverse impact as defined in the EFH rules is "any impact which reduces quality and/or quantity of EFH. . . . [and] may include direct, indirect, site-specific or habitat wide impacts, including individual, cumulative, or synergistic consequences of actions." The 2004 *Essential Fish Habitat Consultation Guidance* (National Marine Fisheries Service 2004) states that when an agency determines that its activities may have an adverse effect on EFH, consultation with the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries Service) is required. Goals of the consultation process are to ensure that federal agencies consider the effects of their actions on important habitats and, as a result, contribute to the sustainable management of marine fisheries.

The CFMC has developed four fishery management plans (FMPs) for the Caribbean region: Spiny Lobster, Shallow Water Reef Fish, Corals and Reef Associated Plants and Invertebrates, and Queen Conch FMPs (Department of the Navy 2007). Since the development of the FMPs, the CFMC has identified EFH for numerous species. The ecologically diverse area encompassed by identified EFH includes habitat essential for fish spawning, breeding, feeding, and growth to maturity and consists of all



waters and substrates surrounding NAPR, including coral reefs, seagrasses, and mangroves. These habitats provide important spawning, nursery, forage, and refuge habitat for a variety of commercially and recreationally important finfish and shellfish, including juvenile and adult mutton snapper (*Lutjanus analis*), juvenile yellowtail snapper (*Ocyurus chrysurus*), and adult squirrelfish (*Holocentrus adscensionis*) (Department of the Navy 2007).

The REA of NAPR's nearshore area (Geo-Marine, Inc. 2005a) summarized the results of a study that included reef fish surveys at four EFH sites in the vicinity of NAPR, three of which are near Parcel III properties evaluated in this SEA including EFH Sites 2 through 4 located off of Isla Cabritas, Isla Cabras, and the northern peninsula of Enseñada Honda, respectively, near where the Caribbean Riviera (Zone 2) and El Yunque (Zone 3) would be located. The REA resulted in the identification of 75 reef fish species belonging to 25 families of fish (Geo-Marine, Inc. 2005a). Seven of these species, including squirrelfish, schoolmaster (*Lutjanus apodus*), yellowtail snapper, banded butterflyfish (*Chaetodon striatus*), white grunt (*Haemulon plumieri*), redbtail parrotfish (*Sparisoma Chrysopterus*), and scrawled cowfish (*Acanthostracion quadricornis*), are managed by the reef fish FMP.

### 3.7.3 Seagrass

Seagrass beds are among the most productive of all natural systems in the world (Department of the Navy 2007). Seagrasses grow in protected areas such as bays or coves with slow currents and moderate wave action and are often found near protective barrier reefs (Department of the Navy 2007). Seagrass beds are important in controlling and reducing erosion by trapping and consolidating bottom sediments with their extensive root and rhizome network. Seagrass meadows in the Caribbean are frequently associated with coral reefs. In many cases, seagrass meadows and coral reefs can be highly interconnected. By trapping sediments, seagrass meadows prevent sediment re-suspension and transport onto the adjacent reefs. In turn, reefs protect seagrass meadows by dissipating wave energy.

Seagrass beds are an important food source for various fish, sea turtles, and the endangered West Indian manatee (*Trichechus manatus*), which feeds on the roots, rhizomes, and leaves of seagrasses (Department of the Navy 2007). As noted in Section 3.7.2, seagrass beds have been designated as EFH because they provide important spawning, nursery, forage, and refuge functions for a variety of commercially and recreationally important finfish and shellfish.

Seagrass species that occur in Puerto Rico include turtle grass (*Thalassia testudinum*), manatee grass (*Syringodium filiforme*), shoal grass (*Halodule wrightii*), and paddle grass (*Halophila decipiens*) (Department of the Navy 2007). Large areas of manatee and turtle grass beds are along the southwest, south, and east coasts of Puerto Rico where there is a wide, shallow shelf, a coastline protected from heavy wave action and reduced river runoff (Department of the Navy 2007). A large area of seagrass beds covers the seafloor between the southeast coast of Puerto Rico and Vieques (Department of the Navy 2007).

Within the waters surrounding NAPR, seagrass beds occur along most shorelines, including shorelines near Parcel III properties evaluated in this SEA: Enseñada Honda where the extreme northwestern and southeastern portions of Port Caribe (Zone 1) would be located; around Isla Cabras where the Caribbean Riviera (Zone 2) would be located; around Punta Puerca where El Yunque (Zone 3) would be located; and around Punta Medio Mundo where the Environmental Retreat (Zone 5) would be located. In addition, seagrass beds occur along the coastline near the area traversed by Lake Chamberlain Road (see Figure 3-8).

The main sources of impact to seagrass habitat of Puerto Rico include raw sewage discharge, agricultural runoff, coastal construction (which creates turbidity that obstructs incident light), pipe placement (e.g., telephone, water, electricity), mechanical impacts (e.g., anchoring, propeller

plowing/scarring, ship grounding), silt-laden runoff (from upland and coastal deforestation/land clearing), sand burial and turbidity following storms and hurricanes, and disease (Department of the Navy 2007).

### 3.7.4 Mangroves

Mangroves are an ecological community that includes four species of salt-tolerant trees or bushes that colonize low energy depositional tidal estuarine environments. Four species of mangrove trees occur in Puerto Rico: red mangrove (*Rhizophora mangle*), white mangrove (*Laguncularia racemosa*), black mangrove (*Avicennia germinans*), and button mangrove (*Conocarpus erectus*) (Department of the Navy 2007).

Mangrove forests contribute a vital component to the estuarine food chain through the decomposition of organic material and the release of organic and inorganic nutrients (Department of the Navy 2007). Mangrove roots and branches provide cover and protection for wildlife and fish/shellfish, particularly as spawning grounds and nurseries. Species that utilize mangrove environments include: various invertebrates (e.g., sponges, crabs, tunicates, bivalves, and spiny lobsters) and fishes (e.g., bluestriped grunt (*Haemulon sciurus*), sailors choice (*Haemulon parra*), gray snapper (*Lutjanus griseus*), dog snapper (*Lutjanus jocu*), common snook (*Centropomus undecimalus*), and jewfish (*Epinephelus itajara*). Mangroves aid in the prevention of coastal erosion and act as a buffer for major storm events. Additionally, mangroves filter upland runoff and thereby release higher quality water to the ocean. As stated in Section 3.7.2, mangroves within NAPR have been designated as EFH.

Mangrove forests comprise about 2,100 acres (25%) of NAPR (Department of the Navy 2007). There are five main areas of mangrove forests within NAPR, three of which are proximal to Parcel III properties evaluated in this SEA, including the Demajagua Mangrove Forest which is east and adjacent to the proposed Ceiba Park (Zone 11); Los Machos Forest which is adjacent to the proposed Marsh Vista (Zone 4) and the Environmental Retreat (Zone 5); and Enseñada Honda Mangrove Forest which is adjacent to the proposed Community College (Zone 7), Marsh Vista (Zone 4) and Port Caribe (Zone 1) (see Figure 3-7). As discussed in greater detail in Section 4.3.7, several main arterial roads that may require expansion during Phase II of the Proposed Action, including Marine Bypass Road, Forrestal Drive, and PR-3, are also wholly or partially located within these large mangrove tracts. For example, Marine Bypass Road and Forrestal Drive traverse the Enseñada Honda Mangrove Forest, and PR-3 and Lake Chamberlain Road traverse Los Machos Forest. The main mangrove tracts within NAPR have all been altered in some manner by human activities. Impoundment and dredge disposal are key contributors to mangrove alteration at NAPR.

The Los Machos mangroves are located in the northeast portion of NAPR and cover about 1,000 acres. This mangrove complex has been impacted over time by events such as base construction in the 1940s, construction of Lake Chamberlain Road (which reduced tidal circulation in the forest), oil spills, and hurricanes (Department of the Navy 2007). An ecological and hydrological restoration plan was developed for the mangrove complex in 1996 (Department of the Navy 1996). Los Machos mangroves are also the subject of a 2004 Damage Assessment and Restoration Plan Environmental Assessment. The plan was prepared to address the restoration of the natural resources and their functions that were damaged by a JP-5 fuel spill that occurred in October 1999 at NSRR.

The Enseñada Honda mangrove tract has been impacted primarily by dredge disposal. When harbor development began within Enseñada Honda in the 1940s, the dredge material was placed in the nearby mangrove forest, directly impacting approximately 40 acres of the mangrove forest. Subsequent dredge spoil was disposed by the Navy at permitted dredge spoil disposal sites.

As discussed in the EDC Application and Business Plan (LRA 2010b) and illustrated on Figure 1 in that document, the three large mangrove areas (i.e., (Demajagua Mangrove Forest, Los Machos Forest, and Enseñada Honda Mangrove Forest), in close proximity to Parcel III properties, were part of a 2008,

3,340-acre land transfer between the Department of the Interior and the Puerto Rico DNER and were subsequently entered into an administrative agreement with the Puerto Rico Conservation Trust to administer these lands. These properties, which are zoned conservation (PR), are protected from future development. In addition, the conservation lands abutting developable parcels (including Zones 1, 3, 4, 5, 7, and 11), shall respect a development buffer zone as established in the 2010 Reuse Plan Addendum. The width of this buffer zone will be defined in the final PRPB resolution.

In addition to these large tracts of mangroves, smaller areas of mangroves are located within or at the boundary of parcels within the proposed Port Caribe (Zone 1), the Caribbean Riviera (Zone 2), Marsh Vista (Zone 4) Environmental Retreat (Zone 5), and Community College (Zone 7) (see Figure 3-7 and additional general discussion of vegetation, including mangroves, in Section 3.6.1).

### 3.7.5 Unconsolidated Coarse Sandy Benthic Environments

Marine environments with sand or mud bottoms are classified as unconsolidated benthic environments. Shoreline and intertidal areas lacking at least a 10% vegetated cover are classified either as unconsolidated sand environments or unconsolidated mud environments (NOAA 1999). Shoreline and intertidal areas in the vicinity of Parcel III properties that lack seagrass or coral reef coverage, including areas along the east side of Enseñada Honda and Bahía de Puerca (see Figure 3-8), are considered unconsolidated coarse sandy benthic environments (NOAA 2011). Benthic sediments provide habitat for micro- and macro-faunal aquatic species including bacteria, diatoms, polychaetes, echinoderms, and arthropods (McLachlan and Brown 2006).

Productivity and diversity within benthic habitats is dependent upon availability of food and space requirements of benthic organisms. Highly productive environments receive higher levels of light penetration and contain elevated levels of oxygen within sediments. Coarse sediments contain more available space between particles as they are not uniform in particle size. Increases in particle separation within sediments enhance soil porosity and result in high levels of oxygen within benthic environments (Elliott *et al.* 1998). Coarse sands are composed of large particles and have a low suspension threshold. In these areas, sediment suspension within the water column requires large levels of wave or suspension energies. Suspension of coarse sand sediments is often short in duration if it occurs at all. As result, areas composed of coarse sandy sediments will often have low turbidity levels and thus high levels of light penetration (Elliott *et al.* 1998).

Unconsolidated coarse sandy benthic environments occur in the nearshore area of Enseñada Honda and Bahía de Puerca adjacent to Port Caribe (Zone 1), Caribbean Riviera (Zone 2), and El Yunque (Zone 3), where seagrass beds and coral reefs are absent (see Figure 3-8).

## 3.8 Threatened and Endangered Species

Federally and Commonwealth-listed animal and plant species found at NAPR are summarized in Table 3-4.

Table 3-4 Federally and Commonwealth-Listed Species on NAPR				
Common Name	Scientific Name	Federal Status	Commonwealth Status	Habitat Requirements
<b>Mammals</b>				
West Indian Manatee	<i>Trichechus manatus</i>	E	E	Marine, estuarine, and freshwater habitats, especially calm coastal waters with seagrass beds
<b>Reptiles</b>				
Puerto Rican boa	<i>Epicrates inornatus</i>	E	E	Forested Areas
Hawksbill turtle	<i>Eretmochelys imbricata</i>	E	E	Marine areas
Leatherback turtle	<i>Dermochelys coriacea</i>	E	E	Marine areas
Green turtle	<i>Chelonia midas</i>	T	T	Marine areas
Loggerhead turtle	<i>Caretta caretta</i>	T	T	Marine areas
Virgin Islands tree boa	<i>Epicrates monensis granti</i>	E	E	Forested Areas
<b>Birds</b>				
Yellow-shouldered blackbird	<i>Agelaius xanthomus</i>	E	E	Mangrove forests-arid thickets.
Brown pelican	<i>Pelecanus occidentalis</i>	E	E	Salt bays, beaches, ocean areas
Peregrine falcon	<i>Falco peregrinus</i>	—	E	Nests on rocky cliffs
Least tern	<i>Sterna antillarum</i>	—	V	Sandy beaches of freshwater and bays
Piping plover	<i>Charadrius melodus</i>	T	T	Sandy beaches of freshwater and bays
Least grebe	<i>Tachybaptus dominicus</i>	—	T	Freshwater lakes streams, ponds and lagoons
West Indian whistling duck	<i>Dendrocygna arborea</i>	—	T	Fresh and salt water bodies, marshes, coastal forests
Caribbean coot	<i>Fulica caribaea</i>	—	T	Fresh and salt water bodies, marshes
Roseate Tern	<i>Sterna dougallii dougallii</i>	T	E	Rocky coastal islands, outer beaches, salt marsh islands
Snowy plover	<i>Charadrius alexandrinus</i>	—	V	Sandy beaches of fresh water and bays
<b>Plants</b>				
Cobana negra	<i>Stahlia monosperma</i>	T	T	Coastal plains, associated with mangroves and immediately landward side of mangroves
Key: C = Candidate. E = Endangered. T = Threatened. V = Vulnerable.				

### 3.8.1 Marine Mammals

Marine mammals are protected under the Marine Mammal Protection Act of 1972 (U.S.C. 16, 31 §§ 1361-1421), and all federally listed endangered species, including marine mammals, are protected under the Endangered Species Act (ESA; 16 U.S.C. §§ 1531-1544). Of the endangered/threatened marine mammals that may occur in Puerto Rico waters, only the West Indian manatee is known to occur in the waters of NAPR.

The following marine mammals are listed by NOAA Fisheries Service as occurring in Puerto Rico, but they are not discussed in further detail in this SEA because they are not known to occur close to NAPR (and hence would not be adversely impacted by the Proposed Action): blue whale (*Balaenoptera musculus*), Caribbean monk seal (*Monachus tropicalis*), finback or fin whale (*Balaenoptera physalus*), humpback whale (*Megaptera novaengliae*), sei whale (*Balaenoptera borealis*), and sperm whale (*Physeter macrocephalus*) (Department of Navy 2007).

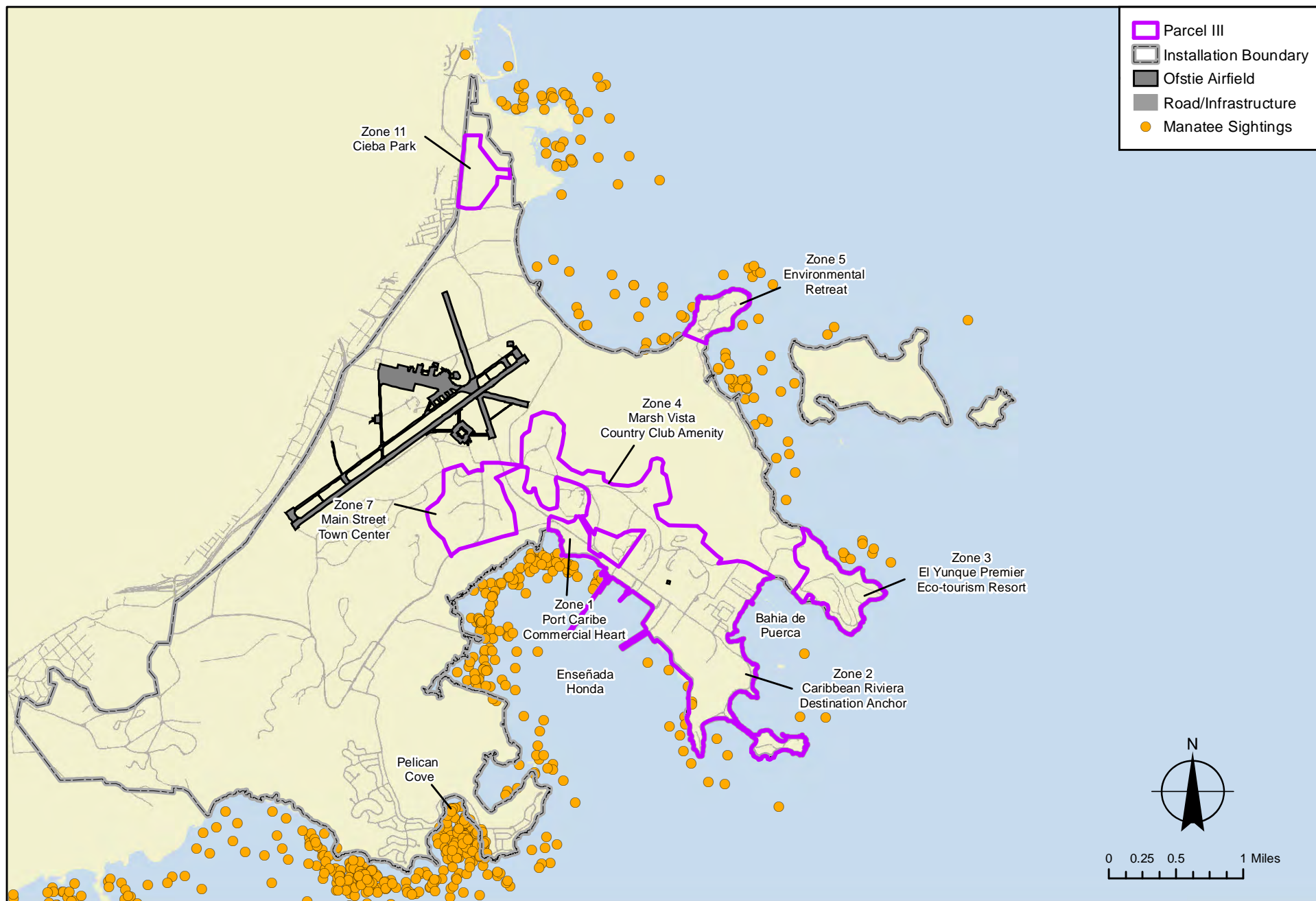
The West Indian manatee, federally listed as endangered in 1985, is a large, slow-moving marine mammal with a preference for calm coastal waters with seagrasses and a source of freshwater. Manatees use seagrass beds for feeding and resting habitats. Although they feed on various types of aquatic vegetation, seagrasses are their primary food source. Manatee habitat includes sheltered marine bays and shallow estuaries with access channels at least 6.6 feet deep (Naval Facilities Engineering Command Southern Division 2000). In 1986, a recovery plan was developed for the Puerto Rican population of manatees that contains recommendations for research, conservation, and law enforcement (Department of the Navy 2007).

Manatee populations in Puerto Rico waters have been documented in three aerial surveys conducted from 1978 to 1979, 1984 to 1985, and in 1993; a radio tracking study conducted from 1992 to 1996; and a year-long intensive study of manatee distribution and abundance (Department of the Navy 2007). The majority of manatees observed were along the southern and northeastern coasts of Puerto Rico, with one-third of the manatees occurring in the vicinity of NAPR (Department of the Navy 2007). Observations of manatee movements, using radio- and satellite-tracking devices, have revealed that some individuals move back and forth between eastern Puerto Rico and Vieques (Geo-Marine, Inc. 2004). The number of manatees inhabiting the waters of Puerto Rico is not known, but the number of manatees counted during United States Fish and Wildlife Service (USFWS) surveys has ranged from 43 to 101 (NAVFAC LANTDIV 2006).

The *Manatee Assessment and Condition Summary for Naval Activity Puerto Rico, Interim Report* (Geo-Marine, Inc. 2004) presents a map showing historical manatee sightings in eastern Puerto Rico, including Vieques. This figure, shown here as Figure 3-9, includes most of the monitoring studies mentioned above. Manatees often concentrate at NAPR in the shallow coves and bays containing seagrasses (Geo-Marine, Inc. 2004). Feeding manatees are most often recorded in Pelican Cove and Enseñada Honda, both of which contain seagrasses. Figure 3-9 indicates that historical manatee sightings have occurred in the vicinity of Parcel III coastal properties including the proposed Port Caribe (Zone 1), Caribbean Riviera (Zone 2), El Yunque (Zone 3), the Environmental Retreat (Zone 5), and along the coastline near the area traversed by Lake Chamberlain Road.

During operation of NSRR, the ocean outfalls from the Capehart, Forrestal, and Bundy WWTP outfalls were documented as a source of freshwater for manatees in the vicinity of the installation (Geo-Marine, Inc. 2004). One concern related to the closure of NSRR was that the closure of the Capehart WWTP (and the associated reduction and cessation of freshwater outflows) would potentially adversely affect the manatee. The Navy coordinated with the USFWS on this issue, and the USFWS gave their approval for reduction of freshwater outflows. As of January 2005, freshwater outflow from the WWTP continued at approximately 150,000 gallons per day. This flow is maintained primarily by the influx of





Source: Geo-Marine, 2005; USFWS, 2005;

**Figure 3-9**  
**Historical Manatee Sightings**  
**in Eastern Puerto Rico**

rainwater into the system (Department of the Navy 2007). Although the Capehart WWTP is not part of the Parcel III properties, this existing agreement with the USFWS and the use of freshwater from the Capehart outfall by habituated manatees is information the Commonwealth should be aware of for continuation of freshwater flow subsequent to the conveyance of the Parcel III properties.

According to the USFWS *Recovery Plan for the Puerto Rico Population of the West Indian (Antillean) Manatee* (Rathbun and Possardt 1986), the main source of manatee mortality from human actions in Florida is accidental boat collisions, while that in Puerto Rico is from entanglement in gill nets. The recovery plan notes that development and the related increase in boat traffic may have started affecting manatees along the southern coast of Puerto Rico. The plan further states that there is no evidence that natural events (e.g., hurricanes), habitat loss, competition, disease, or natural predation cause significant mortality of manatees in Puerto Rico. A more recent report, however, indicated that from 1990 to 1995, collisions with watercraft accounted for the largest number of manatee deaths in Puerto Rico (NAVFAC LANTDIV 2006).

### 3.8.2 Reptiles

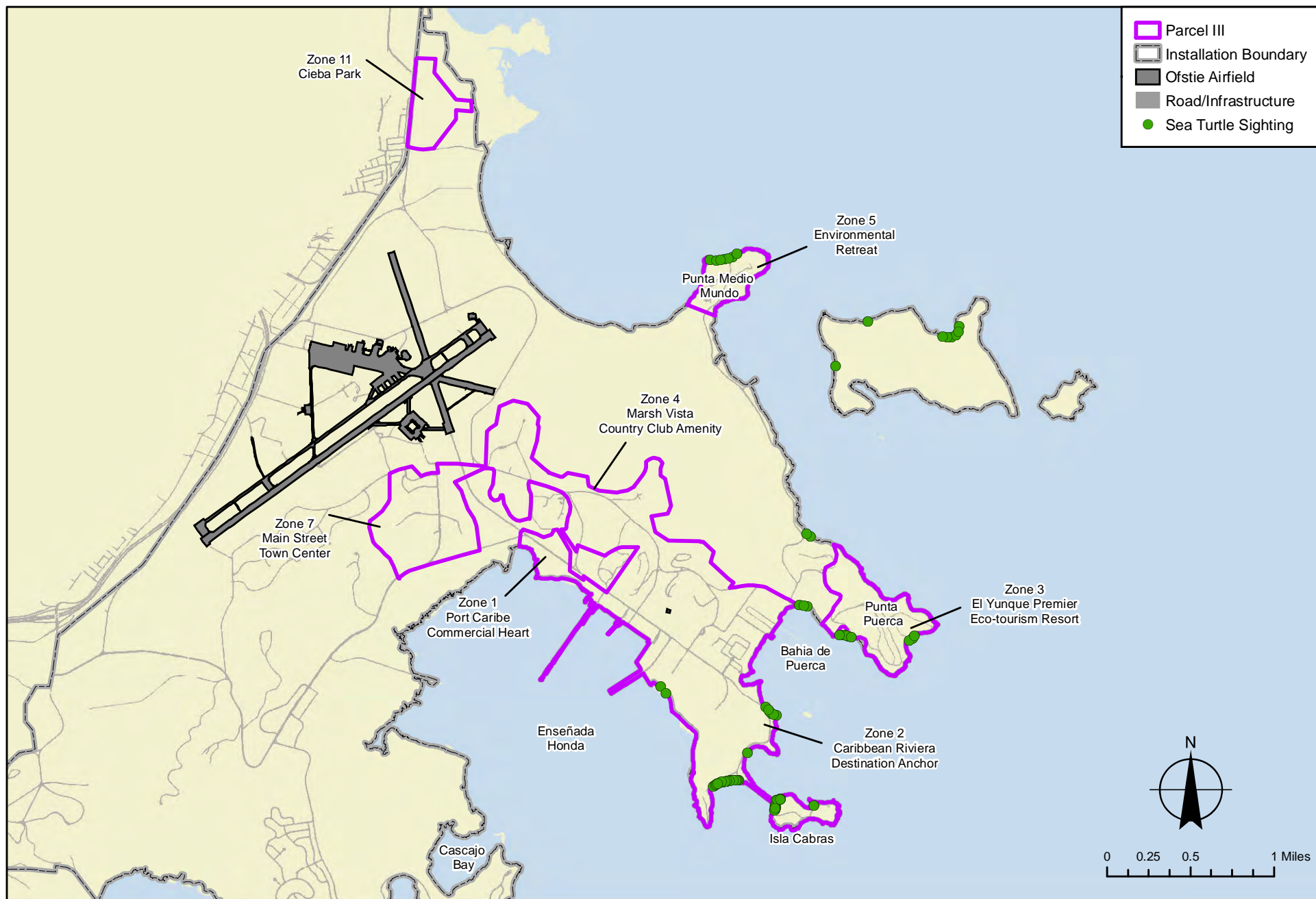
Four species of sea turtles and two snake species listed as federally and Commonwealth threatened and endangered species are known to occur at NAPR (see Table 3-4).

#### 3.8.2.1 Sea Turtles

Four species of sea turtle—leatherback (*Dermochelys coriacea*), green (*Chelonia mydas*), hawksbill (*Eretmochelys imbricata*), and loggerhead (*Caretta caretta*)—may be found in the waters adjacent to NAPR. All four species are federally listed as endangered species and are protected under the 1973 ESA (16 U.S.C. §§ 1531-1544). NOAA Fisheries Service has designated critical habitat for the green sea turtle to include coastal waters surrounding Culebra Island, Puerto Rico, and the hawksbill sea turtle to include coastal waters surrounding Mona and Monito Islands, Puerto Rico. This critical habitat is outside the study area of this SEA. Critical habitat has not been designated for the loggerhead sea turtle (USFWS 2009). Currently, no critical habitat for leatherback sea turtle has been designated for any areas within Puerto Rico. The Sierra Club recently sent a petition to the USFWS to revise critical habitat designation for the leatherback sea turtle to include the waters off the Northeast Ecological Corridor of Puerto Rico. The USFWS determined that the petition does not provide sufficient scientific evidence to warrant a revision to critical habitat (*Federal Register* July 16, 2010).

Sea turtles use shallow-water marine benthic habitats such as seagrass beds and coral reefs for foraging and resting. Each species has a different preferred diet, but as a group they consume plants and animals such as seagrasses, mollusks, crustaceans, tunicates, jellyfish, and fish. Adult female sea turtles emerge from the water to nest. Nests are generally laid on sandy beaches along the shoreline landward of the mean high water line (Department of the Navy 2007).

Rathbun *et al.* (1985) conducted aerial surveys in 1984 and 1985 along the coast of Puerto Rico, including NAPR (see Figure 3-10). One-quarter of the sea turtles observed around the coast of Puerto Rico were in waters adjacent to NAPR. Of the sea turtles identified by species, the green sea turtle accounted for the vast majority of the sightings, followed by the hawksbill, loggerhead, and leatherback. According to Pace and Vega (1988), areas that are most frequently used by sea turtles include the east shore of Enseñada Honda Bay, the north coast of Piñeros Island, and the mouth of Cascajo Bay (Pelican Cove), Pasaje Medio Mundo, Punta Medio Mundo, Punta Puerca, and areas in between (Department of the Navy 2007).



Source: Geo-Marine, 2005; USFWS, 2005;

**Figure 3-10**  
**Cumulative Sea Turtle Sightings from March 1984 through**  
**March 1995 Obtained from Weekly Aerial Surveys of the**  
**Former Naval Station Roosevelt Roads**  
**Naval Activity Puerto Rico**

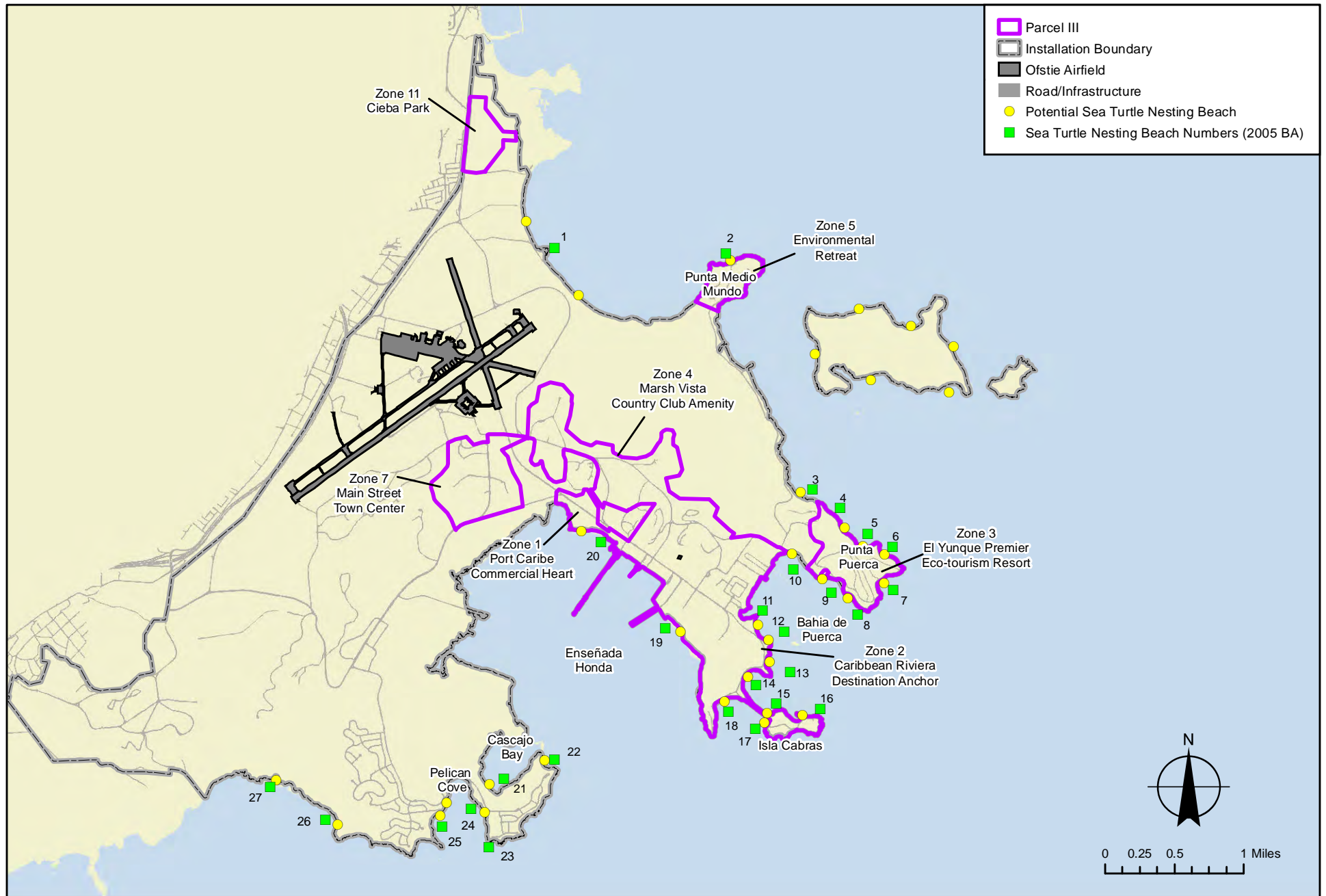
Previous studies conducted in 2000 and 2004 documented sea turtle nesting sites within beach areas of Punta Medio Mundo, Demajagua, Isla Cabras, and within Enseñada Honda (NAVFAC LANTDIV 2006). In 2000, a majority of these observations were located along the western edge of Isla Cabras.

Potential sea turtle nesting beaches at NAPR are shown on Figure 3-11. According to this map, much of the beach surrounding Piñeros Island is noted as excellent potential nesting habitat for hawksbill and leatherback sea turtles, and various locations along the shoreline of NAPR are noted as excellent, suitable, or marginal (only one beach) potential nesting habitat for these two species (Department of the Navy 2007). Several stretches of beach along the shoreline of Enseñada Honda are noted as suitable potential nesting habitat. These potential nesting sites are located within or adjacent to the proposed Port Caribe (Zone 1), Caribbean Riviera (Zone 2), El Yunque (Zone 3), the Environmental Retreat (Zone 5), and in close proximity to Lake Chamberlain Road.

In 2002 and 2004, the Navy conducted weekly nesting surveys on 33 potential nesting beaches. Data from the 2002 survey (conducted from April to December) are discussed in this section; data from 2004 (fewer surveys, from January to April) also have been compiled and are shown in Table 3-5. In 2002, approximately 73 sea turtle nests were recorded on NAPR beaches (NAVFAC LANTDIV 2006). Of the nests identified according to species, 46 were hawksbill nests, 2 were leatherback nests, 1 was a green sea turtle nest, and 24 remained unidentified. Nests were recorded at 12 of the 33 beaches; at some additional beaches only sea turtle tracks were recorded. As shown in Table 3-5, the vast majority of nests were recorded at beach #18 near the mouth of Enseñada Honda (to the northwest of Isla Cabras; see Figure 3-11) (NAVFAC LANTDIV 2006). Depredation of 35 of the nests was noted. Six live turtles also were observed.

<b>Table 3-5</b> <b>Number of Nests Recorded on NAPR Beaches</b> <b>in 2002 and 2004 During Weekly Beach Surveys</b>		
<b>Beach #</b>	<b># of Nests in 2002</b>	<b># of Nests in 2004</b>
2	5	0
3	1	0
7	3	0
9	5	0
10	1	1
12	6	0
14	0	6
15	9	1
16	0	1
17	5	0
18	30	4
19	1	0
22	0	2
25	2	0
A	0	1
B	5	0
<b>Total</b>	<b>73</b>	<b>16</b>
Source: NAVFAC LANTDIV 2006.		





Source: 2005 BA

**Figure 3-11**  
**Potential Turtle Nesting Sites**  
**Naval Activity Puerto Rico**



### 3.8.2.2 Puerto Rican Boa

The Puerto Rican boa (*Epicrates inornatus*) exists only in Puerto Rico. Primary habitat is forested limestone hills, but the species can be found in subtropical moist forests, subtropical wet forests, subtropical dry forests and occasionally in disturbed urban and suburban habitats. The boas use ground-level retreats for sleeping during the day and hunt most of their prey in nearby trees at night (Department of the Navy 2007). Critical habitat has not been designated for this species (USFWS 2011a).

Four Puerto Rican boa sightings were reported at NAPR prior to 1999, and an additional four occurrences were reported between 2001 and 2003 (NAVFAC LANTDIV 2006). Additional habitat assessments and nighttime surveys for Puerto Rican boa and Virgin Islands tree boa were conducted in 2004. Recovering forested areas provide some habitat for the Puerto Rican boa; however, habitat is less than ideal in most places. The forest of Punta Cascajo, northwest of FDR Drive, offers the most suitable habitat at NAPR for the Puerto Rican boa (Department of the Navy 2007). This forest is not located within or adjacent to any Parcel III properties and is approximately 1.9 miles southwest of the proposed Community College (Zone 7), the nearest Parcel III property evaluated as part of this SEA. No Puerto Rican boas were found during 211 man-hours of surveys in potential boa habitat. A shed skin was found in an abandoned building at the NAPR Flying Center at the airfield, where two sightings of the Puerto Rican boa have been reported (Department of the Navy 2007).

### 3.8.2.3 Virgin Islands Tree Boa

The Virgin Island tree boa (*Epicrates monensis granti*) is commonly associated with subtropical dry forest, coastal forests, and mangrove habitats with an abundance of multi-trunk tree species with interlocking canopies. They hunt at heights from eye level to as high as 5 meters in scrub and coastal forests. During the day, these boas may seek concealment on the ground under rocks, logs, and loose sections of termite nests. The bulk of the boa's diet consists of the Puerto Rican crested anole (*Anolis cristatellus*). However, this boa may opportunistically consume small mammals and nestlings of small birds (Department of the Navy 2007). Critical habitat has not been designated for this species (USFWS 2011b).

No historical or recent sightings of the Virgin Island tree boa have occurred at NAPR (NAVFAC LANTDIV 2006). Habitat assessments and nighttime surveys for Puerto Rican boa and Virgin Islands tree boa were conducted in 2004. All forested areas surveyed at the base presented a severely disturbed aspect with very young secondary growth (Department of the Navy 2007). While Puerto Rican boa were reestablished in previously disturbed areas, the Virgin Island tree boa seems to be able infrequently to re-colonize areas from which it has been extirpated (Department of the Navy 2007). The coastlines of Punta Puerco (i.e., where the proposed El Yunque [Zone 3] would be located) and Puerto Medio Mundo (i.e., where the proposed Environmental Retreat [Zone 5] would be located) offer the best habitat at NAPR for the Virgin Island tree boa (Department of the Navy 2007). However, no Virgin Island tree boas were found during the 2004 field surveys. While populations of the Virgin Islands tree boa occur nearby in Rio Grande, Playa Naguabo, and Humacao, this species' existence at NAPR is not confirmed (Department of the Navy).

## 3.8.3 Birds

Four federally and Commonwealth-listed threatened and endangered avian species are known to occur at or in coastal habitats adjacent to NAPR. Federally listed species include; yellow-shouldered blackbird (*Agelaius xanthomus*), brown pelican (*Pelecanus occidentalis*), piping plover (*Charadrius melodus*), and the roseate tern (*Sterna dougallii*) (see Table 3-4).

An additional six species listed only by the Commonwealth are known to occur at the base, including peregrine falcon (*Falco peregrinus*), least tern (*Sterna antillarum*), least grebe (*Tachybaptus dominicus*), West Indian whistling duck (*Dendrocygna arborea*), Caribbean coot (*Fulica caribea*), and snowy plover (*Charadrius alexandrinus*) (see Table 3-4). The peregrine falcon typically nests on cliffs, bridges, tall buildings, and other tall structures. No suitable nesting habitat is present within NAPR, thus peregrine falcons are not expected to nest at NAPR, and use is expected to be limited to transient individuals.

The West Indian whistling duck uses mangroves and other forested wetlands. The least grebe and Caribbean coot are found in freshwater habitats on lakes, marshes, swamps, and ponds, and on rivers, streams, and other habitats with emergent vegetation and occasionally in brackish water, where they feed on aquatic vegetation and small invertebrates. Snowy plover and least terns nest and feed on sandy beaches and mudflats. These species have the potential to utilize habitats within NAPR and the habitats found within or adjacent to the Parcel III properties analyzed as part of this SEA.

### 3.8.3.1 Yellow-Shouldered Blackbird

The yellow-shouldered blackbird is endemic to Puerto Rico and nearby Mona Island. While once widespread throughout Puerto Rico, the species is now limited to three areas: the coastal southwestern area, a small coastal eastern area, and Mona Island. Nesting season occurs May to September primarily in mangroves along the coast and on offshore islands. Other nesting habitat includes large deciduous trees, primarily oxborn bucida (*Bucida buceras*) in dry lowland pastures; coconut trees (*Cocos nucifera*); royal palms (*Roystonea borinquena*); and on Mona, the sheer coastal cliffs that surround the island (Department of the Navy 2007).

The majority of decline in yellow-shouldered blackbird populations is attributed to parasitism by the shiny cowbird (*Molothrus bonariensis*), which lays its eggs in the blackbird's nest and sometimes punctures the host's eggs. Other reasons for decline include introduced pest species (black rat, Norway rat, and mongoose), disease (fowl pox), and habitat loss. Habitat modification and destruction from hurricanes and other natural events have eliminated both foraging and nesting areas. The main threat to the species is habitat loss associated with coastal and offshore island mangroves (Department of Navy 2007). As shown on Figure 3-7, mangrove habitat is located within or adjacent to all reuse zones discussed in this SEA. Lake Chamberlain Road also traverses the Los Machos Forest which consists of mangrove habitat under conservation protection. In addition, suitable nesting/foraging habitat for the yellow-shouldered blackbird is located within the proposed El Yunque (Zone 3), Marsh Vista (Zone 4), Environmental Retreat (Zone 5), Community College (Zone 7), Ceiba Park (Zone 11), and in the vicinity of Lake Chamberlain Road (see Appendix N in the EDC Application and Business Plan [LRA 2010b]).

In 1976, the entire land area at NAPR was designated as critical habitat for the yellow-shouldered blackbird, and the birds within NAPR were attributed to the second largest population group in Puerto Rico. From 1976 to 1982, this population experienced a 97% decline. The species was believed to be absent from NAPR following Hurricane Hugo in 1989 (NAVFAC LANTDIV 2006).

Several incidental sightings were recorded from 1993 to 1999, and four yellow-shouldered blackbird nests were found in the summer of 1999. This prompted the Navy to conduct detailed surveys for the species in 2000, 2002, and 2004. Survey data revealed an increase in yellow-shouldered blackbird observations from 1995 through 2000 and a decline from 2000 through 2004. The number of documented nesting pairs fell from five in 2000 to one unconfirmed nest in 2004. No observations of yellow-shouldered blackbird were recorded during post-breeding surveys at NAPR, but incidental observations have been recorded (NAVFAC LANTDIV 2006).

