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**Coherence of Conservation and Development Policies of Coastal and Marine  
Protected Areas in West Africa**

**Cohérence des politiques de conservation et de développement des aires  
protégées marines et côtières en Afrique de l'Ouest**

**Coerência das políticas de conservação e de desenvolvimento das áreas  
protegidas marinhas e costeiras na Africa Ocidental**

**BIBLIOGRAPHY ON MARINE PROTECTED AREAS**

General and West African references

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## 28. SOCIAL PARTICIPATION

**Al-Oufi, H., McLean, E., & Palfreman, A.** (2000). Observations upon the Al-Batinah artisanal fishery, the Sultanate of Oman. *In: Marine Policy*, 24(5), 423-429.

**Abstract:** The Al-Batinah coast is home to around 35% of the Sultanate of Oman's artisanal fisherfolk, who account for 28% of national landings by traditional means. Over the last 10 years, the region has experienced a general decline in its fishery with a consequence of socio-economic disturbance and increased fishing pressure. The present study was undertaken to gain base line socio-economic information upon the region and to examine the industry's structure and co-management strategies. Fisherfolk (mean age: 44. 4+-8. 77 {SD}) were from large families (avg. 12. 4), educationally challenged (1. 10+-2. 58&nbsp;yr formal education), and had limited opportunity for alternative employment. Mean crew size of fishing vessels was 1. 86+-0. 63 (SD) and two different systems were employed for calculating crew earnings. Average income per person was approx. US\$ 5000 per annum although there was significant disparity in income distribution between villages. Traditionally, fisherfolk have employed the Senat Al-Bahar ("code of the sea"), in efforts to distribute and manage coastal fisheries. However, change in fishery management, away from local, to a more centralised style, has undermined the effectiveness of this system. This has resulted in alterations in fisherfolk behaviour, with some employing illegal mesh sizes, poaching and fishing in prohibited areas.

**Almada, J. L. F. et al.** (1998). A methodology for developing a management program for protected areas: The biosphere reserve of the upper California Gulf and Colorado River Delta, Mexico. California and the World Ocean '97, San Diego, CA (USA), 24-27 Mar 1997. *In: O. R. Magoon, H. Converse, B. Baird, & M. Miller-Henson (eds.), Taking a Look at California's Ocean Resources: An Agenda for the Future*. Vol. 1 (pp. 600-622). Reston, VA USA: ASCE.

**Abstract:** The concept of the Biosphere Reserve is defined within UNESCO'S program for "Man and the Biosphere". In Mexico, the General Law of the Ecological Equilibrium and Environmental Protection, Article 48, defines this concept. The Biosphere Reserve of the Upper California Gulf and Delta of the Colorado River was decreed in July of 1993, and required the development of a management program to define the needs and opportunities found within the reserve. An objective of this work was to define a methodological design for managing the reserve, including its contributions to socioeconomic development, while at the same time preserving the natural processes of the area. This paper outlines a methodology which includes the participation of the inhabitants of the reserve from the formulation of its objectives through to proposal of management strategies. An important part of the methodology is the process of ecological regionalization which sets the stage for capacity for suitable uses, as well as the integration of social demands into the definition of management strategies. The management strategies suggested used the concept of sustainability based on balanced actions related to the protection and the utilization of its natural resources

**American Fisheries Society.** (2002). Symposium on "The Human Dimensions of Marine Protected Areas" during the 2002 Annual Conference of the American Fisheries Society. [s. l. ]: [s. n. ]

**Abstract:** The purpose of this symposium is to focus on the socio-economic aspects of MPAs and foster communication and exchange of ideas among stakeholders. Submission deadline for proposed papers is December 12. More detailed information on the Symposium will be available on the Web site in the future

**Anderson, D. G.** (1997). Coastal cutthroat trout use of the Redwood Creek Estuary, Redwood

National and State Parks, California. Symp. on Sea-Run Cutthroat Trout: Biology, Management, and Future Conservation, Reedsport, Oregon (USA), 12-14 Oct 1995. *In*: J. D. Hall, P. A. Bisson, & R. E. Gresswell Sea Run Cutthroat Trout: Biology, Management, And Future Conservation. Oregon Chapter. (p. 177). Corvallis, Oregon Usa : American Fisheries Society.

**Abstract:** The Redwood Creek estuary has suffered habitat loss and degradation due to land-use activities, flood-control levees, and artificial breaching. Agricultural activities have degraded water quality and sea-run cutthroat trout streams, and removed riparian vegetation. U. S. Army Corps of Engineers flood-control levees have changed circulation and sedimentation patterns, resulting in 47% of the lower estuary (between 0 and 4 feet [1.2 m] mean sea level) being filled with sediment or becoming isolated from the embayment. Uncontrolled artificial breaching of the beach sand berm to alleviate summer flooding of adjacent land reduces fish rearing habitat in the estuary. Historically, the estuary and its associated tributaries were known for their cutthroat trout fishery. Redwood National and State Parks has conducted estuary beach seining during the summer and fall months to monitor salmonid utilization. Though not found in large numbers compared to juvenile chinook salmon and steelhead, coastal cutthroat trout are present annually and several age classes are represented. For the years 1990 through 1995, cutthroat trout were present in the estuary during the entire period of monitoring, from June through September/October. Age-class composition of 142 cutthroat trout seined in the estuary during summer/fall 1983 was age 1: 0.7%, age 2: 25.4%, age 3: 61.3%, age 4: 12.0%, and age 5: 0.7%. Fork length ranged from 110 to 381 mm, with a mean of 225 mm. Statistical evaluation of electrophoretic data from this anadromous population appears to show that it is composed of nonhybridized individuals. Though degraded, the estuary still serves as important salmonid habitat and demonstrates the value of small coastal estuaries to the coastal cutthroat trout.

**Andrushaitis, G.** (1994). Protection of the Baltic coastal area in Latvia. International Working Group On The Unesco Mab Programme Project "Species And Its Productivity In The Distribution Area". *In*: R. Volskis International Meeting "The Urbanization And The Protection Of The Biocoenosis Of The Baltic Coasts", Juodkrante, 4-8 October 1994, Abstracts. (pp. 21-22). Vilnius Lithuania: Open Society Fund Lithuania. Notes: Summary only

**Abstract:** The Baltic Sea takes an important place in the economics of Latvia. The sea coastline is 500 km long, 247 of them are of the open sea and 253 km of the Gulf of Riga. The coastal zone is a habitat of many rare plant species in Latvia. According to fauna protection, the lakes and bogs are of a particular importance for many birds. The sea coast of Latvian territory is under protection in a 2 km wide zone (in some places 5-8 km), 300 m of beach is under particular protection, as well as 300 m of littoral zone (under water). There is a suggestion to form 4 nature reserves of international importance at the Baltic Sea: 1) a coastal section Pape-Perkone with the largest Furcellaria growths in the Baltic Sea; 2) a coastal section Lielirbe-Kolka - a typical shallow sandy area of Latvian coasts with high biological diversity. The area is next to the region of national interest Liiv Rand and Slitere Nature Reserve with the sound Irbe which connects the Gulf of Riga with the open sea; 3) a coastal section Kaltene-Engure - an important site for wintering and moulting waterfowl; 4) a coastal section Dzeni-Ainazi - a unique area of great diversity of biotops and species. The largest reed growths - "randu" meadows

[Anon.]. (1993). How protected areas can meet society's needs: the social, economic and political issues. Chapter 1. *In*: V. Barzetti Parks and Progress. Protected Areas and Economic Development in Latin America and the Caribbean. (pp. 1-33). Washington, DC: IUCN; Inter-American development Bank.

[Anon. ]. ([s. d. ]). Indonesia: components for effective marine conservation. *In: Proceedings of the 7th International Coral Reef Symposium*. [s. l. ]: [s. n. ]

**Abstract:** The Indonesian Archipelago has a coastline of about 80,000 km, which includes some of the most productive and diverse coastal ecosystems on earth. The Indonesian coastal ecosystems are also among the most heavily exploited, especially where human population densities are high. Three main steps need to be taken in order to execute effective management programs: 1) research the ecological aspects of the reef systems; 2) produce an inventory of adverse human influences; and 3) raise public awareness through participation of communities and politicians. The most effective way to take these steps is by bilateral or multilateral cooperation and a multidisciplinary approach. The components are considered here, using examples from current and proposed activities representing some of the most long term on-going marine conservation programs in Indonesia. ii. This study evaluated a method used by the Republic of France to protect discrete marine areas of shoreline and adjacent coastal waters through designation of sites as marine nature reserves. Although much smaller in size than many national marine sanctuaries in the United States, the reserves in France represent successful efforts to protect and manage coastal marine areas. This is due in part to a high amount of local involvement during the designation process; the use of advisory committees at the reserves, as well as scientific committees that develop and conduct research projects within the sites; and the use of core areas, in which almost all human activities are prohibited or restricted, to promote re-populating of fish communities and to increase species diversity. The initiative for creating the reserves begins at the local level and is coordinated among local officials, user groups, environmental organizations, and the national government. This study describes the legal framework in which the reserves are created and examines aspects of management, scientific research, and law enforcement of a marine reserve.

It has been hypothesized that nature reserves should be as circular as possible to maximize the total number of species conserved. Using multiple regression, this study examined the relationship between species richness on oceanic islands and island shape for 33 data sets. After accounting for the effect of island area, island shape does not explain a significant amount of the residual variation in species number in more data sets than expected due to chance alone. It is concluded that if the mechanisms controlling species richness on oceanic islands and isolated patches of terrestrial habitat are the same, then shape is not of major concern in the design of nature reserves.

Increased human activities in the coastal zone has brought about an increase in user conflicts and marine resource exploitation. This article discusses the advantages of marine reserves, specifically for the enhancement of fisheries populations. The author discusses life history strategies of coral reef organisms and the susceptibility of fishery target species to over-fishing. An overview of problems associated with creating marine reserves is discussed.

Reef species are vulnerable to over-fishing because of their life history characteristics. Various fisheries for reef species have declined worldwide, including the Caribbean, Gulf of Mexico, and U. S. South Atlantic. Traditional. 6 fishery management techniques may not be practical or effectively deal with certain problems, such as by-catch and release mortality. Marine fishery reserves, areas with no consumptive usage, provide an alternative management approach with attractive attributes from a fishery prospective. Marine fishery reserves ~ ~n improve reef fish fisheries by protecting species composition, population age structure, spawning potential, and genetic variability within species. Reproductive output from reserves would help re-supply fished areas by natural egg and larval dispersal. Properly located reserves of adequate size could protect the quantity and quality of reproductive output, reduce recruitment uncertainty due to environmental variation, and ensure against management failure. Substantial empirical evidence shows that protection from fishing has increased fish abundance and availability inside and outside protected areas. A model of the red snapper fishery in the Gulf of Mexico with 20 percent of the habitat protected by reserves, show that total egg production was

potentially 1,200 percent greater than under the status quo. Uncertainties remain concerning the ideal number, location, and size of reserves necessary to achieve management objectives

**Arthur, W.** (1991). Sustainable development possibilities and limitations to indigenous economic development in the Torres Strait. *In: Sustainable Development For Traditional Inhabitants Of The Torres Strait Region*. Torres Strait Baseline Study Conference, Cairns, Qld. (Australia), 19 Nov 1990. Townsville, Qld (Australia): Great Barrier Reef Marine Park Authority Workshop Ser. *Great Barrier Reef Mar. Park Auth.* : Notes: map, 4 tables, 22 ref.

**Abstract:** The social and economic characteristics of the Torres Strait region are briefly described, with emphasis on the possibility of increased islander participation in the non welfare economy, and some of the apparent constraints on such a development. Fishing is the Strait's major productive export industry. The majority of islanders involved in the industry are part time fishers who receive other income in the nature of unemployment benefits and other welfare payments. The structure of the welfare system does not give incentive to reduce dependence upon it. It may, however, be contributing to the fishing industry by in effect limiting the need for increased fishing pressure on limited stocks. There is evidence, moreover, that the attractiveness of the islands as a lifetime home for their indigenes is increasing. Sustainable development may thus depend on broadening the economic base by diversifying, rather than simply intensifying the existing fishing effort to what may be unsustainable levels. Further research is needed into the level of population that the region can economically sustain, rather than simply into the level of fish stocks

**Attwood, C. G., Harris, J. M., & Williams, A.** (1997). International experience of marine protected areas and their relevance to South Africa. *In: South African Journal of Marine Science*, 18, 311-332.

**Abstract:** Marine protected areas (MPAs) have become necessary to counter modern threats to marine biodiversity and the sustainability of fisheries. Sensitive habitats, including coral reefs, estuaries and mangroves, have been effectively protected in large MPAs, which control resource use. Protection from pollution and physical destruction by fishing gear are important functions of MPAs in tropical and temperate regions. MPAs have been used to protect endangered species and to allow population recoveries. The advantages for fishery management include maintenance of spawner biomass, improvement of yield, simplified enforcement, research opportunity, insurance against stock collapse and maintenance of intraspecific genetic diversity. MPAs can be small with narrow, focused objectives, or large with core areas, buffer zones and exploitable areas to provide an integrated management approach. A variety of design considerations, based on ecological, fishery and socio-economic conditions, is presented. Optimal size and spacing have not been extensively tested and only theoretical arguments guide the choice of how much to protect. The process of establishing an MPA can be initiated by local communities or by governmental authorities. The former has better public support, whereas the latter promises a well planned system of MPAs. Community and industry involvement in the establishment process is essential for the effective functioning of MPAs. Successful MPAs are administered by national programmes and managed according to management plans. Monitoring, communication and enforcement are integral components of MPA management. South Africa is party to a number of international conventions which promote the designation of MPAs. Better protection of the physical marine environment, incorporation of MPAs in fishery management procedures and the management of MPAs are the major areas where South Africa can improve its marine protection

**Ayling, A., Ayling, A., & Mapstone, B. D.** (1992). Possible effects of protection from fishing pressure on recruitment rates of the coral trout (*Plectropomus leopardus*: Serranidae). *In: Australian Society For Fish Biology Workshop. Recruitment Processes*. Hobart, 21 August

1991. Canberra, N. S. W. Australia : Australian Government Publishing Service

**Abstract:** An examination is made of data obtained during surveys conducted in the CapricornBunker Group of reefs in 1986 and in the Cairns Section of the Great Barrier Reef Marine Park in 1991 regarding the distribution patterns of the coral trout (*Plectropomus leopardus*). Findings suggest a relationship between fishing protection and recruitment for this species. In the CapricornBunker Group there were almost twice as many coral trout over 35 cm TL on protected reefs as on reefs open to fishing, whereas for those smaller than 35 cm TL there were more than twice as many on fished reefs as on protected reefs. In the Cairns Section more fish were found on the front of protected reefs than on the back, whereas more fish were found on the back rather than the front of the fished reefs

**Baccar, H.** (1984). A regional approach to marine and coastal protected areas: The Mediterranean Sea. *In: J. McNeely, & K. R. Miller National Parks, Conservation, And Development. The Role Of Protected Areas In Sustaining Society. Proceedings Of The World Congress On National Parks, Bali, Indonesia, 11-22 October 1982.* (pp. 438-441). [s. l. ]: [s. n. ].

