

# MARINE SPATIAL PLANNING GUIDELINES FOR THE SUBMERGED LANDS OF PUERTO RICO.



DEPARTMENT OF NATURAL AND ENVIRONMENTAL RESOURCES  
COASTAL ZONE DIVISION



DRAFT

2008

# **Marine Spatial Planning Guidelines for The Submerged Lands of Puerto Rico**

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## **1.0 INTRODUCTION**

### **1.1 Overview**

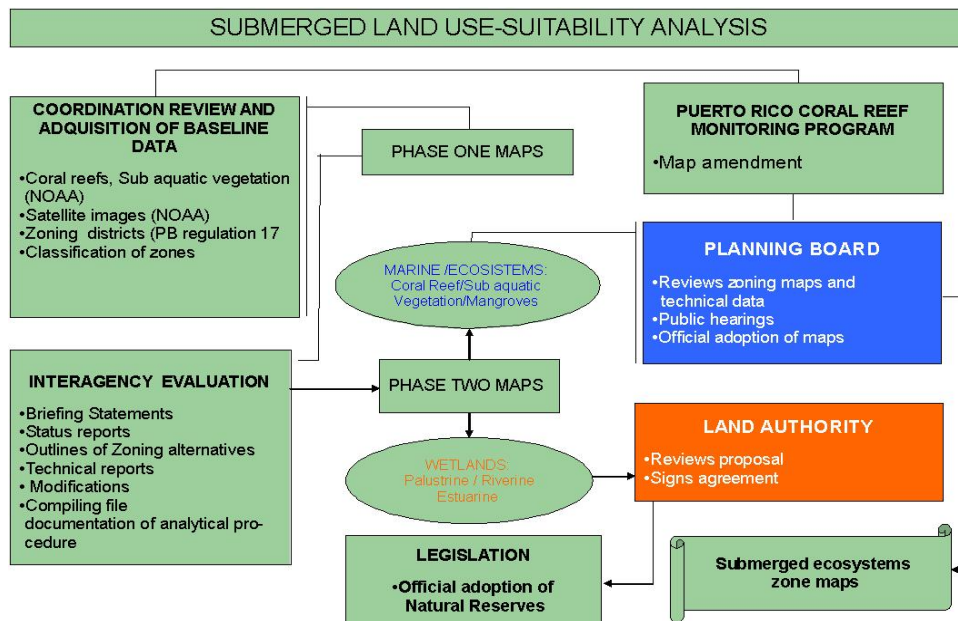
Protecting coastal resources from destruction and deterioration due to improper use or lack of foresight in preventing the adverse impact that other activities have over them entails comprehensive planning, research and monitoring. Natural reserves in Puerto Rico are regulated by strict zoning designations to protect marine ecosystems. The proportion of mapped benthic habitats types found within marine protected areas is 50.19% for coral reefs and 35.20% for submerged aquatic vegetation (DNER-CZMP 2005; Kendall, et al. 2004). Interconnected along the sea bed outside marine protected boundaries, potential sensitive ecosystems were excluded (Valeiras, 2007; FDGC 2006), and others may need additional protection.

### **1.2 Purpose and Scope**

The proportion of habitats mapped as an initiative of NOAA along 1600 square kilometers of Puerto Rico jurisdictional waters within marine protected areas is estimated as 25% (DRNA-CZMP 2005, Kendall et al. 2004). An action plan for zoning marine ecosystems in the remaining jurisdictional waters (75%) was developed using planning regulation # 17 (Figure one). This cost-effective management option, allows the protection of coastal resources (Valeiras, 2006).

The coastal zone is considered as a biological corridor managed for recreation, education and the integral development and conservation of natural resources. Natural reserves will act as buffer areas managed for conservation and used for observational research, and zoning districts as core areas for conservation or strict preservation of sensitive natural resources.

**Figure (1) Submerged Land Use Suitability Analysis**



### 1.3 Regional Setting

All governmental lands within the Coastal Zone of Puerto Rico including submerged lands below the navigable waters contiguous to Puerto Rico and adjacent islands within its jurisdiction, or when deemed necessary to the implementation of planning regulation # 17.

## **2.0 Marine Spatial Planning**

The Marine spatial plan for Puerto Rico promotes ecosystem based management through a set of regulatory measures implemented by Ocean Zoning. Comprehensive ocean zoning differs from land –use zoning in terms of the scale on which it is planned, and in the way it is implemented along the seascape. Different use zones are portrayed in maps because the regulations are area based. Zoning regulations address prohibitions or permission for such uses along the whole plan area, identifying wide linkages across marine and coastal ecosystems.