### 3.8.3.2 Brown Pelican

The brown pelican is found along the coast in California and from North Carolina to Texas, Mexico, the West Indies, and many Caribbean Islands, and to Guyana and Venezuela in South America. Feeding occurs primarily in shallow estuarine waters. The nesting season occurs in March and April. Nesting sites are small coastal islands that provide protection from mammal predators, especially raccoons, and provide sufficient elevation to prevent wide-scale flooding of nests. The timing and success of the breeding cycle and the pronounced seasonal fluctuations of pelican numbers in the region appears to be closely tied to alternating, yet unpredictable, periods of food abundance and scarcity. The primary breeding population is located in the U.S. Virgin Islands; however pelicans of both age classes migrate to Puerto Rico post-season, presumably to exploit more predictable food resources associated with extensive estuarine and mangrove systems. Young pelicans often remain in Puerto Rico for five years until they reach maturation. Adults remain there until they meet pre-breeding nutritional requirements and return to breeding colonies in Puerto Rico and the U.S. Virgin Islands. Threats to the Caribbean subspecies are poaching of eggs, young, and adults; human disturbance; entanglement in fishing gear; and loss or degradation of mangrove forests (Department of the Navy 2007). No critical habitat is designated for the species at NAPR, on adjacent cays, or in nearby coastal waters (USFWS 2011c).

The brown pelican appears to be a common seasonal resident at NAPR and in the surrounding coastal waters. Small numbers, primarily juveniles, were seen perched, feeding, and resting irregularly in onshore and nearshore habitats at NAPR. However, no brown pelican nesting colonies were found at NAPR or on the small cays nearby. (NAVFAC LANTDIV 2006)

### 3.8.3.4 Piping Plover

The piping plover breeds on coastal beaches from Newfoundland to North Carolina and winters primarily on the Atlantic Coast from North Carolina to Florida, although some migrate to The Bahamas and West Indies (Department of the Navy 2007). No critical habitat for piping plover has been designated in Puerto Rico (*Federal Register* July 10, 2001).

The piping plover was observed during migration but was not known to nest at NAPR, as noted in the 1987 Land Management Plan for Naval Station Roosevelt Roads (Ecology and Environment, Inc. 1987), but no specific sighting information was recorded. No piping plover observations were reported at NSRR during the 1990s or during sea turtle nesting surveys conducted in 2002 and 2004 (NAVFAC LANTDIV 2006). The occurrence status at NAPR is expected to be limited to vagrants; a vagrant species occurs less frequently than once every 10 years (NAVFAC LANTDIV 2006).

### 3.8.3.5 Roseate Tern

The roseate tern breeds from Florida through the West Indies to islands off Central America and northern South America. Roseate terns breed primarily on small offshore islands, rocks, cays, and islets. Nesting sites are located near vegetation or jagged rock, on open sandy beaches, close to the waterline on narrow ledges of emerging rocks, or among coral rubble (Department of the Navy 2007). Critical habitat has not been designated for this species (USFWS 2011d).

No historic evidence is available to indicate whether the roseate tern has ever nested at NAPR and no roseate tern observations have been noted in or over coastal waters adjacent to NAPR. No roseate terns were spotted during the 2002 and 2004 boat and pedestrian surveys of sea turtle nesting beaches at NAPR. The nearest active roseate tern colony likely occurs on the eastern end of Vieques (more than 20 miles east of NAPR) (NAVFAC LANTDIV 2006). Although the occurrence of the roseate tern at NAPR has never been documented, the species should be considered accidental at NAPR because the species could be pushed into nearby coastal waters or inshore during a hurricane (Department of the Navy 2007).

### 3.8.4 Plants

One plant federally and Commonwealth-listed as a threatened species is known to occur at NAPR (see Table 3-4).

#### **Cobana Negra**

Cobana negra (*Stahlia monosperma*), is a medium-sized evergreen tree that reaches 25 to 50 feet in height and 1 to 1.5 feet in diameter. It is found on the edge of salt flats in brackish, seasonally flooded wetlands. Its associates are black mangrove and button mangrove (Department of the Navy 2007). Critical habitat has not been designated for this species (USFWS 2011e).

A Cobana negra tree was identified in a mangrove stand near the Coast Guard (old ammunition) pier in Enseñada Honda in 1989 (Vicente *et al.* 1989). Rare species surveys were conducted at NAPR in August 2004 and identified a single individual of this species in a coastal scrub forest area west of American Circle (NAVFAC LANTDIV 2006). This forest is not located within or adjacent to any Parcel III properties and is approximately 2.3 miles southwest of the proposed Community College (Zone 7), the nearest Parcel III property evaluated as part of this SEA.

## 3.9 Socioeconomics

### 3.9.1 Population

The population of Puerto Rico has been in a steady decline since the 1980s when it grew approximately 1%. Population projections (2010 to 2050), however, forecast that the island-wide population will remain relatively stable over the long-term. NAPR is located within the municipal boundaries of Ceiba and Naguabo. The local region for the area surrounding NAPR is the Fajardo/Ceiba Region, which represents eight municipalities: Ceiba, Fajardo, Humacao, Las Piedras, Loiza, Luquillo, Naguabo, and Rio Grande.

The eight municipalities of the Fajardo/Ceiba Region represent approximately 8% of the total population of Puerto Rico, while the five municipalities that comprise the San Juan Region account for an estimated 26% of the total population. The 2000 and 2009 (estimated) populations of Puerto Rico, the San Juan Region, and the Fajardo/Ceiba Region are presented in Table 3-6. The average growth of the Fajardo/Ceiba Region (6.1%) outpaced the Commonwealth of Puerto Rico (4.2%), and the San Juan Region (-0.7%). (U.S. Census Bureau 2009a)

### 3.9.2 Housing

Island-wide internal factors (e.g., population decline) and external factors (e.g., the global economic recession) have significantly increased the housing supply of the Commonwealth, while decreasing the demand for new construction. For example, in 2005, housing sales totaled approximately 13,500 units; in 2009, the number of units sold decreased to approximately 6,259. For 2008-2009, 6,735 permits were granted for new housing, a decrease from the 11,749 permits issued the previous year. On a regional scale, new housing sales in the eastern part of the island decreased from 608 units in 2005 to 302 units in 2009 (Estudios Tecnicos, Inc. 2010).

**Table 3-6**  
**Populations for Puerto Rico, and**  
**the San Juan and Fajardo/Ceiba Regions**

	2000 <sup>(a)</sup>	2009 <sup>(b)</sup>	% Change
<b>Puerto Rico</b>	<b>3,808,603</b>	<b>3,967,288</b>	<b>4.2%</b>
<b>San Juan Region <sup>(c)</sup></b>	<b>1,044,119</b>	<b>1,043,426</b>	<b>-.07%</b>
<b>Fajardo/Ceiba Region</b>	<b>280,705</b>	<b>297,800</b>	<b>6.1%</b>
Ceiba	18,004	17,675	-1.8%
Fajardo	40,712	42,365	4.1%
Humacao	59,035	60,961	3.3%
Las Piedras	34,485	40,565	17.6%
Loiza	32,537	33,898	4.2%
Luquillo	19,817	20,667	4.3%
Naguabo	23,753	24,430	2.9%
Rio Grande	52,362	57,239	9.3%

Source: U.S. Census Bureau 2009a.

Notes:

(a) Census 2000 population.

(b) 2009 population estimate.

(c) The San Juan Region consists of the following municipalities: San Juan, Bayamon, Carolina, Guaynabo, Catano, and Trujillo Alto.

According to the Puerto Rico Community Survey (2005-2009) five-year estimates, of the 1,434,711 housing units on island, approximately 15.4% were classified as being vacant. Data from the survey estimated the homeowner vacancy rate on island at 2.1% and the rental vacancy rate at 7.0% (U.S. Census Bureau 2009b). In comparison, in 2010, the homeowner vacancy rate for the United States ranged from 2.5% to 2.7%, while the rental vacancy rate ranged from 9.4% to 10.6% (U.S. Census Bureau 2011). In general, population declines have created an overbuilt situation for housing in Puerto Rico (C.H. Johnson Consulting, Inc. 2010).

### Parcel III Facilities

Facilities that exist within Parcel III include those used for residential, storage, utilities, industrial, and business. Of the approximately 347 facilities, the large majority of buildings have some structural problems, although maintenance has been part of the continued activities at some of the facilities. Facility sizes range from 100 to 103,986 square feet and total approximately 1,298,768 square feet of structures. In general, the concrete, steel, and mixed construction facilities have maintained their structural integrity. There is minimal telecommunications infrastructure to service these facilities. The Puerto Rico Telephone Company is the predominant service provider within the region (LRA 2010b).

## 3.9.3 Economy, Employment, and Income

### Economy

The Puerto Rican economy has been in recession since mid-2006. The government, the largest on-island employer, is in the process of cutting jobs. For the first six months of 2009, the commercial sector recorded a \$293.3 million (1.7%) decline in sales. In 2008-2009 exports fell by 5%, the largest decline since 1992-1993 (6%). As noted above, construction inactivity has been a consistent indicator of the economic recession with the total value of construction permits decreasing by \$407 million (31.4%) during the first seven months of 2009. Some industry sectors, however, have demonstrated growth



potential. For example, 2003-2008 sectors that experienced employment growth included administrative services (5.9%), health and social services (6.3%), and food service, hospitality and recreation (4.6%) (C.H. Johnson Consulting, Inc., 2010).

For Puerto Rico, the industries that support the highest number of jobs include public administration (or government services), retail, and health and social services. As a percentage of gross domestic product or GDP, manufacturing (40.4%); finance, insurance, and real estate (16.6%); and trade (12.7%) are the primary economic drivers. The tourism sector contributes approximately 6% to island GDP (C.H. Johnson Consulting, Inc. 2010).

Although it represents a relatively small percentage of GDP, the tourism sector is a central tenet of the Puerto Rican economy and one that extends beyond the island to the Caribbean region as a whole. In fact, in 2010, there was a 2% to 3% increase in tourism activity throughout the Caribbean. The number of tourist stops in the Caribbean was estimated at 17.9 million in 2009 of which 1.3 million or 7% stopped in Puerto Rico. Of the \$11.9 billion in Caribbean-generated visitor expenditures in 2004, Puerto Rico represented approximately 25% of this total or \$3.0 billion (World Travel and Tourism Council 2011).

Economic indicators for island-wide tourism activity are variable and reflect the fact that the island continues to recover from a severe economic recession. From 2008-2009, the number of visitors decreased from 5.2 to 4.8 million; however, from 2002-2008, the island experienced an overall increase of 19.6% in total tourist arrivals and an 18.5% in cruise ship passenger visits. The island's hotel room inventory was estimated to be 11,062 in 2000 compared to 13,656 in 2009, an increase of 2,594 rooms over that period. As evidenced by the approximately 1.2 million cruise ship passengers who visited Puerto Rico in 2009, the cruise industry continues to expand worldwide (C.H. Johnson Consulting, Inc. 2010).

The northeast region of Puerto Rico is one of the premier destinations on the island, because it is close to El Yunque National Park and the sister islands of Vieques and Culebra (known as the Spanish Virgin Islands) and because of the large number of golf courses and marinas. Data estimates from the National Visitor Monitoring program show that, in 2006, the El Yunque National Park received close to 1.2 million visitors of which 63% originated off-island (C.H. Johnson Consulting, Inc. 2010). Several well-known hotels are located in the Fajardo/Ceiba Region, including the Westin Rio Mar Beach Resort and Ocean Villas in Rio Grande, the Wyndham El Conquistador Resort and Las Casitas Village in Fajardo, and the Palmas del Mar in Humacao (CB Richard Ellis *et al.* 2004).

The retail industry on Puerto Rico represents an important secondary market for the capture of tourism revenues. Although development activity has been in decline, commercial rental rates have remained relatively stable (CB Richard Ellis *et al.* 2004). The eastern region, defined by the municipalities of Ceiba, Culebra, Fajardo, Luquillo, Rio Grande, and Vieques, represents only 3% of the island's shopping center square footage and retail sales per capita of this area were much lower than that for the island as whole (\$2,946 versus \$5,362). However, annual retail expenditures (approximately 5.9%) indicate that demand for retail within the region has grown at a steady state in recent years. Table 3-7 demonstrates this growth trend from 2004 to 2007, and compares retail sales within the municipality of Fajardo, the most developed area with proximity to NAPR, with those from the San Juan metropolitan area. Estimated demand for retail goods and services in eastern Puerto Rico is considered sufficient to support more than 2 million square feet of additional retail floor space (C.H. Johnson Consulting, Inc. 2010).

<b>Table 3-7</b>					
<b>Retail Sales by Region</b>					
<b>Municipality</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>Distribution</b>
Fajardo	\$589,382,615	\$639,789,695	\$648,591,655	\$718,224,818	2.0%
San Juan Metro	\$11,206,540,752	\$12,572,171,008	\$11,954,990,414	\$11,770,085,513	33.2%
Source: C.H. Johnson Consulting, Inc. 2010.					

Puerto Rico's tourism and retail industries are, in large part, dependent on the many commercial and recreational activities supported by an expansive coastline that provides for waterfront access. As such, air and maritime transportation services and infrastructure are critical to the continued economic success of the Commonwealth. Total passenger movement in the Vieques airport decreased from 160,326 in 2008 to 145,276 in 2009, a 10% reduction tied to decreasing visitation over the same timeframe. Boats available to provide access to the islands of Vieques and Culebra total three cargo boats with a capacity of up to 225 tons and six passenger boats with capacity of up to 577 persons.

NAPR has an existing marina that includes 72 boat slips and 25 moorings. Use of the marina has historically been limited to Navy personnel. Each boat slip is approximately 12 feet wide and most are approximately 31 feet long, with a few in the range of 17 to 35 feet. The facility is generally in good condition as it is relatively new (CB Richard Ellis *et al.* 2004).

## Employment and Income

The Puerto Rican economy continues to suffer the ill effects from the current global economic recession. The on-island population with the ability to work (i.e., ages 16 and older) was estimated at 3,060,016 for 2008. Of this total, approximately 45% participated in the labor force through direct employment or by actively seeking employment. The majority of the existing workforce is located in the San Juan Region, which has 41% of all jobs on the island. Some of the jobs with the highest annual salaries include professions related to electricity, water and gas, and business management. Table 3-8 provides 2009 employment data by sector for Puerto Rico and the Eastern Region (C.H. Johnson Consulting, Inc. 2010).

The unemployment rate for Puerto Rico has been consistently higher than that documented for the mainland United States. In 2008, the unemployed labor force of Puerto Rico was 11%. Of the total 1.3 million workers in June 2010, 217,000 persons or 16.6% were unemployed. In September 2010, the unemployment rate was 16.3% across the Commonwealth. The unemployment rate for March 2011 was recorded at 16.9% (U.S. Bureau of Labor Statistics 2011).

Unemployment in the eastern region (i.e., Ceiba, Culebra, Fajardo, Luquillo, Rio Grande, and Vieques) has typically been higher than the island-wide average. Approximately 16% of its population is in the workforce as compared to 24% of the population island-wide. In November 2009, the region had an unemployment rate of 18.3%, a 3.2% increase from the prior year. The highest unemployment rates for 2009 were recorded for Luquillo and Naguabo at more than 20%, while the lowest rates were for Rio Grande and Ceiba at 16.5% and 17.2%, respectively (see Table 3-9; C.H. Johnson Consulting, Inc. 2010). In September 2010, the employment rate for this region rose to 18.9%. By comparison, in 2010, the annual average unemployment rate for the United States was documented at 9.6% (U.S. Bureau of Labor Statistics 2011).

The average household in Puerto Rico has 3.22 persons. For 2008, of the 1,210,537 households recorded, 41% of households with families have income below the poverty line compared to 59% of individual households. On average, 46% of total households in Puerto Rico are in poverty. The 2008 median household income in Puerto Rico was \$18,610 while the median family household income was \$21,639. Approximately 83.9% of households have incomes less than \$50,000 per annum as compared to 48.1% in the U.S. The 2008 median per capita income in Puerto Rico was \$10,064. (Estudios Technicos, Inc. 2010)

**Table 3-8**  
**2009 Employment by Sector**

Industry	Employment	% of Total Employment
<b>Puerto Rico</b>		
Agriculture	11,490	1.2%
Construction	45,590	4.7%
Manufacturing	94,661	9.8%
Transportation, Communication and Public Utilities	56,878	5.9%
Wholesale	32,984	3.4%
Retail	125,518	13.0%
Finance, Insurance and Real Estate	46,813	4.8%
Services	364,257	37.6%
Government	188,743	19.5%
Other	1,818	0.2%
<b>Total</b>	<b>968,752</b>	<b>100%</b>
<b>Eastern Region</b>		
Agriculture	379	0.8%
Construction	1,422	2.9%
Manufacturing	7,921	16.0%
Transportation, Communication and Public Utilities	2,368	4.8%
Wholesale	195	0.4%
Retail	6,170	12.5%
Finance, Insurance and Real Estate	1,437	2.9%
Services	19,712	39.9%
Government	9,713	19.7%
Other	69	0.1%
<b>Total</b>	<b>49,386</b>	<b>100.0%</b>

Source: C.H. Johnson Consulting, Inc. 2010.

**Table 3-9**  
**Unemployment Rates**

	November 2009	November 2008	2007	2006
<b>Puerto Rico</b>	<b>15.5%</b>	<b>13.1%</b>	<b>10.9%</b>	<b>10.4%</b>
Ceiba	17.2%	15.6%	13.1%	11.2%
Fajardo	17.4%	15.1%	13.0%	12.6%
Humacao	19.2%	16.7%	14.5%	14.0%
Las Piedras	17.5%	16.3%	13.2%	12.9%
Luquillo	20.0%	17.3%	14.8%	13.9%
Naguabo	22.4%	19.5%	15.8%	14.1%
Rio Grande	16.5%	15.8%	11.1%	10.5%
<b>Eastern Region</b>	<b>18.3%</b>	<b>15.1%</b>	<b>13.3%</b>	<b>12.6%</b>

Source: C.H. Johnson Consulting, Inc. (2010)

## Taxes and Revenue

The NAPR property has not been subject to property taxes during its ownership by the United States government. Revenue streams for the municipalities of Ceiba and Naguabo primarily derive from “intergovernmental income,” (approximately 50%) either from the Commonwealth or through benefits from the United States government. In comparison, expenditures are more evenly distributed across government agencies for each municipality (Department of the Navy 2007).

## 3.10 Cultural Resources

### 3.10.1 Historic Buildings

Table 3-10 identifies 36 buildings/structures located at NAPR that are eligible for listing on the National Register of Historic Places (NRHP), either individually or as contributing elements to the Ammunitions Storage District or the Administration and Barracks District. These resources were evaluated as part of a comprehensive architectural survey conducted in 2000 and 2001, the findings of which are documented in the *Architectural Resources Inventory and Evaluation, Naval Station Roosevelt Roads Ceiba, Vieques and Culebra, Puerto Rico*. The Puerto Rico State Historic Preservation Office (SHPO) concurred with the findings of this report in correspondence dated March 3, 2003. Housing resources were evaluated in *Family Housing at the U.S. Naval Station Roosevelt Roads, Ceiba, Puerto Rico* (March 6, 1998). That report concluded none of the family housing is NRHP-eligible and the SHPO concurred with these findings in a letter dated April 13, 1998.

### 3.10.2 Archaeological Resources

The Navy conducted station-wide archaeological surveys in three phases from 1994 through 1996. More than 25% of the Naval Station was surveyed as part of this initiative, resulting in the identification of 27 archaeological sites. An additional four sites were identified during a survey conducted in the summer of 2004. Of the 31 sites identified to date that lie within the area to be disposed, 19 sites have been determined to be eligible and three sites are classified as potentially eligible for listing in the NRHP. The remaining sites have been determined to be ineligible for listing. The remaining 79 acres at the installation, which were identified as being relatively undisturbed and having a moderate to high potential for the presence of archaeological resources, were surveyed in mid-2005. The survey effort identified three additional sites as eligible for the NRHP.

In a letter dated August 31, 2004, the Puerto Rico SHPO concurred that the Navy had completed identification and evaluation efforts for aboveground architecture. With the work completed in the summer of 2004, the Navy has met the requirements for identifying archaeological resources as required under 36 CFR 800.4(a) through (c).

**Table 3-10**  
**Individually Eligible Buildings/Structures**  
**Located Outside Historic Districts**

Building	Year	Original Use
Structure 844, Bolles Dry Dock, 1943		
Building 38, Bombproof Generator Plant, 1944		
Building 256, Communication Center		
Building 504, Bombproof Telephone Building		
<b>Contributing Buildings within the Administrative and Barracks District</b>		
78	1943	Marine Barracks
201	1943	Marine Galley and Mess Hall
202 <sup>(a)</sup>	1943	Marine Barracks
203	1943	Marine Barracks
<b>Contributing Buildings within the Ammunitions Storage District</b>		
300	1943	Inert Magazine
301	1943	Small Arms Storage
302	1943	Small Arms Storage
303	1943	Small Arms Storage
305	1943	Fuse and Detonator Magazine
306	1943	Fuse and Detonator Magazine
307	1943	Fuse and Detonator Magazine
308	1943	Fuse and Detonator Magazine
309	1943	Fuse and Detonator Magazine
310	1943	Fuse and Detonator Magazine
311	1943	High Explosive Magazine
312	1943	High Explosive Magazine
313	1943	High Explosive Magazine
314	1943	High Explosive Magazine
358	1943	Small Arms Magazine
<b>Contributing Buildings within the Ammunitions Storage District</b>		
359	1943	Small Arms Magazine
360	1943	Small Arms Magazine
384	1958	High Explosive Magazine
764	1962	Magazine
765	1962	Magazine
766	1962	Magazine
1665	1967	Ready Issue Magazine
1666	1967	Ready Issue Magazine
1667	1967	Ready Issue Magazine
1668	1967	Arms Storage Magazine
1681	1969	Arms Storage Magazine
1682	1969	Arms Storage Magazine
1682A	1990	Arms Storage Magazine

Note: (a) Resource is considered individually eligible.



## 3.11 Coastal Zone Management

Pursuant to the Coastal Zone Management Act (CZMA) of 1972, the Commonwealth of Puerto Rico has a federally approved Coastal Management Plan (CMP). The CMP defines the coastal zone, identifies the existing sensitive ecosystems within the coastal zone, highlights potential threats resulting from development, and outlines programs and policies designed to manage and protect this sensitive area. The coastal zone in Puerto Rico extends from the seaward boundary of the territorial sea (approximately 9 nautical miles) to 3,283 feet inland from the ocean shoreline and further inland, as necessary, to include important natural coastal systems located landward of the zone's 3,283-foot boundary. The coastal zone includes islands, intertidal areas, salt marshes, saltwater wetlands, beaches, and freshwater wetlands.

The purpose of the Puerto Rico CMP is to guide development of public and private property and water activities in the designated coastal zone. Commonwealth agencies principally responsible for enforcing compliance with planning and permitting in the coastal zone are the PRPB and the Puerto Rico DNER. The PRPB has the authority to issue development permits throughout Puerto Rico, including the maritime zone; it also issues federal consistency certifications for activities affecting coastal uses and resources. The Puerto Rico DNER is responsible for granting mining concessions and franchises for the use of surface and ground waters; the management of the maritime zone, coastal waters, and submerged lands; and the management of forests and the regulation of sand extraction, hunting, and fishing. The Division of Coastal Zone within the Puerto Rico DNER is responsible for administration and coordination of the CMP. In coordination with the U.S. Army Corps of Engineers (USACE), the PRPB and Puerto Rico DNER have developed a joint application process to assist individuals applying for permits for activities that will affect the coastal resources, including the issuance of a certificate of coastal consistency with the Puerto Rico CMP.

Lands owned by the federal government are excluded from the defined coastal zone. However, as required by Section 307(c) of the CZMA, any federal activity that directly or indirectly affects any land or water use or natural resource of the coastal zone must be consistent with the CMP to the maximum extent possible.

## 4 Environmental Consequences

The Proposed Action, the reuse of the Parcel III properties as identified in the 2010 Reuse Plan Addendum, would result in the transfer of approximately 1,370 acres of the NAPR property from federal to private ownership. As required by NEPA, a federal agency proposing an action must evaluate the environmental effects (impacts) that could reasonably be anticipated to be caused by or result from the Proposed Action. This section describes the potential environmental consequences associated with the reuse of the NAPR Parcel III properties that would be transferred to non-federal entities.

The impact assessment contained herein assumes that the Parcel III properties proposed for transfer would be redeveloped as put forth in the 2010 Addendum. As discussed in Section 1.5, the impacts associated with reuse of the property through 2020 (i.e., Phases I and II) under the 2010 Addendum are considered indirect impacts of the Proposed Action. Therefore, such impacts are described at a general level of detail, consistent with that found in the 2010 Addendum. The magnitude of redevelopment beyond Phase II (i.e., Phases III and IV full build-out to 2045), however, would be a function of economic factors and other factors that, with the exception of certain Navy-imposed restrictions, would be beyond the control of the Navy.

The redevelopment of the property from Phase III through Phase IV of the 2010 Addendum is considered to be speculative at present; therefore, the proposed reuses defined in Phases III and IV of the Reuse Plan Addendum have been evaluated as unforeseeable, long-range implications of the Proposed Action and are evaluated only as cumulative impacts. Additionally, the NSRR Tank Farm parcels that lie within the Parcel III footprint are not subject to this SEA except within the context of cumulative impacts. As a PBC, with MARAD as the sponsoring federal agency, the tank farm facilities and infrastructure (to include the fuel pier) will remain under federal law and regulation.

### 4.1 Land Use and Aesthetics

#### 4.1.1 Land Use

In 2004, the Department of Economic Development and Commerce (DEDC), through the auspices of the LRA, submitted a comprehensive zoning plan for the entire NSRR to the PRPB. The zoning for this planned unit development was intended to be flexible in order to adapt to future market conditions. Upon review of the zoning plan, the PRPB, in consultation with the LRA and DEDC, determined a need for a plan revision to better reflect current and anticipated economic factors. As a result, the LRA began development of a revised master plan that would provide the LRA, the municipalities of Ceiba and Naguabo, and the PRPB with enforcement authority to oversee the implementation of the (amended) redevelopment program. Both municipalities would be required to adopt the new development parameters put forth by the revised master plan. As such, the LRA-developed master plan is intended as a “literal translation” of the 2010 Addendum in that the only proposed change to the existing zoning law is a variance in the maximum density allowed – a limitation on density intended to help maintain the character of the existing environment. Any future development projects proposed on the Parcel III properties through Phase II would be reviewed by the PRPB to ensure that such development is consistent with the zoning plan revision.

Phase I of the development program would focus on pre-development activities and would commence with the transfer of the properties in 2011, continuing through 2013. Construction and Phase II would begin in 2012 following final approval of the master development agreement. The initial

components of the proposed redevelopment are expected to be completed in 2014 or a minimum of three years after land conveyance (LRA 2010b).

The reuse of the Parcel III properties, as amended, would alter the nature of the redevelopment program. That is, the type, density, and scope of development within select zones, as provided by the master plan, would be different than those put forward by the 2004 Reuse Plan. The following sections evaluate the revised zoning plan for the Parcel III properties for consistency with historical and existing land uses in eastern Puerto Rico. Direct and indirect impacts associated with the implementation of the 2010 Reuse Plan Addendum through Phase II were evaluated based on whether:

- Reuse would be compatible with historical land uses of the Parcel III properties;
- Reuse would be compatible with land uses adjacent to the Parcel III properties; and
- Reuse would significantly alter the aesthetic quality of the Parcel III properties.

With respect to the Proposed Action, the Navy assumes that potential adverse impacts would be subject to further analysis and mitigation at the project level and that any necessary or additional land use controls (LUCs) would be the responsibility of the Commonwealth.

## 4.1.2 Historical Land Use

### Port Caribe (Zone 1)

Zone 1 (formerly zones 6A/B/C/E and 9), which consists of the former base port facilities, related waterfront infrastructure, and adjacent conservation lands, would be reused consistent with historical use with minor exceptions for limited commercial development. The timeframe for development would be altered to focus on the temporary reuse of facilities and infrastructure improvements during Phase I (2011-2013), while Phase II (2014-2020) would continue to implement plans for the reuse of the existing waterfront facilities and infrastructure, and begin initial commercial development consistent with the renewed focus on tourism put forth by the 2010 Reuse Plan Addendum. In addition, the revised zoning plan would limit the development square footage through Phase II to approximately 160,000 square feet. As the Addendum continues to focus on the reuse of existing facilities and infrastructure within Zone 1, including the maintenance of existing conservation lands, there would be no significant adverse impacts from the Proposed Action.

### Caribbean Riviera (Zone 2)

Zone 2 (formerly zones 7A/F and 6A/B/C/E), as amended by the Addendum, includes approximately 1,310,000 square feet of commercial development. This represents a significant increase in development square footage as compared to the previous zoning plan, which included components of a research and development park and associated conference center. Land use within Zone 2 is currently split between portions of the former base waterfront industrial area and open space areas south to southeast on the peninsula. For those areas within Zone 2 not suitable for reuse (i.e., new construction), the Navy assumes that any potential adverse impacts would be analyzed and mitigated on a project-to-project basis in compliance with local development regulations.

### **El Yunque (Zone 3)**

Zone 3 (formerly zones 7A/D and 9), formerly part of the planned research and development park (with Zone 2 above), includes limited residential and commercial development. The implementation of the Proposed Action would alter the nature of development within Zone 3 as the revised zoning plan includes approximately 215,000 square feet of new development through Phase II of redevelopment program. Proposed land uses include waterfront residential units and small-scale retail establishments. For those areas within Zone 3 not suitable for reuse (i.e., new construction), the Navy assumes that any potential adverse impacts would be analyzed and mitigated on a project-to-project basis in compliance with local development regulations.

### **Marsh Vista (Zone 4)**

Planned development within Zone 4 (formerly zones 7F and 9) consists of approximately 145,000 square feet of residential development (an estimated 50 units) and includes a golf course clubhouse. Zone 4 was originally planned to serve as the gateway to the research and development and conference facilities (Zones 2 and 3 above) to the southeast and northeast of this property, respectively. The golf course and its associated amenities are now planned as a transition area between Port Caribe (Zone 1) and the abundant conservation lands that abut this Zone 4 to the north. For those areas within Zone 4 not suitable for reuse (i.e., new construction), the Navy assumes that any potential adverse impacts would be analyzed and mitigated on a project-to-project basis in compliance with local development regulations.

### **Environmental Retreat (Zone 5)**

The Zone 5 property was formerly planned for federal agency use. The revised zoning plan, however, identifies the former small arms range as appropriate for selective tourism development which includes limited residential and commercial land uses. Due to the low impact nature of the reuse, minimal adverse impacts would result from the Proposed Action.

### **Main Street/Town Center, including the Community College (Zone 7)**

Under the Proposed Action, Zone 7 (formerly zones 4F/B, 1B, and 9) would consist of approximately 100,000 square feet of institutional facilities. As noted in the 2004 Reuse Plan, previous plans through Phase II of this project included development of various commercial, retail, and community establishments consistent with the mixed-use principle for urbanized areas. The majority of the proposed Zone 7 development would be met by facility reuse of currently developed areas and, as necessary, expansion of existing facilities. As such, no significant adverse impacts would be associated with the development of Zone 7. However, due to the proximity of Zone 7 to the airport, land use within the airport noise zones should consider noise attenuation for new development sufficient to protect against a 65-decibel or higher exposure.

### **Ceiba Park (Zone 11)**

Zone 11 (formerly zones 8 and 9) is a new component of the development program through Phase II. This land area was previously planned as an open space reserve and conservation area to ensure continued access to the public beach and the various recreational opportunities provided by the shoreline. Collateral development in relation to Ceiba Park would consist of approximately 10,000 square feet of small-scale commercial or residential units. The Navy assumes that impacts to the existing conservation areas in Zone 11 would be avoided and/or mitigated consistent with the municipal code or federal law, as applicable (LRA 2010b).

Table 4-1 provides a summary of the revised zoning plan put forth by the 2010 Reuse Plan Addendum.

<b>Table 4-1</b> <b>Parcel III Proposed Land Uses through Phase II (2014 – 2020)</b> <b>of the 2010 Reuse Plan Addendum</b>				
<b>Zone</b>	<b>Historical Land Use</b>	<b>Phase II Land Use</b>	<b>Zoned Development Density</b>	<b>Land Use Consistency</b>
<b>Zone 1: Port Caribe</b> "The Commercial Heart"	Port/Industrial	Port/Terminal; Commercial; Industrial	High	Compatible
<b>Zone 2: Caribbean Riviera</b> "The Destination Anchor"	Industrial; Open Space	Commercial; Open Space	High	Compatible with Mitigation
<b>Zone 3: El Yunque Grande</b> "The Premiere Eco-Tourism Resort"	Open Space	Commercial; Open Space	Medium	Compatible with Mitigation
<b>Zone 4: Marsh Vista</b> "The Golf/Country Club Amenity"	Open Space; Industrial	Commercial; Residential; Open Space	Medium	Compatible with Mitigation
<b>Zone 5: Eco-Outpost Base Camp</b> "The Environmental Retreat"	Small Arms Range; Open Space	Commercial; Residential; Open Space	Low	Compatible
<b>Zone 7: Main Street</b> "The Town Center"	Ammunition Storage	Commercial; Residential	Low	Compatible
<b>Zone 11: Ceiba Park</b> "The Gateway"	Open Space; Agriculture	Commercial; Open Space	Low	Compatible with Mitigation
<b>Note:</b> The Phase I launch includes initial projects for Zones 1 through 4 and Zone 7. The Phase II launch includes initial projects in Zones 5, 6, 7 and 8.				

### 4.1.3 Regional Land Use

The total development of the Parcel III properties through Phase II of the development program is estimated at approximately 1,940,000 square feet. This compares to the approximately 4,420,000 square feet estimated at full build-out. The redevelopment of the Parcel III properties, consistent with the 2010 Reuse Plan Addendum, would be compatible with existing regional land use, in particular existing development focused on the island's tourism market in eastern Puerto Rico.

Implementation of the revised zoning plan for the Parcel III properties would result in indirect impacts to the municipalities of Ceiba and Naguabo in terms of future land use. It is anticipated, however, that significant economic benefits associated with the redevelopment of the former military base would accrue to the municipalities and the region as a whole. Infrastructure improvements and the availability and enhancement of commercial services also are anticipated results from the implementation of the Proposed Action. Therefore, any such impacts to regional land use would be considered to be positive and beneficial to the communities in eastern Puerto Rico over the short and long term.

### 4.1.4 Aesthetics

Implementation of the 2010 Reuse Plan Addendum through Phase II would minimally change the overall aesthetic features of the Parcel III properties. The majority of new development associated with



Phase II through 2020 would entail reuse consistent with historical conditions. Existing conservation areas would remain a significant component of the proposed redevelopment helping to preserve the aesthetic appeal of the natural environment. The use of buffer zones between developed areas and sensitive ecosystems and/or watersheds would further enhance the natural aesthetics within individual reuse zones. In this way, aesthetic impacts to the existing natural features on NAPR would be negligible.

The potential for aesthetic impacts associated with the redeveloped urban landscape for the Parcel III properties would be contingent on project-specific parameters such as site selection and design. Any new construction would be required to comply with the “Reglamento Conjunto,” the PRPB approved zoning regulation for the Commonwealth, which limits the allowable densities for the proposed build-out, including the Parcel III properties, to 25% of the maximum allowed by the island-wide zoning regulation. The intent of this proposed variation is to limit the scale of buildings permitted within the NAPR footprint. Therefore, the extent to which the urban landscape would result in adverse impacts to aesthetics would be minimized through land use regulation. The Navy assumes that any indirect impacts to the viewshed would be mitigated on a project-to-project basis.

## 4.2 Environmental Contamination

CERCLA requires federal agencies to conduct any needed response actions to clean up contamination from past releases of hazardous substances that pose an unacceptable risk to human health and the environment. In preparing to dispose of the NAPR property, the Navy will follow the provisions of CERCLA, Section 120(h)(3). These provisions require that the deed transferring the property contain a covenant warranting all remedial actions necessary to protect human health and the environment with respect to contaminants remaining on the property has been taken prior to the date of transfer.

Whenever a Military Department enters into a transfer of real property outside the federal government where CERCLA 120(h)(3) hazardous substances were stored for one year or longer, known to have been released, or disposed of, Section 120(h) of CERCLA reference (f) applies. The DoD has no authority under Section 120(h) to increase or decrease the commitment required by that section. Any deed transferring title to real property shall contain, to the extent required by law, the notices, descriptions, and covenants specified in Section 120(h). While all property must comply with CERCLA 120 requirements for transfer, the cleanup itself may proceed under CERCLA or RCRA, when appropriate (DoD 2006). All such remedial action is considered to have been taken if the construction and installation of an approved remedial design has been completed and the remedy has been demonstrated to the USEPA to be operating properly and successfully.

As discussed in Section 3.2.2, the Navy prepared an ECP report documenting existing hazardous materials and waste sites located at NAPR. The ECP report provides baseline information to support disposal and purchase decisions. Property determined to be uncontaminated is defined as “real property on which no hazardous substances and no petroleum products or their derivatives were known to have been released or disposed of” (Section 120 [h] [4], as amended). The purpose of this process is to determine which real property is uncontaminated and can subsequently be transferred through a Finding of Suitability for Transfer. Potentially contaminated property can still be transferred under the early transfer process of CERCLA. The Navy can prepare a Finding of Suitability for Early Transfer (FOSET) to transfer property prior to cleanup actions. In these cases, the Navy or the property recipient may conduct cleanup actions. The benefit of a FOSET is that the property can be transferred sooner in order to begin redevelopment while still being assured of property cleanup.

Pursuant to CERCLA 120(h)(3)C and the DoD early transfer guidance, the Navy also prepared a Covenant Deferral Request intended to provide the information necessary for approval by the Governor of the Commonwealth of Puerto Rico of the early transfer of certain NAPR property. This report supplements the information in the July 2005 ECP. It presents a road map for environmental remediation

considering disposal and property transfer schedules; planned work, including conducting Remedial Investigations, Feasibility Studies, and Remedial Actions; the CERFA; and other actions as required by CERCLA at a BRAC activity.

Prior to transfer of custody and control of parcels, NAPR would remove and dispose of all hazardous materials in accordance with applicable laws and regulations. The Navy would inform future property owners of the locations of hazardous waste 90-day accumulation areas, the SAAs, and the universal waste storage areas at NAPR. The Navy would be required to close or transfer these areas in accordance with CERCLA, RCRA, and all other applicable federal, state, and local laws and regulations. Where appropriate, restrictions, notifications, or covenants in deeds related to ACM, lead, PCBs, radon, and pesticides will be included in property transfer documents to ensure the protection of human health and the environment.

To comply with CERCLA's early transfer authority, the Governor of the Commonwealth of Puerto Rico would concur property is suitable for transfer as defined under 42 U.S.C. Section 9620(h)(3)(C)(i). Navy transfer documents would ensure post-conveyance uses of contaminated property are restricted to uses similar to or the same as uses in place at the time when NSRR was operational. Future land uses would be consistent with protection of human health and the environment.

Sites with remaining environmental contamination within the 2010 Reuse Plan Addendum Parcel III fall into the following categories:

- RCRA sites, including IR Program sites, SWMUs, AOCs, and ECP sites;
- CERCLA sites;
- Tanks, including MNA sites;
- NRDA area, the 1999 JP-5 fuel spill area and associated mitigation;
- LBP areas, including LBP concerns associated with buildings designed for family housing; and
- ACM, including ACM concerns associated with all installation buildings.

The majority of the contaminated sites are located in two distinct areas:

- The waterfront area along the northeast side of Enseñada Honda, which was the major industrial area of NAPR and is designated for similar port and fueling facilities in the Reuse Plan;
- The developed area northwest of Enseñada Honda, which contained the Navy Lodge, exchange mall, commissary, bowling alley, gas station, mini-mart, etc., and is designated as a "downtown area" in the Reuse Plan.

The cleanup of contaminated sites at NAPR is primarily managed under the corrective action portion of the RCRA Part B permit as issued by USEPA Region II (SWMU, AOC, ECP sites). Since base operations requiring the Part B permit are no longer in operation, only the corrective action portion of the permit remains applicable. As discussed in Section 3.2.4, the USEPA chose to convert the regulation of corrective action requirements from the permit to a Consent Order prior to property transfer. The Navy and EPA voluntarily entered into a Consent Order in January 2007.

Under the Consent Order, the USEPA is the lead agency for all cleanup actions and is the decision-making authority regarding remedy selection. Property subject to cleanup requirements under the Consent Order may be transferred prior to completion of cleanup under CERCLA early transfer authority, pursuant to the Governor's approval of the early transfer. Upon property transfer, LUCs

appropriate to individual sites would be imposed as necessary to ensure protection of human health and the environment. These restrictions may be viewed as interim, pending completion of cleanup activities. Upon USEPA approval of the completion of cleanup at a site, the Navy would modify or remove these LUCs in accordance with the USEPA-approved final remedy.

## Proposed Action

Under the Proposed Action, some parcels could be transferred with LUCs. Implementing this alternative would result in the following:

- Contaminated sites could be transferred earlier under the early transfer.
- All sites would be cleaned up to meet historic land uses, defined as former NSRR operations. Thus, an industrial site would be cleaned to industrial risk-based levels.
- The Navy may choose to retain cleanup or pass cleanup responsibility on to the new owner. The Navy would be replaced by the new owner of the permit (or Consent Order) for those sites where cleanup responsibility is passed to a new owner. The Navy would retain ultimate CERCLA liability in all cases.
- Sites previously completed with LUCs in place would not be reopened, but would be transferred “as-is.”
- The new owner could choose to take action to support removing LUCs. This would be between the new owner and the USEPA. Reuse/redevelopment activity would be limited only by the specified LUCs and/or the new owner’s schedule to reduce or remove the LUCs.