**Abstract:** This case study demonstrates the importance of the regional approach to protected areas in the Mediterranean region. In the field of marine protection, the United Nations Environment Programme has adopted the regional approach to environmental issues, believing that in this way, efforts could be concentrated on the special problems of each area and all concerned governments would gradually become involved in the safeguarding of their marine environment. Problems of balanced management in the Mediterranean imply that development and implementation of measures to control pollution and monitor protected ecosystems require coordination and intervention at the regional level. The different measures and interventions would cover a series of activities concerning protection of the Mediterranean environment, particularly along the coastal fringe. Among these measures, management of protected areas can only be considered in the context of coordinated action

**Bachert, S.** (1991). Acceptance of national parks and participation of local people in decision-making processes. *In: Landscape Urban Ecol.*, 20(1-3), 239-244. **Notes:** Conf. on the People's Role in Wetland Management, Leiden (Netherlands), Jun 1989

**Abstract:** This paper deals with the acceptance of national parks in the German Wadden Sea by the local people. Examples show both advantages and disadvantages of participation of local people in decision-making processes. Different steps to increase acceptance and effectiveness of protection measures are described. The most important of these are: employ professionals for guarding the protected areas; provide guidelines and plans about the development of the areas and guarantee a steady flow of information, regular meetings and discussions with all people involved; support critical, independent organizations, e. g. non-governmental organizations (NGO)

**Bachert, S., & Wesemueller, H.** (1992). The future of conservation in the German Wadden Sea-policy and management proposals from NGOs. *In: Present And Future Conservation Of The Wadden Sea. Proceedings Of The 7th International Wadden Sea Symposium, Ameland (Netherlands), 22-26 Oct 1990.* Texel Netherlands: Nisr

**Abstract:** Ten years ago there were only a few nature reserves in the German Wadden Sea. Germany was then a developing country with regard to nature conservation. At that time German NGOs gained much support from Dutch conservation groups, especially the Wadden Society. In close cooperation with German NGOs, the WWF took a leading role in mobilising forces to safeguard the threatened Wadden Sea area. As a consequence of the increasing interest for longterm maintenance of this sensitive and unique landscape, two national parks were established in the German federal states of Schleswig Holstein and Niedersachsen in 1985 and

1986

**Baldwin, C.** (1989). Water quality and management in the Great Barrier Reef Marine Park. *In* : Water Science and Technology, 21(2), 267-272. Notes: IAWPRC Conf. on Water Quality and Management for Recreation and Tourism, Brisbane (Australia), 10-15 Jul 1988

**Abstract:** Use of the Great Barrier Reef Region for tourism, the economic value of Reef tourism to Queensland, and the value placed by society on natural settings has been increasing rapidly during the 1980's. The Great Barrier Reef Marine Park Authority has the role of providing for reasonable use of this valuable resource. The concern for reefal water quality is discussed in terms of enhanced nutrient levels in the inshore GBR and the low tolerance of corals to nutrients. Findings of a recent Workshop on Nutrients in the Great Barrier Reef Region are described. This paper summarises the Authority's role in ensuring information exchange, appropriate research, and management in the area of water quality management and tourism

**Baran, E., & Tous, P.** (2000). Artisanal fishing, sustainable development and co-management of resources : analysis of a successful project in West Africa. (pp. iv, 42 : ill., maps). Gland: IUCN.

**Bartlett, A.** (1999). Marine fighting fund to sink government inaction. *In*: Australas Sci Inc Search, 20(3), 25-26.

**Abstract:** In an unusual and controversial move, two leading conservation groups, the Australian Conservation Foundation and the Humane Society International, have teamed up with the Australian Democrats to form a Marine Legal Fighting Fund. The parties to this fund have had recourse to the law, which has been one of the most successful ways in the past to break the cycle of governments responding to problems only by commissioning an endless succession of inquiries, reports and advisory committees. Particular areas where Australia's Minister of the Environment, Senator Robert Hill, seems to have taken note include \$A50 million being spent on ocean policy and some areas previously excluded from the Great Barrier Reef Marine Park now being included, making the laws that apply to the reef applicable over a wider area. In response to the recent CSIRO scientific report, 'Effects of trawling', Senator Hill has threatened to take over fishing regulation from Queensland if it continues not to take enforcement action against illegal trawling.

**Beaumont, J.** (1997). Community participation in the establishment and management of marine protected areas: A review of selected international experience. *In*: South African Journal of Marine Science, 18, 333-340.

**Abstract:** Conflicts between conservationists and people seeking access to land and natural resources have caused widespread criticism of conservation organizations and their activities throughout the world. Over the past decade, however, there has been recognition that the resources within protected areas often form part of the economic, social and political system of rural societies in the vicinity of the protected area. This has led to the emergence of approaches that aim to involve those that are directly affected in the process of establishing and managing such areas. Key aspects of participatory approaches are: (i) the type of relationship between the conservation agency and the role-players concerned; and (ii) the type of benefits that accrue to local people. A typology of participatory approaches is outlined and, through a literature review, case studies are drawn from a number of countries that have consulted users and adjacent communities on the establishment or management of protected areas.

**Beltrán, J.** (2000). Indigenous and Traditional Peoples and Protected Areas: Principles, Guidelines and Case Studies. No. 4. (p. xi + 133). [s. l. ]: [s. n. ].

**Bernier, J., Demers, A., & Maldague, M.** (1980). Le développement rural intégré de la région de Bolama. *In: République de Guinée-Bissau Rapport de la phase 1 : Études et propositions préliminaires. Vol. 2).* Laval, Montréal: Centre de Recherches en Aménagement et en Développement, Université Laval, Québec-Service Universitaire canadien Outre-Mer, Montréal.

**Bishop, K., Phillips, A., & Warren, L.** (1995). Protected for ever ? Factors shaping the future of protected areas policy. *In: Land Use Policy, 12(4), 291-305.*

**Abstract:** Protected areas - such as national parks and nature reserves - are a well-established tool of conservation policy. At least 24 separate types of protected areas exist in the UK, and more may be added. While protected areas must remain a central feature of international, national and local conservation effort, there are pressures for change and for reviewing the system of protected areas which we have inherited from the past. Any review should take into account some new thinking about the nature of protected area systems. There are five aspects in particular: new proposals for categorizing protected areas by the objectives of their management; the development of the concept of 'networks' of protected areas; the elaboration of a geographical hierarchy of protected areas; the converging policy objectives of different kinds of protected areas; and the broad objective of integrated management of human activities along substantial lines.

**Bonner, W. N.** (1986). Seals in the human environment. *In: Ambio, 15(3), 173-176.*

**Abstract:** Seals have a long association with man. They provide subsistence products for primitive communities and commercial harvest for industrialized societies. Seals have generally been perceived as damaging to fisheries; fisheries also have adverse effects on seals by possible competition with them for food and through by-catch. Entanglement with "ghost-nets" and other debris is a significant but unquantifiable cause of seal mortality. Pollutants in the marine environment are also damaging to seals and habitat destruction and disturbance can be locally significant. However, in general prospects for seals are good. Research is adding to the information base needed for scientific management of seal populations.

**Borrini-Feyerabend, G.** (1999). Collaborative management of protected areas. Part V Developing new models for protected areas management. *In: S. Stolton, & N. Dudley (ed.), Partnerships for Protection New strategies for planning and management for protected areas. (pp. 225-234). U. K. : Earthscan Publications Ltd.*

**Borrini-Feyerabend, G.** (1996). Collaborative management of protected areas: tailoring the approach to the context. (p. 58). Gland: IUCN.

**Borrini Feyerabend, G.** (1997). Gestion participative des aires marines protégées: l'adaptation au contexte. (p. 79). [s. l. ]: UICN.

**Borrini Feyerabend, G.** (1998). Managing marine protected areas in partnership with communities. *In: Salm, R. ; Tessema, Y. Partnership for Conservation Report of the Regional Workshop on Marine Protected Areas, Tourism and Communities. Nairobi Kenya: IUCN EARO.*

**Abstract:** There are a number of concrete benefits to be expected from community involvement in managing marine protected areas (MPA). The term collaborative management is used to describe a situation in which some or all relevant stakeholders in a MPA are involved in a substantial way in management activities. In this sense, a management partnership with a local community is a form of collaborative management between the MPA authority and the community, and possibly other stakeholders. The paper presents the possible steps in

developing a management partnerships with a local community.

**Borrini Feyerabend, G.** (1997). Manejo participativo de areas protegidas: adaptando o metodo ao contexto. (p. 67). [s. l. ]: UICN.

**Broadwater, J. D. et al.** (1997). Applying modern technology to save a historic warship: The Monitor National Marine Sanctuary. Proceedings Of Oceans '97. Volume 1. Oceans '97, Halifax, NS (Canada), 6-9 Oct 1997. (p. 766 pp). Washington: Marine Technology Society; IEEE.

**Abstract:** On March 9, 1862 the ironclad warships USS Monitor and CSS Virginia (ex-USS Merrimack) fought to a draw at Hampton Roads, Virginia, in one of the most recognized sea battles in history. Now, 135 years later, the Monitor is fighting a losing battle against both natural and human threats. The Monitor's hull, lying in 230 ft. (71 m) of water off Cape Hatteras, North Carolina, is deteriorating at an alarming rate. The National Oceanic and Atmospheric Administration (NOAA) is responsible for the Monitor which, in 1975, was designated America's first National Marine Sanctuary. As a result, NOAA is aggressively applying comprehensive planning strategy and ocean technology to the problem of protecting the Monitor

**Byrne, P.** (1998). Comment on participation by the tourism sector in marine protected areas management in Tanzania. *In:* Salm, R. ;Tessema, Y. Partnership for Conservation Report of the Regional Workshop on Marine Protected Areas, Tourism and Communities. Nairobi Kenya: IUCN EARO.

**Abstract:** These comments represent the perspective of the tourism sector regarding partnership possibilities with government for management of marine protected areas. Drawing from experience on Mafia Island, examples of the type of actions the private sector is able to implement are included. It is recommended that true partnership between government, local people, and tourism industry with clear, agreed roles and responsibilities and equal voting rights, irrespective of the source of funds, be implemented. Decisions would be made through a body similar in function to a company board of directors. Parties not performing would be voted out and their tasks taken over by one of the other parties.

**Cambers, G.** ([s. d. ]). Planning for coastal erosion / eastern Caribbean islands. (also in French and Spanish). *In:* Environment and development in coastal regions and in small islands. APPENDIX III. Forum Contributions up to 30th September 2000.

**Carr, A.** (1984). Sea turtles and national parks in the Caribbean. *In:* J. McNeely, & K. R. Miller National Parks, Conservation, And Development. The Role Of Protected Areas In Sustaining Society. Proceedings Of The World Congress On National Parks, Bali, Indonesia, 11-22 October 1982. (pp. 601-607). [s. l. ]: [s. n. ].

**Abstract:** This paper reviews the conservation difficulties and opportunities involved in sea turtle conservation in the Caribbean, the need for expanded marine sanctuaries to deal with the problem, and the implications of these efforts for world sea turtle conservation. The valuable genetic resources embodied by sea turtles will best be conserved through a combination of appropriate protected areas, particularly nesting grounds, and management of exploitation wherever the species occur.

**Castilla, J. C., & Defeo, O.** (2001). Latin American benthic shell fisheries: emphasis on co-management and experimental practices. *In:* Reviews In Fish Biology And Fisheries, 11(1), 1-30.

**Abstract:** In Latin America the small-scale fishery of marine benthic invertebrates is based on

high-value species. It represents a source of food and employment and generates important incomes to fishers and, in some cases, export earnings for the countries. In the review, we define 2 key concepts: small-scale fishery and co-management. We address the temporal extractive phases which Latin American shellfish resources have experienced, and the corresponding socio-economic and managerial scenarios. We include 3 study cases in which co-management and field experimentation have been used on different temporal and spatial scales: (a) the muricid gastropod (*Concholepas concholepas*) in Chile; (b) the yellow clam (*Mesodesma mactroides*) in Uruguay; and (c) the spiny lobster (*Panulirus argus*) in Mexico. We demonstrate that co-management constitutes an effective institutional arrangement by which fishers, scientists and managers interact to improve the quality of the regulatory process and may serve to sustain Latin American shellfisheries over time. The main factors supporting co-management are: (a) a comparatively reduced scale of fishing operations and well-defined boundaries for the management unit; (b) the allocation of institutionalized co-ownership authority to fishers; (c) the voluntary participation of the fishers in enforcing regulations; (d) the improvement of scientific information (including data from fishers) to consolidate the management schemes; (e) the incorporation of community traditions and idiosyncrasies; and (f) the allocation of territorial use rights for fisheries under a collaborative/voluntary community framework. Chile is identified as an example in which basic ecological and fishery concepts have been institutionalized through management practices and incorporated into the Law. Several factors have precluded shellfishery management success in most of the Latin American countries: (a) the social and political instability, (b) the underestimation of the role of fisheries science in management advice, (c) the inadequacy of data collection and information systems, (d) the poor implementation and enforcement of management practices and (e) the uncertainty in short-term economic issues. In the review, we also show that in Latin America, large-scale fishery experiments are starting to play an important role in the evaluation of alternative management policies on benthic shellfisheries, especially when accompanied by co-management approaches that explicitly involve the participation of fishers. Fisher exclusion experiments have demonstrated changes in unexploited versus exploited benthic shellfish populations and in the structure and functioning of communities. The information has been used by scientists to approach system elasticity. Ecological and fishery related knowledge has been translated into novel co-managerial strategies. The sedentary nature of the shellfish species analyzed in this review allowed localized experiments with different levels of stock abundance and fishing intensity (e. g., marine reserves or maritime concessions versus open access areas). This includes the establishment of closed seasons as de facto management experiments, which proved useful in evaluating the capacity of passive restocking of depleted areas and for the quantification of population demographic features. The precise location of fishing grounds provided reliable area-specific estimates of population density and structure, catch, and fishing effort. This allowed the allocation of catch quotas in each fishing ground. We also discuss the reliability and applicability of spatially explicit management tools. Marine Protected Areas (MPAs) and Territorial User Rights in Fisheries (TURFs) fulfilled objectives for management and conservation and served as experimentation tools. The examples provided in our review include a comparative synthesis of the relative usefulness of alternative spatially explicit management tools under a framework of management redundancy. The cross-linkage between fishery experimental management protocols and the active participation of fishers is suggested as the strategy to be followed to improve the sustainable management of small-scale shellfisheries in Latin America. Finally, we discuss the future needs, challenges and issues that need to be addressed to improve the management status of the small-scale shellfisheries in Latin America, and, in general, around the world. We conclude that for the sustainability of shellfish resources there is an urgent need to look for linkages between sociology, biology and economics under an integrated management framework. Fishers, and not the shellfish, must be in the center of such a framework.

**Castro, G., alfaro, L., & Werbrouck, P.** (2001). A partnership between government and indigenous people for managing protected areas in Peru. *In: Parks*, 11(2), 6-13.

**Cesar, H. et al.** (1997). Indonesian coral reef - An Economic analysis of a precious but threatened resource. *In: Ambio*, 26(6), 345-350.