The following potential benefits of (COZ) have been address:

- Moving management away from fragmented sectoral efforts.
- Overcoming the shortcomings of small –scale protected areas.
- Allowing harmonization with terrestrial land use and coastal planning.
- Articulating private sector roles, responsibilities, and market opportunities.
- Minimizing conflict between incompatible uses.

The legal framework for managing the coastal resources in the submerged lands of Puerto Rico is given by some of the following constitutional rights, by laws, and regulations.

### **First level:**

Constitution of Puerto Rico, Article IV, Section 19 “It shall be the public policy of the Commonwealth to conserve, develop, and use its natural resources in the most effective manner possible for the general welfare of the community ”

### **Second level:**

(1) Law 23 of 1972 as amended: Creates the Department of Natural and Environmental Resources and delegates jurisdiction over the resources.

(2) The Jones Law: Extends jurisdiction within a distance of nine nautical miles in offshore water.

(3) Coastal Zone Law: Extends jurisdiction over the ocean floor, maritime waters, reefs, islets and adjacent islands within a distance of nine nautical miles in offshore water, and up to one kilometer inland including the required additional distance of important natural systems.

### **Third level**

(1) Planning Regulation 17: A guide to control the use and development of the Coastal Zone.

(2) Planning Regulation 4860: regulates permits and concessions over the maritime zone.

(3) DNER Earth Crust Regulations: Dredging and filling permits on jurisdictional waters.

(4) Fishing law, as amended: Regulates commercial and recreational fishing activities on jurisdictional waters.

## **2.1 Protection of Sensitive Resources**

The Zoning Regulation for the Coastal Zone and Access to Beaches and Coasts of Puerto Rico (planning regulation # 17) is a planning tool that was designed as a guide to control the use and development of the Coastal Zone. By means of this regulation the zoning district's established by the Planning Board can be used to control development of land, the ocean floor, maritime waters, reefs, islets and adjacent islands within a distance of nine nautical miles in offshore water, and up to one kilometer inland including the required additional distance of important natural systems. This regulation allows any interested party or official agency to request a zoning map of a sensitive area to the Planning Board, supported by reliable data (Chapter 4, section 25.02).

## **2.2 Action Plan**

A series of workshops were organized using interdisciplinary professional DNER staff to discuss the region's biodiversity and recommend conservation priorities. An important aspect taken during the first phase of this project was planning the acquisition and synthesis of the appropriate data that was required to classify the diverse array of ecosystems distributed along the submerged lands. Relevant data from different layers of existing GIS datasets, marine