Under the Proposed Action, cleanup responsibility for parcels containing sites with remaining cleanup requirements could be handled in two ways: (1) cleanup responsibility would be transferred to the new owner, or (2) the Navy would retain cleanup responsibility. At sites where cleanup responsibility is passed to the new owner, a prerequisite to transfer would be establishment of an acceptable regulatory mechanism between the USEPA and the new owner. Each new owner of a parcel where there are remaining cleanup requirements and/or LUCs would get a Consent Order specifically pertaining to the parcel in question. If the Navy retains the cleanup, the Consent Order for the parcel would be held by the Navy.

The Navy could pass cleanup responsibility to new owners with all parcels to be sold to the public or, if retained as federal property, ownership would be transferred to another federal agency. The Navy would retain cleanup responsibilities for sites contained within parcels that are to be conveyed to recipients via PBCs and EDCs. The Navy would also retain cleanup responsibility at sites where contaminants are known or suspected to cross multiple parcel boundaries (based on best available information, as presented in the 2005 ECP report and the 2007 Covenant Deferral Request), regardless of ultimate parcel ownership.

If the new owner is to perform cleanup, the new owner would be responsible for establishing goals with the USEPA and completing cleanup according to the specific requirements of their own Consent Order, which they would negotiate with the USEPA prior to transfer. Cleanup goals would be risk-based and established based on the owner’s selection of future use, as approved by the USEPA. Where the Navy is performing cleanup, the Navy would identify future use as aligned with current use (i.e., former NSRR operations), as approved by the USEPA. New owners wishing to change that use (i.e., to lift any remaining use restrictions) would be responsible for performing any additional work necessary to achieve that goal, as required by the USEPA.

Similarly, additional cleanup activities are ongoing for MNAs under the regulation of the USEPA. The cleanup responsibilities would be retained or passed to the new owner as described for RCRA permit sites as described above.

Mitigation activities associated with the NRDA would continue under Navy responsibility. Because this mitigation is in lieu of site cleanup, no additional cleanup of the spill area would be performed.

LBP in housing has been inventoried and risk assessments prepared according to Federal Property Management Regulations. Similarly, ACM in buildings has been inventoried. Because future owners may choose to reuse buildings in their current configuration, significantly remodel, or demolish buildings to make way for new development, installation structures would be transferred to new parcel owners “as-is.” New owners would be required to complete any necessary abatement activities as identified in the LBP and ACM inventories to ensure compatibility with use. A small quantity of friable, accessible, and damaged ACM was identified during the ACM survey, and the Navy plans to complete abatement of this material prior to property transfer.

Implementing the Proposed Action with respect to environmental contamination would not result in a significant impact on the environment. In fact, this alternative offers several operational or functional advantages. The cleanup would be controlled by the end users with the appropriate level of cleanup being determined between USEPA and the new owner, based on the property owner’s desired reuse. In addition, this alternative would allow for rapid redevelopment, with sites being available for reuse as soon as a new owner is established. A new owner accepting cleanup responsibility could tailor redevelopment plans and schedules, taking into consideration remediation requirements, cost requirements, and operable development opportunity. Implementing this alternative would allow the Puerto Rico citizenry an opportunity to reap any potential social, economic, and/or recreational benefit.

## 4.3 Infrastructure and Utilities

The water supply, wastewater treatment facilities, and base electrical distribution system will be transferred to the LRA by way of negotiated sale under the terms of Memorandum of Agreement (MOA) Regarding the Disposal of NAPR (August 11, 2010; Appendix A) for base utility systems. In accordance with the MOA, the LRA acquires control and operational responsibility for these onsite utility systems. The MOA also provides the Navy with significant cost savings associated with the operation and maintenance of such systems. In addition to evaluating potential impacts to the potable water, wastewater treatment, and electrical systems, this section also analyzes the potential for adverse impacts associated with shoreline infrastructure, stormwater, solid waste, and transportation.

### 4.3.1 Potable Water Supply and Distribution

The PRASA, as the WTP operator, would be responsible for obtaining an NPDES permit and for maintaining the potable water supply and distribution system to meet the standards and treatment requirements under the Safe Drinking Water Act, as implemented by the Puerto Rico Department of Health. This law provides for the establishment of primary standards for the protection of the public health and secondary standards relating to the taste, odor, and appearance of drinking water. In addition, all enforceable maximum contaminant levels for particular contaminants in drinking water, including trihalomethanes (THMs), would need to be met by the PRASA. In the case that the PRASA would not take over the facilities, closure of such systems would be in accordance with the Consent Order and the Commonwealth would assume responsibility for the operation and maintenance of the potable water system (Department of the 2007).

The extent of the required upgrades to the potable water distribution system for the Parcel III properties would depend on whether the WTP is operated under the American Water Works Association or PRASA design standards. It estimated that the Parcel III properties would require approximately 59,000 linear feet of polyvinyl chloride (PVC) piping ranging from 2 inches to 12 inches in diameter (LRA 2010b). Consistent with the findings of previous NEPA documentation for the disposal of the NAPR property, the reservoir, treatment plant, pump stations, and distribution lines are considered to be in good working order (e.g., no deficiencies or obvious defects; maintenance records are complete and up-to-date; intended function is performed adequately, etc.) (Department of the Navy 2007). The Navy assumes that, depending upon the location of new development, additional upgrades to the distribution system (e.g., water mains and pump stations) may be required and that the system components would be evaluated for compliance with applicable municipal codes.

Based on the assessment and findings of the *Naval Station Roosevelt Roads Potable Water Demand Determination and Cost Analysis Report* (LRA 2010b), the existing potable water supply, treatment, and distribution infrastructure (with required upgrades) would meet the potable water demand through Phase II of the 2010 Addendum with the recommended upgrades. This analysis estimates demand on the system at full build-out to be approximately 4.4 mgd, representing a 0.4-mgd increase from the estimate associated with the 2004 Reuse Plan. Previous NEPA analyses concluded that the system was sufficient to support more than 7,000 persons at 1.0 mgd (i.e, based on the average daily flow at the former base). Therefore, the 0.4-mgd increase at full build-out would have no significant adverse impacts through Phase II of the proposed redevelopment.

#### 4.3.2 Wastewater Conveyance and Treatment

The 2010 Reuse Plan Addendum states that the three existing WWTPs would be replaced with a single, centralized WWTP with tertiary treatment capable of processing wastewater flows from the entire property. It is estimated that collection system infrastructure for a new centralized plant would require approximately 123,900 linear feet of new pipe with diameters ranging from 4 to 16 inches over a 25-year planning period (LRA 2010b). The existing WWTPs, however, would be required to support the revised development plans through Phase II of the build-out.

The PRASA would be responsible for maintaining the wastewater treatment system to meet the standards and treatment requirements of a Section 402 Clean Water Act NPDES permit. The permit would contain limits on pollutant discharge and specify monitoring and reporting requirements and other provisions to ensure that the discharge from the wastewater treatment plant(s) would not affect water quality standards for receiving waters. In the case that the PRASA would not take over the facilities, closure of such systems would be in accordance with the Consent Order and the Commonwealth would assume responsibility for the operation and maintenance of the existing wastewater treatment system.

Consistent with the findings of previous NEPA documentation, the WWTPs, pump stations, and collection and conveyance lines that service the Parcel III properties are considered to be in good working order (e.g., no deficiencies or obvious defects; maintenance records are complete and up-to-date; the intended functions perform adequately, etc.) (Department of the Navy 2007). As such, the majority of required upgrades would be focused on the collection and conveyance systems associated with new development areas. The Navy assumes that, dependent on the type and intensity of the proposed land uses through Phase II of the development program, the conditions of the NPDES permit would be amended accordingly and that components of the existing system would be evaluated for compliance with applicable municipal codes.

Based on the assessment and findings of the *Naval Station Roosevelt Roads Wastewater Generation Determination and Cost Analysis Report* (ERM, Inc. 2010), the existing wastewater collection and treatment infrastructure would meet the capacity through Phase II of the 2010 Addendum with the



recommended upgrades. This analysis estimates demand on the system associated with the build-out of the Parcel III properties to be approximately 1.74 mgd, whereas the estimated total wastewater treatment capacity is approximately 3.3 mgd. Previous NEPA analyses concluded that the average daily treated flow of 1.3 mgd from the existing WWTP facilities (i.e., the Bundy, Capehart, and Forrestal plants) generated by a former base population of more than 7,000 persons would not be exceeded for a projected workforce of 5,000 and residential population of 2,850. Therefore, an adverse impact to the wastewater system from a 0.44-mgd increase through Phase II of the proposed redevelopment is not expected.

The existing NPDES permit (#PR0020010) for NAPR WWTPs expired in January 2003. However, the Navy filed an application for a permit renewal six months prior to its expiration and, as a result, the permit has continued to be operational under an Administrative Continuance. The permit could be directly transferred to the PRASA along with transfer of ownership of the WWTPs, provided PRASA adopts the application for renewal of the permit as its own. However, depending on the uses ultimately served by the WWTPs, PRASA may need to supplement the permit (O'Brien 2005).

### 4.3.3 Electrical Supply and Distribution

The substation upgrades and easement requirements associated with the Proposed Action have not been updated to reflect the 2010 Reuse Plan Addendum. However, the EDC provides an estimate for electrical demand associated with the full build-out of the Parcel III properties. Typical values for commercial and residential electrical use were used to determine electrical loads for each of the proposed reuse zones based on their intended future use. The analysis concluded that full build-out of the Parcel III properties would require an estimated 875,562,000 kilowatt-hours per year, an annual consumption rate that would require expansion of the existing base electrical system over the long term. The analysis also concluded that four additional substations, upgrades to existing substations, and an appropriate level of easement expansion would suffice to meet the electrical demand of the Parcel III properties at full build-out (LRA 2010b).

The PREPA, as the operator of the system, would be expected to provide the necessary investment for upgrades to the existing electrical system, including site security and vehicle access, as appropriate. In the case that the PREPA would not take over the facilities, closure of such systems would be in accordance with the Consent Order and the Commonwealth would assume responsibility for the operation and maintenance of the electrical system.

Consistent with the findings of previous NEPA documentation, the existing system infrastructure would be sufficient to service the Parcel III properties through Phase II of the development program. Although the electrical system as a whole is considered to be in fair to good working condition (e.g., no deficiencies or obvious defects; maintenance records are complete and up-to-date; intended functions are performed adequately, etc.), it is anticipated that the four substations servicing the Parcel III properties would require upgrades to comply with PREPA standards for system integration. PREPA requirements also would include additional easement for substation expansion in Parcel III and an upgrade to secondary voltage of 18.32 kV from 13.2 kV (Department of the Navy 2007; LRA 2010b).

### 4.3.4 Piers and Shoreline Infrastructure

The Proposed Action would include various infrastructure upgrades at the waterfront some of which would include waterfront demolition, construction, and repair. The NAPR conveyance includes a variety of piers and shoreline infrastructure that are identified for reuse per the 2010 Reuse Plan Addendum. The intended reuse of the existing shoreline infrastructure helps to determine the type and necessity of planned upgrades to waterfront infrastructure.

Several facilities have infrastructure that remain in condition suitable for the intended reuse. For example, the drydock/wetslip facility would not require significant upgrades beyond debris removal and/or dredging as its future use for commercial fishing (as part of the eco-tourism resort) would be considered low impact. In addition, the small craft marina remains in good working condition requiring only minor upgrades in support of the Proposed Action. The existing bulkhead system also is in relatively good condition due to routine maintenance and minor surface repairs. All such facilities and infrastructure are capable of supporting their intended future use with minimal upgrades. Therefore, upgrades to these facilities and infrastructure would be considered to result in negligible adverse impacts to the natural and man-made environment.

In some cases, however, implementation of the Proposed Action would require extensive upgrades to shoreline infrastructure to be considered suitable for reuse. For example, although Pier 3 can be used on an interim basis, its long-term use would require demolition and removal as the upgrades necessary to support a cruise or ferry terminal are not feasible, and would require construction of a new pier to meet specifications. In addition, utility and fuel line connections that service Pier 3 are not in compliance with the National Fire Protection Agency (NFPA) 70: National Electric Code requiring full replacement of this infrastructure for continued use. The pier adjacent (and to the north) of the drydock/wetslip facility is similarly in disrepair and would require full demolition and removal to meet the requirements of its intended future use for recreation. In addition, the removed pier adjacent to Pier 3 would require the demolition and removal of pilings that are visible above the water surface.

Under the Proposed Action, Pier 2, adjacent to the small craft marina, would be part of the waterfront redevelopment within Zone 1 intended to accommodate commercial, retail, and recreational vessels. Pier 2 would require an extensive evaluation of structural integrity to determine the scope of any necessary upgrades. To date, the future use or reuse of the customs pier has not been identified. However, this pier also would require an extensive structural analysis to determine the extent of needed repair (LRA 2010b). For all future in-water demolition, construction, and repair, the Navy assumes that potential adverse impacts to the natural and man-made environment would be evaluated on an individual project basis, as applicable.

#### 4.3.5 Stormwater

The implementation of the Proposed Action would require additional stormwater conveyance infrastructure over the long term. Development of the Parcel III properties would significantly increase the amount of impervious surface compared to existing conditions. Stormwater runoff has the potential to adversely affect water quality in the 'quebradas,' mangroves, and marine environments at and adjacent to the Parcel III properties through the introduction of sediments, particulates, and toxins. The Navy assumes that a detailed stormwater master plan would be developed to guide and implement best practices for stormwater management with respect to Parcel III.

The Navy currently maintains a stormwater discharge permit for NAPR – the USEPA General Permit for Discharges from a Small Municipal Separate Storm Sewer System (MS4). To date, the MS4 permit has been the only requirement for compliance with the NPDES. The permit is not transferable upon an ownership change and would be terminated with the transfer of the storm sewer system to the Commonwealth. The Navy assumes that the Commonwealth or a representative government entity would apply for a new permit for the MS4 unless otherwise excluded from compliance as determined by the USEPA (e.g., populations less than 10,000).

NPDES stormwater permits from the USEPA and Control of Erosion and Prevention of Sedimentation (CES) permits from the EQB would be required for construction activities at NAPR or for disturbances to less than 1 acre that are associated with a larger common plan for development. NPDES permits also are required for disturbances to more than 1 acre of land. Large construction activities in

Puerto Rico are eligible for coverage under the USEPA's NPDES General Permit for Storm Water Discharges Associated with Construction Activity. This permit requires developing and implementing a stormwater pollution prevention plan (SWPPP) using best management practices (BMPs) to minimize pollutants in stormwater runoff. For soil disturbance of more than 9,688 square feet (900 square meters) of land, CES permits require that a soil erosion and sedimentation control plan be prepared and implemented (Department of the 2007). The Navy assumes that landowners and developers of the Parcel III properties would comply with these permit requirements to ensure stormwater is adequately controlled at all construction sites. As a result, no significant adverse impacts related to stormwater runoff would be anticipated from implementation of the Proposed Action.

Six outfalls at NAPR are regulated under the USEPA's Multi-Sector General Permit (MSGP) Program which does now allow for the automatic transfer of permit coverage under 40 CFR 122.61(b). The USEPA issued the final 2008 MSGP to replace the 2000 MSGP, which expired in 2005. The 2008 MSGP provides coverage for water discharges associated with industrial activity (Department of the Navy 2007). Upon transfer of the Parcel III properties, the Navy assumes that any industrial operators would comply with the requirements of the 2008 MSGP for the Commonwealth (permit number PRR050000) or obtain individual discharge permits for outfalls in receipt of industrial runoff. This would include the preparation of a SWPPP that meets the requirements of the applicable permit.

#### 4.3.6 Solid Waste

The existing landfill at NAPR has been closed in accordance with RCRA. Therefore, solid waste generated by any future land use on the Parcel III properties through Phase II of the redevelopment would be the responsibility of the local municipalities to utilize existing facilities within the region. Previous NEPA analyses concluded that a population increase of 2,850 or less than 2% of the existing customer base would generate approximately 0.7 tons per year per capita in additional solid waste (Puerto Rico Authority for Solid Waste August 2004). The analysis also concluded that, based on average waste generation for a municipality, an estimated 1,995 tons of solid waste would result from the disposal and redevelopment of NAPR – an increase of approximately 1% to the municipal solid waste currently managed by Landfill Technologies, Inc. (Department of the Navy 2007). Therefore, implementation of the Proposed Action would have negligible impacts on the capacity of the solid waste system through Phase II of the redevelopment. Although facility demolition is a significant component of the 2010 Addendum through the build-out cycle, the reuse and/or recycling of building materials to the maximum extent possible would negate any potential impacts with respect to landfill space.

#### 4.3.7 Transportation

##### Roadway Network

The implementation of the Proposed Action would not be expected to result in significant adverse impacts on the land transportation system. The existing road system at NAPR has been well maintained since base closure in 2004 and the Navy would transfer roadway easements to the LRA consistent with the MOA for most of the main roadways servicing the Parcel III properties to support the planned build-out. Past development on NAPR has been fragmented such that roadways currently extend into each zone considered for reuse, and development sites are generally accessible. The Navy assumes that, although most of the existing roadway network can be used through Phase II of the redevelopment, the main arterials conveying traffic to high-density development areas, such as those identified in the 2010 Addendum, would require modification and/or expansion. For example, it is anticipated that the primary access road into Parcel III would require an upgrade. However, given the conceptual nature of the proposed reuse of the Parcel III properties, roadway construction and/or improvement determinations

would need to be made on a case-by-case basis (and supported by further analysis) as development is phased in through 2020. On a regional scale, the recent opening of PR-66 as an important nexus between southeast and northeast Puerto Rico has served to reduce high traffic volumes on PR-3. Therefore, implementation of the Proposed Action would not be expected to result in significant adverse impacts to the local or regional roadway network.

## Waterway Network

Implementation of the Proposed Action would not result in any significant adverse impacts to the marine transportation network. The reuse of the existing port facilities and infrastructure to enhance the regional waterway network is considered a beneficial impact in that it is consistent with historical use and an improvement in terms of waterfront infrastructure capacity and condition. The Navy assumes no further responsibility for any significant upgrades to piers or other waterfront infrastructure associated with marine transportation. Any such actions with the potential for adverse impacts to surface waters would require a USACE permit consistent with the requirements of the federal Clean Water Act.

## 4.4 Topography, Geology, and Soils

Construction, maintenance, and operation of redevelopment of NAPR through Phase II of the 2010 addendum would have minimal potential impacts on local topography, geology, and soils. The majority of construction activity associated with Phase II is either redevelopment and facility reuse and expansion or new construction that occurs within previously developed areas (see Figure 3-3). For example, development already exists within all zones except Ceiba Park (see Figure 3-3). Because there is no anticipated need for extensive excavation or blasting of bedrock, no widespread impacts to local geology are expected. In addition, proposed development would avoid areas of steep topography and therefore major re-grading activities are also unlikely.

Adverse impacts to topography for a majority of the Parcel III areas would be limited primarily to landscape grading that is required to ensure proper drainage or landscape contouring that is required to implement erosion control measures.

Historically, topography has not been a development constraint within the Port Caribe, Caribbean Riviera, El Yunque and Ceiba Park areas (Department of the Navy 2007). Development associated with the Proposed Action within these areas would have a minimal impact on topography. In addition, no steep topography exists in the vicinity of Lake Chamberlain Road.

Rolling topographic features exist within the Marsh Vista area and the northern edge of this area has a steep topographic gradient north into the Los Machos Forest (see Figure 3-4). Phase II development within this area includes construction of an 18-hole golf course, clubhouse, and approximately 50 residential units. Development within Marsh Vista would avoid steep topographic areas along the northern boundary and would likely incorporate the rolling topographic landscape into golf course design. As such, impacts to topography would be minimal.

The proposed Community College area encompasses portions of the Delicias Hills, an undulating elevated ridge located just south of the Ofstie Airfield (see Figure 3-4). Hillsides within this area are significantly sloped and limit development to hilltop and foothill areas. Under the Proposed Action, development within this area would primarily utilize existing structures and developed areas to support proposed residential, commercial, academic, retail, research and development and entertainment. New construction activities would be minimized in areas of steep topography and therefore, impacts to topography would be minimal.

The proposed Environmental Retreat would be located on Punta Media Mundo, an elevated point located north of the Los Machos Forest (see Figure 3-4). This area was historically used as a small arms

range and contains disparate and separate plateaus (LRA 2010b). The Proposed Action seeks to utilize this area for camping and interpretive excursion. As such, construction activities within the proposed Environmental Retreat area would be minimal and would be expected to utilize existing plateaus to avoid development in areas of steep topography.

The primary concern for future redevelopment of NAPR through Phase II of the 2010 Addendum would be removal of existing vegetative cover which would expose soils potentially resulting in increased soil erosion and sedimentation. In addition, exposed soils could come in contact with pollutants customarily used at construction sites for construction-related activities.

Construction impacts to soils resulting from clearing of vegetation would be short-term and negligible in areas where soil erosion potential is low. Moderate impacts on soils are expected to occur in areas where the soil erosion potential is high. The soil data indicate that highly erodible soils are located in all zones. Small areas of highly erodible soil also are traversed by Lake Chamberlain Road (see Figure 3-5; NRCS 2006).

Soil erosion and sedimentation impacts on highly erodible soils would be minimized by implementing stormwater runoff and soil erosion/sediment control measures required under federal and Commonwealth law (as described below), including use of appropriate BMPs during vegetative clearing and construction activities. Customary BMPs include clearing only small tracts of land at one time or only those areas directly impacted by the construction footprint, minimizing the length of time that cleared areas would be devoid of vegetation, installing erosion control devices correctly and maintaining erosion control devices throughout construction and until revegetation has occurred, returning disturbed areas to the pre-construction contours to the extent practical, and establishing groundcover in previously disturbed areas as soon as possible after construction is completed.

Potential contamination of exposed soils from compounds typically used or found on construction sites (i.e., lubricants, fuels, construction debris, and garbage, etc.) would be minimized by implementing typical spill prevention, containment and countermeasure protocols required under federal and Commonwealth law (as described below) and other customary good housekeeping techniques during construction. For example, to minimize contamination of exposed soils during construction, contractors would be expected to protect exposed soils when changing equipment lubricants and to immediately remove and properly dispose of any soils affected by small spills. Examples of good housekeeping practices during construction include clearing construction debris from construction sites daily and utilizing waste receptacles to maintain clean construction areas.

Construction activities in Puerto Rico that include soil-disturbing activities such as clearing, grading, excavating, stockpiling, etc. that disturb 1 or more acres (43,560 square feet), or smaller sites that are part of a larger common plan of development or sale, are regulated under the USEPA NPDES stormwater program.

The USEPA Construction General Permit (CGP) is an NPDES permit issued under the authority of the Clean Water Act. The 2003 USEPA CGP expired on July 1, 2008. The USEPA issued a new CGP in July 2008 (i.e., the 2008 CGP) that uses substantially similar terms and conditions as the USEPA's 2003 CGP (USEPA 2011b). Currently, new development in Puerto Rico is covered under the 2008 CGP (USEPA 2011a). The 2008 CGP was scheduled to expire on June 30, 2010, however, the USEPA has proposed to extend the 2008 CGP by one year to June 30, 2011, after which a revised CGP will be issued which will incorporate new Effluent Limitations Guidelines (ELGs) into the new CGP (USEPA 2011c). Once promulgated, the new ELGs will represent a significant advancement in the control of sediment discharges from construction sites, imposing national requirements on construction activities that disturb 1 or more acres of land. The guidelines will contain a variety of provisions addressing the regulatory requirements for development of technology-based limits covering sediment and erosion control as well as pollution prevention measures to address other sources of pollutants commonly found at construction sites (USEPA 2011c). The permit also requires developing a SWPPP using BMPs to



minimize pollutants in stormwater runoff. Any developer proposing new construction within Parcel III would be required to apply for and implement either the 2008 CGP or revised CGP guidelines depending upon when the construction activities are initiated and when new CGP guidelines become effective.

Construction activities that result in soil disturbance of greater than 0.22 acre (9,688 square feet) also would require a CES permit. This permit is issued by the Puerto Rico EQB and would need to be obtained by any party proposing a specific redevelopment activity within the Phase III properties. To meet the requirements of a CES permit, a Soil Erosion and Sedimentation Control Plan would be required for each proposed redevelopment project in excess of 0.22 acre to prevent and minimize impacts on soils. The plan would identify soil erosion measures and BMPs to minimize sedimentation and to ensure that the effects of construction and maintenance of the proposed projects on soil erosion and sedimentation would be minor.

Once detailed engineering and design studies are complete, the specific project sponsors/developers would be responsible for obtaining the NPDES CGP and CES permits. With implementation of the required measures that would be specified in the NPDES and CES permits, construction, maintenance, and operation of future redevelopment of NAPR through Phase II of the 2010 Addendum is not expected to result in significant adverse impacts on topography, geology, or soils.

## 4.5 Hydrology and Water

### 4.5.1 Surface Waters

Clearing and grading during future redevelopment of NAPR through Phase II of the 2010 Reuse Addendum and widening of Lake Chamberlain Road could affect surface water. Potential impacts would be associated with physical alteration of natural drainage systems, changes in surface runoff patterns, soil erosion and sedimentation, and introduction of contaminants to surface waters from construction sites or activities. Impacts on surface waters also potentially could occur during the long-term operation of the new facilities.

The three main drainages discussed in Section 3.5.1 do not traverse Zones 1 through 5 or 7, or Lake Chamberlain Road (see Figure 3-6). The Quebrada Aquas Clara flows into Puerto Medio Mundo approximately 0.25 mile south of the Ceiba Park (Zone 11) area and the Quebrada Ceiba flows through the northwest corner of Ceiba Park into Bahía Demajagua after traversing the northwestern corner of the Ceiba Park area (see Figure 3-6). However, construction within the Ceiba Park area would be expected to be sited to avoid the Quebrada Ceiba drainage channel and therefore, no direct, physical alteration of the three main drainage channels within NAPR would occur from the Proposed Action.

As discussed in the EDC Application and Business Plan (LRA 2010b), waterfront construction and/or demolition of existing shoreline infrastructure would be required to meet the objectives of the 2010 Reuse Plan Addendum. Potential impacts to EFH and marine environments from these activities are discussed in Section 4.7.

As discussed in Section 3.5.1, development and changes in land use in the areas surrounding NAPR have resulted in an increase in the amount of surface water reaching NAPR, and as a result, the surface waters at NAPR are subject to ponding, erosion, and flooding. In addition, portions of the Quebrada Aquas Clara have been re-routed from its natural course as result of construction of the Ofstie Airfield. Currently, the majority of the area surrounding existing surface water features on NAPR is undeveloped. Existing vegetation in these areas slows flow velocity and stabilizes stream banks, which attenuates flooding, increases groundwater recharge, and offers some protection against erosion. These vegetated areas also act as filters that trap sediments and contaminants.

Currently, stormwater is collected via inlets, drainage ditches, roadside swales, and pipes and is directly discharged into mangrove areas and surrounding bays. No stormwater detention or stormwater quality treatment facilities exist within NAPR. Natural occurring treatment processes within wetland environments are relied upon to provide stormwater treatment in the current condition (LRA 2010b).

The majority of redevelopment through Phase II is within areas that were previously developed (see Figure 3-3), thereby minimizing impacts on these undeveloped buffer areas. However, new development in previously undeveloped areas could potentially affect vegetative communities and wetlands that act as buffers between existing development and the surface waters at NAPR, thereby changing surface water runoff patterns (a more detailed discussion of impacts on vegetation is provided in Section 4.6 “Terrestrial Environment”).

### **Bahia Algodones to Enseñada Honda Coastal Watershed**

Zones 1 and 2 and portions of Zones 3, 4, and 7 are located within the Bahia Algodones to Enseñada Honda Coastal watershed. The western portion of Lake Chamberlain Road also is located within the Bahia Algodones to Enseñada Honda Coastal watershed (see Figure 3-6). Although the Rio Daguao is approximately 1.75 miles west of the nearest Parcel III boundary (i.e., Community College [Zone 7]), Zones 1, 2, 4, and 7 do contain small acreages of wetlands associated with this watershed. Lake Chamberlain does not traverse any wetlands within the Bahia Algodones to Enseñada Honda Coastal watershed (see Figures 3-6 and 3-7).

Development of the community college and institutional building associated with the Main Street/Town Center (Zone 7) and the Port Caribe Marina (Zone 1) would be sited within existing development to the extent practical, but would be adjacent to the Enseñada Honda Mangrove Forest (see Figure 3-6). In addition, the casino, hotel and retail associated with the Caribbean Riviera (Zone 2) and the Port Caribe Marina (Zone 1) also would be sited within existing development to the extent practical, but would be adjacent to several small areas of mangroves on the east side of Enseñada Honda (see Figure 3-6).

Development within small previously undisturbed areas along the coastline within Zones 1 and 2, on the east side of Enseñada Honda, could impact existing 100-year floodplain (see Figure 3-6). No other impacts to 100-year floodplains within this watershed are expected.

### **Puerto Medio Mundo to Playa Sardinera Coastal Watershed**

Zones 5 and 11 and portions of Zones 3, 4, and 7 are located within the Puerto Medio Mundo to Playa Sardinera Coastal watershed. The majority of Lake Chamberlain Road is also located within the Puerto Medio Mundo to Playa Sardinera Coastal watershed (see Figure 3-6). Zones 5 (Environmental Retreat), 11 (Ceiba Park), and the extreme northern edge of Zone 4 (Marsh Vista) contain wetlands associated with this watershed. Lake Chamberlain Road traverses numerous wetlands within the Puerto Medio Mundo to Playa Sardinera Coastal watershed (see Figures 3-6 and 3-7).

Proposed Phase II redevelopment within the Marsh Vista area would include construction of an 18-hole golf course, clubhouse, and approximately 50 residential units that presumably would be sited primarily within the interior, upland undeveloped areas which include upland and coastal scrub forests. However, this development would be adjacent to open water, tidal flats, mangroves, and 100-year floodplain along the northern parcel boundary which are associated with the Los Machos Forest. Portions of the proposed Marsh Vista Country Club properties drain north, down steep slopes into the open water/mangrove environments of the Los Machos Forest (see Figure 3-6).

Zone 5 is currently developed as a small arms range and Phase II redevelopment would be sited within existing developed areas to the extent practical. However, this area is adjacent to mangroves and 100-year floodplain associated with the Los Machos Forest (see Figure 3-6).

Although Zone 11 is currently undeveloped, it is presumed the proposed 10,000-square-foot concession facility, that would be collateral development with the adjacent town of Ceiba, would be sited within upland areas located on the western side of the zone (see Figure 3-7). Potential impacts to the Quebrada Aguas Clara and Quebrada Ceiba and the surrounding freshwater emergent wetlands and 100-year floodplain would be minimal as a majority of the zone would remain in its current undeveloped, vegetative condition after construction of the concession facility.

As discussed in Section 3.7.4, the lands within the Los Machos Forest, the mangroves around Enseñada Honda, and the Demajagua Mangrove Forest have all been classified as Resource Conservation (PR) in conjunction with the Special Zoning Plan developed by the Puerto Rico Conservation Trust (LRA 2010c). These mangroves and conservation lands are adjacent to Zones 1, 3, 4, 5, 7, and 11. Any trust lands abutting developable parcels must incorporate a protective buffer zone. The width of this buffer zone will be defined in the final PRPB Resolution (LRA 2010c). This buffer zone will protect surface waters and wetlands by filtering sediments and contaminants and slowing surface flow velocities, which attenuates flooding, increases groundwater recharge, and offers protection against erosion and sedimentation into the mangrove wetlands.

Potential impacts on surface water or wetlands discussed above would be minimized or mitigated through the use of BMPs during construction; through development and implementation of SWPPPs for development; and through appropriate treatment prior to discharge of contaminants. As discussed in Section 4.4, these measures are specified in development permits that would be the responsibility of the individual developer to obtain prior to construction commencement. These include, but are not limited to, NPDES stormwater permits from the USEPA and CES permits from the EQB for construction activities at NAPR. As discussed in Section 4.4, the NPDES permit requires developing and implementing a SWPPP and using BMPs to minimize pollutants in stormwater runoff and the CES permits require that a Soil Erosion and Sedimentation Control Plan be prepared and implemented.

The long-term operation of the golf course, routine residential yard maintenance, and commercial lawn/garden care could potentially introduce pesticides, herbicides, and fertilizers and into proximal wetlands and surface waters via stormwater runoff. Owners/operators would be required to use, store, and apply only those pesticides, herbicides, and fertilizers currently approved for commercial and residential use and according to the recommended standard application rates.

As discussed in Section 4.3.7, past development on NAPR has been fragmented such that roadways currently extend into each zone considered for reuse and development sites are generally accessible. The Navy assumes that although most of the existing roadway network can be used through Phase II of the redevelopment, the main arterials conveying traffic to high-density development areas would require modification and/or expansion. For example, Marina Bypass Road, Forrestal Drive, PR-3, and Lake Chamberlain Road may require upgrades during Phase II of the Proposed Action (*see* Appendices Q and R of the EDC Application and Business Plan [LRA 2010b]). These roads traverse surface waters (i.e., wetlands) associated with the Enseñada Honda Mangrove Forest and Los Machos Forest and therefore, road improvements could potentially result in impacts to surface waters within these areas. During road improvements, erosion of exposed soils and sedimentation into adjacent wetlands could occur. Widening of existing paved roads (i.e., Marina Bypass Road, Forrestal Drive, and PR-3; Lake Chamberlain Road is assumed to remain a semi-pervious sand and gravel road) would increase impervious surface area, potentially increasing untreated stormwater runoff volumes and velocities into adjacent wetlands. Widening of existing paved roads also could increase the volume or concentration of typical roadway contaminants entering adjacent wetlands or change hydrological flow patterns under the road if appropriate hydrological flow analyses or culvert sizing studies are not conducted and resulting findings implemented.

Given the conceptual nature of the proposed reuse of the Parcel III properties, roadway construction and/or improvement determinations would need to be made on a case-by-case basis (and

supported by further analysis) as development is phased in through 2020. Any road improvements that result in dredge or fill of jurisdictional water of the U.S. would require a Section 404 permit from the USACE which would include measures to avoid, minimize, and mitigate for impacts associated with road construction/improvements. In addition, these permits would require hydrological flow analyses or culvert sizing studies to be conducted and implemented to maintain adequate hydrological flow patterns post-construction. As discussed in Section 4.4 and above, an NPDES permit requiring a SWPPP and implementation of BMPs to minimize pollutants in stormwater runoff and the CES permits requiring a Soil Erosion and Sedimentation Control Plan also would be required during construction for road improvement projects disturbing greater than 1 acre of land or 0.22 acre, respectively. Additionally, permanent stormwater control structures, such as vegetated roadside swales, would be installed along the roadway to slow, treat, and reduce surface water runoff prior to discharge into adjacent wetlands.

With implementation of the required conservation zone protective buffers on developable parcels adjacent to wetlands protected under conservation easements; implementation of BMPs, SWPPPs, and Soil Erosion and Sedimentation Control Plans required by the NPDES and CES permits; responsible and appropriate use of pesticides, herbicides, and fertilizers; and adherence to Section 404 permits for road improvements within wetlands, the construction, maintenance, and operation of future redevelopment of NAPR through Phase II of the 2010 Reuse Plan Addendum is not expected to result in significant adverse impacts on surface waters.

#### 4.5.2 Groundwater

As discussed in Section 3.5.2, groundwater aquifers within NAPR do not supply sufficient yields to be utilized for drinking water and are classified as SG2, which due to high total dissolved solids concentration (concentrations greater than 10,000 mg/L) are not fit as a source of drinking water supply even after treatment (Puerto Rico Water Quality Standards Regulation, as amended, on March 2003). Therefore, the redevelopment of Parcel III properties is not anticipated to involve withdrawal of groundwater for potable water sources.

Construction, maintenance, and operation of new facilities have the potential to impact groundwater recharge and discharge and water quality. The addition of impervious surfaces associated with new development would create a barrier between groundwater and surface water that may result in alteration of groundwater recharge and discharge patterns. The majority of construction activity associated with the Proposed Action is redevelopment and would occur within previously developed areas (see Figure 3-3), thus a minimal increase in impervious surface is anticipated with the Proposed Action.

As discussed in Section 4.5.1, stormwater runoff from construction activities can have a significant impact on surface water quality and eventually, through percolation and recharge, groundwater quality. Impacts on groundwater would be minimized or mitigated through compliance with NPDES and CES permit requirements, which require using BMPs during construction and developing and implementing SWPPPs for new development. Based on the anticipated compliance with these permitting programs by future developers, construction, maintenance, and operation of future redevelopment of NAPR through Phase II of the 2010 Addendum is not expected to result in significant adverse impacts on groundwater.

## 4.6 Terrestrial Environment

### 4.6.1 Vegetation

Terrestrial vegetation serves to protect against soil erosion, filters and traps sediments and contaminants, and provides habitat for wildlife. Potential impacts to terrestrial vegetation as result of the Proposed Action would include temporary and permanent conversion of natural ecological communities to urban development. Impacts on terrestrial vegetation would be minimized by using previously developed areas and by siting new development within these areas or immediately adjacent to previously developed areas to the extent practical. As a result, impacts on terrestrial vegetative communities would be minimal. However, in some areas, new development would be within or immediately adjacent to upland, stream, wetland, or marine resources.

As shown on Figure 3-3, a significant portion of the Parcel III properties have existing development and infrastructure located within their property boundaries. Although the exact location of future redevelopment is speculative, overlapping of the Parcel III properties with the landscape-rendered location of the proposed zones provides a preliminary approximation of where the redevelopment gross footprint would be sited (see Figure 4-1), thereby providing the ability to give preliminary quantification of potential vegetative impacts associated with the Proposed Action (see Table 4-2). Approximately 36% of the Parcel III properties within the landscape-rendered footprints of the zones consist of urban environments (see Figure 4-1). Furthermore, existing development within Parcel III properties as a whole includes approximately 347 buildings and 87,548 linear feet of roads (LRA 2010b).

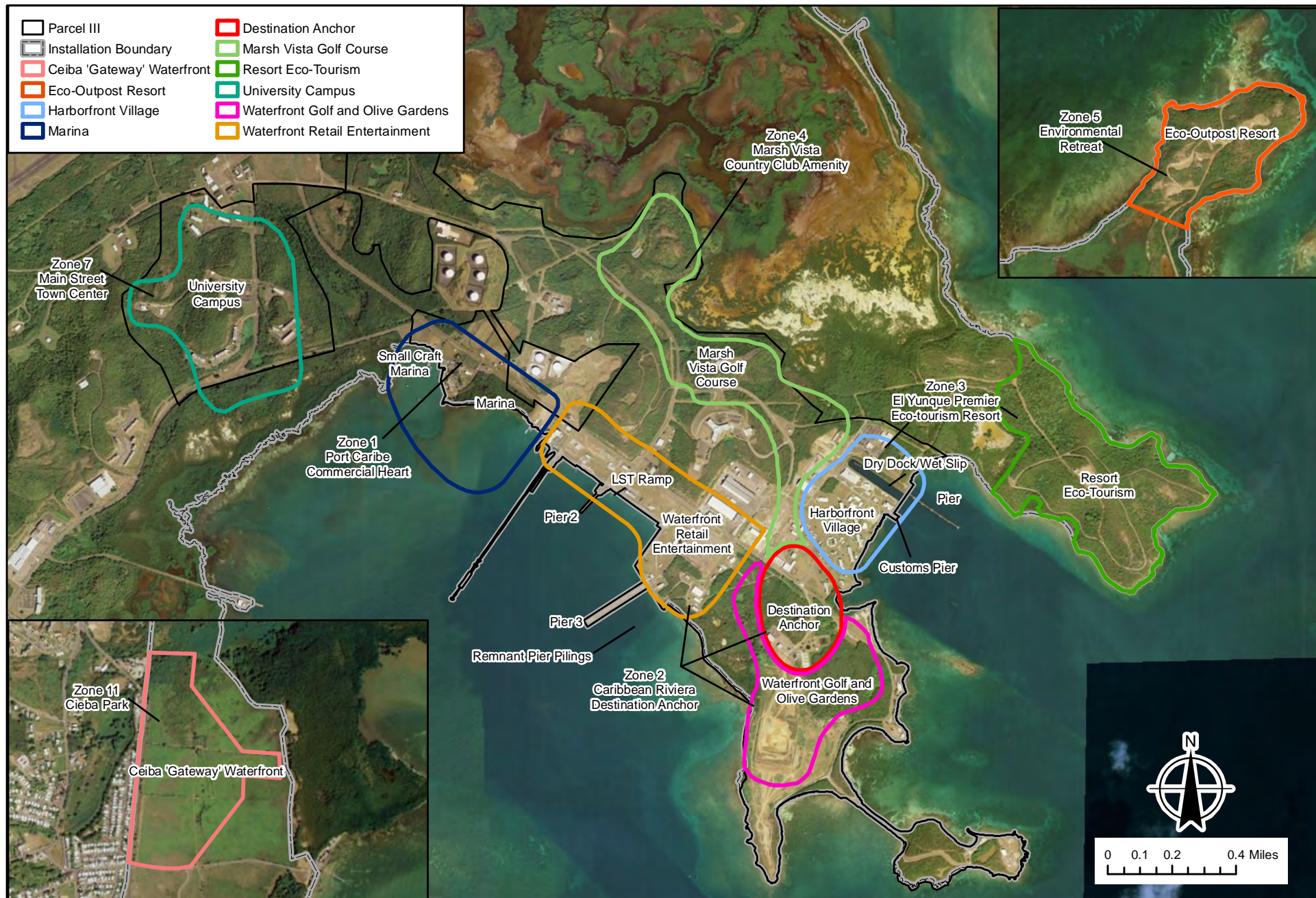
Approximately 49% of the Parcel III properties within the landscape-rendered footprints of the zones consist of upland vegetation, including coastal scrub forest, upland coastal forest, and grassland communities (see Figures 3-7 and 4-1). Wetland communities are primarily located on the periphery of each Parcel III property and represent approximately 15% of the Parcel III properties within the landscape-rendered footprints of the zones. Potentially impacted wetland communities include freshwater emergent wetlands, freshwater forested/shrub wetlands, and mangroves (see Figures 3-7 and 4-1).