**Abstract:** Indonesia's coral reefs are currently undergoing rapid destruction from human activities including: poison fishing; blast fishing; coral mining; sedimentation; pollution and overfishing. In this paper, these destructive activities are described and the private gains from these activities accruing to individuals are compared with the associated costs to society. It is shown that the social costs by far outweigh the short-term private gains. Yet, powerful forces have a clear interest in maintaining the status quo of destruction. These forces vary from high risk, high payoff poison fishing to poverty-trap activities such as coral mining. The paper concludes with a discussion on designing appropriate policy responses such as: local threat-based approach; national threat-based approach; integrated coastal zone management; and the use of marine protected areas.

**Chaloupka, M., & Osmond, M.** (1999). Spatial and Seasonal Distribution of Humpback Whales in the Great Barrier Reef Region. *In: Life in the Slow Lane: Ecology and Conservation of Long Lived Marine Animals.* (pp. 89-106). American Fisheries Society *American Fisheries Society Symposium*: Vol. 23.

**Abstract:** The spatial and seasonal distribution of humpback whales in the Great Barrier Reef Marine Park (GBRMP) was defined using data from a systematic aerial surveillance program. The data comprised 414 pod sightings (812 individuals) recorded from July 1982 to March 1996. These sightings were supposedly of humpbacks from the east Australian Group V substock that migrates during the austral autumn from Antarctic feeding grounds to winter breeding grounds in GBR waters. Humpbacks were sighted in all months and throughout the GBRMP. However, most pods (75%) were sighted in southern GBR waters (below 19 degree S) and mainly during winter and spring (July to September). Occasional sightings of humpbacks in northern GBR waters (above 16 degree S) in summer supports previous claims of a substock resident year-round in northern Australian tropical waters. Mother-calf sightings were rare with most recorded below 21 degree S and mainly in August and September. These limited sightings suggest that the main calving grounds for the east Australian Group V substock occur in the extensive southern GBR lagoonal waters defined northward by the Whitsunday Group of islands and reefs and eastward by the Pompey Swains reef complex. An estimate of the crude birth rate was 0.072 (95% confidence interval [CI]: 0.06-0.11) with Monte Carlo estimates of the median calving rate at 0.3 calves per mature female per year (95% CI: 0.22-0.43) and the median interbirth interval at 3.4 years (95% CI: 2.3-4.5) indicating low and variable juvenile recruitment. Nonparametric time series analysis (seasonal and trend decomposition using loess, STL) of monthly humpback sightings showed that the long-term trend in sightings was increasing but that there was significant inter-annual variability in the seasonal abundance of humpbacks in the GBRMP. The STL analysis also suggested that the frequency of sightings increased earlier in winter (June) and later in the season during spring/summer (October to December). Time series regression analysis of the STL-derived trend in sightings suggested that the east Australian Group V substock increased slowly in abundance over the 14 years from 1982 to 1996 at about 3.9% per year (95% CI: 1.9% to 5.7%)—a finding consistent with an estimate of low and variable juvenile recruitment.

**Chape, S.** (2001). An overview of integrated approaches to conservation and community development in the Lao People's Democratic Republic. *In: Parks*, 11(2), 24-32.

**Chong, K. C.** (1997). Establishment of fish sanctuaries and ban on fishing for juvenile fish

(Hilsa jatka) [Project proposal for technical assistance]. *In: Report of the National Workshop on Fisheries Resources Development and Management in Bangladesh, 29 October 1 November, 1995, Dhaka, Bangladesh.* Madras India: BOBP

**Abstract:** Details are given of a project proposal for technical assistance in the establishment of fish sanctuaries and ban on fishing for juvenile fish (Hilsha jatka). Immediate objectives for the fish sanctuaries project include: 1) identify key locations of all major critical brood stock, particularly their wintering and breeding spawning sites; 2) devise appropriate structural measures to reduce fishing effort to an acceptable level, and/or eliminate it entirely, if feasible, in fish sanctuaries; 3) educate the local fishing communities as to the need for, and benefits of, the establishment of fish sanctuaries bioreserves, and devise non structural measures based on community participation and management to protect and conserve fisheries resources in the fish sanctuaries bioreserves, supported by DOF surveillance; and, 4) formulate an operational plan and implement it. Under the proposed jatka fishing ban project, the immediate objectives are as follows: 1) establish, through field surveys, the downstream migration patterns of juvenile Hilsha and the characteristics and level of fishing mortality inflicted upon them; 2) educate the local fishing communities as to the need for, and benefits of, the establishment of a phase by phase ban on jatka fishing and devise non structural measures based on community participation and management to enforce the ban; and, 3) support community based participation in the jatka ban with Department of Fisheries enforcement capability, based on a monitoring, control and surveillance programme for all major rivers and important secondary rivers during the jatka season.

**Cohen, M.** (1995). The South African Natural Heritage Program: A New Partnership Among Government, Landowners, and the Business Sector. Part III Partnerships with Communities. Chapter 29. *In: J. McNeely (ed.), Expanding Partnerships in Conservation.* Washington, D. C. ;Covelo, California: Island Press.

**Coleman, F. C. et al.** (2000). Long-lived Reef Fishes: The Grouper-Snapper Complex. *In: Fisheries*, 25(3), 14-21.

**Abstract:** The American Fisheries Society (AFS) recognizes that reef fishes must be conservatively managed to avoid rapid overfishing and stock collapse because reef fish communities comprise slow-growing, late maturing fishes such as groupers and snappers. Therefore, the Society recommends that for such species, fishing mortality should be maintained at or near natural mortality. In addition, AFS cautions that an imbalance in the normal sex ratio may occur rapidly during harvesting of many reef fishes, thus leading to stock collapse because many reef fish species mature first as female but then become male later in life; most of the older, larger individuals in the population are male. Thus, conventional management modeling tools such as Spawner Biomass Per Recruit may lead to overly optimistic conclusions and should be used with caution. Many reef fish species form predictable, localized, seasonal spawning aggregations that are very vulnerable to overharvesting. Such aggregations should be protected. The AFS supports the establishment of networks of large Marine Protected Areas and the development of individual transferable quotas, along with more conventional management measures to help maintain and restore reef fish populations and their habitats. The AFS encourages its members to become involved by providing technical information needed for protection of long-lived reef fishes to international, federal, state, and provincial policy makers so decisions are made on a scientific, rather than emotional or political, basis.

**Collie, J.** (1998). National perspective of marine protected area management in Seychelles. *In: Salm, R. ;Tessema, Y. Partnership for Conservation Report of the Regional Workshop on Marine Protected Areas, Tourism and Communities.* Nairobi Kenya: IUCN EARO.

**Abstract:** Marine national parks in Seychelles are managed by the Marine Parks Authority. It is a publicly accountable and service oriented body that aims to respond effectively to the concerns of stakeholders. Within this framework, there is presently only a limited public participatory role for coastal communities in marine protected areas (MPAs) in Seychelles. Coastal communities have no direct role in tourism activities in MPAs, although commercial operators employ locals. Collaborative management will be facilitated when the policy to delegate management to the user is clearly defined, when logistics allow a regular dialogue with stakeholders, and when a schedule of financial support is secured.

**Colwell, R. R.** (1993). Biodegradation of oil in the open ocean. *In: Workshop on the Use of Bioremediation for Oil Spill Response in the Great Barrier Reef Region, Townsville, Qld (Australia), 25 Feb 1991.* Townsville, Qld (Australia): Great Barrier Reef Marine Park Auth.

**Abstract:** The American Society for Microbiology convened a panel of experts to respond to a request from the Environment Protection Authority for advice on the current state of the science of biodegradation of oil in the open ocean. Some of the major points in the response were as follows. Microbial degradation of petroleum is a natural process that can be enhanced. Addition of microorganisms to the open ocean should not cause significant adverse environmental effects. Bacterial emulsification of oil does not have the disadvantage of toxicity that attends the use of chemical dispersants. However, methods for the effective application of materials of any kind in the open ocean, given the often turbulent conditions, are not often tested, and there is little direct evidence for the effectiveness of bioremediation under such conditions. Even in the most favourable situations, enhanced biodegradation of complex hydrocarbons takes weeks to months. Hence the potential for bioremediation at sea is virtually unknown, is probably limited, and at best will be a long-term expedient.

**Costanza, R. et al.** (1999). Ecological economics and sustainable governance of the oceans. *In: Ecological Economics*, 31(2), 171-187.

**Abstract:** This paper is an introduction and synthesis of the papers that appear in this special issue devoted to the sustainable governance of the oceans. The special issue contains papers on various aspects of the problem, including: the ecological and economic importance of the oceans, the problems facing the oceans from an ecological economics perspective, the links between science and policy, the rationale for sustainable ocean governance, and examples of sustainable institutions and governance structures. We developed the 'Lisbon principles' of sustainable governance (responsibility, scale-matching, precaution, adaptive management, full cost allocation, and participation) as a core set of guidelines for sustainable ocean governance. We then describe the major problems facing the oceans in terms of how the principles are violated, and evaluate some suggested institutions in terms of how the principles are incorporated.

**Cox, K. W.** (1995). Stewardship: Landowners as Partners in Conservation. Part III Partnerships with Communities. Chapter 28. *In: J. McNeely (ed.), Expanding Partnerships in Conservation.* Washington, D. C. ; Covelo, California: Island Press.

**Davis, D., & Tisdell, C.** (1995). Recreational scuba-diving and carrying capacity in marine protected areas. *In: Ocean & Coastal Management*, 26(1), 19-40.

**Abstract:** Marine protected areas (MPAs) are declared principally to protect biological and environmental values in areas where such values are special. The declaration of MPAs is well accepted and widely used in a number of countries. Many recreation pursuits rely heavily upon marine resources, and marine-based tourism is growing at a significant rate. Scuba-diving is one recreational pursuit which is experiencing greater participation rates. Consequently, conflicts between recreation and conservation may occur in multi-use MPAs, with scuba-divers

impacting the natural environment on which the sport relies. Heavy usage by scuba divers also reduces amenity values in MPAs. The evidence is that critical social and biological thresholds exist. Above these thresholds amenity values are reduced severely, while biological impacts may also become significant. The interrelationships between amenity and biological values are worthy of further research to identify biological and social carrying capacities in MPAs and, subsequently, to formulate suitable management responses to reduced MPA values.

**Diop, E. S., Soumaré, A., & Diouf, P. S.** (1999). A perspective on integrated management of a tropical coastal area: The case of the Saloum Biosphere Reserve (Senegal, West Africa). *In: Coastal Management*, 27(4), 317-328.

**Abstract:** The Senegalese government is establishing a strategy of multiple use within its coastal protected areas, with community participation in its management. This ongoing study is based on the identification and analysis of natural and human effects on Saloum Biosphere Reserve (Senegal), which is also a Ramsar Wetland area. This article points out a few nonrestrictive orientations for integrated management of the protected area and its surroundings. The main objectives of the current management plan are: a permanent monitoring process of the natural resources; training and information about the positive effects of a sustainable conservation strategy; setting up strategies that could improve the living standards of local communities; and promotion of an institutional framework for better management of the biosphere reserve with all actors' participation.

**Done, T., & Reichelt, R. E.** (1998). Integrated coastal zone and fisheries ecosystem management: Generic goals and performance indices. *In: Ecological Applications*, 8(1), S110-S118.

**Abstract:** Integrated Coastal Zone Management activities such as catchment rehabilitation and marine protected areas are legitimate components of fisheries management. Their goal is to improve the environment and circumstances for the production of reproductive surplus in fisheries through maintaining habitats, ecosystem processes, and biodiversity. However, while concepts of ecosystem processes and biodiversity are laudable, they provide little if any guidance for management actions meant to sustain them. Difficulties in implementation are partly due to lack of information, understanding, and communication of ecosystem concepts among scientists, managers, and fishers. Here, we describe indices whose function is to report progress towards desired ecosystem outcomes recognizable to society at large. One such outcome is the extent to which management reverses shifts from long-lived to short-lived organisms, from mature to immature individuals, and from higher to lower trophic levels. Several generic indices incorporating this and other elements of habitat protection embracing ecological concepts of "representativeness," "successional stage," "alternate states," and "conservation status" are proposed for marine protected area selection and for monitoring trends in the large marine ecosystems of which fisheries are a part. Specific and realistic goals would need to be defined by fishers and other stakeholders in particular coastal areas.

**Dower, M.** (1995). Working with People Who Live in Protected Areas Part III Partnerships with Communities. Chapter 25. *In: J. McNeely (ed.), Expanding Partnerships in Conservation*. Washington, D. C. ;Covelo, California: Island Press.

**Drake, S. F.** (1996). The International Coral Reef Initiative: A strategy for the sustainable management of coral reefs and related ecosystems. *In: Coastal Management*, 24(4), 279-299.

**Abstract:** The International Coral Reef Initiative (ICRI) is a new and innovative strategy developed by countries and nongovernmental partners as a means to implement the recommendations on coral reefs and related ecosystems found in Agenda 21 and other international agreements. The ICRI uses a multilevel (international, national, regional, and

local), participatory (both top-down and bottom-up) approach based on partnerships formed among many different sectors and stakeholders to promote capacity building, research and monitoring, and sustainable use and management of coral reefs and related ecosystems (mangroves and sea grass beds). The ICRI builds on the principles related to coastal zone management and sustainable development-partnership, integration, coordination, and participation. The ICRI has been effective in creating political will and momentum among many different sectors and facilitating the development of an international agenda with priorities for coral reefs. An analysis of ICRI's effectiveness to date is provided along with recommendations for its future success.

**Dugan, J. E., & Davis, G. E.** (1993). Introduction to the International Symposium on Marine Harvest Refugia. *In: International Symposium On Marine Harvest Refugia, San Antonio, TX (USA), 12 Sep 1991.*

**Abstract:** On September 12, 1991, at the 121st annual meeting of the American Fisheries Society, more than 150 fisheries scientists, ecologists, and resource managers shared experiences and forged a link between fishery management and marine protected areas. Thirteen formal presentations on marine reserves and fishery refugia catalyzed a lengthy and far ranging discussion of the potential of refugia as fishery management tools, the strengths and limitations of refugia based management, existing evidence of refugia efficacy, the need for further testing, and design considerations for fishery refugia. The presentations represented a wide variety of ecological and socioeconomic systems, ranging from tropical coral reef in Western Australia, Florida, Bermuda, and the Cayman Islands, through temperate reef systems in California, New Zealand, and South Australia, to arctic systems in the Bering Sea; crustacean and molluscan fisheries were examined as well as those for temperate and tropical reef finfishes.

**Edyvane, K.** (1993). An ecosystem based approach to marine fisheries management. *In: Proceedings. Sustainable Fisheries Through Sustaining Fish Habitat. Australian Society For Fish Biology Workshop. Victor Harbour, SA, 12-13 August 1992.* Canberra Australia : Australian Government Publishing Service

**Abstract:** Large scale, multiple use management is an ideal vehicle to implement and develop a holistic, integrated, ecosystem based approach to fisheries management. Because of the "connected" nature of the marine environment, marine ecosystem management must address both system oriented strategies, to prevent harm from pollution and overuse, and site based strategies to protect habitats or to allocate and separate conflicting use. Large scale, multiple use managed areas, such as marine protected areas (MPAs), provide an ideal tool for implementing such an ecosystem approach to fisheries management. The role of the "fisheries manager" should be to provide input into: (i) the broad strategic approach to ecologically sustainable management; and (ii) tactical habitat management. The goal of the "fisheries manager" should be to ensure the sustainable utilization of species and ecosystems. Inevitably, this will be linked with the maintenance of essential ecological processes and life support systems, and also, the establishment of research and monitoring programs to monitor the effectiveness of management strategies. The challenge for "fisheries managers" will be to redefine and broaden their role as "habitat managers" within a new, integrated, ecosystem approach to management.