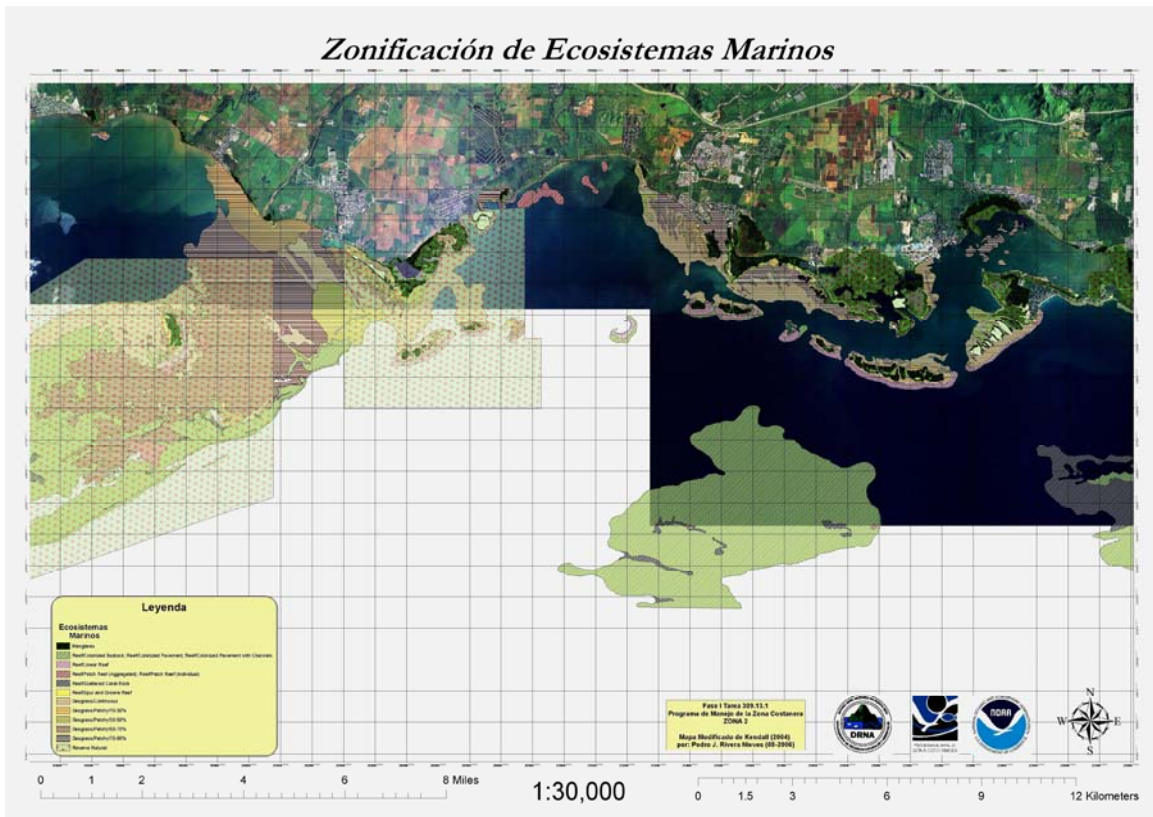
protected areas, satellite images and coral reef baseline data from wetlands and benthic maps made by the U.S. Fish and Wildlife Service, NOAA and DRNA were used to classify excluded marine ecosystems (Valeiras, 2006). The layers of information were overlaid to produce several large base maps (3 by 3 feet) in an easy to use format (Figure 2). Concurrently wetlands (Estuarine, Riverine and Palustrine systems) within the Land Authority boundaries were identified and classified as natural reserves.

To initiate the classification of zoning districts the island shelf was divided into sub-regions containing similar polygons with complex habitat assemblages stratified as mangroves, coral reefs, and sub aquatic vegetation. Participants used their own expertise as well as the regional scale data presented in the base maps as a reference tool, and implemented protection of sensitive areas using five types of zoning districts to protect the ecosystems from degradation and destruction: (PR) Resource Preservation (PM) Fishing and Aquaculture; (CR) Resource Conservation; (B-2) Mangrove Forests; (CRR) Resource Conservation and Restoration. Using the recommendations made by the interdisciplinary group a guideline for zoning procedures was developed.

As part of the mapping process, zoning guidelines procedures were evaluated and used in the elaboration of detailed phase two maps (Valeiras, 2008). The final results were geoprocessed using GIS and publicly displayed during two weeks for interdepartmental review and corrections. Phase two cartographic unit's representativeness was

evaluated and finally reviewed using a group of interagency professionals in another series of workshops. Relevant zoning issues were integrated to coastal maps.

**Figure (2)** relevant data from different layers of existing GIS datasets (marine protected areas, satellite images and coral reef baseline data).



### **3.0 Zoning Guidelines**

Assign a map identification number for each SCA polygon and follow the classification criteria provided in the guidelines.

#### **1- Special conservation areas (SCA)**

These polygons are not isolated units; they can be associated sometimes to others by ecological, economic, political and cultural reasons

##### **a- Single polygons : (R), (M), (SV)**

- **(R) Coral reefs**

Typically occurring in waters at the interface between coastal and oceanic habitats, used by small coastal pelagic fishes and migratory species. Numerous small bodied organisms with highly specialized habitat requirements live within holes and crevices inside the reef (crustaceans, mollusk, fish, and echinoderms) known as crypto fauna.

- **(M) Mangroves**

Most commonly found as thin fringes along bays, rivers, cays, salt ponds and low lying forests in estuarine lagoons. Complex roots structures offer shelters and nursery areas from commercially and recreationally important species.

- **(SV) Sub aquatic vegetation**

Large estuarine, riverine, coastal lagoons and bays that contain extensive sea grass and algal plains areas that serves as nurseries for many species of fishes and invertebrates.

## **B(Mixed polygons): (SVR) ) (SVM),(MR)**

Frequently conservation areas are found adjacent or inside other ecosystems, in this way spatial arrangements as the ones described below area formed:

- **(SVR) Sub acuatic vegetation & Coral reefs**

Important foraging grounds for keynote species such as endangered sea turtles and manatee populations.