It is anticipated that redevelopment would be sited in the following order of preference to minimize impacts to terrestrial vegetation due to the Proposed Action:

- Reuse existing facilities to the extent practical;
- Build new structures in previously developed areas;
- Site new development in undeveloped areas immediately adjacent to previously developed areas.
- For redevelopment that cannot be sited within existing developed areas, utilize interior upland areas, thereby minimizing impacts to the limited wetland acreage which currently remains within the Parcel III properties; and
- Site redevelopment within wetland areas only if absolutely necessary.

Any proposed development in natural areas would be reviewed by the Puerto Rico DNER for compliance with Puerto Rico Law No. 241, which regulates impacts on flora and fauna. Compliance with this law would minimize impacts on vegetative communities on the NAPR property. In addition, wetland environments within NAPR are protected under Section 404(b) of the Clean Water Act. Any redevelopment proposed within wetland communities would require a permit from the USACE. Issuance of these permits would ensure that impacts to wetland vegetation are reduced, minimized, and mitigated.





Source: World Imagery, 2009

**Figure 4-1**  
**Overlay of Parcel III Properties and**  
**Landscape Rendered Zones/In Water Structures**

**Table 4-2**  
**Vegetative Communities Associated with**  
**Landscape-Rendered Zones Within Parcel III Properties (in acres)**

<b>Zone</b>	<b>Feature</b>	<b>Urban Area</b>	<b>Upland Area</b>	<b>Wetland Area</b>
1	Marina	29.8	2.7	9.6
2	Destination Anchor	19.9	19.4	9.2
	Waterfront Retail Entertainment	90.7	15.3	5.8
	Waterfront Golf and Olive Garden	47.4	0.4	38.4
3	Eco-Tourism Resort	19.2	122.7	4.2
	Harborfront Village	10.5	43.2	0.0
4	Marsh Vista Golf Course	45.8	82.3	10.1
5	Eco-Outpost Resort	13.7	42.4	8.7
7	Community College/University	47.0	77.8	16.4
11	Ceiba Gateway Waterfront Park	0.7	38.9	34.7
		<b>324.7</b>	<b>445.1</b>	<b>137.0</b>

As adopted by the final PRPB resolution, required conservation zone protective buffers would preserve natural vegetation in conservation areas adjacent to proposed redevelopment. Use of BMPs specified by the USEPA NPDES permits and CES permits described in Sections 4.4 and 4.5.1 also would minimize impacts to natural vegetation that is not in conservation areas but that is adjacent to proposed redevelopment.

By primarily siting Phase II redevelopment within existing urban areas and secondarily siting new development within upland areas to avoid existing wetlands to the extent practical, implementing required protective measures stipulated within the DNER permit and USACE Section 404 permits (if wetland impacts are occur), implementing required protective vegetative buffers, and implementing BMPs required in the USEPA NPDES and EQB CES permits (see detailed discussions in Sections 4.4. and 4.5.1), impacts to terrestrial vegetation communities by the construction, maintenance, and operation of future redevelopment of NAPR through Phase II of the 2010 Addendum are expected to be minimal.

## 4.6.2 Wildlife

General terrestrial wildlife species (marine fisheries and protected species are discussed in Sections 4.7.4 and 4.8.2) are associated with vegetative communities. Loss of vegetation and modifications to land use, as discussed in Section 4.6.1, could potentially affect the wildlife communities at NAPR. Potential impacts would range from minor short-term impacts associated with temporary displacement during construction to long-term impacts associated with permanent loss or alteration of habitat due to clearing for construction and long-term maintenance of future redevelopment projects.

Wildlife species may be temporarily displaced in peripheral areas during construction, when noise, traffic, and human activity levels increase. However, once construction has been completed, the distribution of wildlife in these peripheral areas should be similar to distributions associated with pre-construction conditions. Consequently, temporary displacement impacts to general terrestrial wildlife would not be significant.

As noted above, existing natural vegetation could be removed by implementing the Proposed Action. However, the majority of both Phase II and subsequent development would be expected to be sited within the 324.7 acres of existing urban areas located within the landscape-rendered footprints of the zones within Parcel III properties (see Figure 4-1). Therefore, the total acres of natural vegetation realistically removed during Phase II redevelopment is expected to be quite small when compared to the



remaining approximately 4,433 acres (i.e., 53%) of NAPR lands which are currently considered unimproved. In addition, Zones 3, 4, 5, 7, and 11 are adjacent to land that has been placed in conservation in which no future development will occur. These conservation areas would provide new habitat for wildlife species displaced indefinitely from adjacent Parcel III areas, assuming appropriate habitat was present. Therefore, no long-term adverse impacts on general terrestrial wildlife due to the construction, maintenance, and operation of future redevelopment of NAPR through Phase II of the 2010 Addendum is expected.

## 4.7 Marine Environment

As described in Section 3.7, marine environments in the vicinity of NAPR include coral reefs, seagrasses, and mangroves, which are considered EFH and fisheries and shellfish propagation areas. Potential impacts to each of these are discussed in this section.

In addition to the proposed inland and coastal terrestrial development which is part of the 2010 Reuse Plan Addendum, the NAPR EDC includes a variety of piers and shoreline infrastructure that are identified for reuse per the 2010 Reuse Plan Addendum. These piers and shoreline facilities are located within Enseñada Honda and Bahía de Puerca where proposed Zones 1 and 3 would be located. Several facilities, such as the existing small craft marina and the majority of the bulkheads, have infrastructure that remains in condition suitable for the intended reuse. However, as discussed in the EDC Application and Business Plan (LRA 2010b), waterfront construction and/or demolition of some existing shoreline infrastructure would be required to meet the objectives of Phases I and II the 2010 Reuse Plan Addendum.

While only above-water construction/renovation is planned through Phase II of the Addendum, all waterfront construction has the potential to adversely impact marine resources. The existing terrestrial and marine environment is described throughout Section 3. The intended shoreline infrastructure upgrades for Phase II of the Addendum are summarized below, so the impact of these activities on the marine environment can be examined. The locations of the piers and shoreline infrastructure that are described below are shown on Figure 4-1.

### Port Caribe (Zone 1)

#### Small Craft Marina

- The small craft marina remains in good working condition and can operate in its current condition with routine maintenance and serve the future intent until expansion and upgrades are warranted (LRA 2010b).

#### Proposed Waterfront Retail Entertainment Area

- Pier 2 would be intended to accommodate yachts, mid-size recreational boating vessels, and miscellaneous water craft using the Waterfront Retail Entertainment area. Pier 2 would require an extensive evaluation of structural integrity, including the underwater portion of the pilings and the deck underpinning, to determine the scope of any necessary upgrades. It is anticipated that Pier 2 would require extensive upgrades and renovation to meet its intended use. Therefore, at some point in the future, it may be more economical to demolish this pier and replace it (LRA 2010b).
- The LST Ramp is in good condition and could accommodate its intended use as a ramp at Enseñada Honda pending a structural evaluation of the landside area behind the existing bulkhead. The concrete ramp would require some minor surface repairs,

washing, and sealing as part of routine maintenance to preserve its existing use (LRA 2010b).

- The existing bulkheads on the east side of Enseñada Honda have received routine maintenance and remain in good condition, but would require washing, concrete patch repairs, some minor resurfacing, and replacement of missing and impaired fender systems to continue serving its intended use in the 2010 Reuse Plan Addendum. A portion of the bulkhead between the LST Ramp and Fueling Pier 1 (previously transferred to the Army National Guard; LRA 2010b) may require additional geotechnical testing to determine the integrity of the bulkhead system to support future large vehicle loadings within this section of the future Port Caribe (LRA 2010b).
- Pier 3 could be used on an interim basis.

### El Yunque (Zone 3)

#### **Proposed Harborfront Village Area**

- The drydock/wetslip facility would not require significant upgrades as its current condition can support the future intended use of commercial fishing. The existing bulkhead system is in relatively good condition due to routine maintenance but would require minor surface repairs such as patching and resurfacing as well as replacement of the rusted ladders, cleats, and mooring appurtenances. The depth of the wetslip would need to be confirmed and debris removal activities and/or dredging may be required to allow for the appropriate channel and berthing depths to support future commercial fishing vessels (LRA 2010).
- The pier adjacent to the wetslip is in complete disrepair and would require full demolition and removal to below the water surface level to accommodate its future intended use as a recreational fishing pier (LRA 2010b).
- To date, the future use or reuse of the customs pier has not been identified. However, this pier also would require an extensive structural analysis to determine the extent of needed repair (LRA 2010b).

Because of the speculative nature of the 2010 Reuse Plan Addendum, the potential effect on marine environments and EFH cannot be fully addressed. For all potential future in-water demolition, construction, and repair and coastal construction projects, the Navy assumes that potential adverse impacts to EFH and the marine environment would be evaluated on an individual project basis, as applicable. Under existing laws and regulations, future landowners/developers would be responsible for applying for permits and other approvals to implement their respective development projects.

The USACE has jurisdiction over all work conducted within navigable waters of the U.S. under Section 10 of the Rivers and Harbors Act, and jurisdiction over the deposition of dredged or fill material in all Waters of the U.S. under Section 404 of the CWA (FDEP 2008). The USACE has previously issued construction and use permits for the existing facilities along the waterfront at NAPR. Therefore, changes to coastal uses that include intensity and operations changes would require users to obtain a new permit from the USACE. The engineering, design, and studies needed to obtain the various approvals from the respective regulatory agencies have not been accomplished, therefore, discussions of potential effects on marine environments and EFH are not quantifiable. However, implementation of the 2010 Reuse Plan Addendum may result in an increase in recreational boating and would introduce ferry services and cruise

ships in the waters around NAPR. Increased vessel traffic could increase the potential for vessel-related groundings on coral reefs and for marine mammal collisions, as well as potentially increase wave action, sediment suspension, and water quality degradation from vessel motors.

To prevent or reduce environmental impacts associated with waterfront work, both managerial and structural BMPs could be implemented as part of the required permits. Examples of customary managerial BMPs that would be appropriate for NAPR and the waterfront work identified above include surveying potential impact areas in advance of construction to locate sensitive marine resources such as coral reefs and seagrass beds; siting and designing infrastructure upgrades to avoid sensitive marine resources to the extent practical; utilizing buffer zones to allow for minimum distances between waterfront construction areas and known marine resources (such as the coral reef located southeast of Pier 3); conducting water quality and biological (e.g. manatee, sea turtle, seagrass, coral reef) monitoring both during and post-construction, as appropriate; adhering to construction windows to avoid specific marine activities/timeframes such as coral spawning, manatee congregations, sea turtle nesting, hatching, incubation, and emergence, shorebird nesting, and migratory bird movement; implementing a pre-construction training/educational program to inform construction personnel of the sensitive marine resources present and construction measures that must be implemented to avoid or minimize impacts to these resources; hiring only qualified personnel to conduct construction monitoring; and utilizing adaptive management which allows for flexibility to change construction operations in response to particular marine events (FDEP 2008). Examples of customary structural BMPs that would be appropriate for NAPR and the waterfront work identified above include using turbidity barriers, as appropriate; implementing dredge operational controls; installing signs or navigational aids to denote appropriate construction ingress and egress routes, speed limits, or designate the location of known marine resources (e.g., sea turtle nests, presence of manatees) (FDEP 2008). Coordination among federal permitting agencies and future landowners/developers could modify this list of BMPs as appropriate, once specific waterfront construction and demolition activities are determined. The managerial and structural BMPs noted above complement and support the mitigation measures previously developed (see Section 4.7.5) and outlined in the EFH Assessment for the 2004 Reuse Plan (Geo-Marine, Inc. 2005b) that would be implemented by future property owners to minimize any potential impacts on EFH as a result of future development. The Navy has determined that these mitigation measures are appropriate for the 2010 Reuse Plan Addendum.

Potential impacts on marine environments and EFH associated with water quality degradation would also be minimized and mitigated via EQB CES permits for activities disturbing areas of 9,688 square feet (900 square meters), and USEPA NPDES permits for construction projects affecting 1 or more acres of land. Compliance with these laws during development and reuse of properties would avoid or minimize potential impacts from sediments and contaminant-laden runoff entering coastal waters and adversely affecting marine resources.

This SEA, while addressing specific components (i.e., Phase II) of the 2010 Reuse Plan Addendum, does not preclude the potential need for future review of specific components of the 2010 Reuse Plan Addendum pursuant to federal and Commonwealth laws. All Puerto Rican entities must comply with relevant federal laws (e.g., the Clean Water Act and Clean Air Act) and Commonwealth planning, zoning, and environmental laws. As discussed above, implementation of the required conservation zone protective buffers adopted by the final planning board resolution and implementation of BMPs, SWPPPs, and Soil Erosion and Sedimentation Control Plans required by the NPDES and CES permits will reduce secondary impacts to marine environments.

While the future potential impacts on marine environments are not quantifiable, the Navy has determined that existing federal laws and Commonwealth rules, regulations, and laws for both waterfront and upland development, as well implementation of managerial and structural BMPs for waterfront work and adherence to the required USACE permits, NPDES Permits, CES permits, and Special Zoning which would be established by the PRPB, would provide adequate protection such that implementation of the



2010 Reuse Plan Addendum would not result in a significant adverse effect on marine environments or EFH.

#### 4.7.1 Coral Reef

Implementation of the Proposed Action would not directly impact coral reefs as they are not located where Phase I and II reuse construction would occur (see Figures 3-8 and 4-1). However, as discussed below, coral reefs could be indirectly affected by the planned developments within NAPR and by adjacent waterfront construction and demolition.

##### **Port Caribe (Zone 1)**

Development of Zone 1 into Port Caribe could impact the coral reef located southwest of Pier 3 (see Figure 3-8), by various means, including potential increases in recreational and commercial vessel traffic and accidental fuel or oil spills. Implementing the 2010 Reuse Plan Addendum may result in an increase in recreational boating and would introduce ferry services and cruise ships in Enseñada Honda. Commerce from these activities could include fishing and diving charters running out of Enseñada Honda, both of which could increase human activities around coral reefs. Increased vessel traffic also could increase the potential of vessel-related groundings on coral reefs, accidental fuel or oil spills, wave action, sediment suspension, and water quality degradation from vessel motors. Waterfront work associated with the demolition, removal, and redesign of Pier 3 to accommodate future cruise and ferry vessel traffic and removal of the remaining pilings of the pier formerly adjacent to and southeast of Pier 3 would be within approximately 0.25 mile of the existing coral reef located within Enseñada Honda (see Figures 3-8 and 4-1) and could result in contact between construction equipment and the coral reef, temporary increases in turbidity during waterfront work, and release of pollutants into the water column.

The EFH Assessment developed for the 2004 Reuse Plan (Geo-Marine, Inc. 2005b) lists mitigation measures that could be implemented by future property owners or Commonwealth agencies to minimize any potential impacts on coral reefs as a result of future development (see Section 4.7.5). In addition, future developers/landowners would be required to coordinate with the USACE to obtain the appropriate permits authorizing any future in-water work or changes in intensity and operations within Enseñada Honda. With implementation of these mitigation measures, no significant adverse impacts on coral reefs near Zone 1 are anticipated.

##### **Caribbean Riviera (Zone 2)**

Development and reuse of Zone 2 for the Caribbean Riviera could impact coral reefs located within Enseñada Honda, Bahía de Puerca, Isla Cabritas and Isla Cabras (see Figure 3-8). Construction of a casino, hotel, and entertainment facilities has the potential to reduce existing natural vegetation in these areas that currently serves to reduce surface runoff and soil erosion and trap sediments and potential contaminants. Zone 2 is composed of mangrove communities located along the eastern and western edge of existing developed areas within the central region (see Figures 3-8 and 4-1). Mangroves in this area currently serve as treatment areas as stormwater is discharged into mangroves via ditches and overland flow within Zone 2. Impacts to natural vegetation within the Caribbean Riviera could potentially result in stress to coral reef environments through increases in sedimentation and turbidity. Potential impacts to coral reef environments would be avoided or mitigated through the implementation of BMPs, SWPPPs, and Soil Erosion and Sedimentation Control Plans required by the NPDES and CES permits (see detailed discussions in Sections 4.4 and 4.5.1). Furthermore, the EFH Assessment developed for the 2004 Reuse Plan (Geo-Marine, Inc. 2005b) lists mitigation measures that could be implemented by future property owners or Commonwealth agencies to minimize any potential impacts on coral reefs as a result of future development (see Section 4.7.5). With implementation of these mitigation measures, no significant adverse impacts on coral reefs near Zone 2 are anticipated.

### **El Yunque (Zone 3)**

Development within the El Yunque Premier Eco-tourism Resort through Phase II of the 2010 Reuse Plan Addendum would include construction of a waterfront retail village, residential villas, and marina. Coral reef environments are located along the northern and eastern edge of Punta Puerca and within Bahía de Puerca along the coastline of Isla Cabritas (see Figure 3-8).

Development of the Harborfront Village may result in an increase in recreational and commercial boat traffic associated with the proposed marina and residential villas. Commerce from these activities could include fishing and diving charters running out of Bahía de Puerca, both of which could increase human activities around coral reefs. Increased vessel traffic also could increase the potential for vessel-related groundings on coral reefs, accidental fuel or oil spills, wave action, sediment suspension, and water quality degradation from vessel motors. Waterfront work associated with the potential debris removal and/or dredging of the drydock/wet slip facility and demolition of the pier adjacent to the wet slip to accommodate a recreational fishing pier would be within approximately 0.5 mile of the existing coral reef located offshore of Isla Cabritas (see Figures 3-8 and 4-1) and could result in contact between construction equipment and the coral reef, temporary increases in turbidity during in water work, and release of pollutants into the water column.

The EFH Assessment developed for the 2004 Reuse Plan (Geo-Marine, Inc. 2005b) lists mitigation measures that could be implemented by future property owners or Commonwealth agencies to minimize any potential impacts on coral reefs as a result of future development (see Section 4.7.5). In addition, future developers/landowners would be required to coordinate with the USACE to obtain the appropriate permits authorizing any future in-water work or changes in intensity and operations within Enseñada Honda.

Impacts to natural vegetation within El Yunque through Phase II would be negligible as the proposed Harborfront Village area is within an existing developed area with little existing vegetation (see Figures 3-7 and 4-1). Minimal impacts to existing natural vegetation in Zone 3 during construction would result in negligible increases in sedimentation and resulting turbidity into coastal waters during construction. In addition, because reuse within Zone 5 through Phase II would be almost entirely within developed areas, increases in impervious surfaces within Zone 5 are anticipated to be minimal, resulting in minimal increases in stormwater runoff during the long-term operation of the Harborfront Village.

Potential impacts to coral reef environments associated with water quality degradation as discussed above would be expected to be negligible because limited vegetative clearing and increases in impervious cover are anticipated. However, these minor impacts could be avoided and mitigated through the implementation of BMPs, SWPPPs, and Soil Erosion and Sedimentation Control Plans required by the NPDES and CES permits (see detailed discussions in Sections 4.4 and 4.5.1).

With implementation of these mitigation measures for waterfront work, intensity and operations changes within Enseñada Honda, and water degradation, no significant adverse impacts on coral reefs near Zone 1 are anticipated.

### **Marsh Vista (Zone 4), Community College (Zone 7), and Ceiba Park (Zone 11)**

Zones 4, 7, and 11 are located inland, away from the NAPR coastline. Due to the presence of significant buffers, (i.e., mangroves) between these zones and the coastline, potential impacts on coral reefs from reuse within these zones are anticipated to be minimal.

### **Environmental Retreat (Zone 5)**

Coral reef environments are located along the northern edge of Punta Medio Mundo (see Figure 3-8). Development and reuse of Zone 5 consists of construction for camping and interpretive excursion.

As such, construction activities within the Environmental Retreat would be minimal, would utilize existing developed areas to the extent practical, and would likely include minimal impacts to natural vegetation. Minimal impacts to existing natural vegetation in Zone 5 during construction would result in negligible increases in sedimentation and resulting turbidity into coastal waters during construction. In addition, because new development within Zone 5 is expected to be minimal and less intensive than coastal areas, increases in impervious surfaces within Zone 5 are anticipated to be minimal, resulting in minimal increases in stormwater runoff during the long-term operation of the Environmental Retreat.

Potential impacts on coral reefs associated with water quality degradation as discussed above are expected to be a temporary and minor, given that the greatest runoff potential would occur if large areas of sediments are exposed. Reuse and operation of existing and new facilities also would increase runoff potential; however, CES permits from the EQB would be required for activities disturbing areas of 9,688 square feet (900 square meters) or more, and NPDES permits from the USEPA would be required for construction projects affecting 1 or more acres of land. Compliance with these laws during development and reuse of properties would avoid or minimize potential impacts from sediments and contaminant-laden runoff. Therefore, potential impacts on coastal coral reefs near Zone 5 from reuse within this zone are anticipated to be minimal.

Coral reef areas have been designated EFH and have protection under the Magnuson-Stevens Fishery Conservation and Management Act. Coral reefs are protected locally by Puerto Rico Law No. 147 (July 15, 1999), the Law for the Protection, Conservation, and Management of Puerto Rico Coral Reefs. This law requires government agencies of Puerto Rico to consult with the DNER regarding proposed development or construction that might impact coral reefs and related ecosystems.

Potential adverse impacts on coral reefs resulting from increased human activities in marine areas as a result of future development around NAPR could be avoided by mitigation measures that could be implemented by future property owners or Commonwealth agencies. Such possible mitigation measures are listed in Section 4.7.5.

Elevated turbidity levels caused by waterfront construction work are expected to be short-term and minor, given that coarse sandy bottoms, which are the marine bottom environment where waterfront construction activities are proposed to occur, have a low suspension threshold (Elliott *et al.* 1998). Any future in-water construction, demolition, or dredging would require permits from the USACE and compliance with these permits and implementation of managerial and structural BMPs would avoid or minimize impacts to coral reefs.

With implementation of these mitigation measures, no significant adverse impacts on coral reefs from the Proposed Action are anticipated.

#### 4.7.2 Seagrass

Implementation of the Proposed Action may indirectly impact seagrass beds as they are located in close proximity to where waterfront construction and demolition would occur (see Figures 3-8 and 4-1). Seagrass beds also could be indirectly affected by the planned developments within NAPR.

##### **Port Caribe (Zone 1)**

Development of Zone 1 into Port Caribe could impact the seagrass beds located within Enseñada Honda (see Figure 3-8), by various means, including increases in vessel traffic and accidental fuel or oil spills. Implementing the 2010 Reuse Plan Addendum may result in an increase in recreational boating and would introduce ferry services and cruise ships in Enseñada Honda. Commerce from these activities could include fishing and diving charters running out of Enseñada Honda, both of which could increase human activities around seagrass beds. Increased vessel traffic also could increase the potential of prop-scarring of seagrasses, accidental fuel or oil spills, wave action, sediment suspension, and water quality

degradation from vessel motors. Increased human activity could result in increases in discarded solid waste such as bags and bottles. This solid waste could enter the water and smother seagrasses.

The EFH Assessment developed for the 2004 Reuse Plan (Geo-Marine, Inc. 2005b) lists mitigation measures that could be implemented by future property owners or Commonwealth agencies to minimize any potential impacts on seagrass beds as a result of future development (see Section 4.7.5). In addition, future developers/landowners would be required to coordinate with the USACE to obtain the appropriate permits authorizing future in-water work or changes in intensity and operations within Enseñada Honda. With implementation of these mitigation measures, no significant adverse impacts on seagrass beds near Zone 1 are anticipated.

### **Caribbean Riviera (Zone 2)**

Development and reuse of Zone 2 for the Caribbean Riviera could impact seagrass beds located within Enseñada Honda, the west side of the Bahía de Puerca, Isla Cabritas and Isla Cabras (see Figure 3-8). Construction of a casino, hotel, and entertainment facilities has the potential to reduce existing natural vegetation in these areas that currently serve to reduce surface runoff and soil erosion and trap sediments and potential contaminants. Zone 2 is composed of mangrove communities located along the eastern and western edges of existing developed areas within the central region (see Figures 3-8 and 4-1). Mangroves in this area currently serve as treatment areas as stormwater is discharged into mangroves via ditches and overland flow within Zone 2. Impacts to natural vegetation within the Caribbean Riviera could potentially result in stress to adjacent seagrass beds through increases in sedimentation and turbidity. Potential impacts to seagrass beds would be avoided and mitigated through the implementation of BMPs, SWPPPs, and Soil Erosion and Sedimentation Control Plans required by the USEPA NPDES and EQB CES permits (see detailed discussions in Sections 4.4 and 4.5.1). Furthermore, the EFH Assessment developed for the 2004 Reuse Plan (Geo-Marine, Inc. 2005b) lists mitigation measures that could be implemented by future property owners or Commonwealth agencies to minimize any potential impacts on seagrass beds as a result of future development (see Section 4.7.5). With implementation of these mitigation measures, no significant adverse impacts on seagrass beds near Zone 2 are anticipated.

### **El Yunque (Zone 3)**

Development within the El Yunque Premier Eco-tourism Resort through Phase II of the 2010 Reuse Plan Addendum includes construction of the Harborfront Village consisting of water-front retail village, residential villas, and marina. Seagrass beds are located along the majority of the Bahía de Puerca coastline (see Figure 3-8).

Development of the Harborfront Village may result in an increase in recreational and commercial boat traffic associated with the proposed marina and residential villas. Commerce from these activities could include fishing and diving charters running out of Bahía de Puerca, both of which could increase human activities around seagrass beds. Similar to Zone 1 above, increased vessel traffic also could increase the potential of prop-scarring of seagrasses, accidental fuel or oil spills, wave action, sediment suspension, and water quality degradation from vessel motors. Increased human activity along the Harborfront Village and recreational fishing pier could result in increases in discarded solid waste such as bags and bottles. This solid waste could enter the water and smother seagrasses. People could walk on seagrass beds, causing physical disturbance and compacting sediments, leading to seagrass bed regression. These impacts would mainly be limited to the surf zone and shallow waters where most beach activity would take place, which would account for only a small percentage of seagrasses within the area.

Impacts to natural vegetation within El Yunque through Phase II would be negligible as the proposed Harborfront Village area is within an existing developed area with little existing vegetation (see Figures 3-7 and 4-1). However, potential impacts to coral reef environments could be avoided or mitigated through the implementation of BMPs, SWPPPs, and Soil Erosion and Sedimentation Control

Plans required by the USEPA NPDES and EQB CES permits (see detailed discussions in Sections 4.4 and 4.5.1). Furthermore, the EFH Assessment developed for the 2004 Reuse Plan (Geo-Marine, Inc. 2005b) lists mitigation measures that could be implemented by future property owners or Commonwealth agencies to minimize any potential impacts on grass beds as a result of future development (see Section 4.7.5). With implementation of these mitigation measures, no significant adverse impacts on seagrass beds near Zone 3 are anticipated.

### **Marsh Vista (Zone 4), Community College (Zone 7), and Ceiba Park (Zone 11)**

Zones 4, 7, and 11 are located inland, away from the NAPR coastline. Due to the presence of significant buffers, (i.e., mangroves) between these zones and the coastline (see Figure 3-8), potential impacts on seagrass beds from reuse within these zones are anticipated to be minimal.

### **Environmental Retreat (Zone 5)**

Seagrass beds are located along the northern and southern coastlines of Punta Medio Mundo (see Figure 3-8). Development and reuse of Zone 5 would consist of construction for camping and interpretive excursion. As such, construction activities within the Environmental Retreat would be minimal, would utilize existing developed areas to the extent practical, and would likely include minimal impacts to natural vegetation. Impacts to seagrass beds adjacent to Zone 5 likely would be minimal as development within Zone 5 would not significantly reduce natural vegetation in the area. Therefore, potential impacts on seagrass beds from reuse within this zone are anticipated to be minimal.

Potential impacts on seagrass beds associated with water quality degradation as discussed above are expected to be temporary and minor, given that the highest intensity zones (i.e., Zones 1 through 3), already consist of urban areas and new development outside of already developed areas would be minimal. Reuse and operation of existing and new facilities would increase runoff potential; however, CES permits from the EQB would be required for activities disturbing areas of 9,688 square feet (900 square meters) or more, and NPDES permits from the USEPA would be required for construction projects affecting 1 or more acres of land. Compliance with these laws during development and reuse of properties would avoid or minimize potential impacts to seagrasses beds from sediments and contaminant-laden runoff.

Potential adverse impacts on seagrass beds resulting from increased human activities in marine areas around NAPR could be avoided by mitigation measures that could be implemented by future property owners or Commonwealth agencies to minimize any potential impacts on coral reefs as a result of future development. Such possible mitigation measures are listed in Section 4.7.5.

Elevated turbidity levels caused by waterfront construction work are expected to be short-term and minor, given that coarse sandy bottoms, which are the marine bottom environment near where waterfront construction activities are proposed to occur, have a low suspension threshold (Elliott *et al.* 1998). Because seagrass beds are very close to existing in-water structures (e.g., Pier 3 and the removed pier pilings in Zone 1 and the dry dock/wet slip and pier in Zone 3), new structures (i.e., ferry and cruise terminal [Zone 1] and recreational fishing pier [Zone 3]) should be sited as close to the existing structures as possible. Any future in-water construction, demolition, or dredging would require permits from the USACE, and compliance with these permits and implementation of managerial and structural BMPs would minimize impacts to seagrass beds.

With implementation of these mitigation measures, no significant adverse impacts on seagrass beds from the Proposed Action are anticipated.



### 4.7.3 Mangroves

Mangroves could be indirectly affected by the development planned under the 2010 Reuse Plan Addendum. Indirect impacts to mangroves also would occur during modification and/or expansion of arterial roads that traverse mangrove forests.

Mangroves currently exist within Port Caribe (Zone 1), Caribbean Riviera (Zone 2), Marsh Vista (Zone 4), Environmental Retreat (Zone 5), and Community College (Zone 7). In addition, the Enseñada Honda Mangrove Forest is adjacent to the proposed Port Caribe (Zone 1), Marsh Vista (Zone 4) and Town Center (Zone 7); the Los Machos Forest is adjacent to the proposed Marsh Vista (Zone 4) and the Environmental Retreat (Zone 5); and the Demajagua Mangrove Forest is adjacent to the proposed Cieba Park (Zone 11) (see Figure 3-8). As discussed in Section 3.7.4, these abutting large mangrove tracts are zoned conservation (PR) and are protected from future development.

As described in Section 3.7.4, mangrove forests contribute a vital component to the estuarine food chain through the decomposition of organic material and the release of organic and inorganic nutrients, provide cover and protection for wildlife and fish/shellfish, aid in the prevention of coastal erosion and act as a buffer for major storm events, and filter upland runoff, thereby releasing higher quality water to the ocean.

#### **Port Caribe (Zone 1)**

Several small areas of mangroves are located within Zone 1, adjacent to, and southeast of, the small craft marina and southeast of Pier 3. The Enseñada Honda Mangrove Forest also is located adjacent to Zone 1 along the western boundary (see Figure 3-8).

Development associated with the construction of Port Caribe would likely locate construction activities within already developed (i.e., urban) areas, thereby avoiding indirect impacts or filling of small mangrove areas located within Zone 1. Development and reuse of the port facility could potentially impact mangroves as a result of an increase in vessel traffic and accidental fuel or oil spills. Increased vessel traffic would increase the potential of vessel-related impacts, e.g., increased wave action, increased sediment suspension, increased human contact, and water quality degradation from vessel motors. A fuel or oil spill would impact mangroves by degrading water quality and, potentially, by fuel or oil coming in direct contact with mangroves.

#### **Caribbean Riviera (Zone 2)**

Within Zone 2, mangroves are located along the eastern side of Enseñada Honda and western side of Bahía de Puerca, with existing urban environments in between. Additional mangrove areas lie within Isla Cabras (see Figure 3-8).

Development of the casino, hotel, and entertainment facilities would occur in existing developed areas to the extent practical, but would likely result in fill of existing mangroves for building footprints (see Figure 4-1). Impacts on mangroves remaining after redevelopment could occur because of additional runoff and discharge from redeveloped areas during construction and operation. It is not known where runoff from reuse and development would be directed or which localized bodies of water would be subject to the greatest effects. However, since water quality degradation is a temporary impact, all mangroves within surrounding waters would be affected, although at varying scales of magnitude.

Accidental discharges or spills of fuel would significantly impact mangroves. Runoff and fuel spills could affect mangroves by many routes, the most harmful being excess high sediment loads and direct contact with hydrocarbons. The lenticels in the mangrove roots are susceptible to clogging by hydrocarbons and similar pollutants (lenticels allow mangroves to breathe). Sewage, toxic materials, pesticides, herbicides, and suspended or floating substances can suffocate, reduce light, and reduce

species diversity in the mangroves. Although mangroves help filter run-off from adjacent lands, excesses of contaminants, especially hydrocarbons, can damage mangroves by fouling lenticels (Department of Navy 2007).

### **El Yunque (Zone 3)**

No mangroves are located within Zone 3 (see Figure 3-8). Phase II activities in this zone would consist of construction of a waterfront retail village, residential villas, and marina associated with the Harborfront Village in areas that are currently developed (i.e., urban) with no immediately adjacent mangroves (see Figure 4-1).

Development of the marina associated with the Harborfront Village could potentially impact mangroves located approximately 0.2 mile southeast of Zone 2 along the west side of Punta Puerca as a result of an increase in vessel traffic and accidental fuel or oil spills. As described above for Zone 1, increased vessel traffic would increase the potential of vessel-related impacts, e.g., increased wave action, increased sediment suspension, increased human contact, and water quality degradation from vessel motors. A fuel or oil spill would impact nearby mangroves by degrading water quality and, potentially, by fuel or oil coming in direct contact with mangroves. Waterfront work associated with the potential debris removal and/or dredging of the drydock/wetslip facility and demolition of the pier adjacent to the wet slip to accommodate a recreational fishing pier could also impact nearby mangroves due to a temporary increase in vessel traffic, temporary increases in turbidity, and release of pollutants from accidental fuel or oil spills.

### **Marsh Vista (Zone 4)**

Mangroves are located along the western and northern boundaries of this zone and are part of the adjacent Enseñada Honda and Los Machos Mangrove Forests (see Figure 3-8).

Development of the 18-hole golf course, club house, and 50 residential units within this zone would likely be sited within interior areas, thereby avoiding mangrove areas located on the periphery of Zone 4. During construction however, a greater potential would exist for runoff to carry increased sediments and/or contaminants to adjacent fringe wetlands and the Enseñada Honda and Los Machos Mangrove Forests, resulting in decreased water quality and increased sedimentation. During the operation phase, pesticides and fertilizers used for the maintenance of the golf course and residential areas also could impact mangrove lenticels (Department of Navy 2007).

### **Environmental Retreat (Zone 5)**

Mangroves are located along the southern and western boundaries of Zone 5 and are part of the adjacent Los Machos Mangrove Forest (see Figure 3-8).

Development and reuse of Zone 5 consists of construction for camping and interpretive excursion. As such, construction activities within the Environmental Retreat would be minimal and would utilize existing developed or upland areas and will likely avoid mangroves located along the periphery of Zone 5. As minimal construction is anticipated in this area, sedimentation and/or contamination impacts to mangroves located on the periphery of this zone and the adjacent Los Machos Forest due to increased runoff during construction and operation are expected to be minor.

### **Community College (Zone 7)**

A small area of mangroves that is part of the adjacent Enseñada Honda Mangrove Forest is located along the southern boundary of Zone 7 (see Figure 3-8).

Development of the community college and institutional buildings within this zone would likely be sited within existing developed areas (i.e., urban), thereby avoiding mangroves located on the periphery of Zone 7. The majority of Phase II development in this area focuses on reuse of existing facilities, therefore, sedimentation and/or contamination impacts to mangroves located on the periphery of this zone and into the adjacent Enseñada Honda Mangrove Forest due to increased runoff during construction and operation are expected to be minor.

### **Ceiba Park (Zone 11)**

No mangroves are located within Zone 11. Mangroves are located east of and adjacent to the Ceiba Park boundary and are part of the Demajagua Mangrove Forest (see Figure 3-8).

Development and reuse of Zone 11 would consist of construction of collateral development with the municipality of Cieba. Construction activities within this zone would likely be located in upland environments along the western edge of Zone 11 near the municipality of Cieba. Because a large portion of existing natural vegetation would remain between proposed development and the adjacent Demajagua Mangrove Forest, impacts on adjacent mangroves are expected to be minor.

### **Road Modifications/Expansions**

As discussed in Section 4.3.7, the main road arteries conveying traffic to high-density development areas, including Marina Bypass Road, Forrestal Drive, and PR-3, may require modification and/or expansion during Phase II of the Proposed Action. In addition, Lake Chamberlain Road may require modification/expansion as it is the only existing road that provides access to the proposed Zone 5. Marina Bypass Road and Forrestal Drive traverse Enseñada Honda Mangrove Forest, while PR-3 traverses Los Machos Forest. Lake Chamberlain Road is located entirely within Los Machos Forest. The USFWS noted that improvements to Lake Chamberlain Road have the potential to impact mangroves within Los Machos Forest (Muniz 2011). Marina Bypass Road, Forrestal Drive, and PR-3 are currently paved, while Lake Chamberlain Road is, and would remain post-improvement, a semi-pervious sand and gravel road).

During road improvements, adjacent mangrove trees could be removed and filled to accommodate additional road right-of-way. Erosion of exposed soils and sedimentation into adjacent mangroves could potentially occur. Widening of existing paved roads, including Marina Bypass Road, Forrestal Drive, and PR-3 would increase impervious surface area post-construction, potentially increasing untreated stormwater runoff volumes and velocities into adjacent mangroves. Modifications of existing roads could change hydrological flow patterns within mangroves post-construction.

Mangroves within NAPR have been designated EFH and have protection under the Magnuson-Stevens Fishery Conservation and Management Act. Compliance with the Act and with Commonwealth and federal environmental laws during development and operation of the planned facilities would lessen any potential adverse impacts on mangroves.

Phase II redevelopment would seek to locate new construction within existing urban areas and secondarily site new development within upland areas to avoid existing mangroves to the extent practical. Any impacts to mangroves would require a Section 404 permit from the USACE. Indirect impacts to mangroves within or adjacent to the reuse zones associated with increased sedimentation, turbidity, and erosion would be reduced and mitigated by implementing BMPs required in the USEPA NPDES and EQB CES permits and by adhering to required protective vegetative buffers where redevelopment abuts mangroves protected under conservation zoning. In addition, the EFH Assessment completed for the 2004 Reuse Plan lists mitigation measures, applicable to the 2010 Reuse Plan Addendum, that could be implemented by future property owners or Commonwealth agencies to minimize any potential impacts on mangroves as a result of future development (see Section 4.7.5)

Potential adverse impacts on mangroves resulting from increased human activities in marine areas around NAPR could be avoided by mitigation measures. These could be implemented by future property owners or Commonwealth agencies to minimize any potential impacts on mangroves as a result of future development. Such possible mitigation measures are listed in Section 4.7.5.

Elevated turbidity levels caused by waterfront construction work in Enseñada Honda and Bahía de Puerca are expected to be short-term and minor, given that coarse sandy bottoms, which are the marine bottom environment where waterfront construction activities are proposed to occur, have a low suspension threshold (Elliott *et al.* 1998). Any waterfront construction or demolition would require permits from the USACE and compliance with these permits and implementation of managerial and structural BMPs would avoid or minimize impacts to nearby mangroves.

Any road improvements that result in dredge or fill of jurisdictional Water of the U.S. (including mangroves) would require a Section 404 permit from the USACE which would include measures to avoid, minimize, and mitigate for mangrove impacts associated with road construction/improvements. These permits would require hydrological analyses to be conducted and appropriate mitigation measures implemented to ensure that road improvements do not result in hydrological changes, thereby causing changes in sedimentation patterns or salinity in adjacent mangrove areas. Additional BMPs that could be required under these permits include implementing dry season construction windows to minimize runoff from the disturbed areas, requiring secondary containment structures around pumps or fuel tanks to minimize the potential for fuel spills or petroleum product leaks into mangrove ecosystems, and conducting hydrological and/or biological monitoring to evaluate for post-construction changes in habitat coverage, species diversity, presence of dead or dying trees, sedimentation, and hydrological changes. In addition, an NPDES permit requiring a SWPPP and implementation of BMPs to minimize pollutants in storm water runoff and the EQB CES permits requiring a Soil Erosion and Sedimentation Control Plan would be required during construction for road improvement projects disturbing greater than 1 acre of land or 0.22 acre, respectively.

With implementation of these mitigation measures, no significant adverse impacts on mangroves from the Proposed Action are anticipated.

#### 4.7.4 Fish and Shellfish

Potential impacts on fish and shellfish would primarily be associated with impacts on various marine habitats, including coral reefs, seagrass beds, and mangroves. As noted previously, impacts on these resources are generally expected to be short-term and minor. Consequently, no significant adverse impacts on fish and shellfish as a result of habitat alterations would occur from implementing the Proposed Action.

Impacts on fish and shellfish also could potentially occur due to increased boat usage in the waters adjacent to NAPR. This increase in boat usage could potentially lead to an increase in fishing, which in turn would increase the recreational harvest of these resources. However, fishing in the coastal waters of Puerto Rico is managed by the DNER under Commonwealth Law No. 278 (November 29, 1998) and its associated fisheries regulations and Administrative Orders. Under the management of the DNER, the increase in fishing that would potentially occur under disposal and subsequent reuse scenarios would not be expected to adversely affect fish and shellfish resources.

#### 4.7.5 Suggested Conservation Guidelines for Future Property Owners

The transfer of NAPR property to other future property owners would not in and of itself result in impacts on EFH. Therefore, no Navy-instituted mitigation measures are proposed.