**Elliott, G. et al.** (2001). Community participation in marine protected area management: Wakatobi National Park, Sulawesi, Indonesia. *In: Coastal Management*, 29(4), 295-316.

**Fairbairn, T. I. J., & Tisdell, C.** (1992). Marine property rights in relation to giant clam mariculture in the Kingdom of Tonga. *Giant clams in the sustainable development of the South*

Pacific: socioeconomic issues in mariculture and conservation. (pp. 119-133, 6 ref., 2 maps). [s. l. ]: ACIAR.

**Abstract:** Marine property rights in the coastal waters of the Kingdom of Tonga are fairly uncomplicated. Ownership of Tonga's reefs and lagoons, as well as its territorial waters as a whole, is vested in the Crown and has been so since the late 19th century. While such an arrangement effectively took away the traditional and customary rights of local groups over these waters, it allows open access to all Tongans for purposes of fishing, both subsistence and commercial. The main exceptions are certain restricted areas set aside as marine parks. Leases over reef sites for giant clam and other forms of mariculture can be negotiated with the government. The Fisheries Act of 1987 and the Fisheries Regulations of 1989 provide the basic legislative framework for such leases. Specific terms and conditions relating to leases are negotiated under the auspices of the Ministry of Agriculture, Forestry and Fisheries. Under existing legislation, the Minister of Agriculture, Forestry and Fisheries has fairly wide regulatory powers to ensure, among other things, that mariculture, and fisheries in general, proceed along sound lines. Tonga appears to possess many favourable features for giant clam mariculture. The country's many constituent and widely scattered islands support extensive reef and lagoon areas; the necessary legislative and tenurial framework is in place; while public awareness on the potential of clams as a major industry seems to be growing (Tonga's 'giant clam circle' project has contributed in this respect). The Ha'apai Group, with its large reef areas and generally favourable social environment, appears to be particularly well-placed to support a major clam project. For purposes of establishing a commercial clam project, including one with foreign participation, the collaboration of local groups seems to be a vital prerequisite. The involvement of local villagers can be particularly valuable for the policing of project sites to prevent poaching. Collaboration with other local groups also seems necessary, for example, the Fishermen's Association and local government officials.

**Forestell, P. H., & Kaufman, G. D.** (1994). Resource managers and field researchers - allies or adversaries?. Townsville, Qld Australia: Great Barrier Reef Marine Park Authority Notes: 16 ref.

**Abstract:** As the public demand for access to marine creatures in their natural habitat increases, so will the challenge for resource managers to balance public appetite on the thin edge of ecosystem integrity. In co-ordinating frequently mis-matched agenda of the public, commercial interests, conservationists, endangered species and threatened habitats, resource managers need input from many sources. Ways in which marine mammal field researchers can facilitate the task of resource managers in permitting public participation while limiting the degree of negative impact are discussed.

**Franzosini, C. et al.** (1990). Il Parco Marino di Miramare: A marine nature reserve in the Adriatic. In: Br. Phycol. J., 25(1), 88. Notes: Summary only.

**Abstract:** The marine park of Miramare, on the northern Adriatic coast of Italy, near Trieste, was founded by the World Wildlife Fund in 1973. It was recognized as a national reserve by the Italian Government in 1982 and became operational in 1986. The park was the first marine reserve established in Italy and is the only one currently operative. The area of the reserve is only 30 hectares, but contains a representative range of the flora and fauna of the Adriatic. A report on the macroalgae of the park, published in 1987, recorded 21 species of Rhodophyta, 16 species of Phaeophyta and 11 species of Chlorophyta. Another study, based solely on field observations made in the reserve and published in 1988, reported 16 species of Rhodophyta, nine species of Phaeophyta and four species of Chlorophyta.

**Gadgil, M., & al.** (1993). Special issue. Biodiversity: ecology, economics, policy. In: Ambio, 12(2-3), 61-172.

**Abstract:** Publication of this special issue was partly supported by SAREC (Swedish Agency for Research Cooperation with Developing Countries) and SIDA (Swedish International Development Authority). Seventeen papers are included on various aspects of biodiversity in relation to sustainability and conservation worldwide. Solutions are briefly explored in 4 categories of degraded land, reserved forests, shifting cultivation, village common land and cultivated land.

**Gadgil, M., Berkes, F., & Folke, C.** (1993). Indigenous knowledge for biodiversity conservation. *In: Ambio*, 12(2-3), 151-156; 41 ref. **Notes:** Special issue. Biodiversity: ecology, economics, policy

**Genolagani, J. M. G.** (1984). An assessment on the development of marine parks and reserves in Papua New Guinea. *In: J. McNeely, & K. R. Miller (eds), National Parks, Conservation, And Development. The Role Of Protected Areas In Sustaining Society. Proceedings Of The World Congress On National Parks, Bali, Indonesia, 11-22 October 1982.* (pp. 322-329). [s. l.]: [s. n.].

**Abstract:** The Papua New Guinea National Parks Service has tried since the early 1970s to establish marine protected areas. This development, however, has made very little progress in establishing additional reserves due to the traditional ownership systems, limited manpower and finance, and lack of enforcement and training. This account is an assesment of the problems in establishing marine parks and reserves, while discussing preliminary needs, actions and future developments and support that is needed. Within this framework, a case study on the proposed Horseshoe Reef-Tahira Marine Park is presented. The experience of the Horseshoe Reef Marine Park is then discussed to identify appropriate actions and support that is needed for marine conservation on a national scale.

**Ghimire, K. B., & Pimbert, M. P.** ([s. d. ]). Social change and conservation: an overview of issues and concepts. *In: K. B. Ghimire, & M. P. Pimbert Social change and conservation: Environmental politics and impacts of national parks and protected areas.* (p. [45]). [s. l.]: [s. n.].

**Gjerde, K. M., & Ong, D.** (1993). Protection of particularly sensitive sea areas under international marine environmental law. *In: Marine Pollution Bulletin*, 26(1), 9-13. **Notes:** Int. Meet. of Legal Experts on Particularly Sensitive Sea Areas, Hull (UK), 20-21 Jul 1993

**Abstract:** An international group of legal experts met at the University of Hull to discuss the emerging concept of Particularly Sensitive Sea Areas (PSAs). The PSA concept has been developed at the International Maritime Organization (IMO) to promote international recognition and protection of significant marine areas vulnerable to the effects of maritime activities. The Experts Meeting reviewed existing mechanisms under international maritime and marine environmental law for protection of sensitive areas in order to identify any shortcomings in this field. The experts generally concluded that the PSA concept could serve as an important vehicle to enhance integrated management of marine protected areas but that it required further development to achieve this purpose. Existing legal instruments may need to be amended and new mechanisms created.

**Gladstone, W.** (2000). The ecological and social basis for management of a Red Sea marine-protected area. *In: Ocean & Coastal Management*, 43(12), 1015-1032.

**Abstract:** The Farasan Islands in the southern Red Sea of Saudi Arabia have nationally and internationally significant conservation values, and are important for a range of marine-based resource uses. In preparation for the establishment of a marine protected area around the Farasan Islands and its management, surveys were undertaken to assess the state of the coastal

and marine resources, and the issues associated with human activities. Stakeholders were interviewed about issues and their attitudes towards the proposed protected area, and constraints to planning and management were identified. Marine habitats included seagrass beds, mangroves, and extensive areas of fringing reef dominated by a diverse coral community or a mixture of coral and macroalgae. Although used for a diverse range of human activities (fishing, shipping, transport, military purposes, recreation, waste dumping, sand extraction) impacts were minimal and localized. The most immediate threat to the marine resources was over-exploitation by fisheries. The types of management activities appropriate to the MPA, and the scale of management, were constrained by a number of unique and important factors: declines in national financial support for conservation efforts, a lack of trained personnel, difficulties in attracting staff to this remote location, loss of community support, the absence of a tourist base from which economic instruments could be developed, and the lack of local non-governmental organizations. Management recommended for the Farasan Islands Marine-Protected Area included zoning, community participation in management, public awareness, and training as a first step, followed by site-specific management actions, research and monitoring, and infrastructure development.

**Goodridge, R. et al.** (1997). Changes in the Shallow Reef Fishery Associated With Implementation of a System of Fishing Priority and Marine Reserve Areas in Soufriere, St. Lucia. Proceedings of the Gulf and Caribbean Fisheries Institute. Christ Church (Barbados), Nov 1996. Vol. 49, Chap. 316-353. [s. l. ]: [s. n. ].

**Abstract:** Conceptually, Marine Protected Areas (MPAs) are a good fishery management tool, since they are known to help protect reef habitat; allow for recovery of fish population abundance, increases in individual fish size and thus fecundity; and allow for restoration of a climax community structure, within the boundaries of the MPA. However, there are few documented cases, to date, where MPAs have been shown to actually benefit surrounding reef fisheries. The Soufriere Marine Management Area (SMMA), spanning an 11 km stretch of the central west coast of St. Lucia, opened on August 1, 1995, and comprises a series of zoned fishing priority and marine reserve areas. It is the first example in the Caribbean of a serious attempt at complex co-management of nearshore marine resources, striving to integrate management of these resources for the benefit of several (often conflicting) users. Monitoring the effects of the SMMA zoning not only on the resources themselves, but also on the resource users is therefore all the more important. This paper reports on the effects of the SMMA zoning on the shallow reef fishery in Soufriere by documenting changes in catch rates and in fisher behavior, including the areas fished, the types of fishing gears used, and the distribution of fishing effort, which have occurred with the implementation of the SMMA.

**Gourbesville, P., & Thomassin, B. A.** (2000). Coastal environment assessment procedure for sustainable wastewater management in tropical islands: the Mayotte example. *In: Ocean & Coastal Management*, 43(12), 997-1014.

**Abstract:** The recent evolution of the coastal environment is characterized by an increase of human potential impacts: coastal zone is located at the cross-road of sectoral issues which give rise to a number of often competing uses. Today, the main challenges in the coastal environment management are not derived from "technical problems" but correspond to the global coastal management and to the means to harmonize the different uses. This new approach has generated the need to apply systemic concepts which are able to describe and analyze large and complex systems. In the coastal zone and especially in sensitive environments such as tropical island surrounded by coral reefs, lagoons or boat channels one of the major challenges is to conciliate the waste waters and pipe outfalls management and the ecological preservation. The paper presents the results which have been obtained with a global approach for the definition of a sustainable wastewater management strategy in highly sensitive

coastal areas located in Mayotte, (Comoros archip, Indian Ocean). This example allows to explain and identify the necessary tools and essential procedures as hydrodynamic modelling or public participation. From this application, a procedure for a coastal environment assessment procedure is formulated and proposed.

**Greiner, R. et al.** (2000). Incentive instruments for the sustainable use of marine resources. *In: Ocean & Coastal Management*, 43(1), 29-50.

**Abstract:** The Australian Government recently ratified the "Oceans Policy" which provides a policy framework to effectively manage the resources and uses of the Australian Exclusive Economic Zone. The Oceans Policy is to be implemented through Regional Marine Plans that are based on the notion of large marine ecosystems and have the objective to integrate sectoral commercial interests and conservation objectives. This paper makes a theoretical contribution to the development of Regional Marine Plans which will demand the specification of detailed policies for regulating the various marine uses and impacts in the respective marine regions. The paper discusses a wide range of policy instruments and exemplifies their potential role for the management of marine resources and uses. The term incentive instrument includes financial and economic instruments as well as legal and regulatory instruments, education, co-management, voluntary approaches, community-based mechanisms and research. A set of criteria is established for the evaluation of individual incentive instruments. They are further placed in the context of a series of principles for policy design. The paper explores potential management instruments to: improve water quality of streams, estuaries and oceans, create sustainable fisheries, ensure sustainable marine tourism and recreation, manage conflict between user and interest groups, ensure environmentally sound marine transport and petroleum exploration and mining.

**Guenette, S., Chuenpagdee, R., & Jones, R.** (2000). Protected Areas with an Emphasis on Local Communities and Indigenous Peoples: A Review. *In: Fisheries Centre Research Reports*, 8(1), 56.

**Gurung, C. E.** (1995). People and Their Participation: New Approaches to Resolving Conflicts and Promoting Cooperation. Part III Partnerships with Communities. Chapter 26. *In: J. McNeely (ed.), Expanding Partnerships in Conservation*. Washington, D. C. ;Covelo, California: Island Press.

**Gutierrez-Carbonell, D., & Bezaury, C. J. E.** (1993). Manejo del sistema arrecifal de Sian ka'an. *In: S. I. Salazar-Vallejo, & N. E. Gonzalez Coastal And Marine Biodiversity Of Mexico. #Biodiversidad Marina Y Costera De Mexico.* (pp. 772-786). [s. l. ]: [s. n. ].

**Abstract:** The limits of the marine portion in the Sian Ka'an Biosphere Reserve were reviewed. Marine boundaries excluded some coral formations, and marine core zones do not include the most important portions of the reef. We propose changes in boundaries and zoning for the marine portions of the Reserve. The proposed boundaries are modified to include all the reef system and to simplify navigation. Cayo Culebras should be eliminated as a marine core zone, since actual use makes it inoperative; some nesting sites in the core zone should be considered as a "special interest area" (frigate bird colony and Cays). Three marine core zones are suggested to protect 12. 3% of the marine environment instead of the current 2. 5%. Buffer zones are subzoned into a zone for "integrated management of marine resources" and another for "integrated management of tourism" to accommodate present and foreseen uses. Finally, management guidelines for each zone are presented.

**Guzman, H. M., & Guevara, C. A.** (1998). Arrecifes coralinos de Bocas del Toro, Panama: II. Distribucion, estructura y estado de conservacion de los arrecifes de las Islas Bastimentos,

Solarte, Carenero y Colon. *In: Revista De Biología Tropical*, 46(4), 889-912.

**Abstract:** The distribution and conservation status of coral reefs along the northern section of the archipelago of Bocas del Toro were evaluated, and the structure of 18 reefs around the Bastimentos, Solarte, Carenero and Colon Islands was described. Reef habitats located on the seaward side of the islands exhibited the lowest coral cover (8%) and coral diversity, while leeward reefs showed the highest living coral cover (32%) and diversity. Macroalgae coverage was similar in both habitats but high (50%) if compared with other continental reefs described in the Ensenada Grande of Almirante Bay (4%). A total of 54 coral species was recorded, representing a 35% increase from previous studies for the region and 88% of the total species described for Panama. The diversity of reef organisms and habitats in the archipelago was greater outside the National Park of Bastimentos Island, the only marine protected area in western Panama. Some recommendations were provided for an integrated management of marine-terrestrial natural resources.

**Haymes, J.** (1998). Involving communities in managing protected areas: contrasting initiatives in Nepal and Britain. *In: Parks*, 8(1).

**Abstract:** Dartmoor National Park (England) and the Royal Chitwan National Park (Nepal) have entered into a partnership agreement under the auspices of the Europarc Partnership and Exchange Programme. This paper concentrates upon the critical area of communication between park authorities and local communities, in securing the conservation and management of protected areas. It contrasts the current efforts to promote local involvement in park management in Nepal, through the direct redistribution of park income to the local communities, with the changes in representation upon British national park authorities, designed to increase local democracy and local involvement in decision making.

