

Coastal Management at Ojo De Liebre, Baja California Sur

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Abstract.— We analyzed the biotic, abiotic, and human components interacting at the coastal zone of the Ojo de Liebre Lagoon, Baja California Sur, Mexico. Using geographic information systems, satellite images, and the main biological, physical, and socioeconomic components, we developed an environmental characterization of the zone. According with the natural features of the zone, including the watershed characteristics, the ecological resources potential, and the soil aptitude, we propose the optimal activities to be developed in each unity. A map of land use containing all the identified unites and the activities proposed to be developed is presented. According to our results, biodiversity conservation and productive activities in this coastal zone are totally compatible.

Introduction

The environmental characterization of a zone is a required steep in order to attain it's sustainable development (López 1996; Zarate Lomelí et al. 1995). In Mexico, the environmental legislation recognize the importance for the proper development and conservation of the environmental characterization (INE 1996). The main goal of such characterization is to obtain an accurate separation and classification of the different ecological units and to establish their proper uses (Cendrero 1989)

In this work, we develop the environmental characterization of the coastal zone of Ojo de Liebre Lagoon.

Material and Methods

This work was developed at the coastal zone of Ojo de Liebre Lagoon, located at the Baja California Peninsula

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(27° 40', 28° 00' NL and 113° 40', 114° 20' WL; fig. 1). Using aerial photographs scale 1:70,000 and a satellite image Landsat MSS, we proceed to determine the main terrestrial characteristics of the zone, such as soil map, hydrology map, geomorphology map, land use map and vegetation map. All these maps were digitized in DXF format (Auto CAD) and converted to PC-Arc/INFO. All the maps were consecutively overlapped, following the order provided in the figure 2, in order to determine the similar landscape units.

After we determined the landscape units, we developed five stays of field work, each one of fifteen in order to confirm our findings. Posteriori, we determined the use capacity of each similar landscape units, following the traditional methods (Cendrero 1989), and based mainly in our knowledge of the zone and our experience of 20 years living in the region.

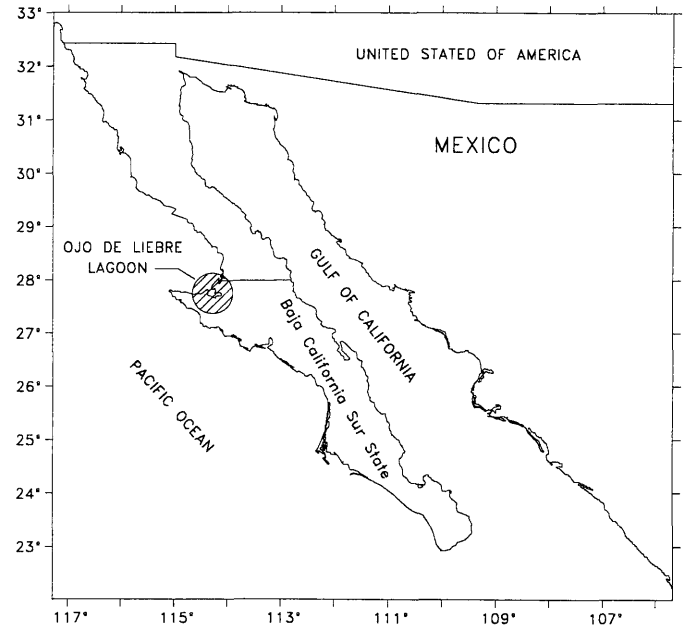


Figure 1. The coastal zone of Ojo de Liebre Lagoon, located at the Baja California Peninsula.

Results and Discussion

In figure 3, it is possible to observe the main distinguished environmental units. Despite the first characterization distinguished 125 environmental units, we de-

ceded to reduce this number to a more manageable, grouping very similar units. In this way we can establish the main suggested uses for the studied region (fig. 3)