There are a number of mitigation measures that Commonwealth and/or federal resource agencies could/may impose on specific project sponsor(s) responsible for development activities. Implementation of these mitigation requirements would be the responsibility of the new owner/developer, and the respective issuing agency would be responsible for ensuring that mitigation measures are instituted.

The following is a list of conservation guidelines that could be implemented by future property owners or Commonwealth agencies to minimize any potential impacts on EFH as a result of future development. The mitigation measures were originally developed for the EFH Assessment developed for the 2004 Reuse Plan (Geo-Marine, Inc. 2005b). The Navy has determined that these mitigation measures remain applicable to the 2010 Addendum because the species, required habitat, and designated critical habitat/EFH impacted by the previous (i.e., 2004 Reuse Plan) and current (i.e., 2010 Addendum) reuse scenarios are similar.

- Prevent nutrient loading of Pelican Cove, Enseñada Honda, and Bahía Puerca;
- Contain (prevent the dispersion of) loose sediments generated during construction;
- Develop a seagrass/mangrove/manatee/sea turtle education program (certification) for construction contractors, ferry vessel operators, and property managers;
- Monitor environmental impacts on EFH during and after the construction phase of projects;
- Develop a long-term seagrass-monitoring program for Pelican Cove, Enseñada Honda, and Bahía Puerca (the condition of seagrasses will be indicative of local water quality);
- Create a clearly marked and buoyed (mandatory channel) for the approach to the ferry terminal(s) and other marine activities;
- Create specific locations where boats may/may not be anchored;
- Establish maintenance and usage restrictions for mooring areas;
- Enforce vessel speed limits through established no-wake zones and other such restrictions;
- Post lookouts on ferries to prevent mechanical impacts on seagrass beds and collisions with manatees and sea turtles;
- Prevent the improper disposal of trash during the construction and use of the docking facilities, paying particular attention to materials made of plastic and Styrofoam, buckets, tools, liquid materials (e.g., paints, solvents, and fuels), excess construction materials, hardware, and cigarette butts;
- Provide containers for proper garbage disposal and enforce the proper disposal of garbage;
- Ensure periodic disposal of trash by garbage disposal contractors; and
- Assist future property owners in establishing conservation easements to facilitate their receiving tax deductions and/or property tax exemptions.



## 4.8 Threatened and Endangered Species

Implementation of the redevelopment of NAPR through Phase II of the 2010 Addendum would not in and of itself adversely affect any listed threatened species. However, following completion of the Proposed Action, future land use changes may affect listed species and designated critical habitat. Potential impacts to threatened and endangered species could result from loss of habitat associated with construction clearing or waterfront demolition, construction, and repair; surface water pollution caused by increased stormwater runoff from an increase in impervious surfaces; increased turbidity caused by sedimentation and erosion into surface waters; and inadvertent ancillary anthropogenic impacts due to increased human activity in the redevelopment zones that could harm protected species or their habitat (i.e., boat strikes, trampling of seagrass or coral reefs, increases in inadvertently discarded solid waste, disturbance of sea turtle nests, entanglement or ingestion of fishing gear and nets or refuse, etc.).

Future redevelopment projects would be individually evaluated to reach a final determination on adverse impacts to listed species. Private landowners/developers would be required to develop and submit site design plans for all required construction permits and to obtain other regulatory approvals to implement their respective development proposals. Any project which has a federal nexus (including permits) that would result in possible adverse effects to protected species would require Section 7 consultation between the federal agency and the USFWS/NOAA Fisheries Service. In addition, project sponsor(s) would need to comply with the required reviews and/or permitting as necessary under other federal (e.g., the Clean Water Act, the Clean Air Act, the ESA) and Commonwealth planning, zoning, and environmental laws at the time the redevelopment proposal is proposed.

For the 2004 Reuse Plan, the USFWS based their determination for “not likely to adversely affect” protected species on future landowner/developers implementing conservation measures for individual species that were developed during the Section 7 consultation which occurred for that Proposed Action at NAPR. The implementation of the conservation measures was deemed necessary to minimize possible adverse effects to the species and designated critical habitat. To provide the necessary assurances that these conservation measures would be implemented when property was transferred to new public and/or private owners, a Special Zoning Plan, which contained these conservation measures, was presented and approved by the PRPB as part of the requirement for final approval and acceptance of the 2006 BA and 2007 EA which were prepared for the 2004 Reuse Plan (NAVFAC LANTDIV 2006). All owners/developers who then subsequently purchased property for development under the 2004 Reuse Plan were informed of:

- The conservation measures applicable to their properties and proposed activities;
- Potential legal consequences of not adhering to the identified conservation measures which could result in violation of Section 9 of the ESA and potential prosecution by the USFWS;
- Additional permit requirements for Incidental Take Permits (ITP), including development of a Habitat Conservation Plan, under Section 10(a)(1)(B) of the ESA, if said property owner/developer was unable to adhere to the conservation measures specified in the Special Zoning Plan.

The Navy has determined that the conservation measures previously approved for the 2004 Reuse and Special Zoning Plans remain applicable to the 2010 Addendum because the species, required habitat, and designated EFH/critical habitat impacted by the previous (i.e., 2004 Reuse Plan) and current (i.e., 2010 Addendum) reuse scenarios are similar. Therefore, the Navy proposed that the previously approved species conservation measures be carried forward as part of the 2010 Reuse Special Zoning Plan to

provide the same level of protective assurances which were conveyed in the previous Special Zoning Plan. The LRA has requested that PRPB include the specific conservation measures indicated in Tables 4-4 through 4-7 as part of the Special Zoning Plan. It is anticipated that the PRPB will adopt the Special Zoning Plan (and associated conservation measures) to guide and control future development of Parcel III properties to ensure that they are developed in an environmentally sound and sustainable manner. The Navy recommends full implementation of these measures to minimize possible adverse effects to threatened and endangered species and designated critical habitat.

In summary, the Navy will notify the following future property owners, including:

- **The Commonwealth of Puerto Rico.** Conservation measures have already been provided to the Local Reuse Authority.
- **Public sale.** Conservation measures will be provided to each prospective bidder to be set out in the bid package for the respective parcel.
- **Successful bidder.** Transfer documents will make it clear that the grantee has the responsibility to implement conservation recommendations to meet ESA requirements.

The USFWS will be notified as to the successful bidder and provided a copy of the recommended conservation measures they were provided with the transfer documents. A matrix indicating which Parcel III zones contain which listed species or habitat is provided in Table 4-3.

Table 4-3 Presence or Absence of Suitable Habitat for Federally Listed Species by Zone Number						
	Listed Group or Species					
	BOA	ST	YSBB	M	P	VI
1		✓	✓	✓	✓	
2	✓	✓	✓	✓	✓	
3	✓	✓	✓	✓	✓	✓
4	✓		✓		✓	
5	✓	✓	✓	✓	✓	✓
7	✓		✓			
11						
Key: ✓ = Habitat present. BOA = Puerto Rican boa. VI = Virgin Islands tree boa (coastal habitats). M = Manatee. P = Pelican. ST = Sea turtles (green, hawksbill, leatherback, and loggerhead). YSBB = Yellow-shouldered blackbird.						

In addition to the species-specific conservation measures, approximately 3,340 acres of land previously within the historical boundaries of NAPR has been transferred to DNER and subsequently entered into an administrative agreement with the Puerto Rico Conservation Trust to administer these lands. These conservation areas support suitable habitat for threatened and endangered species. These conservation areas are outside of the Parcel III properties and no future commercial or residential development projects would be allowed in the conservation zones. To minimize impacts to these conservation parcels and therefore to the protected species utilizing the habitat, Parcel III redevelopment

parcels abutting these conservation lands must implement a buffer zone established in the 2010 Reuse Plan, the width of which will be defined in the final PRPB resolution.

Although future potential impacts on species can not be fully anticipated and quantified because of the speculative nature of the 2010 Addendum, the Navy has determined that the requirement to provide a buffer zone boundary at all redevelopment parcels which abut conservation lands, the establishment of the proposed Special Zoning Plan (with attached conservation measures), the implementation of the proposed conservation measures, the requirement of a Section 10(a)(1)(B) permit for applicants that cannot adhere to proposed conservation measures, and requirements to obtain other federal and commonwealth development permits are effective measures to minimize possible adverse impacts to the species discussed in Sections 4.8.1 and 4.8.2.

#### 4.8.1 Commonwealth-Listed Species

As discussed in Section 3.8, Commonwealth-listed species at NAPR include peregrine falcon, least tern, least grebe, West Indian whistling duck, Caribbean coot, and snowy plover. The peregrine falcon's occurrence at NAPR is expected to be limited to transient individuals; therefore, the Proposed Action is not expected to result in impacts on this species. Freshwater and tidal wetland habitat for West Indian whistling duck, least grebe, Caribbean coot, snowy plover, and least tern is included in the conservation areas of the Los Machos Forest, Enseñada Honda Mangrove Forest, and Demajagua Mangrove Forest. These habitats may be impacted by road improvements made to Marina Bypass Road, Forrestal Drive, PR-3, and Lake Chamberlain Road. However, impacts to these habitats would be considered negligible given the additional surrounding acreage of similar habitat adjacent to these roads that are protected under conservation.

The Proposed Action could result in increased human activity on the beaches at NAPR, which may result in impacts on nesting and feeding habitat for the snowy plover and least tern. Any proposed developments that may impact these areas would require consultation with the DNER under Puerto Rico Law No. 241. Specific project sponsor(s) responsible for development activities would be responsible for consultation with DNER. These consultations would result in impact minimization to these two species.

#### 4.8.2 Federally Listed Species

As discussed in Section 3.8, federally listed species at NAPR include yellow-shouldered blackbird, Puerto Rican boa, Virgin Islands tree boa, brown pelican, piping plover, roseate tern, cubana negra, hawksbill sea turtle, leatherback sea turtle, green sea turtle, loggerhead sea turtle, and Antillean manatee. Each of these species is discussed below.

##### Yellow-Shouldered Blackbird

NAPR supports a very small (less than 20 individuals) population of the endangered yellow-shouldered black bird (Department of Navy 2007). All of the land area at NAPR is designated as critical habitat for the species. However, all of the land does not provide suitable habitat for the species, as some areas of NAPR have been developed.

In 1980, the USFWS and the Navy established an agreement for Section 7 consultations and developed a habitat map based on the biological information available at that time for this species. During late 1990s, the Navy developed additional pertinent maps for this species, including feeding, roosting, and breeding habitats for the species (Department of Navy 2007). As part of the 2004 Reuse Plan, large tracts of land designated as critical habitat for this species within Los Machos Forest, Enseñada Honda Mangrove Forest and Demajagua Mangrove Forest, (and other large tracts of mangrove forests not

proximal to Parcel III properties and located on the western side of NAPR) were designated for conservation adjacent to Parcel III properties and have been previously conveyed to the Commonwealth.

The Proposed Action may result in loss or alteration of designated critical habitat for the yellow-shouldered blackbird. As stated in Section 4.7.3, development of the casino, hotel, and entertainment facilities within Zone 2 would be sited in existing developed areas to the extent practical, but would likely result in loss of designated critical habitat for the yellow-shouldered blackbird. In addition, road improvements within Los Machos Forest and Enseñada Honda Mangrove Forest could potentially impact critical habitat for the yellow-shouldered blackbird. Lastly, waterfront demolition, repairs, or construction of shoreline structures in Enseñada Honda and Bahía de Puerca could potentially impact critical habitat for the yellow-shouldered blackbird, which is located along the coastline in these areas (NAVFAC LANTDIV 2006). Individuals of this species also could be impacted by increased predation by introduced animals; that is, increases in residential use have a potential to result in increased pet and feral animal populations that could prey on the yellow-shouldered blackbird. Additional impacts on eggs and nestlings could occur during construction and demolition activities.

As part of the 2007 EA, which was written to assess impacts to the 2004 Reuse Plan, conservation measures were established to protect yellow-shouldered blackbird populations within NAPR (see Table 4-4). As stated previously, these conservation measures are still applicable to the 2010 Addendum and will be incorporated into the revised Special Zoning Plan. Specific project sponsor(s) responsible for development activities would be responsible for ensuring these conservation measures are maintained during construction and during the long-term operation and maintenance of facilities and the surrounding landscape. Additionally, when developers apply for their respective permits they would become aware of the requirements for protection of the yellow-shouldered blackbird and their obligation for compliance with the ESA.

Future redevelopment of NAPR through Phase II of the 2010 Addendum would not likely cause a significant adverse affect to the yellow-shouldered blackbird as the majority of construction activity associated with the Proposed Action would be redevelopment and/or new construction that would occur within previously developed areas. Furthermore, the protection of 3,340 acres designated critical habitat as conservation land, and sufficient protection under conservation measures and permit requirements would ensure no significant adverse affect would occur to the yellow-shouldered blackbird.

<b>Table 4-4</b> <b>Conservation Measures for the Yellow-Shouldered Blackbird</b>	
<b>During the planning and development phases; vegetation removal, land-clearing activities, new construction; demolition or remodeling of existing structures; grounds maintenance; building maintenance; and general operations, the following conservation measures should be implemented to minimize possible effects to yellow-shouldered blackbirds or their habitat:</b>	
•	Protect as many existing on site palms and trees as possible in new development plans.
•	If forested habitat is proposed for clearing or alteration, consultation with the USFWS should be initiated. <i>Note:</i> A minimum of one year may be required to complete consultation.
•	Schedule activity from September 1 through March 14 or conduct outdoor survey of building(s) (ledges, etc.) and nearby trees (within 50 meters of the building) for yellow-shouldered blackbird nests prior to start date if the development activity is scheduled to occur between March 15 and August 30. Surveys should be conducted by qualified and experienced personnel. Consult with the USFWS if a yellow-shouldered blackbird nest is found.
•	Consult with the Puerto Rico DNER to identify the need for an endangered species permit to conduct such surveys.

**Table 4-4**  
**Conservation Measures for the Yellow-Shouldered Blackbird**

- No trimming or cutting of palms and trees between March 15 and August 30 except in an emergency (i.e., downed trees and palms from storms).
- Survey for yellow-shouldered blackbird nests prior to any outdoor building maintenance activities between March 15 and August 30. Determine identity of any bird nest found. If a yellow-shouldered blackbird nest is found do not disturb, notify and consult with the USFWS.
- Before moving parked outdoor equipment (e.g., carts, vehicles) check for yellow-shouldered blackbird nests (March 15 to August 30). If a yellow-shouldered blackbird nest is located do not disturb, notify the USFWS.

**Note:** The conservation noted above measures are applicable to Zones 1, 2, 3, 5, and 7 (see Table 4-3) when proposed development could potentially impact appropriate habitat. For those parcels that have been identified for conservation no commercial or residential development should take place; however, habitat management activities should be closely coordinated with the USFWS.

**Notice:** If you are willing to comply with the general requirements and conservation measures listed above during the development and subsequent use of these zones, you may proceed with the project. If you have any questions on the conservation measures, please consult with the USFWS, Caribbean Field Office in Boquerón, Puerto Rico. Property owners that cannot adhere to the conservation measures should consult with the USFWS to seek an Incidental Take Permit (ITP) under Section 10(a)(1)(B). Be aware that the preparation of a Habitat Conservation Plan is required to apply for an ITP. Failure to comply with the identified general requirements and conservation measures may result in the violation of Section 9 of the Endangered Species Act. The USFWS has the authority to prosecute violations under the Endangered Species Act.

## Puerto Rican Boa

The endangered Puerto Rican boa occurs in low densities at NAPR (Department of the Navy 2007). Suitable habitat for the species has been identified at Punta Cascajo and in the hills near South Delicias, and adequate habitat for the Puerto Rican boa also exists within coastal scrub forest and upland scrub forest areas found within the Caribbean Riviera (Zone 2), El Yunque (Zone 3), Marsh Vista (Zone 4), Environmental Retreat (Zone 5) and Community College (Zone 7). Future redevelopment of NAPR through Phase II of the 2010 Addendum would not likely cause a significant adverse affect to the Puerto Rican boa as the majority of construction activity associated with the Proposed Action would be redevelopment and/or new construction that would occur within previously developed areas.

As part of the 2007 EA, which was written to assess impacts to the 2004 Reuse Plan, conservation measures were established to protect the Puerto Rican boa (see Table 4-5). As stated previously, these conservation measures are still applicable to the 2010 Addendum and will be incorporated into the revised Special Zoning Plan. Specific project sponsor(s) for the redevelopment of NAPR through Phase II of the 2010 Addendum would be responsible for ensuring these conservation measures were implemented during construction and during the long-term operation and maintenance of facilities and the surrounding landscape. Additionally, when developers apply for their respective permits they would become aware of the requirements for protection of the Puerto Rican boa and their obligation to comply with the ESA.

Due to the low numbers of Puerto Rican boas reported in the area, the limited amount of forested habitat anticipated to be affected by the redevelopment of NAPR through Phase II of the Reuse Plan, and adherence to conservation measures in place, no significant adverse impacts to the Puerto Rican boa would be likely as a result of the Proposed Action.



<b>Table 4-5</b> <b>Conservation Measures for the Puerto Rican Boa</b>	
<b>During the planning and development phases ; vegetation removal, land-clearing activities, new construction; demolition or remodeling of existing structures; grounds maintenance; building maintenance; and general operations the following conservation measures should be implemented to minimize possible effects to the Puerto Rican boa or its habitat:</b>	
<ul style="list-style-type: none"> <li>When planning new developments in zones that contain Puerto Rican boa habitat (see Table 4-3) strive to save as many existing trees as possible.</li> </ul>	
<ul style="list-style-type: none"> <li>If Puerto Rican boa habitat is present and proposed for clearing, consult with the USFWS. Note: A minimum of one year may be required to complete consultation. As part of the consultation process, the USFWS may require a survey just prior to clearing to determine the presence/absence of Puerto Rican boas. If Puerto Rican boas are present, contact the USFWS.</li> </ul>	
<ul style="list-style-type: none"> <li>Notify the USFWS if a Puerto Rican boa is found during maintenance activities, inside a building/structure or on the grounds.</li> </ul>	
<b>Note:</b> The conservation measures noted above are applicable to Zones 2 through 5 and 7 (see Table 4-3) when proposed development could potentially impact coastal scrub forest and upland scrub forest.	
<b>Notice:</b> If you are willing to comply with the general requirements and conservation measures listed above during the development and subsequent use of these zones where the appropriate habitat may be impacted, you may proceed with the project. If you have any questions on the conservation measures, please consult with the USFWS, Caribbean Field Office in Boquerón, Puerto Rico. Property owners that cannot adhere to the conservation measures should consult with the USFWS to seek an Incidental Take Permit (ITP) under Section 10(a)(1)(B). Be aware that the preparation of a Habitat Conservation Plan is required to apply for an ITP. Failure to comply with the identified general requirements and conservation measures may result in the violation of Section 9 of the Endangered Species Act. The USFWS has the authority to prosecute violations under the Endangered Species Act.	

## Virgin Island Boa

No confirmed observations of the endangered Virgin Island boa have been recorded at NAPR (NAVFAC LANTDIV 2006). However, suitable habitat for this species, which includes upland coastal scrub forest, upland coastal forest, and mangroves, has been identified along the coastlines of Punta Puerca and Puerto Medio Mundo. Therefore, potential suitable habitat for this species exists within El Yunque (Zone 3) and the Environmental Retreat (Zone 5). The 2006 BA documented that suitable habitat exists for reintroduction of the Virgin Island Boa within El Yunque (Zone 3), the Environmental Retreat (Zone 5), and Isla Cabras.

As part of the 2007 EA, which was written to assess impacts to the 2004 Reuse Plan, conservation measures were established to protect the Virgin Island boa (see Table 4-6). As stated previously, these conservation measures are still applicable to the 2010 Addendum and will be incorporated into the revised Special Zoning Plan. Specific project sponsor(s) for the redevelopment of NAPR through Phase II of the 2010 Addendum would be responsible for ensuring these conservation measures were implemented during construction and during the long-term operation and maintenance of facilities and the surrounding landscape. Additionally, when developers apply for their respective permits they would become aware of the requirements for protection of the Virgin Island boa and their obligation to comply with the ESA.

**Table 4-6**  
**Conservation Measures for the Virgin Islands Tree Boa**

**During the planning and development phases; vegetation removal, land-clearing activities, new construction; demolition or remodeling of existing structures; grounds maintenance; building maintenance; and general operations the following conservation measures should be implemented to minimize possible effects to the Virgin Islands tree boa or its habitat:**

- When planning new developments in areas that contain Virgin Islands tree boa habitat (see Table 4-3) strive to save as many existing trees as possible.
- If Virgin Islands tree boa habitat is present and proposed for clearing, consult with the USFWS. Note: A minimum of one year may be required to complete consultation. As part of the consultation process, the USFWS may require a survey just prior to clearing to determine the presence/absence of Virgin Islands tree boas. If Virgin Islands tree boas are present contact the USFWS.
- Notify the USFWS if a Virgin Islands tree boa is found during maintenance activities, inside a building/structure or on the grounds.

**Note:** The conservation measures noted above are applicable to Zones 3 and 5 (see Table 4-3) when proposed development could potentially impact coastal scrub forest, upland coastal forest and mangroves.

**Notice:** If you are willing to comply with the general requirements and conservation measures listed above during the development and subsequent use of zones where the appropriate habitat may be impacted, you may proceed with the project. If you have any questions on the conservation measures, please consult with the USFWS, Caribbean Field Office in Boquerón, Puerto Rico. Property owners that cannot adhere to the conservation measures must consult with the USFWS to seek an Incidental Take Permit (ITP) under Section 10(a)(1)(B). Be aware that the preparation of a Habitat Conservation Plan is required to apply for an ITP. Failure to comply with the identified general requirements and conservation measures may result in the violation of Section 9 of the Endangered Species Act. The USFWS has the authority to prosecute violations under the Endangered Species Act.

Because the Virgin Island boas has not been confirmed as occurring in the area, limited amounts of forested habitat are anticipated to be affected by the redevelopment of NAPR through Phase II of the Reuse Plan, redevelopment on Punta Puerca is anticipated to be for less intensive uses (i.e., camps for interpretive excursions and overnight experiences within the Environmental Retreat) and conservation measures are in place, no significant adverse impacts to the Virgin Island boa would be likely as a result of the Proposed Action.

## Brown Pelican

Federally listed endangered brown pelicans occur in low numbers within NAPR and do not use the property for nesting purposes (NAVFAC LANTDIV 2006). The primary breeding population is located in the U.S. Virgin Islands, and brown pelicans observed at NAPR are likely transient or immature birds foraging in estuarine and mangrove systems.

Redevelopment of NAPR through Phase II of the 2010 Addendum may result in increased public access to brown pelican near-shore and on-shore roosting areas. Potential impacts on brown pelicans may include increased harassment, injury, and mortality, as well as the loss of nearshore and onshore roosting habitats due to increases in recreational activities (e.g., swimming, fishing, boating) and vehicular traffic on or near beach areas (e.g., four wheelers, dirt bikes, trucks). Additional impacts on the species may involve ingestion of plastics or other waste items that are produced as a result of redevelopment initiatives (NAVFAC LANTDIV 2006). Construction of marine facilities and roads located near the coastline within mangroves forests that require modifications/expansions would require a permit from USACE. This federal permit process would require a Section 7 consultation between the USACE and the USFWS. During Section 7 consultation, possible adverse effects would be identified and minimized by site-specific

conservation measures. However, the Navy believes that the previous establishment of numerous conservation parcels (PR) adjacent to Parcel III properties may reduce possible effects to brown pelicans.

As stated previously, the future redevelopment of NAPR through Phase II of the 2010 Addendum would not likely cause a significant adverse affect to the brown pelican as the majority of construction activity associated with the Proposed Action would be redevelopment and/or new construction that would occur within previously developed areas. In addition, brown pelicans occur in low numbers within NAPR and do not use the property for nesting. Therefore, no significant adverse affects to brown pelicans would be likely as a result of the Proposed Action.

### Piping Plover

The occurrence of the threatened piping plover at NAPR is expected to be limited to vagrant species and occur once every 10 years (NAVFAC LANTDIV 2006). Therefore, the Proposed Action would not be likely to adversely affect piping plovers.

### Roseate Tern

The occurrence of the threatened roseate tern at NAPR is limited as the species is only observed when pushed into nearby coastal waters during intense storms (NAVFAC LANTDIV 2006). Therefore, the Proposed Action would not likely adversely affect the roseate tern.

### Cobana Negra

In August 2004, a single individual of the threatened cobana negra was recorded in the coastal scrub forest area west of American Circle (NAVFAC LANTDIV 2006), which is approximately 2.3 miles (3.6 km) southwest of the proposed Community College (Zone 7), the nearest Parcel III property evaluated as part of this SEA. This area was identified as undevelopable due to slopes of 15% or greater and has been transferred as a conservation parcel (PR) to the Puerto Rico Conservation Trust. Because of the distance between this area and the nearest Parcel III property, no direct or indirect impacts to this confirmed specimen are anticipated for the Proposed Action.

Cobana negra is found in salt flats, mangrove edges and in brackish seasonally flooded wetlands. Small areas of mangroves are found in Zones 1, 2, 4, 5, and 7 (see Figure 3-8). These mangroves are primarily at the periphery of the respective parcel boundaries. Small areas of tidal flats also are found along the northern periphery of Zone 4. Because the existing wetlands are located at the edge of the respective Parcel III property boundaries, it is anticipated that construction activities would be sited to avoid these wetland communities and suitable cobana negra habitat. However, suitable habitat for cobana negra may be impacted by road improvements made to Marina Bypass Road, Forrestal Drive, PR-3, and Lake Chamberlain Road within Los Machos Forest and Enseñada Honda Mangrove Forest, but impacts to these habitats would be considered negligible given the additional surrounding acreage of similar habitat adjacent to these roads that are protected under conservation. Future redevelopment projects, including road improvements would be individually evaluated to reach a final determination on adverse impacts to cobana negra. Any work in wetlands, such as road improvements, would require a Section 404 permit triggering Section 7 consultation between the USACE and the USFWS to evaluate possible adverse effects to cobana negra. In addition, project sponsor(s) would need to comply with the required reviews and/or permitting as necessary under other federal and Commonwealth's planning, zoning, and environmental laws at the time the road development/expansion is proposed. Because road expansion work in wetlands would require a USACE permit and resulting Section 7 consultation, no significant adverse impacts to the cobana negra would be likely as a result of the Proposed Action.

## Sea Turtles

Redevelopment of NAPR through Phase II of the 2010 Addendum would not directly affect sea turtles. However, indirect impacts on sea turtles could result from impacts to seagrass beds caused by waterfront construction, repairs, and demolition; increases in boat traffic (and hence sea turtle/boat collisions); increases in entanglement in discarded fishing gear or ingestion of harmful refuse, or interference of these materials with successful nesting; an increase in nest predation (or disturbance) due to potential increases in nest predators (or human disturbance); an increase in illegal hunting; degradation of habitat from water quality degradation or physical damage from boats; and lighting that distracts nesting or hatchling sea turtles. Each of these potential impacts is discussed below.

### Impacts to Seagrass Beds Caused by Waterfront Construction

As discussed in Section 4.7.2, waterfront work associated with the demolition, removal, and redesign harbor-front facilities accommodate future cruise and ferry vessel traffic, and removal of the remaining pilings of the pier formerly adjacent to and southeast of Pier 3 could impact existing adjacent seagrass beds located on the southeast side of Enseñada Honda. In addition, work associated with the potential debris removal and/or dredging of the drydock/wetslip facility and demolition of the pier adjacent to the wet slip to accommodate a recreational fishing pier could potentially impact existing seagrass beds located on the north side of the Bahía de Puerca. Maintenance and upgrades to these shoreline structures could result in indirect impacts to seagrass beds, and therefore sea turtles utilizing this habitat. Potential impacts to seagrass beds include prop scarring, deposition of sediment into seagrass beds caused by in-water disturbances, and potential deposition of petroleum products caused by inadvertent spills from construction equipment.

Elevated turbidity levels caused by waterfront construction work are expected to be short-term and minor, as construction would occur on coarse sandy bottoms, which have a low suspension threshold (Elliott *et al.* 1998). Because seagrass beds are very close to existing in-water structures (e.g., Pier 3 and the removed pier pilings in Zone 1 and the dry dock/wet slip and pier in Zone 3), new structures (i.e., ferry and cruise terminal [Zone 1] and recreational fishing pier [Zone 3]) should be sited as close to the existing structures as possible. Any future in-water construction, demolition, or dredging would require permits from the USACE and compliance with these permits and implementation of managerial and structural BMPs (see Section 4.7.2) would minimize impacts to seagrass beds, thereby minimizing adverse impacts to sea turtles.

### Sea Turtle/Boat Collisions

An indirect consequence of the 2010 Addendum would be the potential increase in private and commercial vessel traffic. A distinct difference between the 2004 and 2010 Reuse Plans is more intensive waterfront uses. Since most of the waters surrounding NAPR support habitats that are used by sea turtles for feeding and resting, e.g., seagrass beds and coral reefs (see Figure 3-8), the potential for sea turtle/boat collisions would be greater than that which currently exists.

As discussed in Section 3.8.2.1, about one-quarter of the sea turtles recorded in NSRR waters by Rathbun *et al.* (1985) were in Enseñada Honda, particularly the eastern half. In addition, many cumulative sightings between 1984 and 1985 were within the Bahía de Puerca area (see Figure 3-10). Any increase in vessel traffic in Enseñada Honda or the Bahía de Puerca could result in a corresponding increase in the potential for sea turtle/boat collisions in these areas. The redevelopment of Zone 1 (Port Caribe) through Phase II of the 2010 Addendum would reuse the existing recreational marina and the existing Pier 3 for ferry facilities. However, the actual use of the marina and ferry may increase after the completion of adjacent supporting Phase II facilities (casino, hotel, retail, and restaurants) are completed and serve to draw more users to the Enseñada Honda area. Port Caribe will also serve as an international cruise port and terminal. The redevelopment of El Yunque's (Zone 3) Harborfront Village through Phase II of the

2010 Addendum would include a sports fishing excursion marina, thereby likely increasing recreational and commercial vessel traffic in the Bahía de Puerca area.

The current permits for the marine facilities are construction/use permits. Therefore, any changes in operational tempo for USACE-permitted facilities (e.g., marina, boat ramps, and pier) would require a new permit from the USACE. Any increase in vessel traffic in Enseñada Honda or Bahía de Puerca which could result in a corresponding increase in the potential for sea turtle/boat collisions in these areas would be regulated through the USACE permitting process. It is anticipated that prior to issuing a new permit, the USACE would consult with NOAA Fisheries Service to evaluate possible effects of the Proposed Actions and to implement conservation measures to minimize possible adverse effects pursuant to Section 7 of the ESA. For this reason, although possible adverse effects to sea turtles due to increased vessel traffic could occur, future Section 7 consultation between the USACE and NOAA Fisheries Service would address these possible effects. These permits would be obtained by the individual project sponsor proposing the specific redevelopment activity.

### **Entanglement in and Ingestion of Fishing Gear and Other Debris**

An indirect impact of the redevelopment of through Phase II of the 2010 Addendum could be increased fishing around NAPR. A significant emphasis of the 2010 Addendum is to promote (and preserve) use and enjoyment of the natural resources present in the vicinity of NAPR. The redevelopment is located adjacent to marine environments known for excellent fishing resources, and proposed uses include marinas (Zones 1 and 3) and sport-fishing based retail (Zones 3) and fishing piers (Zone 1). Therefore, the Proposed Action would likely increase fishing activity in the area. Sea turtles would potentially be at increased risk of entanglement in or ingestion of abandoned fishing gear (such as abandoned monofilament fishing line) or other refuse. During operation of NSRR, a seasonal accumulation of trash occurred at Beach #1 (along the northeast coast of NAPR) (Department of Navy 2007), and NAVFAC LANTDIV (2006) noted that piles of discarded fishing gear were found along some NAPR shorelines. In Puerto Rico, beaches are managed by the DNER. This agency regulates both the protection of sea turtles and fishing activities. The Navy anticipates that the DNER will effectively manage both activities, avoiding possible adverse effects on sea turtles.

### **Nest Predation and Hunting**

During nest monitoring at NSRR/NAPR in 2002 and 2004, NAVFAC LANTDIV (2006) recorded a substantial number of nests that had been uncovered and preyed upon. In 2002, 35 of the 73 nests were depredated. In 2004, although fewer surveys were conducted, four of 16 nests experienced depredation. Potential sea turtle nesting beaches have been identified along the coastal areas around Port Caribe (Zone 1), the Caribbean Riviera (Zone 2), El Yunque (Zone3), and the Environmental Retreat (Zone 5) (see Figure 3-11).

Potential sea turtle nest predators include mongoose, feral cats and dogs, rats, and iguanas. Redevelopment of the property may lead to an increase in the number of these potential predators (e.g., dogs and cats) or an increase in their occurrence in the less developed or undeveloped areas (where sea turtle nesting potentially occurs). Such a potential increase in predators, and hence predation of sea turtle nests, could adversely affect successful sea turtle nesting on the property if it occurred year after year. However, the beaches will be managed by the DNER, and the Navy anticipates the DNER will effectively manage and protect nesting beaches.

In addition to the potential animal predators mentioned above, humans have been noted to illegally hunt sea turtles and eggs (Department of Navy 2007). More intensive waterfront redevelopment, as proposed in the 2010 Addendum, could result in an increased access to the shoreline and a greater potential opportunity for humans to come in contact with sea turtle nest and eggs. Poaching of eggs and



hunting of sea turtle are regulated by federal and local agencies. The Navy anticipates the appropriate agencies will effectively manage these issues.

### **Degradation of Habitat**

As shown on Figure 3-8, seagrass beds and coral reefs occur in most areas adjacent to NAPR, including Parcel III properties. These areas are extensively used by sea turtles for feeding and resting. Potential impacts on seagrass and or coral reefs could result from anchoring, boat groundings, and propeller scouring due to increased boating activity in the waters surrounding NAPR; physical disturbance of coral reefs and compaction of sediments underlying seagrasses caused by humans because of increased access to nearshore environments due to redevelopment; and increases in inadvertent solid waste disposal which could potentially smother seagrasses due to more intense nearshore land uses. Measures to lessen potential impacts to seagrasses and coral reefs are described in detail in Section 4.7. Placement of a sufficient amount and appropriate use of waste receptacles in waterfront, beach, and marina areas and appropriate frequency of solid waste pickup from these trash receptacles would minimize degradation of sea turtle habitat caused by solid waste pollution.

Additional impacts on sensitive habitats supporting sea turtles could occur from degradation of water quality from runoff from redeveloped areas or from fuel spills. Adverse impacts associated with water quality degradation would be avoided by compliance with applicable Commonwealth and federal laws, which mandate the use of standard BMPs (e.g., silt fencing, hay bales, earth swales to channel runoff) and implementation of SWPPPs and Erosion and Sediment Control Plans during construction and operation to control upland erosion and/or stormwater runoff from the development sites into adjacent waters (see discussion in Section 4.5.1).

Based on the implementation of the comprehensive sea turtle conservation measures listed in Table 4-7, implementing the disposal action would not likely adversely affect sea turtles and their habitat.

### **Lighting Impacts**

Light pollution on nesting beaches can adversely affect sea turtles because it can alter sea turtle behavior at night (Department of Navy 2007). Artificial light sources can deter nesting sea turtles from emerging onto a beach, thereby forcing the turtle to select a less suitable nesting site, and can disorient sea turtles returning to the ocean. Hatchlings emerge from the nest at sundown and use the diminishing light on the horizon as a cue for the direction of the ocean. Artificial lights can misorient (i.e., cause to move in the wrong direction) and disorient hatchlings, thereby increasing the time it takes them to reach the water (Department of Navy 2007). Sea turtles' ability to survive without water is limited, so prolonged exposure increases the chance of mortality from dehydration, predators, and fatigue, especially for hatchlings.

Potential sea turtle nesting beaches have been identified within Port Caribe (Zone 1), the Caribbean Riviera (Zone 2), El Yunque (Zone3), and Environmental Retreat (Zone 5) (see Figure 3-11). Although redevelopment in these areas would be sited within existing developed areas and cleared land to the extent possible, exterior lights on nearshore structures could adversely impact nesting turtles. The proposed conservation measures in Table 4-7 for the protection of sea turtles include the development of a comprehensive conservation plan to address possible adverse effects of lighting on sea turtles. This measure will become part of the Special Zoning Plan and is expected to mitigate for potential adverse lighting effects on sea turtles.

As part of the 2007 EA, which was written to assess impacts to the 2004 Reuse Plan, conservation measures were established to protect sea turtles from lighting and other impacts (see Table 4-7). As stated previously, these conservation measures are still applicable to the 2010 Addendum and will be incorporated into the revised Special Zoning Plan. Therefore, when developers apply for their respective permits they would become aware of the requirements for protection of the sea turtles and their obligation for compliance with ESA.

**Table 4-7**  
**Conservation Measures for Sea Turtles**

<p><b>During the planning and development phases; vegetation removal, land-clearing activities, new construction; demolition or remodeling of existing structures; grounds maintenance; building maintenance; and general operations the following conservation measures should be implemented to minimize possible effects to the sea turtle species and their habitat:</b></p>
<ul style="list-style-type: none"> <li>• Avoid the removal of vegetation, fence installation, construction activities, and light installation within 50 meters from the high tide.</li> </ul>
<ul style="list-style-type: none"> <li>• Designate a buffer zone of additional 20 meters to minimize indirect impacts from the project and plant sea grapes and native trees within the zone.</li> </ul>
<ul style="list-style-type: none"> <li>• Prepare and implement a comprehensive lighting plan to avoid detrimental impacts of artificial lighting on sea turtles. The goal of the plan should be that lights not be seen directly, indirectly, or cumulatively from the beach. Light management strategies such as shielding, lowering of the lights, locating the lights away from sight view of the beach, using an alternate light source such as low-pressure sodium vapor, and planting of vegetation barriers are some of the available alternatives to reach the plan goal. In already constructed projects, all lights visible from the beach should be eliminated or relocated so as not to be visible. Those remaining lights shall be modified in order to avoid or minimize the possibility of disorientation. The plan goal and the light management strategies should be specified, described, and located in the lighting plan. The plan should be submitted to the DNER and the USFWS for review and approval.</li> </ul>
<ul style="list-style-type: none"> <li>• Once the plan is fully implemented, a lighting inspection should be conducted to identify and correct any remaining problematic lights.</li> </ul>
<ul style="list-style-type: none"> <li>• Enhance coastal vegetation with planting of native species (e.g., sea grapes) within the maritime zone. Protect coastal vegetation and nesting habitat from vehicular traffic in the area.</li> </ul>
<ul style="list-style-type: none"> <li>• Consult with the USFWS and Puerto Rico DNER on all beach use plans and permit requirements</li> </ul>
<ul style="list-style-type: none"> <li>• Notify the DNER if you observe an injured or dead turtle anywhere on the property.</li> </ul>
<ul style="list-style-type: none"> <li>• Pesticide and herbicide applications must follow Commonwealth of Puerto Rico regulations.</li> </ul>
<p><b>Note:</b> The conservation measures above are applicable to coastal areas within Zones 1, 2, 3, and 5 where nesting turtles could be located.</p> <p><b>Notice:</b> If you are willing to comply with the general requirements and conservation measures listed above during the development and subsequent use of these zones, you may proceed with the project. If you have any questions on the conservation measures, please consult with the USFWS, Caribbean Field Office in Boquerón, Puerto Rico. Property owners that cannot adhere to the conservation measures must consult with the USFWS to seek an Incidental Take Permit (ITP) under Section 10(a)(1)(B). Be aware that the preparation of a Habitat Conservation Plan is required to apply for an ITP. Failure to comply with the identified general requirements and conservation measures may result in the violation of Section 9 of the ESA. The USFWS has the authority to prosecute violations under ESA.</p>

Sea turtles would not be directly impacted by the Redevelopment of NAPR through Phase II of the 2010 Reuse Plan. However, redevelopment could adversely impact sea turtles from redevelopment-related actions both on land and in the waters surrounding NAPR. Coastal redevelopment in Zones 1, 2, 3, and 5 could lead to disruption of normal nesting and hatchling emergence behaviors, degradation and/or loss of sea turtle nesting and foraging habitat, increased susceptibility to human and animal predation and increased interaction with fishing gear and watercraft. However, as noted above, the implementation of sea turtle conservation measures as provided in the Special Zoning Plan would minimize possible adverse effects to the four pertinent sea turtle species. Additionally, any future in-water construction activities, as well as activities that would potentially lead to increases in vessel traffic, would require a USACE permit and a Section 7 consultation with NOAA Fisheries Service. Therefore, the Navy has determined that implementing the Proposed Action would not likely adversely affect sea turtles at NAPR.

## West Indian Manatee

Redevelopment of NAPR through Phase II of the 2010 Addendum would not directly affect endangered manatees. However, indirect impacts on manatees could result from impacts to seagrass beds caused by waterfront construction, repairs, and demolition; increases in boat traffic (and hence manatee/boat collisions); degradation of habitat; and entanglement in abandoned or active fishing gear. Each of these potential impacts is discussed below.

### Impacts to Seagrass Beds Caused by Waterfront Construction

As discussed in Section 4.7.2, waterfront work associated with the demolition, removal, and redesign of Pier 3 to accommodate future cruise and ferry vessel traffic, and removal of the remaining pilings of the pier formerly adjacent to and southeast of Pier 3 could impact existing adjacent seagrass beds located on the southeast side of Enseñada Honda. In addition, waterfront work associated with the potential debris removal and/or dredging of the drydock/wetslip facility and demolition of the pier adjacent to the wetslip to accommodate a recreational fishing pier could potentially impact existing seagrass beds located on the north side of the Bahía de Puerca. Maintenance and upgrades to these shoreline structures could result in indirect impacts to seagrass beds, and therefore manatees utilizing this habitat. Potential impacts to seagrass beds during waterfront work include prop scarring, deposition of sediment into seagrass beds caused by in-water disturbances, and potential deposition of petroleum products caused by inadvertent spills from construction equipment.