- **(SVM) Sub acuatic vegetation & mangroves**

Dense mangrove canopy layers provide roosting and nesting habitat for resident and migratory birds, including endangered species.

- **(MR) Mangroves & coral reefs**

Complex well developed areas provide excellent habitat for crypto fauna.

- **Swat polygons -Mangrove & sub aquatic vegetation & coral reefs.**

This highly productive ecosystem encompasses terrestrial and marine habitats such as coastal wetlands, sea grass, coral reefs, and open oceanic habitats. The presence of different habitat's in close association to one another's is considered especially valuable since they provide a natural energy flow between systems.

## **2-Size of the special conservation areas**

(A) Large areas (> 1000 square meters) may sustain a greater density of organisms. May require some form of human involvement to maintain their ecological functions and quality under current pressures and management regimes.

(B) Smaller isolated areas (< 1000 square meters) sustaining lower density of organisms. May require only a reduction of current pressures to preserve the quality of the habitat.-

- *Choose A or B go to number (3) -*

### **3– Interconnection to designated areas.**

Single or mixed polygons that intersect the official limits of a protected marine reserve or a military ordinance section, contributing to their possible stabilization due to their connectivity to adjacent natural special areas.

- *(Yes) go to number (11) -*
- *(No) go to number ( 4 ) -*

### **4- Impact threats:**

(C) Marine habitats along the inner and outer shelf are exposed to low human pressures and habitat degradation, but highly susceptible to large scale disturbances (Global warming, storms, tsunamis, sedimentation). proximity between nearby habitats contribute to their ability to adapt to change.

(D) Coastal near shore environments are slightly degraded due to nutrients and pollution from coastal development, port activities, agricultural and industrial runoff. Capacity to adjust and recover from future disturbances will require some human intervention to maintain ecosystem integrity and functioning.

- *Choose C or D go to number (5).*

### **5- Fishing and Aquaculture (PM)**

Establish to classify those coastal sectors which are been utilized or can be used because of its great potential, to develop a fishing

industry and/or aquaculture, or cultivate marine species. Includes sections of land and water whose principal use is or could be the commercial production of sea food.

- *(Yes) identify polygon as **PM***
- *(No) go to number (6)*

## **6- Mangrove Forests (B-2)**

Established to classify the different types of mangroves forest in Puerto Rico and to protect them from irreparable damages caused by improper use and lack of foresight in considering the negative impact that other activities have over them.

- *(Yes) identify polygon as **B-2***
- *(No) go to number (7)*

## **7- Conservation and Restoration of Resources (CRR)**

Established to classify land or properties or portions thereof in the coastal zone of Puerto Rico, which constitutes part of the architectural, cultural and historic patrimony of PR

- *(YES) identify polygon as **CRR***
- *(No) go to number (8)*

## **8 – Public Beaches (PP)**

Established to classify beach sectors in Puerto Rico that due to its scenic, historic, or recreational characteristics have an optimum potential for future development or present use, as coastal tourist and

recreational centers; as well as terrain within the terrestrial maritime zone.

- *(Yes) identify polygon as **PP***
- *(No) go to number (9)*

## **9 – (a) Developed areas (AD)**

Non Urban areas that have been developed into rural communities, townships, isolated urbanizations, industrial development and other similar uses.

### **(b) Marine developed areas (AD- M)**

Underwater pipelines, cables, wrecks, marinas, ports, dredged, spoiled areas and other similar uses.

- *(Yes) identify polygon as **AD** or **AD-M***
- *(NO) go to number (10)*

## **10 -Data availability -**

- *No relevant data is available at the time :*

If impact threats are < for (AC) or (BC) then go to number (11)

If impact threats are > for (AD) or (BD) then go to (12)

## **11- Resource Preservation (PR)**

Marine or Coastal polygons single or mixed that can be used only to preserve existing natural conditions of ecosystems, migratory patterns of wildlife, and to enhance the continuity of evolutionary

processes and genetic flow patterns. Established to classify specific areas of the coastal zone constituting natural resources to be protected for scientific studies and contemplation

## **12 - (a) Conservation of Resources (CR)**

Established to classify areas of the coastal zone such as mangroves, bioluminescent bays, forest, dunes, lakes, geological formations, coral reefs, wildlife refuges, reservations, falls, springs, caves and sinks, natural habitats for endangered species, and other areas of special interest that should be protected for observation, scientific studies and the limited and controlled use of recreational facilities.

