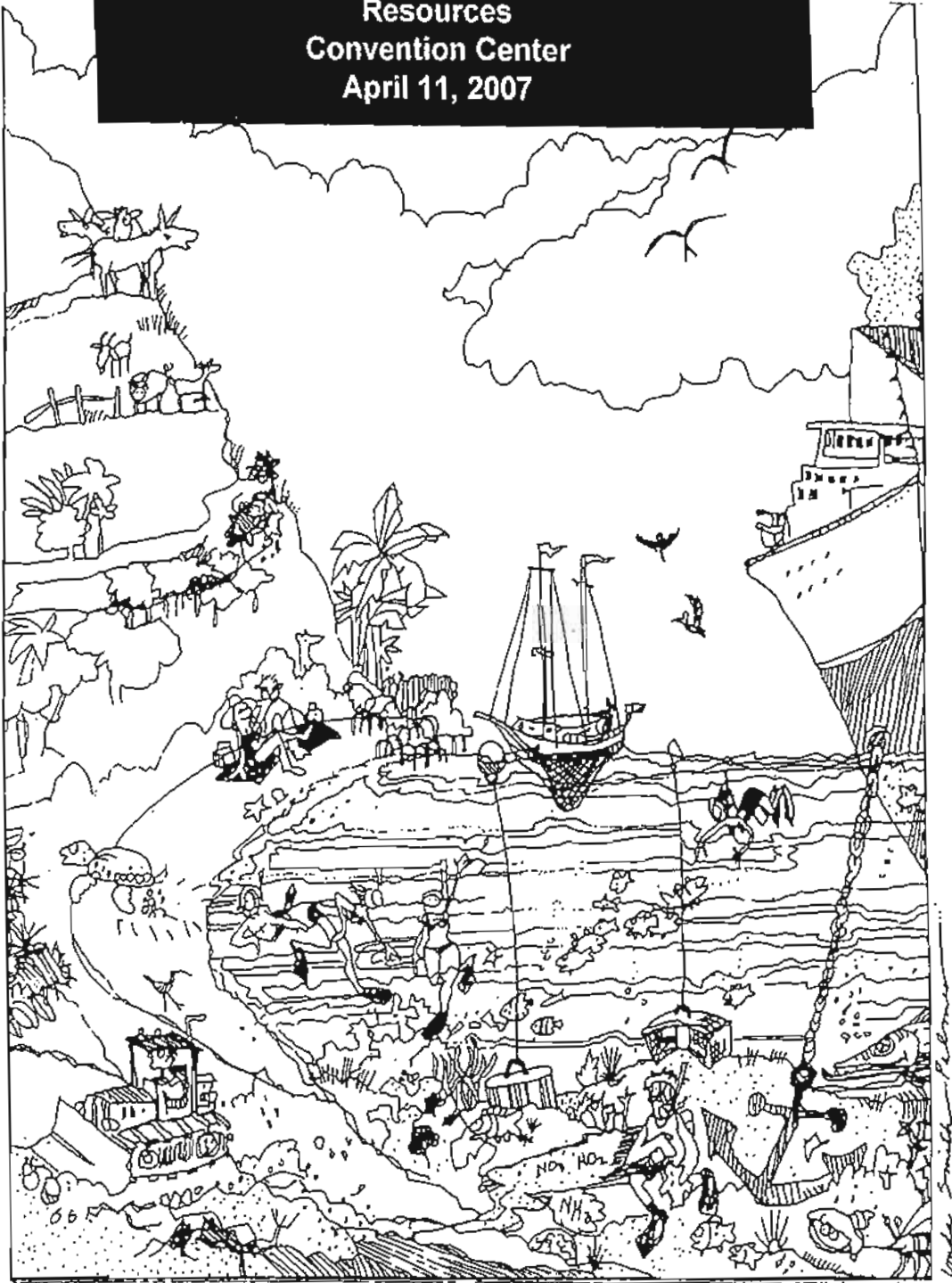


MANAGING COASTAL RESOURCES IN THE SUBMERGED
LANDS OF PUERTO RICO

First Coral Reef Symposium of the Puerto Rico
Department of Natural and Environmental
Resources
Convention Center
April 11, 2007



Estado Libre Asociado de Puerto Rico
DEPARTAMENTO DE RECURSOS NATURALES Y AMBIENTALES



MANAGING COASTAL RESOURCES IN THE SUBMERGED LANDS OF PUERTO RICO

By: *Plan. Evelio Valeiras Mini Department of Natural and Environmental (*) Resources, Coastal Zone Division*

INTRODUCTION

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, 2005; FDGC 2006), and others may need additional protection.