**Holmlund, C. M., & Hammer, M.** (1999). Ecosystem services generated by fish populations. *In: Ecological Economics*, 29(2), 253-268.

**Abstract:** In this paper, we review the role of fish populations in generating ecosystem services based on documented ecological functions and human demands of fish. The ongoing overexploitation of global fish resources concerns our societies, not only in terms of decreasing fish populations important for consumption and recreational activities. Rather, a number of ecosystem services generated by fish populations are also at risk, with consequences for biodiversity, ecosystem functioning, and ultimately human welfare. Examples are provided from marine and freshwater ecosystems, in various parts of the world, and include all life-stages of fish. Ecosystem services are here defined as fundamental services for maintaining ecosystem functioning and resilience, or demand-derived services based on human values. To secure the generation of ecosystem services from fish populations, management approaches need to address the fact that fish are embedded in ecosystems and that substitutions for declining populations and habitat losses, such as fish stocking and nature reserves, rarely replace losses of all services.

**Horrill, J. C.** (1998). A case study of collaborative management of marine protected areas in partnership with communities. *In: Salm, R. ; Tessema, Y. Partnership for Conservation Report of the Regional Workshop on Marine Protected Areas, Tourism and Communities.* Nairobi Kenya: IUCN EARO.

**Abstract:** Collaborative management plans were formulated by villagers and local government officers in two villages of the Tanga region, Tanzania. The area includes fringe of mangroves, coral reefs, extensive seagrass beds and sand flats. These plans recognise the need to increase reef fish stocks through conservation measures and reduction of fishing pressure on reef stocks. It should be achieved through diversification of fishing activities and reduction in the numbers of fishers. The process of management plan development started with a series of workshops

where villagers and government personnel together identified critical issues, their perceived causes, and possible solutions to resolve them. At the same time, participatory socioeconomic and coral reef surveys and a study of existing traditional management systems were undertaken. The villagers formed village committees to deal with fisheries related issues. The management plans of both villages have been implemented fully for less than a year only, and the communities are still learning what their likely implementation problems are and how to resolve them.

**Huntsman, G. R. et al.** (1999). Groupers (Serranidae, Epinephelinae): Endangered Apex Predators of Reef Communities. *In: Life in the Slow Lane: Ecology and Conservation of Long Lived Marine Animals.* (pp. 217-231). Bethesda USA: American Fisheries Society *American Fisheries Society Symposium: Vol. 23.*

**Abstract:** Distributed worldwide in warm water reef systems, groupers display ecological and biological characteristics that engender overharvest and, in extreme cases, endangerment to particular species. Most of the larger groupers have low natural mortality rates, reach maturity and maximum size slowly, are inherently rare, move little as adults, often aggregate to spawn at locations known to fishers, and are protogynous. The larger groupers of the Atlantic coast of the southeastern United States illustrate the vulnerability of groupers in general and offer reasonable proxies for the condition of many grouper populations throughout the world. The interaction of fishing mortality and protogyny has reduced the frequency of male gag *Mycteroperca microlepis* to 6% from more than 20% in 1973 and the spawning potential ratio (SPR) based on male biomass to 0.03 (from 1.0 in the unfished population). Reproduction in the protogynous red porgy *Pagrus pagrus* failed when the male SPR fell below 0.10. For the speckled hind *Epinephelus drummondhayi* in 1990 the numerical population was 10%, the population biomass was 5%, and the biomass of mature fish was 2% of that existing in 1973. The Warsaw grouper *E. nigrurus* is now so rare that too few individuals are measured to assess the population status. Jewfish *E. itajara* and Nassau grouper *E. striatus* are so rare as to be totally protected from harvest. The marbled grouper *E. (Dermatolepis) inermis* may not be overfished but is so inherently rare that its population status is a mystery. Of the several potential management schemes for groupers only the implementation of a system of marine reserves solves all the complex problems of managing these valuable fishes.

**Hutchings, P., Payri, C., & Gabrie, C.** (1994). The current status of coral reef management in French Polynesia. *In: Marine Pollution Bulletin, 29(1-3), 26-33. Notes: Special issue: The Pacific reefs: A paradise lost?*

**Abstract:** The current status of French Polynesian coral reefs is reviewed with respect to the resources, both renewable and non-renewable, which are extracted from the reef areas. The various factors impacting on the reefs such as sewage, land run-off, overfishing, industrial and agricultural effluent, and tourism are discussed together with any legislation controlling these activities. The three marine reserves and the protected species legislation are reviewed together with comments on the latest planning initiative which potentially will allow an integrated approach to coastal zone management to occur. Finally, the problems of the lack of enforcement of existing legislation are discussed and the real need for a more effective integrated management of the reefs. Currently much of the economy of French Polynesia is largely dependent upon reef resources, such as tourism, fisheries and pearl culture and, therefore, the maintenance of "healthy reefs" is vital, and yet little enforcement of even existing legislation appears to be occurring; this is despite the reefs of French Polynesia being better known than many other reefs in the South Pacific.

**Jackson, T.** (1998). Integrated coastal management: A concept in practice in central California through the Monterey Bay National Marine Sanctuary. *California and the World Ocean '97, San*

Diego, CA (USA), 24-27 Mar 1997. In: O. R. Magoon, H. Converse, B. Baird, & M. Miller-Henson (eds), Taking a Look at California's Ocean Resources: An Agenda for the Future. Vol. 1 (pp. 594-599). Reston: ASCE.

**Abstract:** The Monterey Bay National Marine Sanctuary (MBNMS) encompasses over 5,000 square miles of ocean area along the California coast between San Francisco and Cambria. The overall goal of the program is to protect and enhance natural resources in a wide array of habitats within its boundaries. MBNMS achieves this goal through a responsive integrated coastal management approach that promotes cooperation between the Sanctuary office and other public agencies and capitalizes on the expertise of individuals and interest groups that share a common interest in preserving the natural resources of the Sanctuary. The structure of the program involves integrating a small Sanctuary staff with various management agencies and interest groups. An example of this integration includes coordination with the Sanctuary Advisory Council, made up of twenty-four representatives from public agencies and user interests plus specific working groups for research (22 marine institutions), education (20 educational institutions) and conservation (15 conservation organizations). The Sanctuary also is involved in developing a water quality protection program for the region that presently involves twenty-seven different agencies plus interest groups. Additionally, the public has opportunities for input into the program through council meetings, through representatives from working groups or council members, and through contact with Sanctuary staff. The MBNMS program is linked nationally with eleven other Sanctuaries and twenty-six Estuarine Research Reserves through the Sanctuaries and Reserves Division in Washington DC. This integrated approach has addressed numerous issues ranging from assessing former military exclusion zones and improving water quality to facilitating multiple resource use conflicts such as shark chumming. In this manuscript, I will outline the structure and process of the MBNMS integrated management approach and provide examples of resource management issues that have been addressed.

**Jagannatha Rao, M., David, P. V., & Shanmugaraj, T.** (1998). Community-based marine resources management in the Gulf of Mannar Biosphere Reserve. In: Bay of Bengal News, 2(10), 25-28.

**Abstract:** Designated a national biosphere reserve, the Gulf of Mannar and its 3,600 species of plants and animals constitute a biologically rich coastal region -- one of the richest in all of mainland India. Management of this reserve (GOMMBRE) is presently being strengthened through a project sponsored by GEF, UNDP and the Government of India, implemented by the M. S. Swaminathan Research Foundation. The primary goal of this project is to improve the welfare of local, regional and national communities while restoring the ecological qualities of the area. Present threats to the Gulf's marine resources are highlighted. Resources management and 'people's participation' in management of biosphere resources are discussed, considering also mechanisms for community participation.

**Jansen, E. G., Abila, R. O., & Orwino, J.** (1998). Constraints and opportunities for "community participation" in the management of Lake Victoria fisheries. (p. 37). Oslo: Centre for Development and the Environment.

**Janzen, D. H.** (2001). Good fences make good neighbours: Area de conservacion Guanacaste, Costa Rica. In: Parks, 11(2), 41-49.

**Jeanrenaud, S.** (1999). People-oriented conservation: progress to date. Part III Building stronger alliances with people. In: S. Stolton, & N. Dudley (ed.), Partnerships for Protection New strategies for planning and management for protected areas. (pp. 126-134). U. K. : Earthscan Publications Ltd.

**Johannes, R. E.** (1984). Traditional conservation methods and protected marine areas in Oceania. In: J. McNeely, & K. R. Miller (eds), National Parks, Conservation, And Development. The Role Of Protected Areas In Sustaining Society. Proceedings Of The World Congress On National Parks, Bali, Indonesia, 11 22 October 1982. (pp. 344-347). [s. l. ]: [s. n. ].

**Abstract:** Local fishermen in Polynesia, Micronesia and eastern Melanesia have an understanding of shallow tropical fisheries which can be invaluable to marine resource use planners. Their knowledge is often superior to that obtained from conventional resource surveys. They have also developed traditional methods of conservation that provide a variety of opportunities for those concerned with establishing and managing protected areas. Recognition of traditional fishing rights can be an important factor in protecting fisheries from over-exploitation. An understanding of local traditions is essential for marine resource use planners.

**Jones, P. J. S.** (1999). Marine nature reserves in Britain: past lessons, current status and future issues. In: Marine Policy, 23(4-5), 375-396.

**Abstract:** This paper reviews experiences with voluntary and statutory marine nature reserves in Britain, and considers what lessons can be applied to the designation of 39 marine special areas of conservation that are currently being pursued under the Habitats Directive. It is argued that these experiences indicate that cautious approaches which provide for the meaningful participation of stakeholders can be successful in both achieving nature conservation objectives and promoting cooperation, and that a reliance on statutory powers can exacerbate conflicts and undermine the potential for cooperation. It is concluded that there is a need to put concepts into practice by shifting from the consultation. interpretation paradigm to one based on meaningful stakeholder participation and joint planning if the major opportunity provided by the Habitats Directive is not to be jeopardised.

**Kaplan, I. M., & Kite-Powell, H. L.** (2000). Safety at sea and fisheries management:; fishermen's attitudes and the need for co-management. In: Marine Policy, 24(6), 493-497.

**Abstract:** Safety at sea is a serious issue for the commercial fishing industry; it ranks highly in all assessments of occupational dangers including risk-taking, injuries, and fatalities. This paper examines the impact of fisheries management on safety at sea and the use of fishermen's input in the safety regulatory and management process. Using case study techniques of analysis, 22 boatowners, captains and crew all with a minimum of 10 years experience in the commercial fishing industry and from a common New England port (New Bedford) are interviewed. Findings strongly suggest that regulations that have been primarily designed to reduce pressure on fish stocks may also result in increased pressure on fishermen and decreased safety at sea. Attitudes about the role of the New England Fisheries Management Council and improvements to the safety regulatory and management process particularly with regard to the increased participation by fishermen are also examined.

**Kauffman, K. S.** (1998). The California coast: Of, by and for the people. California and the World Ocean '97. In: O. R. Magoon, H. Converse, B. Baird, & M. Miller-Henson (eds), Taking a Look at California's Ocean Resources: An Agenda for the Future. Vol. 2 (p. 1146). Reston: ASCE.

**Abstract:** In order to adequately protect our marine resources in California it is essential to continue to involve the public. Governmental and educational institutions cannot do that job alone, nor are there sufficient funds available in the public sector. Recognizing the wealth and variety of California's coastal and ocean resources, the complicated interplay of political jurisdictions, and the high expectations on the part of the public, this is our challenge: We must find ways to mobilize and utilize coastal advocates more effectively. We must be ready to channel energies and enthusiasm. We must develop formal structures to plug in willing

volunteers and recruit more. Some existing role models which already provide such structure are the Sanctuary Advisory Council of the Monterey Bay National Marine Sanctuary, the Big Sur Multi-Agency Advisory Council and the Monterey Bay Sanctuary's Water Quality Protection Program. Each serves as an example of integrated management and inter-agency coordination on a variety of governmental levels. Each insists on public involvement and a network of organizational and agency support. Each has a history of successes and recognized achievements. Utilizing California's unique coastal and ocean resources - which include its people - we have the potential to provide global leadership in designing more productive patterns of governance

**Kelleher, G.** (1996). A global representative system of marine protected areas. *In: Ocean & Coastal Management*, 32(2), 123-126.

**Abstract:** The first major phase of the IUCN's program to establish a global representative of marine protected areas was completed with the publication by IUCN of Guidelines for Establishing Marine Protected Areas and, in association with the World Bank and the Great Barrier Reef Marine Park Authority, of the four volume report A Global Representative System of Marine Protected Areas. This latter report lists existing marine protected areas (MPAs) in each of the major biogeographic regions into which the world's coastal seas have been divided and identifies priorities, on both regional and national bases, for establishing new MPAs or for improving management in those which exist but are poorly managed or not managed at all. In addition, general recommendations are made relating to the protection and sustainable use of marine biological diversity and productivity, with particular emphasis on the need for management regimes which provide for integrated management of ecosystems, either by incorporating complete ecosystems in MPAs or by using MPAs as a component of a wider integrated system of planning and management, such as integrated coastal management.

**Kelly, G. C.** (1992). Public participation and perceived relevance as critical factors in marine park management. *In: Proceedings of the 7th International Coral Reef Symposium*.

**Abstract:** The success of management for the conservation of marine resources in a democratic country is directly related to public understanding, sympathy and support. Support for attempted management may derive from a perception of its' relevance to supporting individuals and organizations. The perceived relevance of management arrangements to certain users of marine reserves in five countries was examined. Public communication programs conducted to encourage public support were examined, and common successful components identified. Compliance with regulations as an indicator of public support for management constraints, was compared. Cultural differences in acceptance of the need for a particular style of management should be incorporated into public communication programs

**King, M., & Faasili, U.** (1999). A network of small community-owned village fish reserves in Samoa Part V Developing new models for protected areas management. *In: S. Stolton, & N. Dudley (ed.), Partnerships for Protection New strategies for planning and management for protected areas*. (pp. 235-242). U. K. : Earthscan Publications Ltd.

**King, M., Faasili, U., & Ropeti, E.** (1995). Management strategies for inshore fisheries in tropical Pacific Islands. *In: South Pacific Commission And Forum Fisheries Agency Workshop On The Management Of South Pacific Inshore Fisheries. Manuscript Collection Of Country Statements And Background Papers. Volume 2* (pp. 507-519).

**Abstract:** Reasons for declines in the stock sizes of some Pacific Island lagoon and reef species include overexploitation, the use of damaging and overly-efficient fishing practices and environmental deterioration. In many cases, these have been exacerbated or caused by

inadequate knowledge and poor management practices. An examination is made of such concerns and constraints, offering also possible strategies to address them. The use of previously published data to suggest safe sustainable yields from different types of environments and relative catch rates are recommended to indicate the health of the fish stocks and the need to take appropriate action. An important strategy is to move the focus away from commercial fisheries, and concentrate on subsistence fisheries. The marine environment continues to suffer from the effects of sewage disposal, mangrove clearance, land reclamation and, particularly, siltation in lagoon systems. The use of co-management, between central governments, fisheries authorities, fishers and village communities is an important ingredient in strategies to conserve inshore fish stocks. Nationally imposed fisheries regulations are likely to be ineffective unless they have the support of the community. Innovative ways of ensuring the sustainability of fish stocks include the establishment of community-supported Marine Protected Areas within a village's usual or traditional fishing area.