1. Salt production
2. Commercial fishery
3. Ecotourism

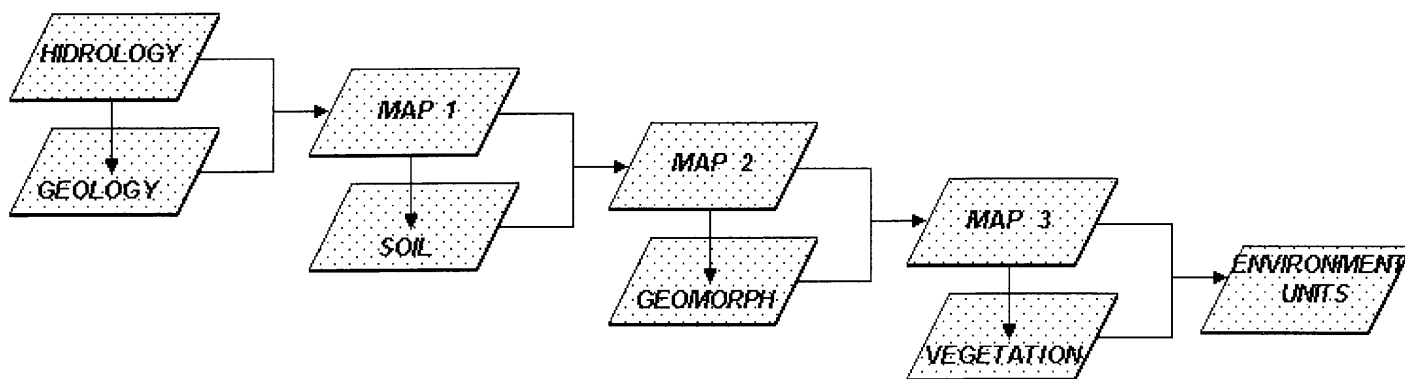


Figure 2. All maps were consecutively overlapped, following the order in this figure, to determine similar landscape units.