Elevated turbidity levels caused by waterfront construction work are expected to be short-term and minor, given that coarse sandy bottoms, which are the marine bottom environment near where waterfront construction activities are proposed to occur, have a low suspension threshold (Elliott *et al.* 1998). Because seagrass beds are very close to existing in-water structures (e.g., Pier 3 and the removed pier pilings in Zone 1 and the dry dock/wet slip and pier in Zone 3), new structures (i.e., ferry and cruise terminal [Zone 1] and recreational fishing pier [Zone 3]) should be sited as close to the existing structures as possible. Any future in-water construction, demolition, or dredging would also require permits from the USACE and compliance with these permits and implementation of managerial and structural BMPs would minimize impacts to seagrass beds (see Section 4.7.2), thereby minimizing adverse impacts to manatees.

### Degradation of Seagrass Habitat

As shown on Figure 3-8, seagrass beds occur in most areas adjacent to NAPR, including Parcel III properties. Seagrass beds are used extensively by manatees as feeding and resting areas. Potential impacts on seagrass could result from waterfront construction, anchoring, boat groundings, propeller scouring, or fuel spills associated with increased boating activity in the waters surrounding NAPR; decreased water quality from additional runoff and discharge from redeveloped areas during construction and operation; physical disturbance and compaction of sediments underlying seagrasses caused by humans because of increased access to nearshore environments due to redevelopment; and increases in inadvertent solid waste disposal which could potentially smother seagrasses due to more intense nearshore land uses. Measures to lessen potential impacts to seagrass are described in detail in Section 4.7.2.

### Manatee/Boat Collisions

An indirect consequence of the 2010 Addendum would be the potential for increase in private and commercial vessel traffic. A distinct difference between the 2004 and 2010 Reuse Plans is more intensive waterfront uses. Most of the waters surrounding NAPR support habitat that is used by manatees for feeding and resting (see Figure 3-8). Instituting boating restrictions such as speed limitations and

anchoring restrictions as may be required as part of new federal permits would reduce the potential for manatee/boat collisions.

As shown on Figure 3-9, manatees frequently use Enseñada Honda for feeding, traveling, and socializing. USFWS data have recorded manatees feeding in areas on the southeastern end of Enseñada Honda, the southwestern end, and the middle-western area. Manatees also have been historically sited in the Bahía de Puerca. Any increase in vessel traffic in Enseñada Honda or the Bahía de Puerca could result in a corresponding increase in the potential for manatee/boat collisions in these areas.

The redevelopment of Zone 1 (Port Caribe) through Phase II of the 2010 Addendum would reuse the existing recreational marina and the existing Pier 3 for ferry facilities. However, the actual use of the marina and ferry may increase after the completion of adjacent supporting Phase II facilities (casino, hotel, retail, and restaurants) and may serve to draw more users to the Enseñada Honda area. Port Caribe will also serve as an international cruise port and terminal. The redevelopment of El Yunque's (Zone 3) Harborfront Village through Phase II of the 2010 Addendum would include a sports fishing excursion marina, thereby increasing recreational and commercial vessel traffic in the Bahía de Puerca area.

The current permits for the marine facilities are construction/use permits. Therefore, any changes in operational tempo for USACE-permitted facilities (e.g., marina, boat ramps, and pier) would require a new permit from the USACE. Any increase in vessel traffic in Enseñada Honda or Bahía de Puerca which could result in a corresponding increase in the potential for manatee/boat collisions in these areas would be regulated through the USACE permitting process. It is anticipated that prior to issuing a new permit, the USACE would consult with the USFWS to evaluate possible effects of the Proposed Actions and to implement conservation measures to minimize possible adverse effects pursuant to Section 7 of the ESA. For this reason, although possible adverse effects to manatees due to increased vessel traffic could occur, future section 7 consultations between the USACE and the USFWS would address these possible effects. These permits would be obtained by the individual project sponsor proposing the specific redevelopment activity.

### **Entanglement in Abandoned or Active Fishing Gear**

Entanglement in gill nets is the main source of manatee deaths in Puerto Rico (Rathbun and Possardt 1986). An indirect impact of the redevelopment of through Phase II of the 2010 Addendum could be increased fishing around NAPR. A significant emphasis of the 2010 Addendum is to promote (and preserve) use and enjoyment of the natural resources present in the vicinity of NAPR. The redevelopment is located adjacent to marine environments known for excellent fishing resources, and proposed uses include marinas (Zones 1 and 3) and sport-fishing based retail (Zones 3) and fishing piers (Zone 1). Therefore, the Proposed Action would likely increase fishing activity in the area. This could increase the likelihood of broken/abandoned gill nets.

As stated previously, manatees travel all the waters in the southeastern area of Puerto Rico (see Figure 3-9). While the waters around NAPR historically were restricted to boats, fishing just outside the restricted areas has taken place. Thus, the potential for broken/abandoned gill nets from fishermen impacting manatees has always existed adjacent to NAPR. The exception would be Enseñada Honda. However, with the proposed redevelopment of Zone 1 (Port Caribe) through Phase II of the 2010 Addendum to include use of the existing marina, ferry terminal, and cruise ship terminal, pleasure boats and commercial vessels would use Enseñada Honda. This would potentially limit the usage of gill nets in the harbor and thus limit the likelihood for impacts to manatees in this area. In addition, fishing activities in Puerto Rico are managed by the DNER. Regulatory authority of the DNER provides protection to manatees from entanglement of fishing equipment.

Redevelopment of NAPR through Phase II of the 2010 Reuse Plan could adversely manatees from redevelopment-related actions both on land and near the waters surrounding NAPR. Coastal redevelopment in Zones 1, 2, 3, and 5 could lead to degradation and/or loss of seagrass and thus foraging

habitat for manatees, increased potential for boat collisions, decreased water quality, and increased potential for entanglement with fishing gear. Potential adverse impacts to manatees such as increases in boat traffic and impacts to seagrass would require a USACE permit and a Section 7 consultation with NOAA Fisheries Service. Additionally, regulatory authority of the DNER provides protection to manatees from entanglement of fishing equipment. Therefore, the Navy has determined that implementing the Proposed Action would not likely adversely affect manatees at NAPR.

## Conclusions

In summary, threatened and endangered species and habitat could potentially be indirectly affected by the redevelopment of NAPR through Phase II of the 2010 Reuse Plan. Because of the speculative nature of the Reuse Plan, its full effects on listed species cannot be addressed. However, with the previous transfer of approximately 3,340 acres of land into conservation (PR) under administration by the Puerto Rico Conservation Trust (LRA 2010b), many of which are adjacent to the Parcel III properties that are analyzed as part of this SEA, and the adoption of a Special Zoning Plan for NAPR that incorporates the implementation of proposed conservation measures from the 2007 EA into the site/development review process as previously described, and the requirement to obtain new permits from the USACE for any changes in authorized use for permitted waterfront facilities or nearshore wetland impacts, the Navy has determined that the implementation of the 2010 Addendum at NAPR would not likely adversely affect threatened and endangered species or designated critical habitat at NAPR.

## 4.9 Socioeconomics

### 4.9.1 Population

Under the Proposed Action, the population in eastern Puerto Rico would be expected to increase through Phase II of the redevelopment before leveling out to reflect island-wide trends over the long term. As noted in Section 3.9.1, population change within the larger region increased by approximately 6% from 2000 to 2009. Together, these factors would be expected to increase the temporary and permanent population of the local area and the region, and create potential for significant population increases in the short term. Table 4-8 compares population increase over time beginning with the 2000 U.S. Census and concluding with market-based population projections for 2015. Phase II of development program would begin in 2014, when significant development activities would commence. Therefore, the 2015 projections are presented as a worst-case scenario to include both the temporary and permanent populations that would reside in close proximity to NAPR.

For the primary trade area, including the municipalities of Ceiba, Naguabo, and Fajardo, the total 2015 population is projected to increase (from the 2009 baseline) by approximately 6,977 persons. For the secondary trade area, including the municipalities of Luquillo and Rio Grande, the total 2015 population is projected increase (from the 2009 baseline) by approximately 5,787 persons (C.H. Johnson Consulting, Inc. 2010). Under the Proposed Action, such a population increase would provide both a direct and indirect economic benefit to the region. Therefore, no significant adverse impacts would be associated with an increasing population.



**Table 4-8**  
**Trade Area Population Projections for 2015**

	2000 <sup>(a)</sup>	2009 <sup>(b)</sup>	2015 (Projected) <sup>(c)</sup>
<b>Primary Trade Area</b>			
Ceiba	18,004	17,675	19,285
Fajardo	40,712	42,365	45,792
Naguabo	23,753	24,430	26,370
<b>Total (Primary)</b>	<b>82,469</b>	<b>84,470</b>	<b>91,447</b>
<b>Secondary Trade Area</b>			
Luquillo	19,817	20,667	22,274
Rio Grande	52,362	57,239	61,419
<b>Total (Secondary)</b>	<b>72,179</b>	<b>77,906</b>	<b>83,693</b>
Sources: (a) U.S. Census Bureau 2009a (Census 2000 population). (b) U.S. Census Bureau 2009a (2009 population estimate). (c) C.H. Johnson Consulting, Inc. 2010. Note: The primary trade area consists of those municipalities with direct proximity to key components of the redevelopment; the secondary trade area includes those with indirect proximity to the redevelopment where additional patronage could accrue to the local the market.			

## 4.9.2 Housing

As discussed Section 3.9.2, there is currently an overbuilt situation for housing in eastern Puerto Rico attributable to varied economic factors, including the illiquidity of banks. However, based on the population projections presented above, and the fact that substantial construction activity within the Parcel III properties would begin in 2014, the current inventory of housing would be expected to be largely absorbed by 2015 (Estudios Tecnicos, Inc. 2010). In short, the temporary and permanent population increases associated with the development program would have a positive impact on the current vacancy rate in the region. Therefore, there would be no significant adverse impacts to the housing market associated with implementation of the Proposed Action.

## 4.9.3 Economy, Employment, and Income

The redevelopment of the Parcel III properties through Phase II, and the changes put forth by the 2010 Reuse Plan Addendum, are largely the result of extensive market and financial research conducted under the auspices of the Commonwealth and, more specifically, the LRA. Since 2004, a myriad of economic factors considered in previous NEPA documentation for the disposal of the NAPR property, are no longer valid indicators of local and regional economic conditions. The 2010 Addendum, through the revised zoning plan, focuses more on induced economic growth in the commercial and tourism sectors and less on the industrial sector that already has a regional presence. The additional focus on tourism and a decrease in the allowable density of development were the key drivers for the updated market analyses (LRA 2010b).

### Economy

Reuse of the Parcel III properties is expected to have a positive economic impact through direct funding, job creation, and tax revenue over the short and long term. Gross sales value associated with Parcel III is estimated to range from \$49.6 to \$248.2 million with Zone 2, the Caribbean Riviera, having the most significant impact on projected total real estate value (Estudios Tecnicos, Inc. 2010). Table 4-9 summarizes sales and rental volumes for the full build-out, including Phases I and II. New construction

investment in the Parcel III properties is estimated at approximately \$1.5 billion, a considerable amount of which would be spent through Phase II of the development program.

<b>Table 4-9</b>							
<b>Phased Sales and Rental Volume Projections (units of 1,000; rounded)</b>							
<b>End of Year →</b>	<b>1</b>	<b>5</b>	<b>10</b>	<b>15</b>	<b>20</b>	<b>25</b>	<b>30 +</b>
Entertainment and Leisure Services	\$390	\$503	\$625	\$1,218	\$1,379	\$1,542	\$1,703
Lodging	\$200	\$325	\$436	\$713	\$845	\$965	\$1,066
Residential	\$85	\$31	\$147	\$37	\$41	\$46	\$50
Commercial (office)	\$3	\$5	\$8	\$17	\$33	\$44	\$53
Other	\$4	\$10	\$18	\$23	\$30	\$35	\$39
<b>Total</b>	<b>\$682</b>	<b>\$874</b>	<b>\$1,234</b>	<b>\$2,008</b>	<b>\$2,328</b>	<b>\$2,632</b>	<b>\$2,911</b>
Source: C.H. Johnson Consulting, Inc. 2010. Note: Industry classifications were combined as appropriate to summarize sales and rental volumes for the Parcel III properties.							

Implementation of the 2010 Addendum would provide a focused redevelopment strategy and one that responds to projected future growth for tourism, recreation, and leisure services within the region. The redevelopment strategy would take full advantage of the existing air, land, and marine transportation infrastructure at NAPR in seeking a more immediate return on investment. The tourism sector in Puerto Rico represents a relatively small percentage of island GDP and one that is heavily dependent on the United States market. The potential for growth in this sector is evidenced by projections for the Caribbean tourism market that predict an annual visitation of more than 27 million visitors by 2020 (World Travel and Tourism Council 2011). In addition, demand for retail goods and value of retail expenditures in the region is considered sufficient to support more than 2 million square feet of retail space. Fiscal impacts from the implementation of the Proposed Action are expected to result in approximately \$280 million of construction-related revenues, and \$660 million from subsequent operations over a 20- to 25-year timeframe (C.H. Johnson Consulting, Inc. 2010). As such, impacts to the local economy would be considered positive and beneficial.

## Employment and Income

Increased revenue associated with the Proposed Action would be expected to generate a variety of employment opportunities within the region. Construction spending associated with the Proposed Action would be expected to average more than 17,000 persons per year of employment. The initial phases of the redevelopment plan are projected to result in roughly 7,800 permanent, full-time-equivalent jobs. Over a 30-year planning period, an estimated 27,000 direct, permanent jobs would result from subsequent development phasing (C.H. Johnson Consulting, Inc. 2010). Table 4-10 projects job creation for a 30-year build-out, including indirect or induced employment that would likely result from implementation of the Proposed Action.

The nearly \$2 billion investment associated with Phases I and II of the development program – the Parcel III properties – is estimated to create roughly 14,958 direct jobs for the local economy (C.H. Johnson Consulting, Inc. 2010). Table 4-11 highlights projections for direct job creation for each of the Parcel III reuse zones and compares this to total investment within each respective zone.

The redevelopment, by all indications, would have a net positive impact on employment through both direct and induced growth in the local job market. Table 4-12 projects the average 2015 per capita income for the primary (i.e., the municipalities of Ceiba, Fajardo, and Naguabo) and secondary (i.e., the municipalities of Luquillo and Rio Grande) trade areas. The projections suggest that job creation associated with the implementation of the Proposed Action could result in significant increases to per capita income within the region.

**Table 4-10**  
**Phased Employment Projections (Direct and Indirect)**

<b>End of Year →</b>	<b>1</b>	<b>5</b>	<b>10</b>	<b>15</b>	<b>20</b>	<b>25</b>	<b>30 +</b>
Entertainment and Leisure Services	3,650	4,483	5,043	8,726	9,060	9,226	9,226
Lodging	3,000	4,500	5,475	8,100	8,700	9,000	9,000
Residential	45	105	230	320	400	475	550
Commercial (office)	500	750	1,063	2,000	3,500	4,263	4,700
Educational	200	400	500	600	800	800	800
Other	293	755	1,231	1,511	1,761	1,911	1,911
<b>Total Direct</b>	<b>7,688</b>	<b>10,933</b>	<b>13,542</b>	<b>21,257</b>	<b>24,221</b>	<b>25,675</b>	<b>26,187</b>
Multiplier (0.4)	3,075	4,373	5,417	8,503	9,688	10,270	10,475
<b>Total Direct and Indirect</b>	<b>10,763</b>	<b>15,306</b>	<b>18,959</b>	<b>29,760</b>	<b>33,909</b>	<b>35,945</b>	<b>36,662</b>

Source: C.H. Johnson Consulting, Inc. 2010.

Note: Industry classifications were combined as appropriate to summarize sales and rental volumes for the Parcel III properties.

**Table 4-11**  
**Projected Direct Job Creation**

<b>Parcel III Reuse Zone</b>	<b>Direct Jobs</b>	<b>Total Investment (million)</b>
Zone 1	2,340	\$189
Zone 2	7,970	\$907
Zone 3	1,590	\$294
Zone 4	110	\$61
Zone 5	112	\$18
Zone 7	2,746	\$429
Zone 11	90	\$7
<b>Total</b>	<b>14,958</b>	<b>1,905</b>

**Table 4-12**  
**Average per Capita Income in the Trade Area**

	<b>1990</b>	<b>2000</b>	<b>2015 (Projected)</b>
<b>Primary Trade Area</b>			
Ceiba	\$5,119	\$9,256	\$25,538
Fajardo	\$4,148	\$7,852	\$21,664
Naguabo	\$3,221	\$7,529	\$20,773
<b>Average (Primary)</b>	<b>\$4,163</b>	<b>\$8,212</b>	<b>\$22,658</b>
<b>Secondary Trade Area</b>			
Luquillo	\$3,795	\$6,960	\$19,203
Rio Grande	\$3,529	\$7,347	\$20,271
<b>Average (Secondary)</b>	<b>\$3,662</b>	<b>\$7,154</b>	<b>\$19,737</b>

Source: C.H. Johnson Consulting, Inc. 2010.

In general, an increase in tourism and business activity associated with the Proposed Action would have a positive impact on the Commonwealth's tax base by increasing the value of the Parcel III properties. At the municipality level, development taxes or permit fees offer an opportunity to generate revenue for local government operations. Tax revenues associated with the Proposed Action would benefit from recently passed legislation that establishes a legal and tax framework to encourage

investment. The Puerto Rico Municipal Economic Development and Tourism Incentives Act authorizes a reduced tax rate for investments of \$500 million or more for approved projects. The Act is also intended to reduce tax liability for gaming operations and allows for a 10% tax return to support LRA operations and provide assistance to regional economic development initiatives. The LRA also would have the ability to negotiate the leasing of individual parcels to generate revenue (LRA 2010b).

## 4.10 Cultural Resources

In accordance with Section 106 of the National Historic Preservation Act (NHPA), the Navy entered into consultation with the Puerto Rico SHPO during the 2007 EA process (letter dated 10 May 2005). As part of implementing the original Proposed Action, an MOA between the Navy and the Puerto Rico SHPO was executed on 23 January, 2007. The MOA detailed which archaeological sites would undergo data recovery and to what level. In addition, it specified the level of documentation needed for respective historic structures or the consultation process needed to establish the level of recordation.

The original MOA expired on September 30, 2009, prior to the full disposal of the property. The Navy is developing a new MOA (see Appendix A) as the legal instrument required for the disposal of NAPR, addressing changes in the proposed reuse of NAPR property per the 2010 Reuse Plan Addendum. Specifically, the Punto Medio Mundo area and the area around the small arms range at NAPR is no longer proposed for retention under federal ownership; rather, it would be developed as proposed under the Addendum. In 2010, three archaeological resources (Sites RR-9/CE-34, RR-10, and RR-11/CE-35) within the small arms range were evaluated for National Register of Historic Places (NRHP) eligibility. One site, RR-9/CE-34, was determined eligible for the NRHP. The Puerto Rico SHPO concurred with these findings (letter dated 4 June, 2010). As such, the new MOA would address mitigation measures for Site RR-9/CE-34, as well as other outstanding preservation matters as they relate to the final disposal of the property.

The Navy invited the Advisory Council on Historic Preservation (ACHP) to participate in the development of a new MOA (letter dated February 9, 2011). The ACHP chose not to participate in the consultation pursuant to 36 CFR 800.69(a)(1)(iii) (letter dated 23 February, 2011). The Navy also invited the Puerto Rico DNER and the LRA to participate as concurring parties to the agreement.

Through execution of the new MOA, and by implementing the stipulations provided therein, the Navy will fulfill their responsibilities under Section 106 of the NHPA (Draft MOA provided in Appendix A). The MOA will ensure protection of historic and archaeological resources at NAPR and be finalized through the Section 106 process.

For structures located on NAPR deemed eligible for listing on the NRHP, the Navy would undertake recordation to mitigate the potential for adverse effects in the event any structures are demolished or modified subsequent to Navy ownership. Recordation would be undertaken in accordance with applicable National Park Service standards and as agreed to between the Navy and the Puerto Rico SHPO.

## 4.11 Coastal Zone Management

The Navy has determined that the Proposed Action, as described in Section 1.4, would not constitute an effect on coastal uses and resources, as defined by enforceable policies of the Puerto Rico Coastal Zone Management Program (CZMP). Accordingly, the Navy has provided the PRPB with a copy of the negative determination. In a letter dated (TBD), the PRPB determined the Proposed Action does not require a federal Coastal Consistency Determination with the Puerto Rico CZMP. The future reuse of the disposed NAPR property would be under the purview of the PRPB, which would be responsible for

ensuring that development projects and activities do not adversely affect the existing sensitive ecosystems within the coastal zone.

Once the areas of NAPR are transferred from federal ownership, however, the Parcel III properties would no longer be excluded from the coastal zone, and Proposed Actions within this area with the potential to impact the coastal zone would be subject to CZMP-consistency reviews.

## 4.12 Environmental Justice/Protection of Children from Environmental Health Risks

In accordance with Executive Order 12898, dated February 11, 1994, and Secretary of the Navy Notice 5090, dated May 27, 1994, the Navy is required to identify and address, as appropriate, the potential for disproportionately high and adverse human health or environmental effects of its actions on minority or low-income populations.

The Navy has not directly or indirectly used criteria, methods, or practices that discriminate on the basis of race, color, or national origin. In addition, the Navy has analyzed the economic and social impacts of the Proposed Action (i.e., disposal of Parcel III properties) and subsequent reuse and determined no economic or social impacts on minority or low-income communities are anticipated. Because of the nature of disposal and reuse, and the oversight of the planning process by the LRA, most impacts would be expected to be positive for the local communities. According to the 2010 Reuse Plan Addendum, guiding principles of the Commonwealth during planning for reuse aimed to benefit the citizens, including the residents of Ceiba, Naguabo, and surrounding areas. These guiding principles were to encourage community participation, promote activities to create jobs, and to protect natural resources. According to the Reuse Plan, at full build-out the total number of jobs created would be an estimated 26,000. Some portion of the jobs created would likely go to residents in the nearby communities. There would also likely be some positive economic benefits for the business sector in these communities from the additional spending by tourists and visitors and new residents and employees, in addition to the construction dollars that would be introduced to the economy. Additionally, no human health impacts are anticipated. No mitigation measures are necessary to address significant adverse environmental impacts on minority and low-income communities. Therefore, the Proposed Action would not result in disproportionately high and/or adverse human or environmental effects on minorities or low-income populations.

Executive Order No. 13045, “Protection of Children from Environmental Health Risks,” mandates federal agencies to identify and assess environmental health and safety risks that may affect children disproportionately as a result of the implementation of federal policies, programs, activities, and standards (63 *Federal Register* 19883 to 19888). The Proposed Action would not negatively impact schools, housing areas, or gathering places of children. Therefore, there would be no short- or long-term environmental health or safety risks to children posed by the implementation of the Proposed Action.

## 4.13 Irreversible and Irretrievable Commitment of Resources

Implementation of the Proposed Action would not result in the irreversible or irretrievable loss of any resources discussed in this EA. The Proposed Action does not irreversibly or irretrievably curtail the reasonable range of potential uses of the environment. However, because of the speculative nature of the 2010 Reuse Plan Addendum, its full effects on all resources cannot be addressed. Under existing laws and



regulations, future landowners/developers would be responsible for establishing zoning and applying for building permits and other approvals to implement their respective development projects. The engineering and design studies needed to obtain the various approvals from the respective regulatory agencies have not been accomplished.

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## 5 Cumulative Impacts

Cumulative impacts are the sum of all impacts from implementation of the Proposed Action—the transfer and reuse of the Parcel III—and from other past or reasonably foreseeable future projects relative to these land parcels. Potentially significant effects can result from the additive or synergistic effects of individually minor actions that affect the same resources over the duration of the Proposed Action and within the same geographic area. For the purpose of this assessment, the area considered for cumulative impacts is Parcel III at NAPR in context with the entire NAPR property, as well as the northeast region of Puerto Rico near NAPR, including the communities of Luquillo, Fajardo, Ceiba, and Naguabo.

As discussed in Section 1.5 of this EA, the impacts associated with reuse of the property through 2020 (i.e., Phases I and II) under the 2010 Reuse Plan Addendum are considered indirect impacts of the Proposed Action. These impacts are described in Section 4 at a general level of detail, consistent with the level of detail found in the Reuse Plan Addendum. However, the magnitude of redevelopment beyond Phase II (i.e., Phases III and IV build-out to 2045) would be a function of economic factors and other factors that, with the exception of certain Navy-imposed restrictions, would be beyond the control of the Navy. As such, the ultimate redevelopment of the property through Phase IV of the Addendum is considered to be speculative at present; therefore, the proposed reuses defined in Phases III and IV of the Reuse Plan Addendum have been evaluated as unforeseeable, cumulative implications of the Proposed Action.

### 5.1 Land Use and Transportation

Implementation of Phases III and IV of the Reuse Plan Addendum would result in additional land use impacts as areas are developed more intensively. Significant internal or external land use inconsistencies are not anticipated because most of the additional development would comprise expansions or continuation of developments initiated during Phase II of the plan. Furthermore, the PRPB and other Commonwealth and federal agencies would continue to be responsible for reviewing individual development projects to ensure that such projects are consistent with the applicable zoning regulations, thereby minimizing the potential for unforeseeable future land use inconsistencies.

Suburban growth trends over the last decade provide a regional perspective on land use within eastern Puerto Rico. Towards the south, eastern coast municipalities experienced increased development in the early 1990s and again in the early 2000s extending to the municipal boundary of Ceiba to the north of NAPR. Further inland and to the north, municipalities in the central-eastern portion of the island (i.e., Gurabo, Juncos, Las Piedras, and Humacao) also have experienced growth stemming from the municipality of Caguas (to the east). This growth was primarily driven by an expanded pharmaceutical and manufacturing presence in the region with Caguas serving as an economic hub. The convergence of these two urban growth fronts, from Fajardo south and from Humacao to the east and north, within the municipalities of Naguabo and Ceiba provide a direct connection between Fajardo and Humacao. Ceiba and Naguabo neighbor NAPR, including the Parcel III properties, and, consistent with the master plan revision, are considered suitable for expanded growth. In addition, PR-53 along the eastern coast has increased the connectivity within and between these eastern jurisdictions.

Additional upgrades to the transportation system would be necessary as Phases III and IV of the Reuse Plan are implemented and areas are developed more intensively. Accordingly, the plan proposes the expansion and improvement of 13 roadways on the property during Phases III and IV. However, given that Phases III and IV would be implemented over a 10- to 20-year period and would not be initiated until at least 10 years after transfer of the property, further review and evaluation of the adequacy

of the transportation system would be needed as the development plan progresses. Potential adverse impacts from the redevelopment at full build-out would include relatively minor increases to the regional population and urban development, and increased traffic volumes associated with each. With the implementation of mitigation measures, any adverse impacts from the Proposed Action are expected to be minimal and negligible.

## 5.2 Vegetation

Implementation of the Proposed Action, disposal of NAPR, combined with past, present, and future actions, could have the potential for an adverse cumulative impact on vegetative communities at NAPR. Redevelopment through Phase IV of the Reuse Plan would result in additional loss or alteration of vegetation in terrestrial communities throughout the property. While a significant portion of land in areas with wetlands and steep slopes would be avoided, the full build-out of the Reuse Plan would result in additional expansion of the development footprint into previously undeveloped upland areas at NAPR. Furthermore, full build-out would result in additional development up to the boundaries of sensitive freshwater wetland, surface water, tidal wetland, and marine ecosystems. The resulting loss of vegetation could remove protective buffers that are important to the health of these sensitive resources.

Implementing BMPs during construction and complying with all Puerto Rico Commonwealth permitting regulations could minimize any potential impacts. Therefore, the resultant loss in vegetation would in and of itself not be expected to have a significant adverse impact on natural resources. It should also be noted that the 2004 Reuse Plan resulted in the permanent protection of more than 3,000 acres of vegetative communities, including more than 2,100 acres of mangroves, through establishment of conservation areas. Protection of such an extensive area of natural vegetation in perpetuity is a beneficial impact of the Proposed Action.

## 5.3 Air and Noise

Cumulative air quality impacts from the Proposed Action and other existing and reasonably foreseeable actions are not expected to be significant. The reuse of NAPR through Phase IV, as proposed in the Reuse Plan, would entail a more intensive use of residential, tourism/resort, commercial and light industrial facilities than the current land uses and infrastructure at NAPR support. The specific levels of air emissions associated with the proposed reuses through Phase IV are speculative and not quantifiable at this time. Each proposed development would be required to adhere to the Commonwealth's permit and development review process.

Other existing air pollutant sources include emissions from ferry operations between Vieques and Fajardo, engine emissions from aircraft using the NAPR, Fajardo, and Vieques airports, and from private watercraft operating near the shore.

Proposed construction projects at NAPR, as part of the reuse activities, are not expected to generate air pollutant emissions at levels that would impact the air quality within the disposed land areas. Projects such as these would address any potential significant air quality impacts caused by the project in environmental documentation prepared for each project. The cumulative effect of these actions is not expected to adversely affect the region's designation as an attainment area.

The Proposed Action would not directly or indirectly generate sufficient noise to have a cumulative effect on the overall noise environment of the NAPR property or nearby areas. Historical noise sources located at NAPR include aircraft operations, watercraft operating near the shore, and past military activities. Because of the geographic expanse (8,442 acres), the varying topography of NAPR, and the fact that the majority of Parcel III land area is surrounded by the other areas of NAPR, the

proposed reuse demolition and construction projects at NAPR are not expected to generate sufficient noise to be noticeable outside the disposed land areas.

## 5.4 Terrestrial and Marine Environments and Threatened and Endangered Species

Implementation of the Proposed Action, when combined with past, present, and future actions, would not have a significant impact on the terrestrial environment and on those threatened and endangered species that occur at NAPR. As discussed in Section 1.5, the potential impacts associated with development through Phase II of the Reuse Plan are considered as indirect impacts of the proposed disposal action. Potential impacts from development through Phase IV of the Reuse Plan are discussed below.

It is anticipated that the PRPB would adopt a Special Zoning Plan based on the proposed Reuse Plan Addendum for the development of Parcel III at NAPR. Included in the zoning plan would be specific conservation measures (see Tables 4-4 through 4-7) to be undertaken by future landowners/developers to assure protection of threatened and endangered species and their habitat. A statement that directs property owners/developers to consult with USFWS if they have questions on, or cannot comply with, the conservation measures would be part of the zoning conditions. It would further state that failure to comply could violate Section 9.0 of the ESA and that the USFWS has the authority to prosecute violations under the Act. As these conservation recommendations would become part of the Special Zoning Plan for the development of NAPR, they would constitute conditions that all future landowners/developers will be advised of when undergoing the site/development review process required to obtain a building permit. In addition, any changes in layout or operational tempo for USACE-permitted facilities (e.g., marina, boat ramps, and cargo pier) would require a new permit from the USACE no matter where in the phase development these changes occur.

During implementation of Phase I of the Reuse Plan Addendum, which is the disposal action, the Navy would include notification of the recommended conservation measures in all bid packages as it relates to the respective parcel. The successful bidder's transfer documents would also include a copy of the applicable recommended conservation measures, as well as notification to the USFWS as to who the successful bidder is. During the subsequent Phases III and IV, developers will become aware of the conservation measures as part of the zoning/building permit process.

Implementation of the Proposed Action could have the potential for an adverse cumulative impact on the marine environment, seagrasses, sea turtles, and the West Indian manatee if proper conservation measures are not undertaken. It is likely that restrictions on use of nearshore waters by private vessels and protective restrictions in the Enseñada Honda marina area have contributed to the conservation of these resources. In addition, use of the waters adjacent to NAPR by the Navy decreased dramatically and ultimately ceased with the closure of training facilities and operations at Vieques and NSRR. However, over time, a greater use of the waters for civilian purposes (e.g., recreation, fishing, and tourism) would occur. At present any analysis of the impacts of potential increase in vessel traffic in coastal waters around NAPR as a result of the Proposed Action is purely speculative. Adherence to the mitigation measures listed below, as well as review and issuance of new permits for any USACE-permitted facilities should the operational tempo of those facilities change, is vital to minimize future impacts to these resources.

Potential future in-water construction, demolition, or dredging could potentially result in impacts to EFH by temporarily increasing turbidity during in-water work, and possibly releasing pollutants into the water column (FDEP 2008). However, as stated in Section 3.7.5, the shoreline and intertidal areas in the vicinity of Parcel III properties are unconsolidated coarse sandy bottom environments lacking



seagrass beds or coral reefs (NOAA 2011). Unconsolidated coarse sandy bottom is the primary marine substrate underlying all areas where future in-water construction is proposed (see Figures 3-8 and 4-1). Coarse sand has a low suspension threshold (Elliott *et al.* 1998); therefore, in-water work in these areas would be expected to result in short-term elevated turbidity levels.

In addition to the conservation measures specific to zoning, there are a number of mitigation measures that Commonwealth and/or federal resource agencies could/may impose on these non-federal owners/developers prior to issuance of development-specific approvals or permits. Implementation of these mitigation requirements would be the responsibility of the new owner/developer, and the respective issuing agency would be responsible for assuring that the mitigation measures are instituted.

Following is a list of potential mitigation measures that could be implemented to minimize any potential impacts to threatened and endangered species or their habitat as a result of future development:

- Prevent nutrient run-off through the use of sedimentation barriers during ground clearing and other construction activities;
- Create a clearly marked and buoyed (mandatory) channel for the approach to the ferry terminal(s) and other marine activities;
- Create specific locations where boats may/may not be anchored;
- Establish maintenance and usage restrictions for mooring areas;
- Enforce vessel speed limits through established 'make no wake' zones and other such restrictions;
- For construction activities within the coastal zone, establish appropriate set backs and enforce lighting restrictions as they relate to sea turtles and nesting beaches;
- Assist future property owners in pursuing establishing conservation easement to facilitate their receiving tax deductions and/or property tax exemptions; and
- Local municipalities or Commonwealth agencies establish animal pest management programs to help manage feral cats and dogs, as well as the introduced mongoose.

Provided that future owners/developers develop and follow mitigation measures for reuse activities that have the potential for adverse impacts on marine resources, seagrasses, and sea turtles, the proposed reuse through Phase IV (if it occurs as proposed) would not be expected to result in significant adverse cumulative impacts.

## 5.5 Socioeconomics

Based on the analyses contained in Section 4, any cumulative, long-term socioeconomic impacts associated with the implementation of the Proposed Action would be considered positive and beneficial. The growth strategy put forward by the 2010 Reuse Plan Addendum and the revised master (zoning) plan provides for flexible, systemic growth that remains adaptable to changing market conditions. New economic activity within the region is projected to stimulate the economy, including increased employment and income for the local population, and increased tax revenues for the Commonwealth and municipalities that comprise the region.

## 5.6 Environmental Contamination

The Proposed Action would have a beneficial effect on environmental contamination through the cleanup of existing contamination. The cleanup of environmental contamination would have indirect, short-term land use impacts (see Section 4.2). The duration and extent of the remedial process at each site is dependent on the outcome of the current ECP (U.S. Navy 2005) investigations and future work (remedial investigations/feasibility studies, remedial designs, and remedial actions). Site-access controls (e.g., fencing) would be evaluated early in this process. Some contaminated parcels would require mechanized land clearing, excavations, backfilling, and re-grading to complete investigations and cleanups, resulting in indirect, short-term impacts. These impacts can be minimized through the use of BMPs to control erosion, sedimentation, and noise related to cleanup and by appropriate restoration upon completion of cleanups.

## 5.7 Cultural Resources

Potential adverse cumulative impacts on cultural and historic resources are not expected to be significant. Potentially eligible sites that remain outside of existing conservation zones would be exposed to the threat of natural or manmade disturbances (including looting), adversely affecting the integrity or research potential of the sites. Without monitoring and possible intervention or mitigation, erosion or neglect could affect the integrity of the features or deposits. Over time and in the absence of federal oversight, sites could also be destroyed through development, landscape modification, looting, or uncontrolled excavation. However, inclusion of cultural and historic sites within Parcel III previously not part of the MOA would minimize or mitigate potential impacts such that the cumulative effect would not be significant. Further, through execution of the MOA between the Navy and the Puerto Rico SHPO, and by implementing the stipulations provided therein, the Navy would ensure protection of historic and archaeological resources within Parcel III at NAPR.

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## 6 List of Preparers

This EA was prepared for the Department of the Navy, BRAC Program Management Office SE, Office of the Assistant Secretary of the Navy Energy, Installations and Environment, by Ecology and Environment, Inc. A list of the principal participants in the preparation of the EA is presented below.

**List of Preparers**

<b>Name</b>	<b>Role</b>	<b>Degree/ Date</b>	<b>Project Responsibility</b>
Peggy Farrell	Contract Manager	BS/1979	Quality assurance, quality control
Doug Heatwole	Project Director	MS/1981 BS/1979	Quality assurance, quality control,
Jan Brandt	Project Manager	MS/1995 BS/1992	Overall project management, purpose and need, Proposed Action and alternatives
Cynthia Shurling	Assistant Project Manager	MEM/2006 BS/1998 BA/1995	Environmental contamination, cultural resources
Brenda Powell	Biologist	MS/1990 BS/1998	Geology, topography and soils, marine environment, threatened and endangered species
Michael Robertson	Environmental Planner	MA/2005 BS/1999	Land use and aesthetics, transportation, stormwater, and infrastructure, Socioeconomics
Jonathan Oravetz	Biologist/Environmental Scientist	MS/2008 BS/2005	Hydrology and water quality, terrestrial environment, threatened and endangered species, GIS
Gina Edwards	Technical Editor	BS/1983	Layout, technical review and editing, production coordination
Jeff Schihl	Graphics	BFA/1997	Cover art, graphics

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## Appendix A

# Draft Memorandum of Understanding

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**DEPARTMENT OF THE NAVY**  
COMMANDER NAVY REGION SOUTHEAST  
BOX 102, NAVAL AIR STATION  
JACKSONVILLE, FLORIDA 32212-0102

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Ser N45/ 063  
FEB 09 2011

Advisory Council on Historic Preservation  
Federal Property Management Section  
Attn: Ms. Louise Brodnitz, Historic Preservation Specialist  
Old Post Office Building  
1100 Pennsylvania Avenue, NW, Suite 803  
Washington, DC 20004

Dear Ms. Brodnitz:

SUBJECT: INVITATION TO COMMENT OR PARTICIPATE ON DRAFT  
MEMORANDUM OF AGREEMENT (MOA) BETWEEN THE UNITED  
STATES NAVY AND THE PUERTO RICO HISTORIC PRESERVATION  
OFFICER CONCERNING THE DISPOSAL OF NAVAL ACTIVITY  
PUERTO RICO

The Navy is writing in regard to the disposal of Naval Activity Puerto Rico, formerly known as Naval Station Roosevelt Roads (NSRR), located in Ceiba, Puerto Rico. The Advisory Council on Historic Preservation (ACHP) was notified of this disposal and potential adverse effects and provided documentation about the findings on May 11, 2006. The ACHP chose not to participate in the consultation pursuant to 36 C.F.R. 800.69(a)(1)(iii) via letter dated June 6, 2006. A Memorandum of Agreement (MOA) was developed with the Puerto Rico State Historic Preservation Officer (PR SHPO) (see Exhibit A of enclosure 1).

The termination date (September 30, 2009) for the Memorandum of Agreement (MOA) for disposal of the property passed prior to full property disposal. The Local Redevelopment Authority (LRA) also published an addendum to their Reuse Plan in 2010. The Small Arms Range at NAPR may no longer be retained under federal ownership. Three archaeological resources (RR-9/CE-34, RR-10, RR-11/CE-35) within this range were evaluated for National Register of Historic Places (NRHP) eligibility in 2010. RR-9/CE-34 was determined eligible for the NRHP through PR SHPO consensus and RR-10 and RR-11/CE-35 were determined not eligible for the NRHP through PR SHPO consensus.

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The Navy is preparing a new MOA for the disposal of NAPR. This MOA codifies the proposed mitigation of RR-9/CE-34 and identifies stipulations to satisfy preservation requirements for other historic properties at NAPR.

Pursuant to Section 106 of the National Historic Preservation Act (36 CFR 800.1), the Navy is herein inviting the Advisory Council on Historic Preservation (ACHP) to consult on the proposed undertaking and participate in the development of a MOA concerning the disposal of Naval Activity Puerto Rico. Attached as enclosure (1) is a "draft" MOA and exhibits developed in satisfaction of the requirements contained in 36 CFR Part 800.6 (Resolution of Adverse Effects) to facilitate the disposal.

We look forward to receiving your decision on whether the ACHP will elect to participate in the matter of the development of the MOA. If you have any questions before formulating your response, please do not hesitate to contact Mr. Darrell Gundrum, Project Manager at: (904) 542-6944 or Mr. Len Winter, Historic Preservation Officer at: (904) 542-6861.

Thank you for your time and consideration.