**Kiwiya, M. A., & Rumisha, C. K.** (1998). Community participation in the establishment and management of marine protected areas: Potential opportunity for sustainable coastal and marine resources management. African Fishes and Fisheries Diversity and Utilisation. (p. p. 368). Grahamstown (South Africa): FISA/PARADI.

**Kousis, M.** (2000). Tourism and the environment; a social movements perspective. *In: Annals of Tourism Research*, 27(2), 468-489.

**Abstract:** This paper provides evidence on local environmental mobilizations against tourism activities in Greece, Spain, and Portugal from the early 70s to the mid 90s. Its ultimate aim is to introduce to the sociology of tourism and environment a social movements approach. The paper focuses on active host community environmental groups and the groups they challenge. It examines these groups' approaches and actions and the impact on tourism, local ecosystems, and sustainable development. The paper further highlights the determining factors of such conflicts and their deeper implications concerning socio-environmental aspects of Southern European societies.

**Kullenberg, G.** (1999). Approaches to addressing the problems of pollution of the marine environment: an overview. *In: Ocean & Coastal Management*, 42(12), 999-1018.

**Abstract:** A review is presented of major international actions taken to address the pollution of the marine environment, from various sources. The actions are put into the context of the third United Nations Convention on the Law of the Sea and the outcomes of the United Nations Conference on Environment and Development 1992, and are related to major issues facing society with respect to the marine environment. These concern governance, institutions, implementation of international agreements, capacity building, as well as impacts on the ocean and needs for research and observations. The need for political will to act is also emphasized.

**Leach, M., Mearns, R., & Scoones, I.** (1999). Environmental Entitlements: Dynamics and Institutions in Community-Based Natural Resource Management. *In: World Development*, 27(2), 225-247.

**Abstract:** While community-based natural resource management (CBNRM) now attracts widespread international attention, its practical implementation frequently falls short of expectations. This paper contributes to emerging critiques by focusing on the implications of intracommunity dynamics and ecological heterogeneity. It builds a conceptual framework highlighting the central role of institutions -- regularized patterns of behavior between individuals and groups in society -- in mediating environment-society relationships. Grounded in an extended form of entitlements analysis, the framework explores how differently positioned social actors command environmental goods and services that are instrumental to

their well-being. Further insights are drawn from analyses of social difference; "new", dynamic ecology; new institutional economics; structuration theory, and landscape history. The theoretical argument is illustrated with case material from India, South Africa and Ghana.

**Love, L., & Gorodezky, L.** (1998). Enhancing education - partnerships that work !. California and the World Ocean '97, San Diego, CA (USA), 24-27 Mar 1997. *In*: O. R. Magoon, H. Converse, B. Baird, & M. Miller-Henson (eds), Taking a Look at California's Ocean Resources: An Agenda for the Future. Vol. 2 (p. 684). Reston: ASCE.

**Abstract:** The Monterey Bay and the Channel Islands national marine sanctuaries are two of twelve marine sanctuaries nationwide under direction of the National Oceanic and Atmospheric Administration (NOAA). The mission of the National Marine Sanctuary Program is to manage marine areas of special national significance to protect their ecological and cultural integrity for the benefit of current and future generations. Mission objectives include conducting research, education and stewardship programs that foster public understanding, support and participation, and promote the ecologically sustainable use of the nation's marine resources. The Sanctuary Program strives to provide leadership and link the assets of governmental and non-governmental organizations to focus people's attention on the need to protect marine resources, and depends for its success upon extensive participation by other agencies and organizations, as well as the public.

**Lowry, K., Pallewatte, N., & Dainis, A. P.** (1999). Policy-relevant assessment of community-level coastal management projects in Sri Lanka. *In*: Ocean & Coastal Management, 42(8), 717-745.

**Abstract:** Community-level coastal management programs are being introduced in some countries as a practical strategy to respond to conditions of poverty and unsustainable resource use practices. Two recently developed Special Area Management (SAM) programs developed in Sri Lanka are part of this international trend. These two SAM programs were assessed to identify planning and early management issues that may be relevant to future projects. This paper examines general issues in assessing community-level projects. The particular focus is on a few issues of general relevance: community participation in the planning process; the adequacy of the boundary; quality of the technical analysis; adequacy of resource management activities; transparency of management decisions; community acceptance of the program; and sustainability of resource management activities.

**Lusigi, W. J.** (1995). How to Build Local Support for Protected Areas Part I Principles of Partnerships. Chapter 3. *In*: J. McNeely (ed.), Expanding Partnerships in Conservation. Washington, D. C. ; Covelo, California: Island Press.

**MacKinnon, K., & Wardojo, W.** (2001). ICDPs: imperfect solutions for imperilled forests in South East Asia. *In*: Parks, 11(2), 50-59.

**Malleret-King, D.** (1998). Benefits of the Kisite marine national park as perceived by stakeholders. *In*: Salm, R. ; Tessema, Y. Partnership for Conservation Report of the Regional Workshop on Marine Protected Areas, Tourism and Communities. Nairobi Kenya: IUCN EARO.

**Abstract:** A study has been carried out to determine if and how no take zones, such as the Kisite Marine National Park, benefit surrounding communities that use marine resources. It provides information on the socioeconomic structures of the different communities, their evolution and how they relate to the park, how they perceive it and how it affected their livelihoods. The degree of resignation, tolerance, and acceptance of the park by the communities seems to vary mainly with the amount of aid received. As the communities differ

greatly in their relationship to the park, they are structurally different and hence should be approached with an understanding of these variables. A park is not always a benefit to the neighbouring communities and it is essential to seek ways to make it beneficial. To improve the current management of the park, coordination of willing partners, education, participation in monitoring, communication, and promotion should be encouraged. It is important to involve the most willing communities, as well as those that are least supportive and accessible.

**Marcovaldi, M. A., & dei Marcovaldi, G. G.** (1999). Marine turtles of Brazil: the history and structure of Projeto TAMAR-IBAMA. *In: Biological Conservation*, 91(1), 35-41.

**Abstract:** Projeto TAMAR-IBAMA, jointly administered by the Government of Brazil and the non-governmental organization Fundacao Pro-TAMAR, has established 18 conservation stations which cover 1100 km of the Brazilian mainland coast (in the states of Sao Paulo, Rio de Janeiro, Espirito Santo, Bahia, Sergipe, and Ceara). In the oceanic islands of Fernando de Noronha, Atol das Rocas, and Trindade, only the first has a permanently staffed station. The program was initiated in 1980 to investigate and implement a program for the conservation of sea turtles. As a direct result of TAMAR's efforts, the harvest of gravid females and of eggs has ceased in all major nesting areas. The success of the program is based on local participation of the fishing villages, including the employment of former egg poachers to patrol the beaches and protect the nests, education programs, and ecotourism. The majority of stations are staffed year round and not only promote the conservation of endangered sea turtles, but also organize community festivals, support local schools and health care facilities, and assist in developing alternative sources of income for residents who once relied on the exploitation of sea turtles. A similar effort to protect coastal feeding areas where incidental capture is high was initiated in 1991.

**Martens, E. E.** (1997). KWS Coastal Wetlands Conservation Project. *In: J. Hoorweg (ed.), Environmental management, research and training in coast province, Kenya*. Chap. 1, (pp. 27-29). Nairobi Kenya : Acts Press.

**Abstract:** The three main coastal wetland biotopes constitute mangrove forests, intertidal seagrass beds and coral reefs. The coastal wetlands support abundant marine life, area refuge for rare or threatened species and are crucial resting and feeding grounds for resident and migratory birds. They have important interrelationships, which are the basis for biodiversity. In addition to being a centre for social, subsistence and recreational activity, wetlands also add to the economy through tourism, fisheries and fisheries products. Because of the inextricable linkage of wetlands to their surrounding systems, their conservation management must be pursued in the context of an integrated approach to environmental conservation and ecologically sustainable development. The main objective of the programme is to promote and facilitate conservation and integrated management of marine protected areas and coast wetlands to safeguard the biodiversity and integrity of ecosystems and their productivity. The overall objective follows the three main goals of KWS which are biodiversity conservation, partnership and nature tourism. The coastal wetland projects, which are funded by the Netherlands government supports conservation and management activities in the marine parks and reserves along the coast. The projects give special attention to endangered species such as turtles, dugongs and also mangroves within and outside protected areas. Other wetland conservation and training programmes funded by the Netherlands are the inland wetlands project based at KWS Nairobi headquarters and training project at Naivasha Training Institute

**Mascia, M. B.** (1999). Governance of marine protected areas in the Wider Caribbean: Preliminary results of an international mail survey. *In: Coastal Management*, 27(4), 391-402.

**Abstract:** In order to develop a regional "profile" of marine protected area (MPA) governance regimes, an international mail survey of MPAs in the Wider Caribbean was conducted. Forty-

two MPA managers - individuals directly responsible for site management - were surveyed regarding the institutional arrangements governing the development and management of a single, specified MPA. Results indicate that Wider Caribbean MPAs were usually established without comprehensive information regarding local biological and socioeconomic conditions. Participation in MPA development and management varied extensively by stakeholder group and by governance process. National government and local groups (resident users, local governments, and local nongovernmental organizations) were the stakeholders most frequently "actively involved" in MPA governance. Efforts to ensure compliance with MPA regulations relied almost wholly upon sanctions and environmental education; incentive-based mechanisms such as skills training, equipment trading, and employment programs were rarely used. Zoning was a commonly employed but not universally adopted management tool. Though further study is necessary to confirm these preliminary data, results from this survey provide the contextual basis for designing and interpreting research into the development and management of MPAs.

**McCloskey, M.** (1978). Marine sanctuaries: two steps forward, one step back. *In: Oceans*, 11(4), 61-62.

**Abstract:** The author reviews the progress in implementation of the Marine Protection, Research, and Sanctuaries Act of 1972 in the United States, and laments the delay in identifying marine sanctuaries authorized by Title III of the act. Only 2 sanctuaries have been established out of 168 recommendations, which is especially surprising since the regulations regarding sanctuaries are very flexible. Criteria considered in potential areas, and amendments to Title III enabling sanctuaries to be established more readily, are outlined. The article concludes with a plea for greater public participation in this matter.

**McLaughlin, R., & Howorth, L. S.** (1991). Mississippi ocean policy study. (p. 117). Ocean Springs (USA): Mississippi-Alabama Sea Grant Consort.

**Abstract:** Contents: Physical and Cultural Setting; Government Structure; State Submerged Lands Jurisdiction; Coastal Zone Management Act and Federal Consistency; Marine Pollution; Offshore Mineral Resources; Oil and Hazardous Substance Spills; Living Resources Management; Marine Recreation; Marine Education and Research; Marine Salvage and Finds; Protected Marine Areas; Management Frameworks for Improved Interstate, Interagency, and Citizen Participation; Model Legislation for Mississippi Ocean Resources Management Planning Act; Mississippi Ocean Policy Survey Results. (DBO)

**McNeely, J.** (1995). *Expanding Partnerships in Conservation*. Washington, D. C. ;Covelo, California: Island Press.

**Abstract:** Protected areas around the globe-national parks, wildlife reserves, biosphere reserves-will prosper only if they are supported by the public, the private sector, and the full range of government agencies. Yet such support is unlikely unless society appreciates the importance of protected areas to their own interests, and the protected areas are well-managed and contribute to the national welfare in a cost-effective way. A crucial foundation for success is full cooperation between individuals and institutions. Based on papers presented at the Nth World Congress on National Parks and Protected Areas, *Expanding Partnerships in Conservation* explores how new and stronger partnerships can be formed between managers of protected areas and other sectors of society. It describes a range of activities currently underway in many parts of the world that are intended to improve conservation efforts at the international, national, and local level. The book will be a valuable resource for anyone involved with establishing new protected areas, improving the management of existing areas, and building more positive relationships with the people who live in and around the protected areas

**McNeely, J., & Miller, K. R.** ((eds.)). (1984). National parks, conservation, and development. The role of protected areas in sustaining society. Proceedings of the World Congress on National Parks Bali, Indonesia, 11-22 October 1982. (p. 825). Washington, Dc Usa : Smithsonian Institution Press.

**Abstract:** Abstracts of the 15 relevant chapters are cited individually.

**Mdodo, R. M.** ([s. d. ]). Reef degradation following mass coral bleaching in Kenya. *In: Proceedings Of Oceans '99. Key Largo Coral Reef Marine Sanctuary literature survey and water quality monitoring program* Washington, D. C. (USA): Marine Technology Society (MTS), IEEE

**Abstract:** Elevated seawater temperature in March and April 1998 caused by the El Niño Southern Oscillation (ENSO) caused mass coral bleaching along the Kenya coast. ENSO event had an effect on the climate of Kenya coast and the Western Indian Ocean region in general, with heavy rains starting in October 1997, and continuing to July 1998. Seawater temperatures in March and April rose to an average 1.5°C above values measured in the same period in 1997, with daytime low-tide highs of over 32 degree C. Coral bleaching is the whitening of corals resulting from the loss of symbiotic zooxanthellae and/or reduction of photosynthetic pigment concentrations in the zooxanthellae. Bleaching was first observed in Kanamai in October 1997 during and after the El Niño rains, most likely due to sedimentation and seawater dilution in the shallow lagoon. In November bleaching was observed in Malindi Marine Park caused by sediment discharge from the Sabaki River. Later, extensive temperature induced bleaching and subsequent coral mortality was observed in mid March 1998 covering the entire coast of Kenya. Over 90% bleaching and mortality was recorded in Mombasa Marine Park, Malindi Marine Park and Kanamai.

**Metcalf, M. C.** (1995). Communities, Parks, and Regional Planning: A Co-Management Strategy Based on the Zimbabwean Experience. Part III Partnerships with Communities. Chapter 31. *In: J. McNeely (ed.), Expanding Partnerships in Conservation.* Washington, D. C. ; Covelo, California: Island Press.

**Monk, K. A.** (2001). The evolution and scope of ICDPs: the example of the Leuser Ecosystem, Sumatra, Indonesia. *In: Parks*, 11(2), 33-40.

**Morin, T.** (2001). Sanctuary Advisory Councils: Involving the public in the National Marine Sanctuary Program. *In: Coastal Management*, 29(4), 327-339.

**Abstract:** Scientists work with marine protected area (MPA) managers to design MPAs that will protect marine resources, maintain biodiversity, promote tourism, and enhance biological production. It has become increasingly clear that scientific input is not the only requisite for ensuring establishment of these areas. Understanding the political institutions and management systems that govern these areas is as important for establishing MPAs as understanding the natural resources in the area. Recent studies have found that the success of establishing and managing MPAs can be attributed to increased public participation in the management process. This article looks at the public's involvement in the management of the U. S. equivalent of MPAs, the National Marine Sanctuaries. In particular, Sanctuary Advisory Councils are examined as one mechanism through which the public can participate in the management of marine sanctuaries. The article concludes with comments on the evolving role of these councils in marine resource management.