### **(b) Conservation of Marine Resources (CR-M)**

Established to identify and classify pristine marine ecosystems such as coral reefs, sub aquatic vegetation, and other areas of special interest that should be protected for observation, scientific studies and the limited and controlled use of recreational facilities. Anchoring is not allowed, and fishing activities must follow established regulations.



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## Appendix- Interdisciplinary DNER workshops participants.

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Wilfredo Santiago Benítez	8/09/2006	Juveempleo
Luisa Nelly González	8/09/2006	Div. Consultas
Clarimar Díaz Rivera	8/09/2006	Plan. Recursos Terrestres
Nuria Mercedes Ávila	8/09/2006	“
Nancy M. Vázquez	8/09/2006	“
Anna Ortiz Romper	8/09/2006	“
Astrid J. Green	8/09/2006	Rel. Con la Comunidad
José Casas	8/09/2006	“
Julio Toro	8/02/2006	Div. Corteza Terrestre
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Javier Ramos	7/12/2006	“
José Luís Padilla	7/12/2006	“
Maria D. Coronado	7/12/2006	Div. Procesos Ambientales
Rafael Pérez	7/12/2006	“
Carlos Adorno	7/12/2006	“
Jenny Fortuno Borrero	7/12/2006	“
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Tnt. José Santiago	8/18/2006	Div. Marítima
Capt. Frank Hacker	8/18/2006	“
Capt. Víctor Rojas	8/18/2006	“
Tnt. Harold Remires Pagan	8/18/2006	“
Cmdt. Luis Vega	8/18/2006	“
Tnt. Antonio Rivera Román	8/18/2006	“
Capt. Nelson Roldan Calero	8/18/2006	“
Tnt. José Javier Tavarez O.	8/18/2006	“
Cmdt. Ismael Rojas Reyes	8/18/2006	“

**Appendix- Interagency workshops participants.**

<b>Name</b>	<b>Date</b>	<b>Agency</b>
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Dr. Richard Fontanez	“	CEC
Miguel Sánchez	“	La Casa del Buzo
Frank S. González García	“	Red Limieda
Javier Mercado	“	Junta de Calidad Ambiental
Dr. Edwin Hernández D.	“	UPR Rió P.Depto. Biología
Merianne Meyn	“	Misión Industrial
Plan. Ebenezer Negron	<b>6/14/2007</b>	Junta de Planificación
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Dra. Graciela Gracia M.	“	Consejo de Pesca del Caribe
Ángel Rovira	“	La Parguera Divers
Pedro Días	“	Geological Survey
Luis Rivera	“	Laboratorio Pesquero
Jesús Leño	“	Laboratorio Pesquero
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Dr. Jorge García Sais	“	UPR Dep. Biol. Mayagüez
	“	<u>Snaper Farms</u>



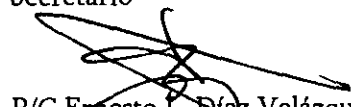
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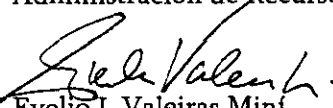
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## Departamento de Recursos Naturales y Ambientales

25 de septiembre de 2008

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Administración de Recursos Naturales

  
Evelio J. Valeiras Miní  
Planificador Ambiental III  
División de Zona Costanera

### MAPAS DE ZONIFICACIÓN Y COMITÉ (RPME)

Los mapas de zonificación de los ecosistemas marinos y de los terrenos sumergidos estarán disponibles para la revisión del público en general durante las fechas y lugares indicados a continuación. El Comité de Revisión y Planificación Marino Especial que coordinará la revisión de estos mapas ha sido organizado; se incluye la lista de las personas que lo integrarán para su aprobación final.

#### ITINERARIO TENTATIVO REVISIÓN MAPAS DE ZONIFICACIÓN

MES	FECHA	LUGAR
ENERO	19-23	Reserva Natural Caño Tiburones, Arecibo
MARZO	23-27	Reserva Natural Estuarina Bahía de Jobos, Guayama
MAYO	18-22	Oficina Central DRNA, San Juan

#### COMITÉ DE REVISIÓN Y PLANIFICACIÓN MARINO ESPACIAL (CRPME)

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