Sincerely,



C. R. DESTAFNEY, PE  
Regional Environmental Director  
By direction of the Commander

Enclosure: 1. Draft MOA

Copy to:

Mr. David Criswell, BRAC PMO SE



# **DRAFT**

## **MEMORANDUM OF AGREEMENT BETWEEN THE UNITED STATES NAVY AND THE PUERTO RICO HISTORIC PRESERVATION OFFICER CONCERNING THE DISPOSAL OF NAVAL ACTIVITY PUERTO RICO**

**WHEREAS**, the United States Department of Defense Appropriations Act of Fiscal Year 2004 (Public Law 108-87) directed the U.S. Navy to close the Naval Station Roosevelt Roads (NSRR) in Ceiba, Puerto Rico and dispose of NSRR (Undertaking) under the procedures and authorities contained in the Base Closure and Realignment Act of 1990 (Title XXIX of Public Law 101-510; 10 U.S.C. 2687 note); and

**WHEREAS**, the U.S. Navy, pursuant to Public Law 108-87 on March 31, 2004 closed NSRR and re-designated it as Naval Activity Puerto Rico (Property); and

**WHEREAS**, the U.S. Navy proposed to dispose of portions of the property through Economic Development Conveyance, Public Benefit Conveyance, sale, and through transfer to other federal agencies; and

**WHEREAS**, the U.S. Navy established a Memorandum of Agreement (MOA) with the Puerto Rico State Historic Preservation Officer for the disposal of said property (Exhibit A); and

**WHEREAS**, the U.S. Navy and Puerto Rico State Historic Preservation Officer (SHPO) agree that National Register of Historic Places (NRHP) eligible architectural resources (historic properties) at the property were adequately recorded and that the U.S. Navy has fulfilled its responsibility to these architectural resources via the submission of documentation to the SHPO and Puerto Rico Department of Natural and Environmental Resources (DNER) as required per stipulation in Exhibit A; and

**WHEREAS**, the U.S. Navy concluded and the SHPO concurred that the archaeological resources located within the property to be transferred to other Federal Agencies as identified in the MOA (Exhibit A) would be afforded protection by such agencies; and

**WHEREAS**, the U.S Navy evaluated eight archaeological sites (Ceiba 1, Ceiba 3, Ceiba 5, Ceiba 6/10, Ceiba 9, Ceiba 11, Ceiba 30 and RR-12) at the property per stipulation in Exhibit A and determined, via SHPO concurrence in a letter dated May 15, 2009 (Exhibit B), that Ceiba 3, 5, 9, 11 and 30 are eligible for the NRHP and that sites Ceiba 1, 6/10, and RR-12 are not eligible for the NRHP; and

**WHEREAS**, the U.S. Navy performed data recovery at GMI-2 (Ceiba 32), GMI-4 (Ceiba 31), RR-14 ( Ceiba-33) per stipulation in Exhibit A and at Ceiba 11, located within sale parcels 16 (Parcel II), 27 (Parcel I), and 40 (Parcel III), and proposed report organization and submission schedule to which the SHPO agreed via letter dated June 29, 2009, permitting the BRAC disposal of said sale parcels prior to the completion and submission of the technical reports (Exhibit C); and

**WHEREAS**, the U.S. Navy proposed an alternative treatment measure (Synthetic Context Study) for sites Ceiba 5, 9, 30 and boundary (Exhibit D) for said study to the SHPO and the SHPO concurred via letter dated June 4, 2010 (Exhibit E); and

**WHEREAS**, the termination date (September 30, 2009) of the MOA (Exhibit A) for disposal of said property passed prior to full property disposal; and

**WHEREAS**, the Local Redevelopment Authority (LRA) published an addendum to their Reuse Plan in 2010 and the parcel sought by the LRA under an Economic Development Conveyance (Parcel III) is different from the 2004 LRA Reuse Plan and parcel 38 (Small Arms Range)/Solid Waste Management Unit (SWMU) 77 may no longer be retained under federal ownership; and

**WHEREAS**, the U.S. Navy evaluated the three archaeological sites (RR-9/CE-34, RR-10, RR-11/CE-35) located within parcel 38/SWMU 77 and determined that RR-9/CE-34 was eligible for the NRHP and that sites RR-10 and RR-11/CE-35 were not eligible for the NRHP and the SHPO concurred via letter dated June 4, 2010 (see Exhibit E); and

**WHEREAS**, the U.S. Navy has concluded and the SHPO concurs that the disposal of parcel 38/SWMU 77 has the potential to adversely affect RR-9/CE-34; and

**WHEREAS**, in accordance with 36 C.F.R. § 800.6(a)(1), the U.S. Navy has notified the Advisory Council on Historic Preservation (ACHP) of its findings of potential adverse

effects and provided documentation about the findings on (date), and the ACHP has chosen not to participate in the consultation pursuant to 36 C.F.R. § 800.6(a)(1)(iii) via letter dated (date); and

**WHEREAS**, the designated Local Reuse Authority for the former Naval Station Roosevelt Roads and DNER are invited to be consulting parties in this MOA in accordance with 36 CFR§ 800.2(c); and

**WHEREAS**, the U.S. Navy has provided for public involvement in this MOA in accordance with 36 CFR§ 800.8(c)(1)(iv) by coordinating the Section 106 review with public review and consultation under the National Environmental Policy Act, 42 U.S.C. §§ 4321 et seq. (1969)(NEPA).

**NOW, THEREFORE**, the U.S. Navy shall ensure that the following stipulations are implemented in order to take into account the effects of the property disposal on historic properties, and that these stipulations shall govern the property disposal and all of its parts until this MOA expires or is terminated. With the implementation of these stipulations, the SHPO concurs that the U.S. Navy has fulfilled its responsibilities under the National Historic Preservation Act (NHPA) of 1969, as amended, for the disposal of Naval Activity Puerto Rico.

## **STIPULATIONS**

The U.S. Navy shall ensure that the following stipulations are implemented:

1. An archaeological data recovery effort shall take place at site RR-9/CE-34 prior to the disposal of parcel 38 (Small Arms Range)/SWMU77. The data recovery effort shall sample those portions of site RR-9/CE-34 (Locus 1 and Locus 2) that contribute to the NRHP eligibility of the site.

The Navy will work with the SHPO to develop an appropriate Data Recovery Plan to mitigate adverse effects at site RR-9/CE-34.

A copy of the Data Recovery Plan shall be provided to SHPO for review within 30 days.

If the SHPO fails to respond in writing within the 30 days, it may be assumed that the SHPO has no comments on the Data Recovery Plan and archaeological mitigation as specified can commence.

In a reasonable period following archaeological mitigation, the Navy will submit a draft copy of the Data Recovery Report to the SHPO for review within 30 days.

If the SHPO fails to respond in writing within the 30 days, it may be assumed that the SHPO has no comments on the Data Recovery Report and the Navy will proceed with the disposal of the parcel containing site RR-9/CE-34.

If comments are received from the SHPO within 30-days, the Navy will address those comments and consult with the SHPO to successfully conclude the Data Recovery Report.

The Navy will consult with the SHPO throughout all phases of investigation with the intent to satisfactorily conclude the archaeological mitigation of site RR-9/CE-34 and to facilitate the timely disposal of the parcel upon which it is located.

2. A Synthetic Context Study shall be developed as an alternative treatment measure for sites Ceiba 5, 9, 30.

The Navy will work with the SHPO to develop an appropriate Work Plan for the Synthetic Context Study to mitigate adverse effects to sites Ceiba 5, 9, 30.

A copy of the Work Plan shall be provided to SHPO for review within 30 days.

If the SHPO fails to respond in writing within the 30 days, it may be assumed that the SHPO has no comments on the Work Plan and archaeological mitigation as specified can commence.

In a reasonable period following archaeological mitigation, the Navy will submit a draft copy of the Synthetic Context Study to the SHPO for review within 30 days.

If the SHPO fails to respond in writing within the 30 days, it may be assumed that the SHPO has no comments on the Synthetic Context Study and the Navy will proceed with the disposal of the parcels containing sites Ceiba 5, 9, 30.

If comments are received from the SHPO within 30-days, the Navy will address those comments and consult with the SHPO to successfully conclude the Synthetic Context Study.

The Navy will consult with the SHPO throughout all phases of investigation with the intent to satisfactorily conclude the archaeological mitigation of sites Ceiba 5, 9, 30 and to facilitate the timely disposal of the parcel upon which it is located.

3. The U.S. Navy shall develop a preservation covenant for the protection of Ceiba 3 prior to disposal of sale parcel 25/SWMU 1 (Parcel I). The preservation covenant, and its boundary, shall be developed in consultation with the SHPO. The U.S Navy shall develop legally enforceable restrictions or conditions to ensure the long-term preservation of the property's historic significance prior to the transfer, lease, or sale of the property out of Federal ownership or control.

4. The US Navy shall insure that all archaeological materials and copies of field notes, photographs, maps, etc. generated as part of archaeological investigations required as part of Exhibit A and/or this MOA will be housed in an archaeological curation facility that meets the standards outlined in 36CFR79. It is recognized that at the time of this MOA being signed by all parties, there is no federally approved archaeological repository located in the Commonwealth of Puerto Rico that is prepared to accept this collection. Therefore, the Navy will identify an approved repository for the archaeological collection and notify the SHPO in writing of the location and points of contact.

## **AMENDMENTS AND TERMINATION**

1. Pursuant to 36 C.F.R. § 800.6(c)(7) only signatory parties (U.S. Navy and SHPO) to this MOA may request that it be amended, whereupon the parties shall consult to consider such an amendment. Consulting parties shall be notified of any such amendments.



2. If the U.S. Navy determines that it cannot implement the terms of this MOA, or if the SHPO determines that the MOA is not being properly implemented, the U.S. Navy or the SHPO may propose to the other party that it be terminated.
3. Termination shall include the submission of any outstanding documentation on any work done up to and including the date of termination.
4. A party proposing to terminate this MOA shall notify the other party to the MOA, explaining the reasons for termination and affording them at least thirty (30) days to consult and seek alternatives to termination.
5. Should such consultation fail and the MOA be terminated, the U.S. Navy shall comply with 36 C.F.R. § 800.6(c)(8) by either executing another memorandum of agreement with the signatories under 36 CFR 800.6(c)(1) or request the comments of the ACHP under 36 C.F.R. § 800.7(a).
6. Should any signatory or concurring party to this MOA object at any time to any actions proposed or the manner in which the terms of this MOA are implemented, the Navy shall consult with such party to resolve the objection. If the Navy determines that such objection cannot be resolved, the Navy will:

A. Forward all documentation relevant to dispute, including the Navy's proposed resolution, to the ACHP. The ACHP shall provide the Navy with its advice on the resolution of the objection within thirty (30) days of receiving adequate documentation. Prior to reaching a final decision on the dispute, the Navy shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP, signatories and concurring parties, and provide them with a copy of this written response. The Navy will then proceed according to its final decision.

B. If the ACHP does not provide its advice regarding the dispute within the thirty (30) day time period, the Navy may make a final decision on the dispute and proceed accordingly. Prior to making such a final decision, the Navy shall prepare a written response that takes into account any timely comments regarding the dispute from the signatories and concurring parties to the MOA, and provide them and the ACHP with a copy of such written response.

C. The Navy's responsibility to carry out all other actions subject to the terms of this MOA that are not subject of the dispute remain unchanged.

## **DURATION**

This MOA will continue in full force and effect until disposal of the Property has been fully completed. Prior to transfer, all Data Recovery Plans will be fully implemented.

## **ANTI-DEFICIENCY ACT**

All requirements set forth in this MOA requiring the expenditure of Government funds are expressly subject to the availability of appropriations and the requirements of the Anti-Deficiency Act, 31 U.S.C. §1341. No obligation of this MOA shall require or be construed to require a commitment by the Navy to expend funds not appropriated for a legally sufficient purpose.

The obligations of this MOA as to the Navy are severable. If the Navy cannot perform any obligation set forth in this MOA because of the unavailability of funds, the parties intend that the remainder of the MOA be executed to the greatest extent practicable. The parties agree to consult on any obligation of the MOA that cannot be performed because of the unavailability of funds.

## **EXECUTION**

Execution of this MOA by the U.S. Navy and the SHPO and its submission to the ACHP in accordance with 36 C.F.R. § 800.6(b)(1)(iv), shall, pursuant to 36 C.F.R. § 800.6(c), be considered to be an agreement with the SHPO and the ACHP for the purposes of Section 110(l) of the NHPA. Execution and submission of this MOA evidence that the U.S. Navy has afforded the ACHP an opportunity to comment on the Undertaking and any potential adverse effects on historic properties within the Property, and that the U.S. Navy has taken into account any potential adverse effects of the Undertaking on such resources.

**SIGNATORY PARTIES:**

U.S. NAVY

By: \_\_\_\_\_ Date: \_\_\_\_\_

PUERTO RICO STATE HISTORIC PRESERVATION OFFICER

By: \_\_\_\_\_ Date: \_\_\_\_\_

**CONSULTING PARTIES THAT CONCUR:**

LOCAL REDEVELOPMENT AUTHORITY

By: \_\_\_\_\_ Date: \_\_\_\_\_

DEPARTMENT of NATURAL and ENVIRONMENTAL RESOURCES

By: \_\_\_\_\_ Date: \_\_\_\_\_

**LIST OF EXHIBITS**

- Exhibit A: Memorandum of Agreement Between the United States Navy and the Puerto Rico State Historic Preservation Officer Concerning the Disposal of Department of Defense Properties at Naval Station Roosevelt Roads, Puerto Rico
- Exhibit B: Puerto Rico SHPO letter dated May 15, 2009
- Exhibit C: Puerto Rico SHPO letter dated June 29, 2009 and Report Submission Schedule
- Exhibit D: Synthetic Context Study Boundary
- Exhibit E: SHPO letter dated June 4, 2010

# **EXHIBIT A**

**Memorandum of Agreement Between the  
United States Navy and the Puerto Rico State  
Historic Preservation Officer Concerning the  
Disposal of Department of Defense Properties at  
Naval Station Roosevelt Roads, Puerto Rico**


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**MEMORANDUM OF AGREEMENT**  
**BETWEEN THE UNITED STATES NAVY AND THE PUERTO RICO STATE**  
**HISTORIC PRESERVATION OFFICER**  
**CONCERNING THE DISPOSAL OF DEPARTMENT OF DEFENSE**  
**PROPERTIES AT NAVAL STATION ROOSEVELT ROADS, PUERTO RICO**  
**December 15, 2006**

**WHEREAS**, the United States Department of Defense Appropriations Act of Fiscal Year 2004 (Public Law 108-87) directed the U.S. Navy to close the Naval Station Roosevelt Roads (NSRR) in Ceiba, Puerto Rico and dispose of NSRR (Undertaking) under the procedures and authorities contained in the Base Closure and Realignment Act of 1990 (Title XXIX of Public Law 101-510; 10 U.S.C. 2687 note); and

**WHEREAS**, the U.S. Navy, pursuant to Public Law 108-87 on March 31, 2004 closed NSRR and re-designated it as Naval Activity Puerto Rico (Property); and

 **WHEREAS**, the U.S. Navy has established the Undertaking's area of potential effect (APE), as defined at 36 C.F.R. § 800.16(d), as the disposal area which consists of the entire property exclusive of the area to remain under Federal control as shown on Exhibit A; and

**WHEREAS**, the U.S. Navy proposes to transfer portions of the property through Economic Development Conveyance and Public Benefit Conveyance, and offer for sale the remaining tracts of lands as identified in Exhibit A; and

**WHEREAS**, the U.S. Navy intends to convey approximately 3,300 acres to the Puerto Rico Department of Natural and Environmental Resources (DNER) through a Public Benefit Conveyance (PBC). The proposed parcels for conveyance to DNER are shown as "Conservation" in Exhibit A. The PBC will be sponsored by the U.S. Department of Interior under the authority of 40 USC 550 (Federal Property and Administrative Services Act). It is the intention of DNER to have these properties managed by the Conservation Trust of Puerto Rico; and

**WHEREAS**, the designated Local Reuse Authority for the former Naval Station Roosevelt Roads and DNER are invited to be consulting parties in this MOA in accordance with 36 CFR§ 800.2(c); and

**WHEREAS**, the U.S. Navy has determined that the Undertaking has the potential to adversely affect architectural resources within the APE, which the Navy and the Puerto Rico State Historic Preservation Officer (SHPO) have agreed meet the criteria for inclusion on the National Register of Historic Places (NRHP), consisting of structures and facilities as identified in Exhibit B; and

**WHEREAS**, the U.S. Navy and the SHPO agree that these architectural resources have been adequately recorded through existing reports and photographic documentation and copies of this documentation will be provided to the SHPO and DNER as stipulated in Exhibit C; and

*me* **WHEREAS**, the U.S. Navy and the SHPO have agreed, based on the fieldwork and recommendations contained in the Archaeological reports database reviewed by the SHPO, that all reports were completed in accordance with the *Secretary of the Interior's Standards and Guidelines for Archaeological and Historic Preservation* (48 FR 44 738-9), conducted by R. Christopher Goodwin Associates, Inc. and Geo Marine, Inc. between 1993 and 2005, and based on the findings of those reports as displayed in Exhibit D that sites GMI-2, GMI-4 and RR-14 require data recovery; sites Ceiba 1, Ceiba 3, Ceiba 5, Ceiba 6, Ceiba 9, Ceiba 10, Ceiba 11 and RR-12 require additional survey to determine eligibility by the U.S. Navy; and

**WHEREAS**, the U.S. Navy has concluded and the SHPO concurs that the archaeological resources located within the property to be transferred to other Federal Agencies as identified in Exhibit D will be afforded protection by such agencies; and


**WHEREAS**, the U.S. Navy has determined and the SHPO has concurred that the Undertaking has the potential to adversely affect archaeological resources in eight sites potentially eligible for the NRHP that are located within the parcels proposed for sale, as shown on Exhibit A and identified in Exhibit D; and

**WHEREAS**, the U.S. Navy has consulted with the SHPO in accordance with Section 106 of the National Historic Preservation Act (16 U.S.C. §§ 470, et seq. (NHPA)) and its

implementing regulations (36 C.F.R. Part 800) to resolve any potential adverse effects of the Undertaking on architectural and archaeological resources; and

**WHEREAS**, in accordance with 36 C.F.R. § 800.6(a)(1), the U.S. Navy has notified the Advisory Council on Historic Preservation (ACHP) of its findings of potential adverse effects and provided documentation about the findings on May 11, 2006, and the ACHP has chosen not to participate in the consultation pursuant to 36 C.F.R. § 800.6(a)(1)(iii) via letter dated June 6, 2006; and

**WHEREAS**, the U.S. Navy has provided for public involvement in this MOA in accordance with 36 C.F.R. § 800.8(c)(1)(iv) by coordinating the Section 106 review with public review and consultation under the National Environmental Policy Act, 42 U.S.C. §§ 4321 et seq. (1969) (NEPA).

 **NOW, THEREFORE**, the U.S. Navy and the SHPO agree that upon the U.S. Navy's decision to proceed with the Undertaking, the U.S. Navy shall ensure that the following stipulations are implemented to mitigate any potential adverse effects of the Undertaking on architectural or archaeological resources, and that these stipulations shall govern the Undertaking and all of its parts until this MOA expires or is terminated. With the implementation of these stipulations, the SHPO concurs that any potential adverse effects of the Undertaking upon these resources have been taken into account.

## **STIPULATIONS**

The U.S. Navy shall ensure that the following stipulations are implemented:

1. Archaeological data recovery efforts shall take place at Sites: GMI-2, GMI-4 and RR-14 prior to these properties being transferred out of Navy ownership. The Navy will work with the SHPO to develop appropriate Data Recovery Plans for these sites to mitigate adverse effects. Copies of the reports on the findings from the Data Recovery efforts shall be provided to SHPO for review and acceptance as sufficient. SHPO reviews shall be completed within thirty (30) calendar days of receipt of Data Recovery Plans and Reports and on the implementation of Data Recovery Plans. If the SHPO fails to respond in writing within the 30 days, it may be presumed that the SHPO has no comments on the plans or documentation. As such, the findings will be considered as complete allowing the Navy to proceed with transfer of parcels. If comments are

received from the SHPO within 30-days transfer of the parcels containing sites GMI-2, GMI-4 and RR-14 will not occur until the final reports implementing the Data Recovery Plans are complete or the two parties agree that end of field reports and notes allow transfer to proceed with proposed timeline and dates for Final Reports.

2. Surveys to attempt to locate and determine the eligibility of sites Ceiba 5 and Ceiba 6 and surveys to evaluate sites Ceiba 1, Ceiba 3, Ceiba 9, Ceiba 10, Ceiba 11 and RR-12, shall be conducted and the findings submitted to the SHPO. If Navy/SHPO determine that sites are not eligible as outlined in 36 CFR 800.4(c) for the NRHP, the sites will be immediately available for disposal. In the event that any of these sites are determined NRHP eligible, the Navy will work with the SHPO to develop Data Recovery Plans to mitigate adverse effects to these sites. Copies of the reports on the findings from the Data Recovery efforts shall be provided to SHPO for review and comment. SHPO reviews shall be completed within thirty (30) calendar days of receipt of Evaluation Testing Reports, Data Recovery Plans and Reports on the Data Recovery Plans. If the SHPO fails to respond in writing within the 30 days, it may be presumed that the SHPO has no comments on the documentation, and that the Navy may proceed with the transfer of parcels without objection. If comments are received from the SHPO within 30-days transfer of the parcels containing NRHP eligible sites will not occur until the final reports implementing the Data Recovery Plans are complete or the two parties agree that field efforts and notes allow transfer to proceed.

3. Copies of the previously prepared reports and photographic documentation on architectural resources specified in Exhibit C shall be provided to the SHPO and DNER prior to transfer of the parcels containing this property.

4. Upon application for the PBC by DNER, the U.S. Navy will provide DNER with a copy of this MOA, details of the archaeological sites Ceiba 2, Ceiba 4, RR-1, RR-3, RR-4, RR-5, RR-6, RR-7, RR-8, RR-16, RR-17, RR-20, and GMI-3 and responsibilities for the protection of these resources in consultation with the SHPO.

5. The US Navy shall insure that all archaeological materials and copies of field notes, photographs, maps, etc will be housed in an archaeological curation facility that meets the standards outlined in 36CFR79. It is recognized that at the time of this MOA being signed by all parties, there is no federally approved archaeological repository located in the Commonwealth of Puerto Rico that is prepared to accept this collection. Therefore,

the Navy will identify an approved repository for the archaeological collection and notify the SHPO in writing of the location and points of contact.

## AMENDMENTS AND TERMINATION

1. Pursuant to 36 C.F.R. § 800.6(c)(7) only signatory parties (U.S. Navy and SHPO) to this MOA may request that it be amended, whereupon the parties shall consult to consider such an amendment. Consulting parties shall be notified of any such amendments.
2. If the U.S. Navy determines that it cannot implement the terms of this MOA, or if the SHPO determines that the MOA is not being properly implemented, the U.S. Navy or the SHPO may propose to the other party that it be terminated.
3. Termination shall include the submission of any outstanding documentation on any work done up to and including the date of termination.
4. A party proposing to terminate this MOA shall notify the other party to the MOA, explaining the reasons for termination and affording them at least thirty (30) days to consult and seek alternatives to termination.
5. Should such consultation fail and the MOA be terminated, the U.S. Navy shall comply with 36 C.F.R. § 800.6(c)(8) by either executing another memorandum of agreement with the signatories under 36 CFR 800.6(c)(1) or request the comments of the ACHP under 36 C.F.R. § 800.7(a).
6. Should any signatory or concurring party to this MOA object at any time to any actions proposed or the manner in which the terms of this MOA are implemented, the Navy shall consult with such party to resolve the objection. If the Navy determines that such objection cannot be resolved, the Navy will:
  - A. Forward all documentation relevant to dispute, including the Navy's proposed resolution, to the ACHP. The ACHP shall provide the Navy with its advice on the resolution of the objection within thirty (30) days of receiving adequate documentation. Prior to reaching a final decision on the dispute, the Navy shall prepare a written response that takes into account any timely advice or comments




regarding the dispute from the ACHP, signatories and concurring parties, and provide them with a copy of this written response. The Navy will then proceed according to its final decision.

B. If the ACHP does not provide its advise regarding the dispute within the thirty (30) day time period, the Navy may make a final decision on the dispute and proceed accordingly. Prior to making such a final decision, the Navy shall prepare a written response that takes into account any timely comments regarding the dispute from the signatories and concurring parties to the MOA, and provide them and the ACHP with a copy of such written response.

C. The Navy's responsibility to carry out all other actions subject to the terms of this MOA that are not subject of the dispute remain unchanged.

#### **DURATION**



This MOA will continue in full force and effect until transfer of the Property has been fully completed or no later than September 30, 2009, which ever comes first. Prior to transfer, all Data Recovery Plans will be fully implemented.

#### **EXECUTION**

Execution of this MOA by the U.S. Navy and the SHPO and its submission to the ACHP in accordance with 36 C.F.R. § 800.6(b)(1)(iv), shall, pursuant to 36 C.F.R. § 800.6(c), be considered to be an agreement with the SHPO and the ACHP for the purposes of Section 110(l) of the NHPA. Execution and submission of this MOA evidence that the U.S. Navy has afforded the ACHP an opportunity to comment on the Undertaking and any potential adverse effects on architectural and archeological resources within the Property, and that the U.S. Navy has taken into account any potential adverse effects of the Undertaking on such resources.

**SIGNATORY PARTIES:**

U.S. NAVY

By: James E. Anderson Date: 23 January 2007

PUERTO RICO STATE HISTORIC PRESERVATION OFFICER

By: [Signature] Date: 23 January 2007

**CONSULTING PARTIES THAT CONCUR:**

LOCAL REDEVELOPMENT AUTHORITY

By: [Signature] Date: 23 January 2007

DEPARTMENT of NATURAL and ENVIRONMENTAL RESOURCES

By: [Signature] Date: 2/1/07

**LIST OF EXHIBITS**

- Exhibit A: Sitemap Identifying Archaeological Sites, Areas to be retained by the Federal Government, and Planning Zones for Disposal Property
- Exhibit B: List of National Register Eligible Structures and Facilities
- Exhibit C: Architectural Resource Documentation to be Provided
- Exhibit D: List of Archaeological Sites Status and Planned Action

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# Naval Station Roosevelt Roads Archaeological Sites

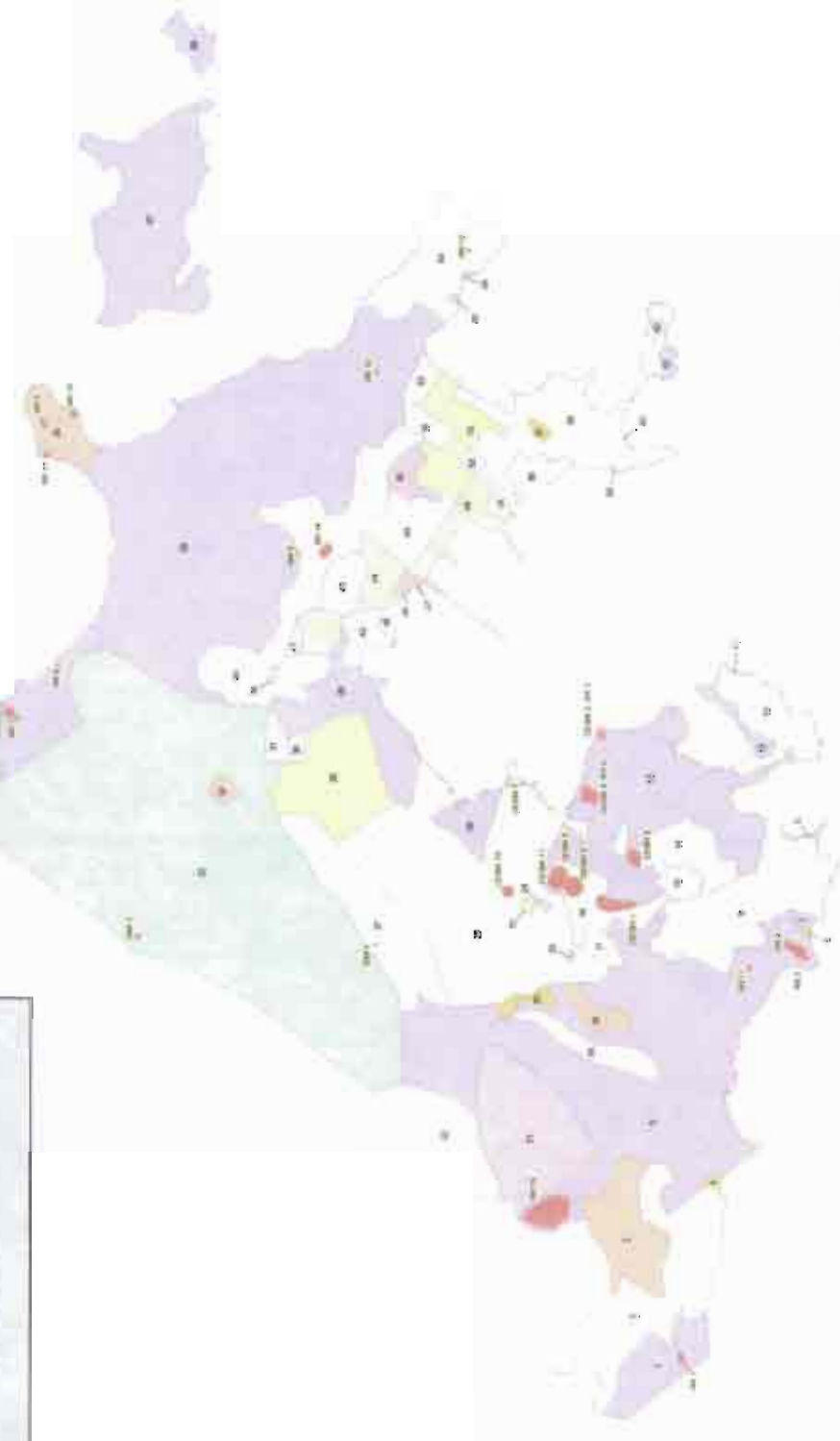
## Legend

- Archaeology Site
- Planning Zones
  - Airport
  - Caribe Beach North
  - Caribe Beach South
  - Conservation
  - EDC
  - Federal
  - Gulf County
  - Health Clinic
  - Homeless Provider
  - Hospital
  - Port
  - Sale
  - Water Treatment



1 inch equals 0.60 miles

March 13, 2006



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**NAVAL ACTIVITY PUERTO RICO  
PARCEL CONVEYANCE LISTING**

NUMBER OF PARCELS	PARCEL ID	Archaeological sites	METHOD OF CONVEYANCE	ACRES	TO COMMONWEALTH
1	6		EDC	1.852900248	1.852900248
2	7		PBC	6.033361652	6.033361652
3	9		PBC	2.468834475	2.468834475
4	11		PBC	1.048367936	1.048367936
5	10		Sale	95.89800539	
6	4		EDC	3.948395409	3.948395409
7	12		PBC	18.11329603	18.11329603
8	15		Sale	21.55254279	
9	61		PBC	8.76282654	8.76282654
10	62		Sale	2.743996774	
11	8		Sale	223.5676957	
12	60		PBC	0.296003869	0.296003869
13	14	Ceiba-9	Sale	82.18224381	
14	58		PBC	0.53486358	0.53486358
15	1	RR-1	PBC	94.44434545	94.44434545
16	17		Sale	18.43485056	
17	3		Fed	120.2388761	
18	23		PBC	0.751967121	0.751967121
19	18		Fed	30.32860457	
20	16	Ceiba-1 Ceiba-5 Ceiba-6 Ceiba-11	Sale	72.48386966	
21	2		Sale	257.9741571	
22	24		PBC	2.214494624	2.214494624
23	57		EDC	5.514393828	5.514393828
24	56		Sale	32.19587349	
25	20		EDC	14.39450473	14.39450473
26	19		Sale	51.60685933	
27	54		Sale	14.14430262	
28	21		Sale	216.0474227	
29	66		PBC	1.065009579	1.065009579
30	53		Sale	6.174582519	
31	59		Sale	212.3659278	
32	65		PBC	1.460945054	1.460945054
33	49		PBC	59.02221538	59.02221538
34	63		Sale	18.52987351	
35	55		Sale	23.54087395	
36	47		Fed	4.924862715	
37	46		Fed	1.289420206	
38	50		PBC	27.24673442	27.24673442
39	45		Sale	8.670412109	
40	22		Sale	120.304895	
41	48		Sale	69.02713488	
42	64	RR-12	Sale	147.9097475	
43	42		Sale	32.557111	
44	43		Sale	39.30508564	
45	44		PBC	72.34535492	



46	30		Sale	7.089829796	72.34535492
47	41		Sale	6.4680855	
48	29		EDC	170.4405066	170.4405066
49	32		Fed	10.31568391	
50	68		PBC	28.29156971	28.29156971
51	67	RR-16	PBC	326.2421539	326.2421539
52	38	RR-9, RR-10, RR-11	Fed	66.16237026	
53	35		PBC	159.4285515	159.4285515
54	37		Sale	74.56287441	
55	36		PBC	67.72973366	67.72973366
56	13	Celiba-4, RR-6, Celiba-2, RR-5	PBC	381.2552934	381.2552934
57	26		PBC	42.36410361	42.36410361
58	28		PBC	143.1770794	143.1770794
59	5	RR-3, RR-4, RR-17, RR-20	PBC	948.2468576	948.2468576
60	27	GMI-4	Sale	298.6412049	
61	31		Sale	70.26670933	
62	39	RR-7, RR-8	PBC	1314.108951	1314.108951
63	33	GMI-3	PBC	918.5896238	918.5896238
64	51		EDC <sup>1</sup>	0	0
65	69		PBC <sup>2</sup>	0	0
66	69		PBC <sup>2</sup>	0	0
67	69		PBC <sup>2</sup>	0	0
68	52		EDC	90.10245435	90.10245435
69	40	RR-14, GMI-2	Sale	295.6334844	
70	34		EDC	295.6334844	295.6334844
71	25	Celiba-10, Celiba-3	Sale	588.4269072	
Total <sup>3</sup>				8548.685555	5207.129178

Note:

- 1-- Bowling Alley added, but not surveyed
- 2-- Small antenna site needed by Ports Authority, not surveyed and not noted on index map
- 3-- Total may not be equal to total acreage for Station [8,665 ac. (total perimeter fence line)] due to some parcels to including roads as well as the 3 small antenna sites and the bowling alley building

Blue: Transfer to Federal Agency
Yellow: Sale Parcel w/ Phase II Survey Requirement
Orange: Sale Parcel w/ Phase III Data Recovery Requirement
Green: Public Benefit Conveyance

## Exhibit B

### ELIGIBLE PROPERTIES WITHIN THE AREA OF POTENTIAL EFFECT

At Roosevelt Roads Naval Station, Ceiba, the following buildings, structures and districts have been determined eligible to the National Register:

Old Barracks "E", Personnel Support and Pass Office, 1943 (Building 202): Criteria C  
Bolles Dry Dock, 1943 (Structure 844): Criteria A & C  
Bombproof Generator Plant, 1944 (Building 38): Criteria A & C  
Roosevelt Roads Ammunitions Storage District, 1943: Criteria C (see building list)  
NAS Administrative and Barracks District, 1943: Criteria C (see building list)

Building 504 (bombproof telephone building, Fort Bundy) is architecturally unique at Roosevelt Roads, and therefore the architectural survey identified it as possibly eligible under Criterion C at a local level. Further research was recommended in order to identify original plans and verify architectural integrity and significance with respect to current conditions and other similar buildings in Puerto Rico. Building 256 (old NAS Communications Center) may possess historical significance associated with Navy Communications in Puerto Rico. Further research was recommended to establish a historical context regarding Navy Communications in order to adequately evaluate this possibility. For purposes of Section 106, the Navy will treat Buildings 504 and 256 as eligible.

### INDIVIDUALLY ELIGIBLE BUILDINGS/STRUCTURES LOCATED OUTSIDE HISTORIC DISTRICTS

Structure 844, Bolles Dry Dock, 1943  
Building 38, Bombproof Generator Plant, 1944  
Building 256, Communication Center,  
Building 504, Bombproof Telephone Building

### CONTRIBUTING BUILDINGS ADMINISTRATIVE AND BARRACKS DISTRICT

Bldg	Year	Contributing Use
78	1943	Marine Barracks
201	1943	Marine Galley and Mess Hall
202*	1943	Marine Barracks
203	1943	Marine Barracks

\* Resource is considered individually eligible.

## Exhibit B

### CONTRIBUTING BUILDINGS WITHIN THE AMMUNITIONS STORAGE DISTRICT

Bldg	Year	Original Use
300	1943	Inert Magazine
301	1943	Small Arms Storage
302	1943	Small Arms Storage
303	1943	Small Arms Storage
305	1943	Fuse and Detonator Magazine
306	1943	Fuse and Detonator Magazine
307	1943	Fuse and Detonator Magazine
308	1943	Fuse and Detonator Magazine
309	1943	Fuse and Detonator Magazine
310	1943	Fuse and Detonator Magazine
311	1943	High Explosive Magazine
312	1943	High Explosive Magazine
313	1943	High Explosive Magazine
314	1943	High Explosive Magazine
358	1943	Small Arms Magazine
Bldg	Year	Original Use

## Exhibit B

359	1943	Small Arms Magazine
360	1943	Small Arms Magazine
384	1958	High Explosive Magazine
764	1962	Magazine
765	1962	Magazine
766	1962	Magazine
1665	1967	Ready Issue Magazine
1666	1967	Ready Issue Magazine
1667	1967	Ready Issue Magazine
1668	1967	Arms Storage Magazine
1681	1969	Arms Storage Magazine
1682	1969	Arms Storage Magazine
1682A	1990	Arms Storage Magazine

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**EXHIBIT C**  
**ARCHITECTURAL RESOURCE DOCUMENTATION REQUIREMENTS**

**Copies of the Following Reports will be provided to the SHPO and DNER**

*Architectural Resources Inventory and Evaluation, Naval Station Roosevelt Roads, Ceiba, Vieques & Culebra, Puerto Rico, October 19, 2001, Prepared by LawGibb Group*

Volume I – Final Report	3 photocopies 3 digital copies
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Volume II- Inventory Data Forms	3 photocopies 3 digital copies
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Photographic Compendium	1 set of original photographs and negatives 2 photocopies 2 digital copies
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## EXHIBIT D

### Archaeological Site Status

Naval Station Roosevelt Roads Archaeological Sites Status				
Site Name	Location	Site Type	Status	Proposed Treatment
Ceiba 1	Ensenda Honda	Pre-Columbian Preceramic (Pre-400BC)	Additional Recon Survey completed AUG 04, unable to confirm site boundaries. Additional survey planned prior to sale	<b>Archaeological Evaluation Data Recovery if warranted</b>
Ceiba 2 (RR 5)	Ensenda Honda	Pre-Columbian Santa Elena (400-800AD) Late Cuevas Monserrate (1200-1500AD)	Determined National Register Eligible. Nomination Package prepared but not listed.	<u>In Conservation Zone</u>
Ceiba 3	Ensenda Honda	Pre-Columbian Petroglyph	Determined National Register Eligible. Nomination Package prepared but not listed.	<b>Archaeological Management Plan required</b>
Ceiba 4	Ensenda Honda	Pre-Columbian Petroglyph	Determined National Register Eligible. Nomination Package prepared but not listed.	<u>In Conservation Zone</u>
Ceiba 5	Ensenda Honda	Pre-Columbian Campsite Santa Elena (800-1200AD) Esperanza (1200-1500AD)	Additional Recon Survey completed AUG 04 unable to confirm site boundaries.	<b>Archaeological Evaluation, Data Recovery if warranted</b>
Ceiba 6	Ensenda Honda	Pre-Columbian Campsite	Additional Recon Survey completed AUG 04 unable to confirm site boundaries.	<b>Archaeological Evaluation, Data Recovery if warranted</b>
Ceiba 9	Ensenda Honda	Pre-Columbian Cuevas (350-600AD) Ostiones (700-1200AD)	Site relocated during AUG 04 Recon Survey. Confirmed retains integrity. Site is eligible.	<b>Archaeological Evaluation, Data Recovery if warranted</b>
Ceiba 10	Ensenda Honda	Pre-Columbian Ceramic Age (Post 400BC)	Data Recovery Conducted in 1988.	<b>Archaeological Evaluation, Additional Data Recovery if warranted</b>
Ceiba 11	Ensenda Honda	Pre-Columbian Ceramic Age (Post 400BC)	Additional Recon Survey completed AUG 04 - unable to confirm site boundaries.	<b>Archaeological Evaluation, Data Recovery if warranted</b>
RR1	Fort Bundy	Pre-Columbian Ceramic Age (Post 400BC) Spanish Colonial	Testing conducted AUG 04 determined eligible.	<u>In Conservation Zone</u>
RR2	Fort Bundy	Pre-Columbian Ceramic Age (Post 400BC)	Testing conducted AUG 04 determined ineligible	No Mitigation Required.