**Motongwa, H.** (1998). Poissons et Pêches Africains Diversité et Utilisation. *In: African Fishes and Fisheries Diversity and Utilisation. International Conference for the Paradi Association and The Fisheries Society of Africa, Grahamstown (South Africa), 13-18 Sept 1998.* Grahamstown

South Africa: FISA; PARADI Notes: Summary only.

**Abstract:** Marine fisheries provide food protein, employment and income for the coastal population and the surrounding inhabitants. Both an artisanal and commercial fishery are carried out although the artisanal fishery dominates and supports approximately 6,500 fishermen. Fishing is done in shallow waters using beach seines, traps, fishing lines and cast nets as major gears. During the last decade the total annual marine fish output has varied from 5,000 to 8,000 tons. Approximately 80 percent of the total fish landing come from shallow coastal waters and 18 percent from offshore trawlers. Inshore reef fisheries are at or near maximum sustainable yields, while offshore areas are considered under-exploited. The fisheries have been overshadowed by shoreline and water-dependent tourism activities and the development of residential and commercial establishments. In addition to the traditional fisheries for food production, sport fishing has increased. A small amount of aquarium fish collected for export has been reported in the marine reserves. Marketing of fish is majorly done by middlemen on whom the fishermen also depend for vessels for a price resulting in poor returns. The bulk of the fish landed along the Kenyan coast is to a greater extent consumed locally. Generally, the production of the marine fish and other products has declined in the last two years due to lack of adequate capacity to effectively utilize the Exclusive Economic Zone (EEZ) in the Indian Ocean and the inefficiency in transforming semi-processed fish products to standard finished outputs. In order to assist in fish marketing, fishermen's co-operatives have been encouraged. They are aimed at ensuring fair practices and reasonable returns to the fishermen for their landings

**Munro, J. L.** (1995). Alternative strategies for coastal fisheries rehabilitation. *In: J. L. Munro, & M. C. Balgos (eds.), Artificial Reefs In The Philippines. Chap. 49, (pp. 42-51). Manila, (Philippines): ICLARM.*

**Abstract:** Alternative uses are proposed for financial resources devoted to the construction and installation of coral reefs. These include environmental management and rehabilitation, the development of community-based resource management or co-management systems, the creation of marine protected areas, active management of fish stocks and fisheries enhancement for selected species. The benefits and constraints of these alternatives are evaluated and it is concluded that many of these options should be give priority over the installation of artificial reefs.

**Musick, J. A. et al.** (2000). Protection of Marine Fish Stocks at Risk of Extinction. *In: Fisheries, 25(3), 6-8.*

**Abstract:** The American Fisheries Society (AFS) recommends that regulatory agencies closely scrutinize both marine fish and invertebrate stocks that may be at risk of extinction and take remedial action before populations are threatened or endangered. Initial AFS analyses of marine stocks at risk in North America show at least four primary geographic "hot spots" with stocks at risk - the Florida Keys; the Indian River Lagoon area of Florida; Puget Sound, Washington and adjacent Canadian waters; and the Gulf of California. Further AFS analyses show that certain groups of fishes are particularly vulnerable because they have slow growth and late maturity. Severe population declines have been documented for several snappers and groupers (Lutjanidae, Serranidae) in the Atlantic and the Gulf of California, several rockfishes (Sebastinae) in the Pacific, and some sharks (Selachei), skates (Rajidae), and sawfishes (Pristidae). Regulatory agencies should be apprised that these groups are extraordinarily vulnerable, and priority management should be given to these species. The greatest threat to many long-lived marine species may be bycatch (including regulatory discard) in fisheries targeting other, often more-productive species. Regulatory agencies must monitor bycatch of long-lived species and move to implement conservation actions if population declines are recorded. The most effective management strategy for some species taken as bycatch and for

targeted species such as deeper-water groupers and Pacific rockfishes, may be establishment of large, protected marine reserves to supplement traditional management practices outside of the protected areas. The AFS supports the development, use, and evaluation of large marine reserves or Marine Protected Areas to protect and rebuild vulnerable populations. These reserves must have clearly defined goals, include a wide variety of environmental conditions, be of sufficient number to protect marine ecosystems within each region, allow adaptive management, and be large enough to be self-sustaining. The AFS encourages its members to become involved by providing technical information needed for protection of at-risk marine stocks to international, federal, state, and provincial policy makers, so decisions are made on a scientific, rather than emotional or political, basis.

**Muthiga, N., & McClanahan, T.** (1997). Coral Reef Conservation Project. *In*: J. Hoorweg (ed.), Environmental management, research and training in coast province, Kenya. Chap. 1, (pp. 61-63). Nairobi Kenya : Acts Press.

**Abstract:** Coral reefs are among the earth's most diverse ecological systems and may serve as important biological laboratories for determining impacts on the small scale of human resource use to larger scale environmental factors of global warming. The main aim of the Coral Reef Conservation Project (CRCP) is to study the impact of human activities on coral reefs in Kenya, and the East Africa region in general. CRCP is financially supported by the Wildlife Conservation Society, Food and Health Foundation, the Rockefeller Foundation and USAID. It is affiliated to KWS and KMFRI. Within the WIO region, the greatest concentration of research has been based on Kenya's fringing reef. Studies of impacts on corals include surveys on finfish, sea urchins, substrate cover, shell abundance and diversity, river discharge and eutrophication. The long term success of reef monitoring will depend on a regional association of nationally based marine scientists who can exchange ideas and learn and compare field methodologies. CRCP offers an internship programme in collaboration with MU; KMFRI, TAFIRI (Tanzania) and Department of Environment (Eritrea). The internships which are for 3 to 6 months, are open to nationals of African coastal countries. As Kenya marine parks continue to be haven for fish, corals, gastropods and many other unstudied organisms, it is imperative that these areas continue to receive protection.

**Mwamfupe, D.** (1998). Demographic impacts on protected areas in Tanzania and options for action. *In*: Parks, 8(1), 8-19.

**Abstract:** Population growth and internal migration, when coupled with changes in land tenure, is exerting increasing pressure on the environment and natural resources in Tanzania. This paper examines population dynamics affecting seven protected areas, and highlights factors such as poverty, alienation from land and resources, drought, and lack of local participation in conservation activities that are currently hindering conservation efforts in the country.

**Ngoile, M., & Kiwia, M. A.** (1996). Community participation in the development of Mafia Island marine park. *In*: O. Linden, & C. G. Lundin National Workshop on Integrated Coastal Zone Management in Tanzania, Zanzibar, (Tanzania), 8-12 May 1995. (pp. 124-132). Washington, -D. C. -USA : World Bank, Environmental Department, Land, Water and Natural Habitants Division.

**Abstract:** The southern part of Mafia Island hosts a great variety of natural resources and habitat types with considerable physical and biological diversity. Larvae produced within the reef system of southern Mafia is likely to contribute to the maintenance of reef related marine life, including commercial fish stocks in Tanzania and the northern Eastern Africa coastal waters. Thus southern Mafia may serve as a seed bank for an area much more extensive than Mafia itself. Threats undermining the sustainable resource use at Mafia include the recent rise in dynamite fishing, clear felling mangroves, use of illegal fishing gears, coral mining for

building and lime production, anchorage damage, pollution from oil discharge and siltation and imbalances caused by changes in terrestrial run-off after deforestation in the Rufiji Delta. Marine turtles are threatened by encroachment at breeding sites and increasing numbers are caught in shark nets.

**Nurse, M., & Kabamba, J.** (2000). Defining institutions for collaborative mangrove management : a case study from Tanga, Tanzania. (p. 16). Nairobi: EARO.

**Odum, W. E.** (1984). The relationship between protected coastal areas and marine fisheries genetic resources. *In: J. McNeely, & K. R. Miller (eds), National Parks, Conservation, And Development. The Role Of Protected Areas In Sustaining Society. Proceedings Of The World Congress On National Parks, Bali, Indonesia, 11 22 October 1982.* (pp. 648-655). [s. l. ]: [s. n. ].

**Abstract:** The fisheries of the world appear to have reached a plateau in total annual catch between 70 and 80 million metric tons, and are unlikely to exceed 100 million tons per year in the future; between 50 and 75 of the commercial fish catch comes from species which utilize coastal and estuarine waters. This paper reviews the scientific evidence which indicates a strong connection between critical coastal habitats and fisheries production, discusses the need for protection of these critical habitats and reviews a few examples where protected coastal areas contribute significantly to coastal fisheries. The key to effective habitat preservation for benefit of fisheries genetic resources is to protect the complete sequence of critical habitat types encompassing the entire salinity gradient; the preservation of one type of habitat without consideration of functionally connected habitats may lead to disruptions in life history cycles and long-term decline in fishery production

**Paris, B., & Pereira, H. F.** (1994). Bilan des consultations avec les populations locales des îles d'Orango en vue de la création d'un parc national. (p. 28). Bubaque: GPC.

**Parker, S. et al.** (2000). Management of Pacific Rockfish. *In: Fisheries*, 25(3), 22-30.

**Abstract:** The American Fisheries Society (AFS) recognizes the need for conservative and robust management of Pacific rockfishes because of naturally low population growth, the overfished state of many of the stocks, and complex nature of the mixed-stock fisheries (60-plus species). The AFS recommends that catch information be collected on a species-specific basis, and that management targets also be established on a species-specific basis including species taken as bycatch. Such management will require accurate studies of discards at sea. Reduction in rockfish discards should be a management priority in all fisheries which capture significant numbers of rockfish. The AFS further recommends establishment of adequate fishery independent surveys to more accurately assess and monitor rockfish stocks. The AFS supports the establishment of systems of Marine Protected Areas to protect the habitat of Pacific rockfish and to promote recovery of stocks. Such areas should be established along with traditional management measures to control fishing mortality. Regardless of the management strategy used, substantial decreases in fishing mortality must be achieved soon to avoid stock collapses. The AFS encourages its members to become involved by providing technical information needed for protection of rockfish to international, federal, state, and provincial policy makers so decisions are made on a scientific, rather than emotional or political, basis

**Penney, A. J. et al.** (1999). Long-term trends in catch and effort in the Kwazulu-Natal nearshore linefisheries. *In: South African Journal of Marine Science*, 21, 51-76.

**Abstract:** The boat-based linefishery is the most important marine fishery along the coast of KwaZulu-Natal, producing 40% of the total annual mass of fish landed there. Since 1900, the fishery has supported commercial and recreational sectors that compete for more than 120

species, using similar methods in the same fishing areas. Catch-and-effort data have been collected sporadically from the commercial linefishery since 1910 and the recreational linefishery since 1970. The number of commercial vessels increased from 10 in 1910 to 140 in 1995, and effective commercial effort continues to increase, despite a limit placed on the number of vessels in 1985. Recreational participation escalated from 20 skiboats in 1948 to 2 000 in 1995 and entry to this sector remains unlimited. Introduction of the beach-launched, trailable skiboat in 1945 resulted in a rapid expansion of effort to coastal areas that previously functioned as harvest refugia for resident reef fish. Total catch has declined, despite increased effort, as has catch per unit effort (cpue). There have also been substantial changes in catch composition and catches have been sustained by sequential target switching from large endemic reef fish such as seventyfour *Polysteganus undulosus*, red steenbras *Petrus rupestris* and rockcods *Epinephelus* spp., to smaller sparids, such as slinger *Chrysoblephus puniceus*, santer *Cheimerius nufar* and blueskin *Polysteganus coeruleopunctatus*, and shoaling migrants, such as king mackerel *Scomberomorus commerson*, geelbek *Atractoscion aequidens* and kobs *Argyrosomus* spp. The linefish resources off KwaZulu-Natal have long been incapable of sustaining the fishing effort in the region and most resident species are now overexploited. Existing linefish management measures have not been successful in limiting fishing mortality to sustainable levels and existing limits on commercial permits and recreational launches will have to be substantially reduced if this is to be achieved. Bag limits may also have to be substantially reduced, particularly for endemic reef fish, to rebuild stocks to sustainable levels. Given the difficulty of implementing such controls, the maintenance of a number of large, suitably sited marine reserves appears to offer one of the few practicable chances of conserving the endemic reef fish stocks of KwaZulu-Natal.

**Pollard, D.** (1993). Maximising the potential for both sustainable fisheries and alternative uses of fish habitat through marine harvest refugia. *In: Proceedings. Sustainable Fisheries Through Sustaining Fish Habitat. Australian Society For Fish Biology Workshop. Victor Harbour, Sa, 12-13 August 1992. Olympic Coast National Marine Sanctuary Management Plan, Washington, New Source NPDES General Permit Oil And Gas Extraction, Outercontinental Shelf Region, Gulf Of Mexico (Draft Supplement To The final Environmental Impact Statement Of November 1992).* Canberra Australia : Australian Government Publishing Service

**Abstract:** A discussion is presented on various alternative non consumptive uses of marineestuarine ecosystems, which may be broadly grouped into recreational, educational, scientific and aesthetic purposes. An examination is also made of an appropriate management regime to address the inevitable ecological pressures and use conflicts which will arise. It is believed that the maintenance of ecosystem biodiversity, in terms of both the sustainability of the fish and the preservation of their habitats should be the most critical and primary management objective. Reference is made to the great barrier Reef Marine Park which provides a model which demonstrates that a multiple use management approach based on the general principles of ecological sustainability and user equity can successfully operate within a suitable framework of CommonwealthState cooperation.

**Pollnac, R. B., Crawford, B. R., & Gorospe, M. L. G.** (2001). Discovering factors that influence the success of community-based marine protected areas in the Visayas, Philippines. *In: Ocean & Coastal Management*, 44(11-12), 683-710.

**Abstract:** Community-based marine protected areas have become a popular coastal resources management method advocated in many projects and programs. While many case studies have been written about factors contributing to project success, few empirical studies using quantitative methods have been employed. A study was conducted of 45 community-based marine protected areas in Philippines. Several success measures were developed and analyzed in relation to a number of independent variables categorized as contextual or project

intervention factors. Correlations between individual factors and the dependent variables are discussed. Stepwise multiple regression was used to determine the most important predictors of success. These included: population size of the community, a perceived crisis in terms of reduced fish populations, successful alternative income projects, high levels of participation in community decision making, continuing advice from the implementing organization and inputs from local government. The implications of these results for policy makers and project managers are discussed.