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. This cost-effective management option, allows the protection of coastal resources (Valeiras, 2006).

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 water, and up to one kilometer in land 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).

METHODS

The action Plan consists of 4 phases (see figure 1). During the (1) phase 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 and estuarine ecosystems using the zoning districts of planning regulation number 17. In the (2) phase relevant zoning issues were integrated to coastal maps. As an effort to disseminate and implement protection of sensitive areas, five types of zoning districts were used 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. Concurrently wetlands within the Land Authority boundaries were identified and classified as natural reserves. The evaluation of interagency as well as public comments will be coordinated, and final maps reviewed. Subsequently the (3) phase, requires coordination between the Department of Natural and Environmental Resources, the Planning Board the Land Authority and Legislators, to implement administrative policies, public hearings, and the official adoption of the coastal zone maps as part of the island wide land use plan. In the (4) phase, baseline characterization of coral reef communities produced by the Puerto Rico Coral Reef Monitoring Program will be used by the DRNA-CZMP to request amendments to existing coastal zoning maps as required, for the effective protection of resources.

RELEVANCE

The approval and adoption of the Coastal Zone maps will enable the PBPR and DNER, as well as all relevant government instrumentalities to use these new tools as enforceable policies for coastal resources management.

- Maps can be used in planning the installation of mooring bouys and artificial reefs.
- Enforce applicable marine resources regulations in natural reserves and zoned areas.
- Improve commercial and recreational utilization of marine resources.
- Provide baseline data for emergency response situations.

Integrating communities, environmental groups, non-profit organizations, universities, and private enterprise in the adoption of marine zoned areas to promote the protection and conservation of marine ecosystems.

- Supporting ongoing long term monitoring programs to implement effective management strategies.
- Validating area estimates of benthic habitats and their geographic distribution within the Puerto Rico shelf
- Developing appropriate management guidelines for marine zoned areas.
- Relieving the operational cost from government.

CONCLUSIONS

Establishing a range of zoning districts that are adopted by the Planning Board of Puerto Rico provides a strong legal basis for the conservation and preservation of natural areas. Any changes in officially adopted zoning districts boundaries will require public hearings. The permitting process, particularly Sec. 404 permits, will be bound by the use provisions of the zoning districts, and be subject to federal consistency. Linking the coral reef initiative to land and water-based zoning, adds to the array of mechanisms available for marine resource protection.

Zoning districts in submerged lands act as core natural areas for conservation or strict preservation. The coastal zone is considered as a biological corridor managed for recreation, education and the integral development and conservation of natural resources. Natural reserves act as buffer zone areas managed for conservation and used for observational research. The final maps can be used to evaluate which cases within the coastal zone impose threats to marine ecosystems and wetlands that may require protection, conservation or restoration (see figure 2).

REFERENCES

Department of Environmental and Natural Resources-Coastal Zone Management Program (DNER-CZMP) 2005. Alvarez, N. and E.Diaz. *Estadísticas sobre los Arrecifes de Coral y Ecosistemas Bentónicos Asociados a P.R.*, Draft.

(FGDC) Federal Geographic Data Committee, Marine Boundary Working Group, 2006. *Marine Managed Areas: Best Practices for Boundary Making*

Kendall M.S. , Curtis R. Kruer, Ken R. Buja, John D. Christensen, Ernesto Diaz, Robert A. Warner and Mark E. Monaco, 2004. *A Characterization of the Shallow-Water Coral Reefs and Associated Habitats of Puerto Rico*. Gulf and Caribbean Research Vol.16 (2). 172-184.

Planning Board of Puerto Rico, 1983 . *Zoning Regulation for the Coastal Zone and Access to Beaches and Coasts of Puerto Rico*.

Valeiras Mini Evelio, 2006. *Zoning the Submerged Lands of Puerto Rico*. International Submerged Lands Management Conference, Red Bank, New Jersey, USA. Department of Environmental Protection, Coastal Management Office.

_____, 2005. *Conservation and Management Strategies for Cueva del Indio Natural Reserve Arecibo, Puerto Rico*. Coastal Zone 05-Balancing the Edge. New Orleans, USA.