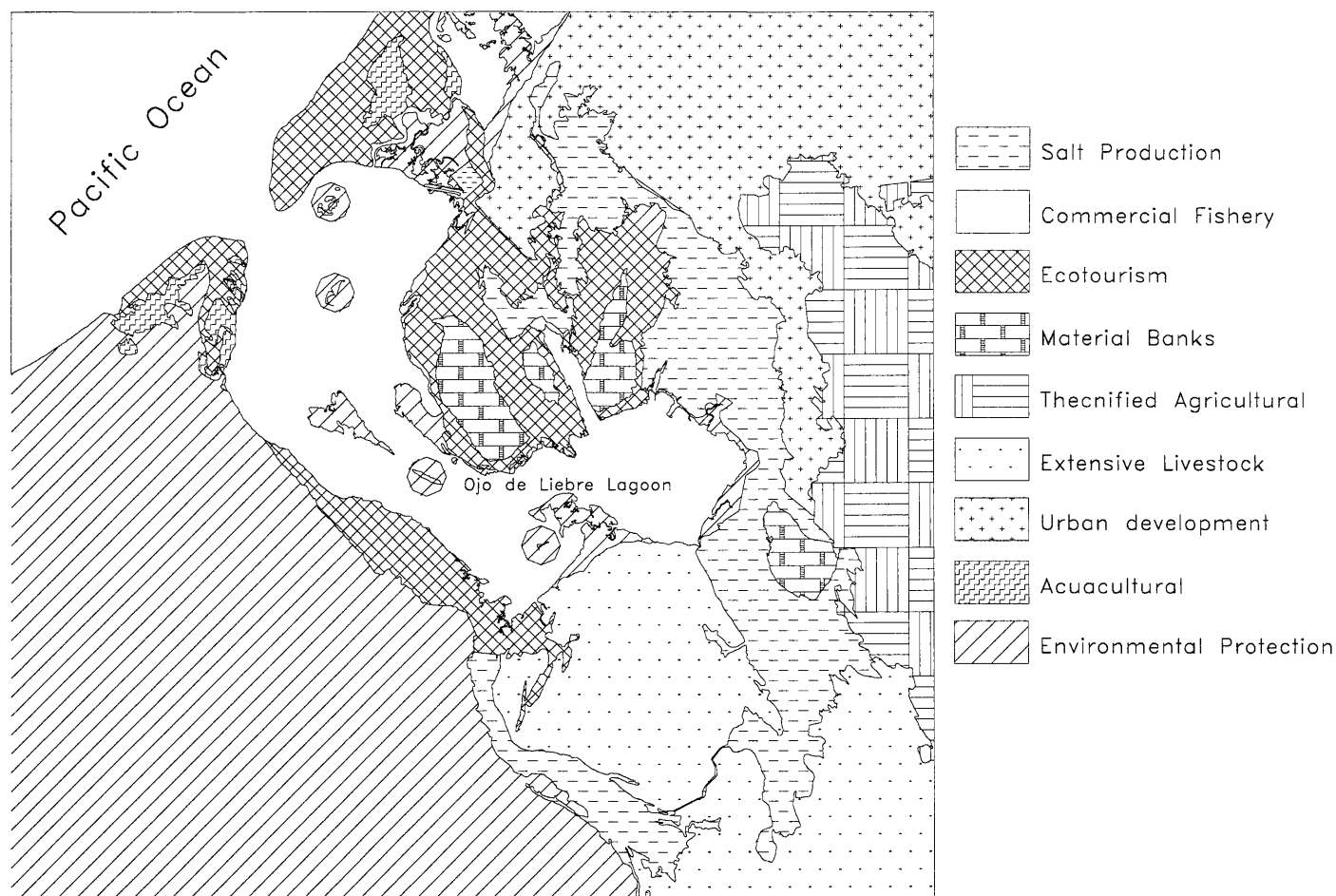


Figure 3. The primary distinguished environmental units.

4. Material banks
5. Thecnified agricultural
6. Extensive livestock
7. Urban development
8. Aquacultural
9. Environmental protection areas

The recommended uses for each zone are the result the objective analysis of the main physical, biological and socioeconomic components of this coastal zone. We are sure that, following the recommended activities suggested in this work, it will be feasible to attain the sustainable development of this key region

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Literature Cited

- Andrade, A. 1994. Zonificación ecológica como base para el estudio integral del paisaje y la planificación del uso de las tierras. *Sistema de Información Geográfica Plan de Acción Forestal Para Colombia* (2)28-31.
- Bridgewater P.B. 1993. Landscape ecology, geographic information system and nature conservation. Part II. Roy Haines-Young, David R. Green and Stephen H. Cousins (Ed.) *Landscape Ecology and GIS*. Ed. Taylor & Francis. Salisbury, Great Britain. 23-36 p.
- Cendrero, A. y J. R. Díaz de Terán. 1987. The environmental map system of the University of Cantabria, Spain. In: *Mineral Resources extraction, environmental protection and land-use planning in the industrial and developing countries* (P. Arndt y G. Luttig eds.). Stuttgart. 149-181 pp.
- Cendrero, A. 1989. Mapping and evaluation of coastal areas for planing. *Ocean and Shoreline Management* (12): 427-462.
- Cendrero, A. y R. M. Charlier. 1989. Resource, land-use and management of the coastal Fringe. *Geolis* 3(1-2): 40-55.
- Díaz de Terán, J. R. 1985. Estudio geológico ambiental de la franja costera de Cantabria y establecimiento de bases para su ordenación territorial. Tesis de doctorado. Universidad de Cantabria. Santander. España.
- I.N.E. 1996. Ley General del Equilibrio Ecológico y Protección al Ambiente. Instituto Nacional de Ecología.
- I.N.E.G.I. 1982. Cartas topográficas escala 1:50,000 Punta Malarrimo, Sierra los Indios, Guerrero Negro, Laguna Ojo de Liebre, Sierra Campo Nuevo, Las Bombas, Arroyo de San José y Desierto del Vizcaíno.
- I.N.E.G.I. 1989. Cartas topográficas, edafológicas, geológicas, aguas superficiales, aguas subterráneas, uso del suelo y vegetación 1:250,000 Santa Rosalía y Guerrero Negro.
- I.N.E.G.I. 1995. Espaciomapas escala 1:250,000 Santa Rosalía y Guerrero Negro.
- López E. R. 1996. Propuesta de Ordenamiento de las Actividades de la Zona Marina de Loreto, B. C. S. México (Tesina). Facultad de Ciencias Marinas. Universidad Autónoma de Baja California. Ensenada. 56 p.
- Ortíz-Solorio C. A. y H. E. Cuanalo de la Cerda. 1984. Metodología del levantamiento fisiográfico. Un sistema de clasificación de tierras. Centro de Edafología. Colegio de Postgraduados. Chapingo. México. 18 pp.
- Stow, D.A. 1993. The role of geographic information system for landscape ecological studies. Part II. Roy Haines-Young, David R. Green and Stephen H. Cousins (Ed.) *Landscape Ecology and GIS*. Ed. Taylor & Francis. Salisbury, Great Britain. 11-22 p.
- Zarate-Lomelí, D., G. Pealike-Aponte, J.L. Rojas-Galavíz y M. A. Ortiz-Pérez. 1995. La delimitación y regionalización ecológica: necesidades para el manejo de la zona costera. *Jaina* Vol. 6 (3)14-15.