## EXHIBIT D

### Archaeological Site Status

Naval Station Roosevelt Roads Archaeological Sites Status				
Site Name	Location	Site Type	Status	Proposed Treatment
RR3	Punta Algodones	Pre-Columbian Petroglyph	To be treated as National Register Eligible for purposes of Section 106 consultation	<u>In Conservation Zone</u>
RR4	Punta Algodones	Pre-Columbian Ceramic Age (Post 400BC)	Determined National Register Eligible	<u>In Conservation Zone</u>
RR 5	Ensenada Honda	Spanish Colonial	To be treated as National Register Eligible for purposes of Section 106 consultation	<u>In Conservation Zone</u>
RR7	Puerto Medio Mundo	Pre-Columbian Ceramic Age (Post 400BC) Spanish Colonial	To be treated as National Register Eligible for purposes of Section 106 consultation	<u>In Conservation Zone</u>
RR8	Puerto Medio Mundo	Pre-Columbian Ceramic Age (Post 400BC)	To be treated as National Register Eligible for purposes of Section 106 consultation	<u>In Conservation Zone</u>
RR9	Puerto Medio Mundo	Pre-Columbian Ceramic Age (Post 400BC)	Determined Potentially Eligible. <b>In area to be retained by Federal Government</b>	To Remain Federal Property
RR10	Puerto Medio Mundo	Pre-Columbian Ceramic Age (Post 400BC)	Determined Potentially Eligible. <b>In area to be retained by Federal Government</b>	To Remain Federal Property
RR11	Puerto Medio Mundo	Spanish Colonial	Determined Potentially Eligible. <b>In area to be retained by Federal Government</b>	To Remain Federal Property
RR12	Punta Puerca	Pre-Columbian Petroglyph	To be treated as National Register Eligible for purposes of Section 106 consultation	<b>Evaluation of resource, Mitigative options to be provided if warranted</b>
RR 13	Ensenada Honda	Pre-Columbian Ceramic Age (Post 400BC)	Determined Not Eligible	No Mitigation Required
RR14	Ensenada Honda	Santa Elena (800-1200AD) Esperanza (1200-1524AD)	Determined National Register Eligible	Data recovery
RR15	Fort Bundy	Spanish Colonial	Testing conducted AUG 04 determined Ineligible	No Mitigation Required
RR16	Pineros Island	Pre-Columbian Ceramic Age (Post 400BC)	To be treated as National Register Eligible for purposes of Section 106 consultation	<u>In Conservation Zone</u>
RR17	Punta Algodones	Pre-Columbian Ceramic Age (Post 400BC)	Testing conducted AUG 04 determined eligible	<u>In Conservation Zone</u>

## EXHIBIT D

### Archaeological Site Status

Naval Station Roosevelt Roads Archaeological Sites Status				
Site Name	Location	Site Type	Status	Proposed Treatment
RR18	Quebrada Seca	Pre-Columbian Ceramic Age (Post 400BC) Spanish Colonial	Testing conducted AUG 04 determined ineligible	No Mitigation required
RR19	Punta Puerca	Pre-Columbian Ceramic Age (Post 400BC)	Determined Not Eligible	No Mitigation required
RR20	Fort Bundy	Pre-Columbian Ceramic Age (Post 400BC) Spanish Colonial	To be treated as National Register Eligible for purposes of Section 106 consultation	<u>In Conservation Zone</u>
RR21	Quebrada Seca	Spanish Colonial	Determined Not Eligible	No Mitigation required
RR22	Puerto Media Mundo	Pre-Columbian Ceramic Age (Post 400BC)	Determined Not Eligible	No Mitigation required
RR-GMI-1		Pre-Columbian (A.D. 900-1200)	Determined Not Eligible	No Mitigation required
RR-GMI-2		Prehistoric	Located during AUG 04 Survey - eligible for purposes of Section 106 consultation.	Data recovery
RR-GMI-3		Historic	Located during AUG 04 Survey - eligible for purposes of Section 106 consultation.	<u>In Conservation Zone</u>
RR-GMI-4		Historic	Located during AUG 04 Survey - eligible for purposes of Section 106 consultation.	Data recovery

\*Navy is expanding conservation zones in some areas where land is classified in the Reuse Plan as not developable, and contains cultural and natural resources.

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# **EXHIBIT B**

**Puerto Rico SHPO letter dated May 15, 2009**



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May 15, 2009

Mr. Len Winter  
Historic Preservation Officer  
Naval Facilities Engineering Command Southeast  
Jacksonville, FL 32212-0030

**SHPO 07-20-04-02 SIGNIFICANCE EVALUATION OF EIGHT  
ARCHAEOLOGICAL SITES AT THE NAVAL FACILITY FORMERLY  
KNOWN AS ROOSEVELT ROADS, CEIBA, PUERTO RICO**

Dear mister Winter:

We have reviewed the draft report titled *Significance Evaluations of Eight Archaeological Sites at the Naval Facility Formerly Known as Roosevelt Roads, Ceiba, Puerto Rico*. The following sites were evaluated: Ceiba 1, Ceiba 3, Ceiba 5, Ceiba 6/Ceiba 10, Ceiba 9, Ceiba 11, Ceiba 30, and RR-12. We concur with the report's conclusion that Ceiba 3, Ceiba 5, Ceiba 9, Ceiba 11 and Ceiba 30 (formerly RR-SRC-1) are eligible for inclusion into the National Register of Historic Places. We also concur that Ceiba 1, Ceiba 6/Ceiba 10, and RR-12 are not eligible for inclusion into the National Register and that no further action is required for these three sites.

As for the National Register eligible sites, we concur in principal with the treatment recommendations presented for each site. Specifically, a preservation boundary should be established for Ceiba 3 to ensure its protection and, as previously discussed, archaeological data recovery and artifact analysis is ongoing for the prehistoric shell midden at Ceiba 11 (pending is the completion of artifact analyses, interpretations and the presentation for our review of the draft final report on Ceiba 11, RR-GMI-2, RR-GMI-4 and RR-14). Regarding Ceiba 5, Ceiba 9 and Ceiba 30, in lieu of further fieldwork, we concur with the report's recommendation of the alternative treatment measure of incorporating the research results from these sites into a regional archaeological synthesis of investigations carried out in the former Naval Station.

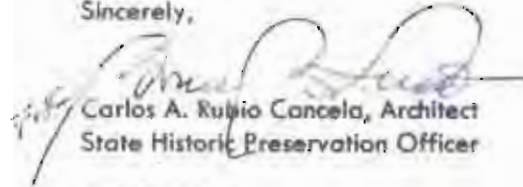
As stated in your letter, the above treatment or mitigation measures require further discussions between the U. S. Navy and our Office. Should the Navy agree to these measures; we request information as to how the preservation boundary for Ceiba 3 would be established, and a work plan that clearly establishes the level of detail and scope that the regional synthesis would cover. Once preservation and synthesis plans acceptable to both parties are developed and provisions to

Len Winter  
May 15, 2009  
Page 2

ensure their implementation are established, we will be able to agree to no further archaeological fieldwork at the Naval Activity Puerto Rico.

If you have any questions concerning our comments, please contact Miguel Bonini at 787-721-3737 or mbonini@prshpa.gobierno.pr.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Carlos A. Rubio Cancela', is written over a printed name and title. The signature is fluid and cursive.

Carlos A. Rubio Cancela, Architect  
State Historic Preservation Officer

CAR/BRS/MB

# **EXHIBIT C**

**Puerto Rico SHPO letter dated June 29, 2009  
and Report Submission Schedule**

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June 29, 2009

Ms. Camille Destafney, PE  
Director  
Regional Environmental Program  
Commander Navy Region Southeast  
Box 102, Naval Air Station  
Jacksonville, FL 32212-0102

**SHPO 07-20-04-02 BRAC DISPOSAL OF THE LAND PARCELS 16, 27  
AND 40 AT THE NAVAL FACILITY FORMERLY KNOWN AS  
ROOSEVELT ROADS, CEIBA, PUERTO RICO**

Dear Ms. Destafney:

We acknowledge receipt on June 15, 2009 of your letter (dated June 10, 2009) regarding the BRAC disposal of the land parcels numbered 16, 27 and 40 within the Naval Facility formerly known as Roosevelt Roads. Based on the executive summary of the Phase III data recovery field investigations carried out within these parcels at the archaeological sites Ceiba 11, GMI-2, GMI-4 and RR-14, the field objectives have been met and, therefore, no further fieldwork is required at these four sites. As provided for in Stipulation 1 of the 2007 Memorandum of Agreement, we agree with your proposal to allow the transfer of the above three parcels prior to the completion of the final technical reports conditioned to the U. S. Navy ensuring that all planned analyses, interpretation and report preparations are completed no later than 2011.

If you have any questions concerning our comments, please contact Miguel Bonini at 787-721-3737 or mbonini@prshpo.gobierno.pr.

Sincerely,

Carlos A. Rubio Cancela, Architect  
State Historic Preservation Officer

CAR/BRS/MB



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## **Phase III Data Recovery Reports: Organization and Schedule**

**Roosevelt Roads Phase III Excavations: 4 Sites: Ceiba 11, RR-GMI-4, RR-GMI-2, RR-14.**

**FIELDWORK: January through May 2008**

**EXECUTIVE SUMMARY (end of fieldwork report) submitted: June 5, 2008**

**ARTIFACTUAL MATERIAL TO BE ANALYZED: 49 banker boxes (from combined sites)**

### **Artifact Summary (by site):**

**Ceiba 11:** 24 banker boxes of material including ceramics (approx. 5000 sherds, bone [approx. 5500 from ¼-inch screen, this does not including bulk sampling]; lithics, shell tools. Shell bulk samples were collected and cleaned in the field but sorting is on-going in the SEARCH laboratory. To highlight the amount of material in this site, a single 10 cm level of one 1-x-1 m unit contained 1360 MNI of shell from 27 different species, in addition to 180 sherds and 200 pieces of bone. In total, 12 square meters of the shell midden was excavated. A portion of this shell sample was analyzed in the field.

**RR-GMI-4:** 10 banker boxes of material including 7000 historic sherds, 4000 pieces of glass, 2000 nails and a minor component of historic period bone remains. Approximately 13,000 artifacts. All large construction remains from this Colonial house (bricks, tejas, etc.) were analyzed in the field. Historic archival research is underway in Puerto Rico to identify a chain of title to this piece of land and try to identify the people who lived at this hacienda.

**RR-GMI-2:** 10 banker boxes of material made up of approximately 7200 ceramics. Additional fine mesh samples are being processed. Various specialized studies are underway on the ceramics and soils from this site.

**RR-14:** 5 banker boxes of ceramics, lithics, and shell (including fine mesh samples of the minor shell midden component found at this site).

**Anticipated Artifact Analysis and Quantification completion: Dec. 30, 2009.**

### **DELIVERABLES:**

**1 report on historic period site RR-GMI-4: Anticipated Draft: June 30, 2010**

**1 report for prehistoric sites Ceiba 11, RR-GMI-2, RR-14, and incorporating additional data from Ceiba 5, Ceiba 9, and Ceiba 30 (investigated at the Phase II level): Anticipated Draft: December 30, 2010**

<b>Anticipated Final Deliverables:</b>	<b>February 1, 2011 (GMI-4 report)</b>
	<b>March 1, 2011 (for Ceiba 11, RR-GMI-2/RR-14 report)</b>

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# **EXHIBIT D**

**Synthetic Context Study Boundary**

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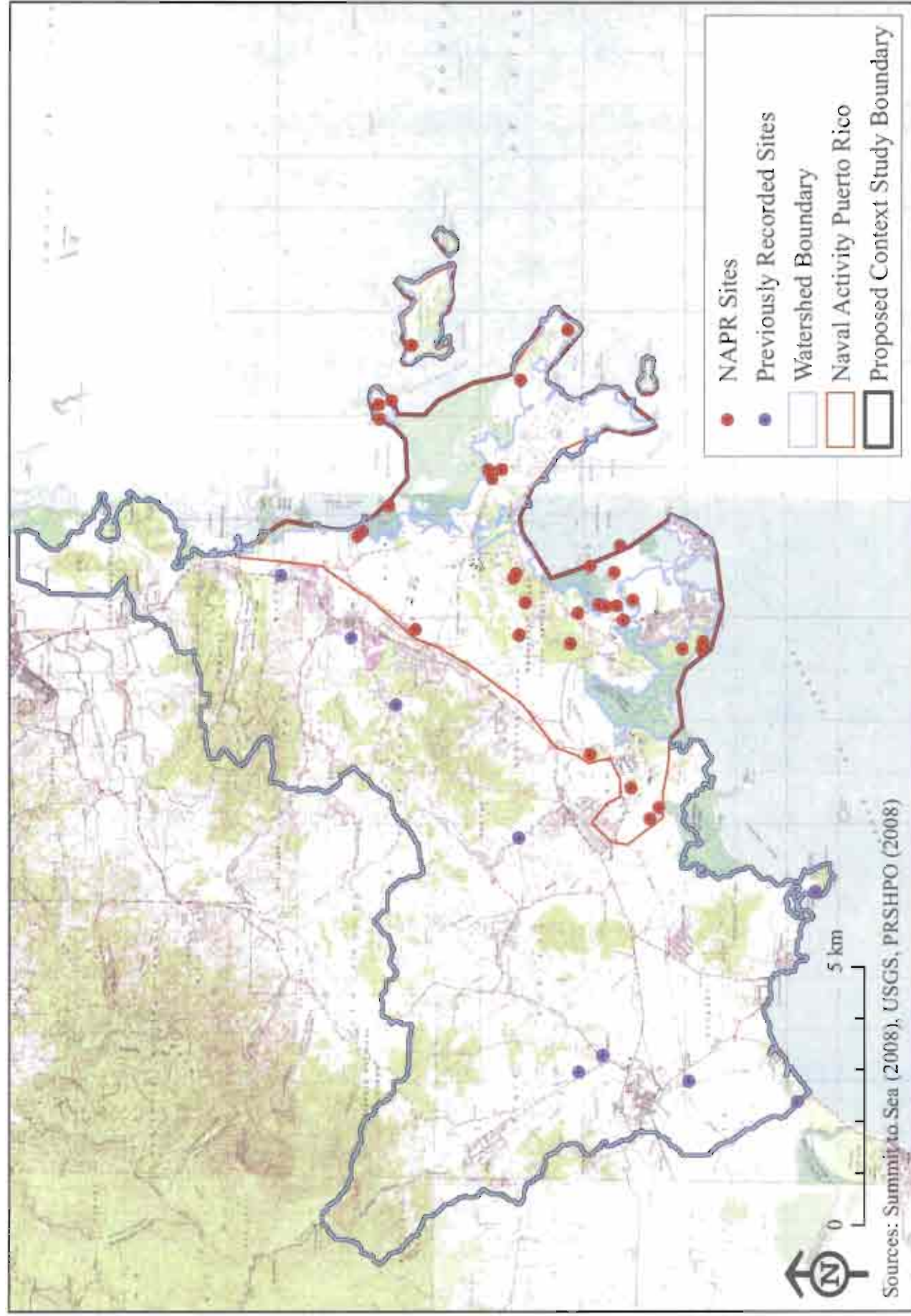


Figure 1. Proposed Context Study Boundary and Archaeological Sites



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# **EXHIBIT E**

**SHPO letter dated June 4, 2010**

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June 4, 2010

Ms. Cornille Desafney, PE  
PE Regional Environmental Director  
Commander Navy Region Southeast  
Box 102, Naval Air Station  
Jacksonville, FL 32212-0102

**SHPO 07-20-04-02 BASE REALIGNMENT AND CLOSURE (BRAC)  
ACTION AT NAVAL ACTIVITY PUERTO RICO, CEIBA**

Dear Ms. Desafney:

We acknowledge receipt on May 10, 2010 of your letter (dated April 28, 2010) regarding determinations of eligibility for archaeological sites RR-9, 10 and 11, as well as other matters. Regarding site RR-9, we agree it is eligible under Criterion D for inclusion into the National Register of Historic Places (NRHP). As for RR-10 and 11, we agree that neither meets the criteria for eligibility into the NRHP and that no further action are required at these two sites.

In the matter of the synthetic context study for the Roosevelt Roads region, we concur with the study boundary delineated in Enclosure 2.

Finally, we agree that the historic period site of RR-GMI-4 should have a separate report from the prehistoric sites of Ceiba 5, 9, 11, 30, RR-GMI-2 and RR-T4.

If you have any questions concerning our comments, please contact Miguel Benito at 787-721-3737 or mbenito@prshpo.gobierno.pr.

Sincerely,

  
Carlos A. Rubio Cancela, Arch.  
State Historic Preservation Officer

CAR/BRS/MB



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*Preserving America's Heritage*

February 23, 2011

C. R. Destafney, PE  
Regional Environmental Director  
Commander Navy Region Southeast  
Box 102, Naval Air Station  
Jacksonville, FL 32212-0102

***Ref: Proposed Disposal of Naval Activity Puerto Rico  
(former Naval Station Roosevelt Activity Puerto Rico)  
Ceiba, Puerto Rico (5090, Ser N45)***

Dear Mr. Destafney:

On February 14, 2011, the Advisory Council on Historic Preservation (ACHP) received your notification and supporting documentation regarding the adverse effects of the referenced undertakings on properties listed on and eligible for listing in the National Register of Historic Places. Based upon the information you provided, we have concluded that Appendix A, *Criteria for Council Involvement in Reviewing Individual Section 106 Cases*, of our regulations, "Protection of Historic Properties" (36 CFR Part 800), does not apply to this undertaking. Accordingly, we do not believe that our participation in the consultation to resolve adverse effects is needed. However, if we receive a request for participation from the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer, affected Indian tribe, a consulting party, or other party, we may reconsider this decision. Additionally, should circumstances change, and you determine that our participation is needed to conclude the consultation process, please notify us.

Pursuant to 36 CFR §800.6(b)(1)(iv), you will need to file the final Memorandum of Agreement (MOA), developed in consultation with the Puerto Rico SHPO and any other consulting parties, and related documentation with the ACHP at the conclusion of the consultation process. The filing of the MOA and supporting documentation with the ACHP is required in order to complete the requirements of Section 106 of the National Historic Preservation Act.

Thank you for providing us with the opportunity to review these undertakings. If you have any questions, please contact Louise Brodnitz at 202-606-8527, or via email at [lbrodnitz@achp.gov](mailto:lbrodnitz@achp.gov).

Sincerely,

Raymond V. Wallace  
Historic Preservation Technician  
Office of Federal Agency Programs



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## Appendix B

# Agency Correspondence

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**GOVERNMENT OF PUERTO RICO**

**LUIS G. FORTUÑO**  
GOVERNOR

January 27, 2011

Honorable Raymond E. Mabus  
Secretary of the Navy  
The Pentagon  
Washington, DC 20350

Dear Mr. Secretary:

As contemplated by regulations promulgated by the President's Council on Environmental Quality to implement the National Environmental Policy Act (NEPA), 42 U.S.C. 4321 *et seq.*, I hereby request designation of Puerto Rico as a Cooperating Agency, as authorized by 40 CFR 1501.6, with respect to any environmental impact analyses undertaken pursuant to NEPA for Naval Station Roosevelt Roads ("NSRR"). I am prepared to designate the Environmental Quality Board ("EQB") as Puerto Rico's lead agency with respect to the Navy's NEPA evaluations. Toward that end, I have authorized the Executive Director of the EQB to enter into discussions with your staff and execute a memorandum of agreement on behalf of Puerto Rico to define the NEPA responsibilities to Puerto Rico.

As the jurisdiction that will exercise governmental authority over all of the NSRR property when it is transferred out of federal ownership, Puerto Rico has special expertise and interest in such property and the environmental impacts associated with its future use. Our involvement in the environmental impact analyses as a Cooperating Agency with the Navy will facilitate and expedite the required NEPA evaluations.

Representatives of Local Redevelopment Authority for the Naval Station Roosevelt Roads ("NSRR LRA") have discussed this approach with members of your staff and, with the designation of the EQB as the lead agency for Puerto

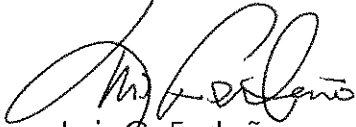
Honorable Raymond E. Mabus

Page 2

January 27, 2011

Rico in the Navy's NEPA evaluations, I am informed that this request is viewed with favor. I am available to discuss this matter with you at your convenience.

Sincerely,



Luis G. Fortuño

c.: Hon. Pedro Pierluisi, Resident Commissioner  
Hon. Roger Natsuhara, DASN (I&E)  
Ms. Kimberly Kesler, Navy BRAC PMO  
Mr. Jimmy Anderson, Navy BRAC PMO, Southeast  
Mr. Erwin Kiess, Executive Director, NSRR LRA



DEPARTMENT OF THE NAVY  
BASE REALIGNMENT AND CLOSURE  
PROGRAM MANAGEMENT OFFICE SOUTHEAST  
4130 FABER PLACE DRIVE  
SUITE 202  
NORTH CHARLESTON, SC 29405

Ser BPMOSE dcj/0074  
28 Feb 11

Mr. Pedro Nieves  
Executive Director  
Puerto Rico Environmental Quality Board  
P.O. Box 11488  
San Juan, PR 00910

Subj: SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT (SEA) FOR THE UNITED STATES DEPARTMENT OF THE NAVY DISPOSAL AND REUSE OF NAVAL ACTIVITY PUERTO RICO (NAPR; FORMERLY NAVAL STATION ROOSEVELT ROADS)

Dear Mr. Nieves:

This letter is to inform you of the proposed changes to the reuse of Naval Activity Puerto Rico (NAPR) as an outcome of the United States Department of the Navy (Navy) disposal of the property. Pursuant to the United States Department of Defense Appropriations Act of Fiscal Year 2004 (Public Law 108-87), the Navy closed the Naval Station Roosevelt Roads in Puerto Rico in the spring of 2004. The installation was then re-designated as the NAPR in order to maintain a Navy presence and associated security during the disposal process (Figure 1).

In 2007, the Navy prepared the *Environmental Assessment (EA) for the Disposal of Naval Activity Puerto Rico* (the 2007 EA) that evaluated the potential environmental impacts associated with the disposal of approximately 8,400 acres of the NAPR property from federal to private ownership. In April 2010, the Commonwealth of Puerto Rico (the Commonwealth), through the Local Redevelopment Authority (LRA), submitted an addendum to the 2004 *Naval Station Roosevelt Roads Reuse Plan* (Reuse Plan). The Navy is currently developing a Supplemental EA (SEA) to evaluate the environmental consequences of the proposed disposal of approximately 1,300 acres (of the original 8,400 acres) of the NAPR property from federal to Commonwealth ownership (Figure 2). The proposed action is in accordance with the Commonwealth's 2004 Reuse Plan, as modified by the 2010 Addendum (Figure 3), and as adopted by the Commonwealth and the LRA.

The Navy will assess the environmental impacts associated with the proposed action. Alternatives to the proposed reuse plan also will be considered. Potential environmental issues identified by the Navy may include, but are not limited to, threatened and endangered species, water quality, cultural resources, and hazardous materials. In accordance with our Cooperating Agency agreement, you are invited to solicit and provide any written comments or concerns regarding the proposed reuse of NAPR within 30 days of receipt of this letter.



Ser BPMOSE dcj/0074  
28 Feb 11

When the Navy completes its environmental analysis, the draft SEA will be made available for public review. A Notice of Availability of this document will be published in local newspapers. Comments regarding the analysis presented in the draft EA will be solicited. Thank you for your interest and participation in this action. If you have any questions regarding this project, please do not hesitate to contact Mr. Dale C. Johannesmeyer, BRAC PMO SE NEPA Coordinator at (843) 743-2128 or at [dale.johannesmeyer.ctr@navy.mil](mailto:dale.johannesmeyer.ctr@navy.mil).

Sincerely,

A handwritten signature in cursive script that reads "Thuane B. Fielding".

THUANE B. FIELDING  
Base Closure Manager

Encls:

- (1) Figure 1
- (2) Figure 2
- (3) Figure 3

Copy to:

Mr. Erwin Kiess, LRA Executive Director  
Mr. Jan Brandt (Ecology and Environment, Inc.)



DEPARTMENT OF THE NAVY  
BASE REALIGNMENT AND CLOSURE  
PROGRAM MANAGEMENT OFFICE SOUTHEAST  
4130 FABER PLACE DRIVE  
SUITE 202  
NORTH CHARLESTON, SC 29405

Ser BPMOSE dcj/0075  
28 Feb 11

US EPA Region 2  
Attn: Dale Carpenter  
Chief, Caribbean Section  
RCRA Programs Branch  
290 Broadway, 22nd Floor  
New York, NY 10007-1866

Subj: SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT (SEA) FOR THE UNITED STATES DEPARTMENT OF THE NAVY DISPOSAL AND REUSE OF NAVAL ACTIVITY PUERTO RICO (NAPR; FORMERLY NAVAL STATION ROOSEVELT ROADS)

Dear Mr. Carpenter:

This letter is to inform you of the proposed changes to the reuse of Naval Activity Puerto Rico (NAPR) as an outcome of the United States Department of the Navy (Navy) disposal of the property. Pursuant to the United States Department of Defense Appropriations Act of Fiscal Year 2004 (Public Law 108-87), the Navy closed the Naval Station Roosevelt Roads in Puerto Rico in the spring of 2004. The installation was then re-designated as the NAPR in order to maintain a Navy presence and associated security during the disposal process (Figure 1).

In 2007, the Navy prepared the *Environmental Assessment (EA) for the Disposal of Naval Activity Puerto Rico* (the 2007 EA) that evaluated the potential environmental impacts associated with the disposal of approximately 8,400 acres of the NAPR property from federal to private ownership. In April 2010, the Commonwealth of Puerto Rico (the Commonwealth), through the Local Redevelopment Authority (LRA), submitted an addendum to the 2004 *Naval Station Roosevelt Roads Reuse Plan* (Reuse Plan). The Navy is currently developing a Supplemental EA (SEA) to evaluate the environmental consequences of the proposed disposal of approximately 1,300 acres (of the original 8,400 acres) of the NAPR property from federal to Commonwealth ownership (Figure 2). The proposed action is in accordance with the Commonwealth's 2004 Reuse Plan, as modified by the 2010 Addendum (Figure 3), and as adopted by the Commonwealth and the LRA.

The Navy will assess the environmental impacts associated with the proposed action. Alternatives to the proposed reuse plan also will be considered. Potential environmental issues identified by the Navy may include, but are not limited to, threatened and endangered species, water quality, cultural resources, and hazardous materials. You are invited to provide any written comments or concerns regarding the proposed reuse of NAPR within 30 days of receipt of this letter.

28 Feb 11

When the Navy completes its environmental analysis, the draft SEA will be made available for public review. A Notice of Availability of this document will be published in local newspapers. Comments regarding the analysis presented in the draft EA will be solicited. Thank you for your interest and participation in this action. If you have any questions regarding this project, please do not hesitate to contact Mr. Dale C. Johannesmeyer, BRAC PMO SE NEPA Coordinator at (843) 743-2128 or at [dale.johannesmeyer.ctr@navy.mil](mailto:dale.johannesmeyer.ctr@navy.mil).

Sincerely,

A handwritten signature in black ink, appearing to read "Thuan B. Fielding". The signature is fluid and cursive, with the first name "Thuan" being the most prominent.

THUANE B. FIELDING  
Base Closure Manager

Encls:

- (1) Figure 1
- (2) Figure 2
- (3) Figure 3

Copy to:

Mr. Jan Brandt (Ecology and Environment, Inc.)



DEPARTMENT OF THE NAVY  
BASE REALIGNMENT AND CLOSURE  
PROGRAM MANAGEMENT OFFICE SOUTHEAST  
4130 FABER PLACE DRIVE  
SUITE 202  
NORTH CHARLESTON, SC 29405

Ser BPMOSE dcj/0072  
28 Feb 11

Mr. Roy Crabtree, Director  
National Marine Fisheries Service  
National Oceanographic and Atmospheric Administration  
9721 Executive Center Drive North  
St. Petersburg, FL 33702-2432

Subj: SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT (SEA) FOR THE  
UNITED STATES DEPARTMENT OF THE NAVY DISPOSAL AND REUSE OF  
NAVAL ACTIVITY PUERTO RICO (NAPR; FORMERLY NAVAL STATION  
ROOSEVELT ROADS)

Dear Mr. Crabtree:

This letter is to update the National Oceanographic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries) of the proposed changes to the reuse of Naval Activity Puerto Rico (NAPR) as an outcome of the United States Department of the Navy (Navy) disposal of the property.

Pursuant to the United States Department of Defense Appropriations Act of Fiscal Year 2004 (Public Law 108-87), the Navy closed Naval Station Roosevelt Roads in Puerto Rico in the spring of 2004. The installation was then re-designated as NAPR in order to maintain a Navy presence and associated security during the disposal process (Figure 1). In 2007, the Navy prepared the *Environmental Assessment (EA) for the Disposal of Naval Activity Puerto Rico* (the 2007 EA) that evaluated the potential environmental impacts associated with the disposal of approximately 8,400 acres of the NAPR property from federal to private ownership. In April 2010, the Commonwealth of Puerto Rico (the Commonwealth), through the Local Redevelopment Authority (LRA), submitted an addendum to the 2004 *Naval Station Roosevelt Roads Reuse Plan* (Reuse Plan). Comparison of the 2010 Reuse Plan Addendum with the original 2004 Reuse Plan indicates that, of the parcels sought by the LRA under an Economic Development Conveyance (EDC), Parcel III is the only portion of the site where redevelopment is sufficiently different in type or intensity of use to warrant further NEPA analysis. As a result, the Navy is currently developing a Supplemental EA (SEA) to evaluate the environmental consequences of the proposed reuse of approximately 1,300 acres (of the original 84,000 acres) of the NAPR property from federal to Commonwealth ownership (Figure 2). The proposed action is in accordance with the Commonwealth's Reuse Plan, as modified by the 2010 Addendum, and as adopted by the Commonwealth and the LRA. As part of the SEA, the Navy is re-assessing the potential impacts to the essential fish habitat (EFH) as a result of the proposed action.

The 2010 Reuse Plan Addendum is conceptual and focuses on proposed land uses and not on specific developments (Figure 3). The LRA, in conjunction with the PRPB, is developing a Special Zoning Plan for NAPR based on the 2010 Reuse Plan Addendum. Upon its adoption, this plan would serve as the official zoning of the property. Any future development projects proposed on former NAPR property would be reviewed by the PRPB to ensure such development is consistent with the Special Zoning Plan. Once detailed engineering and design studies are complete, the specific project sponsor(s) will be responsible for obtaining necessary permits and approvals prior to implementation of redevelopment activities.

The area in and around the NAPR contain extensive mangrove forest, coastal lagoons, near shore seagrass beds, and coral reefs, as well as several streams that support fringing estuarine wetlands near their outlets to the Caribbean Sea. These areas have been designated as EFH by the Caribbean Fishery Management Council, pursuant to the requirements of the Magnuson-Stevens Fishery Conservation and Management Act. In 2004, the Navy completed an EFH assessment, including field surveys, characterization of the sites, effects of the proposed action, and recommended mitigation as a follow-on action by future land owners and Commonwealth agencies, for the NAPR property. Findings of this assessment were included in the 2007 EA. After thorough review of the EFH findings and the development alternatives in the 2007 EA, it was concluded that the transfer and disposal of the NAPR property to other future property owners would not in and of itself result in impacts on EFH. Therefore, no Navy-instituted mitigation measures were proposed or been implemented.

However, the 2007 EA included a number of mitigation measures that the Commonwealth could/may impose on properties being transferred out of federal ownership to non-federal owners/developers before development-specific approvals or permits are issued. Unfortunately, engineering, design, and studies needed to obtain the various approvals for future developments from the respective regulatory agencies and estimating future potential effects on EFH is not quantifiable. However, the following mitigation measures incorporated in to the 2007 EA could be implemented by future property owners or Commonwealth agencies to minimize any potential impacts on EFH:

- Prevent nutrient loading of Pelican Cove, Enseñada Honda, and Bahía Puerca;
- Contain (prevent the dispersion of) loose sediments generated during construction;
- Develop a sea grass/mangrove/manatee/sea turtle education program (certification) for construction contractors, ferry vessel operators, and property managers;

- Monitor environmental impacts on EFH during and after the construction phase of projects;
- Develop a long-term sea grass-monitoring program for Pelican Cove, Enseñada Honda, and Bahía Puerca (the condition of sea grasses will be indicative of local water quality);
- Create a clearly marked and buoyed (mandatory channel) for the approach to the ferry terminal(s) and other marine activities;
- Create specific locations where boats may/may not be anchored;
- Establish maintenance and usage restrictions for mooring areas;
- Enforce vessel speed limits through established no-wake zones and other such restrictions;
- Post lookouts on ferries to prevent mechanical impacts on sea grass beds and collisions with manatees and sea turtles;
- Prevent the improper disposal of trash during the construction and use of the docking facilities, paying particular attention to materials made of plastic and Styrofoam, buckets, tools, liquid materials (e.g., paints, solvents, and fuels), excess construction materials, hardware, and cigarette butts;
- Provide containers for proper garbage disposal and enforce the proper disposal of garbage;
- Ensure periodic disposal of trash by garbage disposal contractors; and
- Assist future property owners in establishing conservation easements to facilitate their receiving tax deductions and/or property tax exemptions.

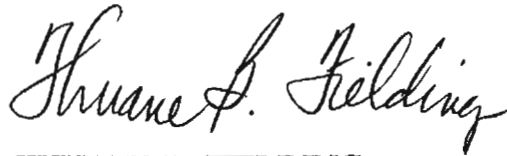
Implementation of these mitigation requirements would be the responsibility of the new owner/developer, and the respective issuing agency would be responsible for ensuring that mitigation measures are instituted, as the Navy would no longer retain any ownership or control of these properties.



The Navy determined in the 2007 EA that existing federal laws and Commonwealth rules, regulations, and laws, would provide adequate protection such that the disposal of NAPR to the Commonwealth and other non-federal entities would not result in an adverse direct or indirect effect on EFH. The Navy does not anticipate these findings and conclusions to differ in the SEA. In an ongoing effort to ensure no adverse direct or indirect impacts would occur to the EFH in and around the NAPR, the Navy invites NOAA Fisheries to comment on the SEA. You are invited to provide any written comments or concerns regarding the proposed reuse of NAPR within 30 days of receipt of this letter.

Thank you for your consideration in this matter. If you have any questions regarding this project, please do not hesitate to contact Mr. Dale C. Johannesmeyer, BRAC PMO SE NEPA Coordinator at (843) 743-2128 or at [dale.johannesmeyer.ctr@navy.mil](mailto:dale.johannesmeyer.ctr@navy.mil).

Sincerely,

A handwritten signature in black ink, reading "Thuane B. Fielding". The signature is written in a cursive, flowing style.

THUANE B. FIELDING  
Base Closure Manager

Encls:

- (1) Figure 1
- (2) Figure 2
- (3) Figure 3

Copy to:

Mr. Jan Brandt (Ecology and Environment, Inc.)



DEPARTMENT OF THE NAVY  
BASE REALIGNMENT AND CLOSURE  
PROGRAM MANAGEMENT OFFICE SOUTHEAST  
4130 FABER PLACE DRIVE  
SUITE 202  
NORTH CHARLESTON, SC 29405

Ser BPMOSE dcj/0073  
28 Feb 11

Mr Edwin Muñiz  
United States Fish and Wildlife Service  
Boqueron Field Office  
Carr. 301, KM 5.1, Bo. Corozo  
P.O. Box 491  
Boqueron, PR 00622

Subj: SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT (SEA) FOR THE UNITED STATES DEPARTMENT OF THE NAVY DISPOSAL AND REUSE OF NAVAL ACTIVITY PUERTO RICO (NAPR; FORMERLY NAVAL STATION ROOSEVELT ROADS)

Dear Mr. Muñiz:

This letter is to update the United States Fish and Wildlife Service of the proposed changes to the reuse of Naval Activity Puerto Rico (NAPR) as an outcome of the United States Department of the Navy (Navy) disposal of the property.

Pursuant to the United States Department of Defense Appropriations Act of Fiscal Year 2004 (Public Law 108-87), the Navy closed the Naval Station Roosevelt Roads in Puerto Rico in the spring of 2004. The installation was then re-designated as the NAPR in order to maintain a Navy presence and associated security during the disposal process (Figure 1). In 2007, the Navy prepared the *Environmental Assessment (EA) for the Disposal of Naval Activity Puerto Rico* (the 2007 EA) that evaluated the potential environmental impacts associated with the disposal of approximately 8,400 acres of the NAPR property from federal to private ownership. In April 2010, the Commonwealth of Puerto Rico (the Commonwealth), through the Local Redevelopment Authority (LRA), submitted an addendum to the 2004 *Naval Station Roosevelt Roads Reuse Plan* (Reuse Plan). Comparison of the 2010 Reuse Plan Addendum with the original 2004 Reuse Plan indicates that, of the parcels sought by the LRA under an Economic Development Conveyance (EDC), Parcel III is the only portion of the site where redevelopment is sufficiently different in type or intensity of use to warrant further NEPA analysis (Figure 2). The Navy is currently developing a Supplemental EA to evaluate the environmental consequences of the proposed disposal of approximately 1,300 acres (of the original 8,400 acres) of the NAPR property from federal to Commonwealth ownership. The proposed action is in accordance with the Commonwealth's 2004 Reuse Plan, as modified by the 2010 Addendum, and as adopted by the Commonwealth and the LRA.

The 2010 Reuse Plan Addendum is conceptual and focuses on proposed land uses and not on specific developments (Figure 3). The LRA, in conjunction with the PRPB, is developing a Special Zoning Plan for NAPR based on the 2010 Reuse Plan Addendum. Upon its adoption, this plan would serve as the official zoning of the property. Any future development projects proposed on former NAPR property would be reviewed by the PRPB to ensure such development is consistent with the Special Zoning Plan. Once detailed engineering and design studies are complete, the specific project sponsor(s) will be responsible for obtaining necessary permits and approvals prior to implementation of redevelopment activities.

In 2006, in accordance with the Endangered Species Act (ESA; 50 CFR 402.12), the Navy developed a Biological Assessment (BA) that assessed the potential impacts of the proposed action on ESA-listed species or their habitat. Species assessed included the yellow-shouldered blackbird (*Agelaius xanthomus*), the Virgin Island tree boa (*Epicrates monensis grantii*), Puerto Rican boa (*Epicrates inornatus*), piping plover (*Charadrius melodus*), roseate tern (*Sterna dougalli dougalli*), brown pelican (*Pelecanus occidentalis occidentalis*), the plant *Stahlia monosperma* (cóbana negra), and three threatened and endangered sea turtles (*Dermochelys coriacea*, *Eretmochelys imbricate*, and *Chelonia mydas*). As part of the protective measure outlined in the BA, the Navy divided the NAPR into 68 distinct parcels. For each of these 68 distinct parcels, the Navy developed, as necessary, conservation measures that future landowners should undertake to protect threatened and endangered species or their habitat. In addition, 18 parcels were also designated for conservation. These conservation parcels were identified as supporting suitable habitat for threatened and endangered species. Along with the designation of the conservation parcels, the Navy also incorporated conservation measures to minimize possible effects related to future activities by various users for each of the above mentioned species as addressed in the 2006 BA.

As part of the 2007 EA process, special zoning was proposed to further minimize possible future effects to special status species. The BA included information regarding the development of a Special Zoning Plan, which included development of long-term conservation measures for species and their habitats. Future Commonwealth or private landowners/developers would be responsible for complying with the established special zoning and implementing conservation measures. In a letter to the USFWS (December 2, 2005), the Puerto Rican Department of Economic Development and Commerce pledged their commitment to implement this plan. In a letter dated April 7, 2006, based on the establishment of the 18 conservation parcels, the development of Special Zoning Plan, and the implementation of conservation measures, the USFWS concurred with the Navy's determination that the proposed action would not likely adversely affect federally-listed species and would not result in adverse modification of designated critical habitat within the project area. This Letter of Concurrence was incorporated into the Finding of No Significant Impact for the 2007 EA.

The Navy believes that incorporation of the conservation measures presented in the 2007 EA into the Supplemental EA would ensure there would be no adverse impacts to ESA-listed species or their habitat. The Navy invites USFWS to comment on the Supplemental EA and looks forward to ensuring the requirements of Section 7(a)(2) of the ESA are met, as documented in the 2007 EA. You are invited to provide any written comments or concerns regarding the proposed reuse of NAPR within 30 days of receipt of this letter.

Ser BPMOSE dcj/0073  
28 Feb 11

Thank you for your consideration in this matter. If you have any questions regarding this project, please do not hesitate to contact Mr. Dale C. Johannesmeyer, BRAC PMO SE NEPA Coordinator at (843) 743-2128 or at [dale.johannesmeyer.ctr@navy.mil](mailto:dale.johannesmeyer.ctr@navy.mil).

Sincerely,

A handwritten signature in black ink, appearing to read "Thuan B. Fielding". The signature is fluid and cursive, with the first name "Thuan" and last name "Fielding" clearly distinguishable.

THUANE B. FIELDING  
Base Closure Manager

Encls:

- (1) Figure 1
- (2) Figure 2
- (3) Figure 3

Copy to:

Mr. Jan Brandt (Ecology and Environment, Inc.)

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## United States Department of the Interior



### FISH AND WILDLIFE SERVICE

Boqueron Field Office  
Carr. 301, KM 5.1, Bo. Corozo  
P.O. Box 491  
Boqueron, PR 00622

MAR 10 2011

Mr. Thuane B. Fielding  
Base Closure Manager  
BRAC PMO SE  
4130 Faber Place Drive  
Suite 202  
North Charleston, SC 29405

Re: Supplemental EA for the disposal and reuse of  
former Naval Station Roosevelt Roads

Dear Mr. Fielding:

This is in reply to your February 28, 2011 letter updating the Service of the proposed changes to the reuse of Naval Activity Puerto Rico (NAPR), or the former Naval Station Roosevelt Roads. Our comments are provided in accordance with the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and the Endangered Species Act (16 U.S.C. 1531 et seq. as amended).

Your letter mentions that in April 2010 the Commonwealth of Puerto Rico through the Local Redevelopment Authority (LRA) submitted an addendum to the 2004 Reuse Plan. Our office commented on a Commonwealth EIS for the Reuse Plan in 2008. According to our records we have not seen or commented on any LRA document since 2008. We tried to access the LRA website but it is closed for improvements. The Service sent a letter to David Criswell February 2009, stating that the proposed land sales by the Navy included mangrove wetlands previously earmarked for preservation in the Commonwealth Reuse Plan EIS (Parcel 25, SWMU 1&2). In addition we expressed concerns regarding the sale of Parcel 38 (Punta Medio Mundo) the former small arms range (SWMU 77). Access to this area is through Los Machos wetland, a conservation zone with an unimproved dirt road. The area has wetlands which are part of the Los Machos complex as well. These mangrove areas are also designated Critical Habitat for the yellow-shouldered blackbird *Agelaius xanthomus*. The waters adjacent to NAPR are occupied by the endangered Antillean manatee *Trichechus manatus*. Several changes have occurred in the LRA leadership, it would be important to know if the Commonwealth of Puerto Rico considers the submitted addendum still valid.



In order for our office to evaluate the proposed changes in the 2010 addendum and to provide substantive comments, we request that you provide our office a copy of the entire Commonwealth 2010 Addendum and the Navy's proposed conservation measures. The proposed SEA should include not only a discussion regarding impacts to listed species but should include a discussion on possible wetland impacts and compliance with existing wetland guidance and regulations. Be aware that changes to the previously evaluated project requires re-initiation of consultation under Section 7(a)(2) of the Endangered Species Act.

Thank you for the opportunity to comment on this action, if you have any questions please do not hesitate to contact Felix Lopez of my staff at 787 851 7297 x 210.

Sincerely,

  
Edwin Muñiz  
Field Supervisor

fhl

cc:

EQB, San Juan

PRPB, San Juan

DNER, San Juan