Valeiras Mini Evelio, Rivera Nieves Pedro, 2005. Department of Environmental and Natural Resources - Coastal Zone Management Program (DNER-CZMP) 2005 *Submerged marine ecosystems interconnected and excluded by MPA boundaries*. Draft.



KEYWORDS: coastal zone management, submerged lands, marine ecosystems, nautical archeology, zoning regulations, anthropogenic effects, environmental planning.

(*) Department of Natural and Environmental Resources, Coastal Zone Division.
 P.O. BOX 366147
 San Juan , Puerto Rico 00936
 evaleiras@drna.gobierno.pr

FIGURE (1) Submerged Land Use Suitability Analysis

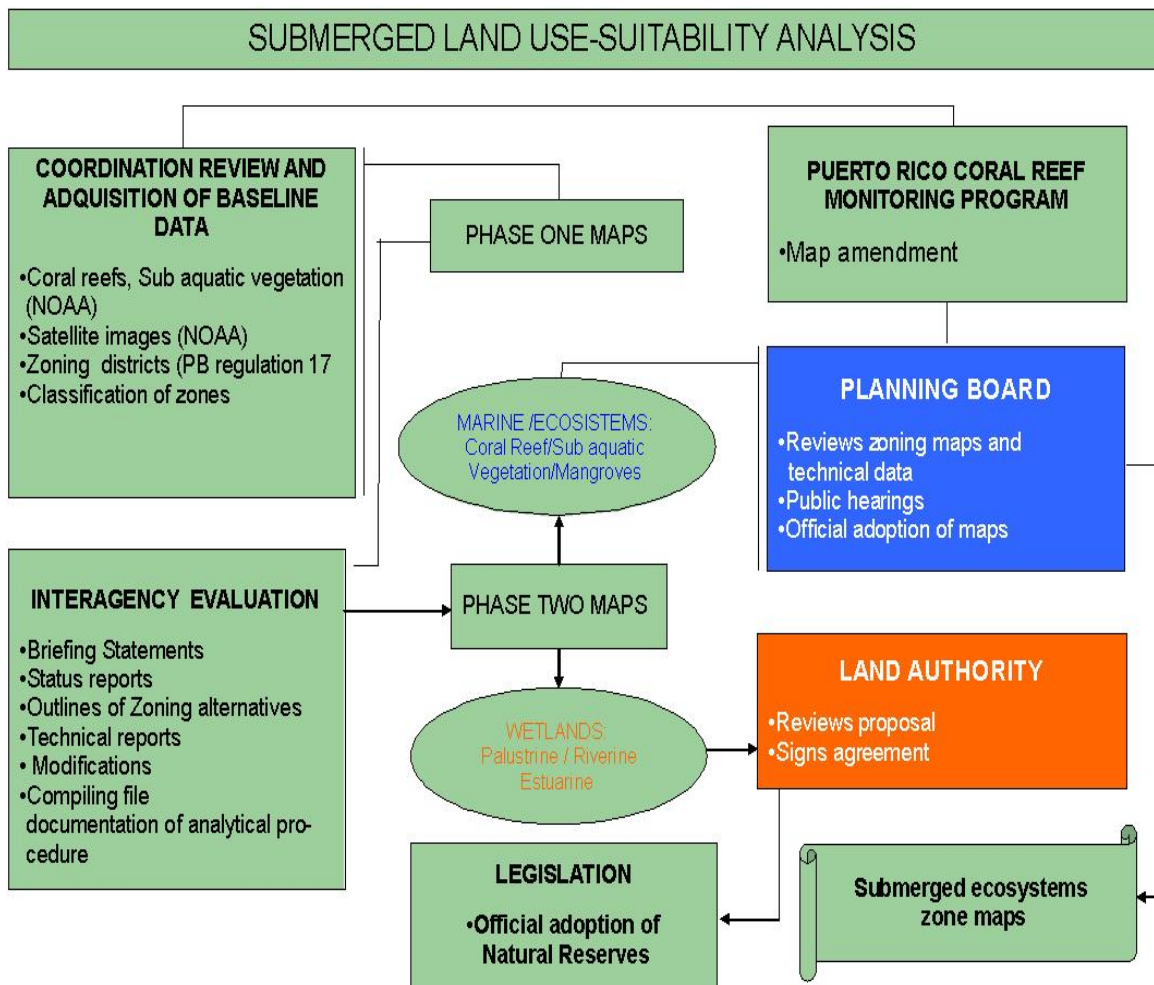


Figure (2) Phase two map