**Pomeroy, C.** (1999). Social considerations for marine resource management: Evidence from Big Creek Ecological Reserve. Reports of California Cooperative Oceanic Fisheries Investigations. Symp. of the CalCOFI Conference: A Continuing Dialog on No Take Reserves for Resource Management, Asilomar, CA (USA), 4 Nov 1998. (Report No. 40). [s. l. ]: [s. n. ].  
**Abstract:** Growing interest in no take marine protected areas (MPAs) as a complement to traditional fishery management has led to increased attention to biophysical considerations for MPA design, implementation, management, and evaluation. Considerably less attention has been directed, however, toward social, cultural, and economic considerations for MPAs. Information on and understanding of the relationship between MPAs and local fisheries in social, cultural, and economic, as well as biophysical, terms is especially important. At the same time, there is growing interest in collaboration between fishers and scientists to provide more complete and accurate information on fisheries and marine ecosystems. Such collaboration is one element of cooperative (or co) management of local fisheries, which is gaining recognition as potentially more effective, appropriate, and equitable than traditional, top down resource management. These two themes social considerations for MPAs and co management of local fisheries are central to a study being conducted at central California's Big Creek Ecological Reserve. This paper provides an overview of the local skiff fishery and the cooperative arrangement at Big Creek; discusses that arrangement as a form of co management, and as it has played an integral role in the history of the marine reserve; and concludes with observations and emerging questions about the social aspects of establishing and maintaining no take marine reserves in the context of local fisheries

**Prospero, J. M., & Harwell, C. C.** (1994). Symposium on Florida Keys Regional Ecosystem. November 1992. *In: Bulletin of Marine Science*, 54(3), 577-1094. Notes: Miami, FL (USA), Nov 1992

**Abstract:** The papers presented in this special issue of the Bulletin of Marine Science were selected from presentations at the 1992 Symposium on Florida Keys Regional Ecosystem. This Symposium had its beginnings in a workshop (Research Planning Workshop for the Florida Keys National Marine Sanctuary) that was held at the University of Miami's Rosenstiel School of Marine and Atmospheric Science in October 1991. As a result of the high level of interest generated during that workshop, the Rosenstiel School's Cooperative institute for Marine and Atmospheric Studies and Center for Marine and Environmental Analyses organized this Symposium, held in November 1992, in Miami FL. Co sponsors of the Symposium include NOAA's National Undersea Research Program, the Southeast Fisheries Science Center, the Atlantic Oceanographic and Meteorological Laboratory, the National Science Foundation, and Sigma Xi. Over 200 participants attended the presentations. Because the meeting occurred several months after Hurricane Andrew, a special session was arranged for presentations that assessed the impacts of Andrew on the South Florida environment. The Symposium focused on the full regional ecosystem of the Florida Keys to encourage wide scientific participation and to emphasize the interconnectedness of the South Florida ecosystems.

**Quinn, J. F., Wing, S. R., & Botsford, L. W.** (1993). Harvest refugia in marine invertebrate fisheries: Models and applications to the Red Sea urchin, *Strongylocentrotus franciscanus*. *In:*

American Zoologist, 33(6), 537-550. Notes: Annual Meeting of the American Society of Zoologists and the Canadian Society of Zoologists, Vancouver, BC (Canada), 27-30 Dec 1992

**Abstract:** Benthic marine invertebrates with planktonic larvae may exhibit Allee effects in reproduction or recruitment. Hydrodynamic considerations and experimental evidence suggest that species broadcasting gametes suffer greatly reduced fertilization efficiencies as densities decline. There is also evidence for some species, including the red sea urchin, that post-dispersal recruitment success declines at low densities of adults, if adults provide shelter from predators or other sources of mortality. Species displaying strong Allee effects may be susceptible to catastrophic population collapses with slight increases in mortality due to harvesting or natural causes. A simple two patch logistic model suggests that the establishment of a harvest refuge is necessary to prevent collapses and maintain sustainable catches at high levels of harvesting effort. A more detailed, age structured model based on the biology of the red sea urchin, *Strongylocentrotus franciscanus* produces similar results. Effects of harvesting strategies are sensitive to Allee effects caused by both fertilization efficiency and the disruption of adult spine canopies. Theoretical requirements for the size and spacing of marine reserves depends upon the dispersal abilities of the target species. Multiple reserves, spaced more closely than the average larval dispersal distance, appear to be an effective and conservative strategy for maintaining healthy populations and sustainable levels of harvest. (DBO)

**Rakotonindrina, R.** (1998). The Economic Reality of the Participation of Local Communities in Biosphere Reserves: A Case from Madagascar. *In:* IUCN-The World Conservation Union World Commission on Protected Areas, UNESCO, & Division des Sciences Ecologiques. Programme Man and Biosphere Biosphere reserves - Myth or reality? Proceedings of the workshop on biosphere reserves, world Conservation congress, Montreal 1996. (pp. 29-35). Gland: IUCN;UNESCO.

**Ray, G. C., Hayden, B. P., & Dolan, R.** (1984). Development of a biophysical coastal and marine classification system. *In:* J. McNeely, & K. R. Miller (eds), National Parks, Conservation, And Development. The Role Of Protected Areas In Sustaining Society. Proceedings Of The World Congress On National Parks, Bali, Indonesia, 11-22 October 1982. (pp. 39-46). [s. l. ]: [s. n. ].

**Abstract:** This paper describes the development of a marine biogeographical classification system. This system was also included on a very large world map, with all coastal and marine protected areas indicated, Showing how the system might be used to assess protected area coverage. It is recognized that a global classification system such as this one is useful primarily at the global level, and that it will need to be supplemented by national and regional systems at the appropriate scales. While it is impossible to devise a biogeographical classification system that pleases all specialists, this paper comes up with a rational and straightforward system which should be widely useful for conservation purposes.

**Recksiek, C. W., Appeldoorn, R. S., & Creswell, R. L.** (1998). In pursuit of design criteria for Marine Fishery Reserves. 50. Annu. Gulf and Caribbean Fisheries Institute, Merida (Mexico), Nov 1997. Proceedings of the Gulf and Caribbean Fisheries Institute. Chap. 50, (pp. 372-384). [s. l. ]: [s. n. ].

**Abstract:** Marine Fishery Reserves (MFRs) have been identified as efficient instruments to achieve certain fishery conservation and management goals. International interest is growing rapidly and design issues are being discussed. No tested, generally accepted biological/ecological guidelines or principles yet exist which allow managers to designate where a reserve should be placed or the habitats that should be included to achieve MFR goals. If an MFR is large enough, goals will eventually be accomplished simply by returning a significant proportion of shelf area to a state prior to exploitation. The difficulty arises when society elects

that an MFR is desirable while fishery exploitation must go on. The MFR design challenge is to minimize the amount of fishing ground set aside while building the biological and social support infrastructures for sustainable, and perhaps greater, fishery production for the long term. In these situations MFRs must be 'small,' at least until positive fishery impacts of the MFR are locally accepted. Data limitation is a fundamental complication affecting MFR design. Detailed information cannot be available for all areas under consideration. A few well studied systems must yield a set of robust principles that can be applied at other locations.

**Reti, I. et al.** (1994). The Pacific. Protecting nature: regional reviews of protected areas. Vol. 10 ref. (pp. 255-276). [s. l. ]: [s. n. ].

**Abstract:** This paper describes established protected areas in South Pacific island countries, which are a relatively new phenomenon. It describes those countries which have developed protected area systems, including Savai'i, Western Samoa, Tonga, the Cook Islands, the Northern Mariana Islands, New Caledonia, Papua New Guinea and the Solomon Islands. It outlines the factors which have influenced the establishment of these protected area systems and notes that the main factor for the lack of progress in this area is the nature of land and resource ownership. This lack of action has also meant that South Pacific island participation in major international protected area programmes has been limited. The paper describes the major lessons that have been learned, such as that the establishment of protected areas in this region will require the consent of the customary or other land or resource owning groups. It also describes the extent of protected area coverage, recommends requirements for future protected areas, and highlights the current levels of financial investment in protected areas. The training facilities and needs of protected areas management are also described, and some of the major issues surrounding protected areas in the region are highlighted, including human use of terrestrial and marine areas and resources, involvement by the private sector, and the lack of integrated land use planning. Some priorities for future action in the region are outlined in conclusion.

**Robertson, J., & Mapstone, B.** (1992). Research into the effects of fishing in the GBR [Great Barrier Reef] region. *In: Newsl. Aust. Soc. Fish Biol., 22(2), 50-51.* Notes: 19. Annu. Conf. and Workshop. Australian Society for Fish Biology, Victor Harbour, S. A. (Australia), 12 Aug 1992 Summary only.

**Abstract:** A formal program of research designed to address concerns by user groups, managers and scientists over the effects of fishing on the Great Barrier Reef is being coordinated by the Great Barrier Reef Marine Park Authority. The general objectives of the programme are to evaluate the direct and indirect effects on reef and associated benthic communities of recreational and commercial line fishing, commercial prawn trawling in inter-reef areas and in the GBR lagoon inshore of the mid shelf reef complex, and the interaction between the two fisheries. The "Effects of Fishing" programme research commenced in the 1991/92 financial year with two main components: A joint research project by CSIRO and QDPI to assess the environmental effects of prawn trawling in the Far Northern Section of the Great Barrier Reef Marine Park; and a large scale experimental design developed to assess the effects of line and inter-reef trawling on reef and inter-reef communities within special 'Fisheries Experimental Areas' incorporated into the rezoning of the Cairns and Central sections of the marine park. The research is expected to run for 5 to 10 years.

**Salamanca, A. M. et al.** (1995). Community-based coastal resources management in Mabini, Batangas. Third National Symposium in Marine Science of the Philippine Association of Marine Science (PAMS). Philippine Scientist.

**Salm, R., & Ngoile, M.** (1998). Marine protected areas: Changes and challenges. *In: Salm, R.*

;Tessema, Y. Partnership for Conservation Report of the Regional Workshop on Marine Protected Areas, Tourism and Communities. Nairobi Kenya: IUCN EARO.

**Abstract:** Marine protected areas (MPA) are unevenly distributed through the western Indian Ocean (WIO) region. Presently 46 MPAs are listed for the region, but there are none in Somalia and the Comores. Integration of MPA management with that of surrounding areas is generally inadequate and is an area that needs to be strengthened. There has been little progress in linking coastal people into the MPA selection, planning, and management process, and consequently little benefit to them. Existing MPAs generally have greater value at the national than regional level. A greater effort is required to establish a regional system of MPAs that addresses the WIO biogeographic province as an integral unit. Support to MPAs to date has been inequitably scattered over the region and uncoordinated. The lack of adequate institutional capacity is one of the major constraints in achieving effective management of PMAs in the region. Another is the general lack of effective control of activities outside MPAs. Bilateral or multinational cooperation is needed to enable transnational issues to be adequately addressed. In addition building effective partnerships between the management authority and stakeholders for collaborative management of MPAs remains a major challenge, along with determining and providing adequate incentives for stakeholders to take on and sustain an active role in management.

**Salm, R., & Tessema, Y.** (1998). Partnership for conservation. Report of a Regional workshop on marine protected areas, tourism and communities. (p. 109). Nairobi, Kenya : IUCN-EARO.

**Abstract:** Marine protected area (MPA) management is becoming increasingly costly and unsustainable in its present form. MPA managers in the western Indian Ocean region are facing challenges for which they are seeking assistance : how to forge effective partnerships with stakeholders for collaborative management, and how to achieve financial self sufficiency for these areas. The goal of the workshop is to share the different perceptions and expectations of MPAs, and discuss the opportunities for partnerships in MAP management.

**Sandersen, H. T., & Koester, S.** (2000). Co-management of tropical coastal zones: The case of the Soufriere marine management area, St. Lucia, WI. *In: Coastal Management*, 28(1), 87-97.

**Abstract:** Centralized top-down fisheries management models based on biological stock-recruitment have, at best, achieved limited success when adapted to Third World fisheries. Comanagement, a resource management approach oriented towards resource users and their communities, has been proposed as an alternative strategy for managing Third World fisheries. We examine the initial success and subsequent problems of one such collaborative coastal zone management project on St. Lucia's leeward coast. Factors that must be considered in the development, implementation, and maintenance of coastal comanagement systems operating in the contexts of tropical marine ecosystems in developing nations are identified and discussed.

**Sanderson, E. W. et al.** (2002). A conceptual model for conservation planning based on landscape species requirements. *In: Landscape and Urban Planning*, 58(1), 41-56.

**Abstract:** Effective conservation planning requires, considering all the complicated biological, social and economic factors which impinge on the ecological integrity of a site, and then focusing inevitably limited conservation resources on those times, places and activities that most impact ecological structure and function. The landscape species concept provides a useful lens for defining conservation landscapes and highlighting potential threats from human activity. This paper outlines a conceptual methodology for landscape conservation being tested by the Wildlife Conservation Society at three sites in Latin America and Africa. Based on the biological requirements of an ecologically functioning population of a landscape species, the "biological" landscape is defined. This landscape is compared to the landscape of human

activities through the use of Geographic Information Systems (GIS). Focal landscapes sufficient to meet species requirements are defined and threats from human activity evaluated with respect to biological requirements. A suite of landscape species may be selected depending on resources, leading to multiple, often overlapping, focal landscapes. A hypothetical example is presented.

**Schelhas, J., & Shaw, W. W.** (1995). Partnerships Between Rural People and Protected Areas: Understanding Land Use and Natural Resource Decisions. Part III Partnerships with Communities. Chapter 24. *In: J. McNeely (ed.), Expanding Partnerships in Conservation*. Washington, D. C. ;Covelo, California: Island Press.

**Schwabacher, R. A., & Bolton, H. S.** (1982). The Tragedy of the Oceans - The 1981 Deadline Revisited. *In: Oceans 82 Conference Record: Industry, Government, Education Partners In Progress* Washington, D. C., September 20 22, 1982. (pp. 1119-1124).

**Abstract:** The past year has seen a major shift with regard to federal ocean dumping policy. The Congressionally-mandated 1981 deadline on the ocean dumping of harmful sewage sludge and industrial wastes has not been implemented due to a Court order in response to a legal challenge to EPA's ocean dumping regulations. At the same time, a number of municipalities and advisory groups have been calling for greater use of the oceans as a waste disposal alternative. Congress, in reauthorizing Titles I & II of the Marine Protection, Research and Sanctuaries Act of 1972 is presently considering a number of legal, public policy, and scientific issues relevant to the future use of the oceans to assimilate society's wastes. The authors review the current legislative proposals and summarize several policy options which have been proposed with regard to reauthorizing the Ocean Dumping Act.

**Seale, R. G.** (1995). Aboriginal Societies, Tourism, and Conservation: The Case of Canada's Northwest Territories. Part III Partnerships with Communities. Chapter 27. *In: J. McNeely (ed.), Expanding Partnerships in Conservation*. Washington, D. C. ;Covelo, California: Island Press.

**Shafer, C.** (2001). Inter-reserve distance. *In: Biological Conservation*, 100(2), 215-227.

**Abstract:** Since the mid-1970s, reserve planners have been advised to locate reserves in close proximity to facilitate biotic migration. The alternative, putting great distance between reserves as a safeguard against catastrophe or long-standing chronic degradation forces, has received little discussion. The demise of a population can be caused by both natural and anthropogenic agents and the latter, including poaching and global warming, could be the bigger threat. Reserves sharing biotic components, whether close together or far apart, have advantages as well as costs. We need to consider whether the result of adopting the proximate reserve design guideline to preserve maximum species number will contribute to the potential extinction or extirpation of some rare flagship species? Should such extinctions occur, will society be understanding of science-based advise? Current conservation dogma that claims reserves should be located in close proximity demands more scrutiny because that choice may be tested this century.

**Shore, T.** (2000). Campaign Report: Pressure Mounts to Create Kemp's Ridley Marine Reserve. *In: Marine Turtle Newsletter*, (87), 18-19.

**Abstract:** Pressure is mounting to create a Marine Reserve for Kemp's Ridley turtles (*Lepidochelys kempii*) in South Texas after large numbers of sea turtles continued to wash up dead during the 1999 shrimping season. Sea turtle and environmental groups including: The Humane Society of the United States (HSUS), National Sierra Club and Caribbean Conservation Corporation joined Sea Turtle Restoration Project (STRP) and Help Endangered

Animals-Ridley Turtles (HEART) in calling for a Kemp's Ridley Marine Reserve along North and South Padre Island, Texas. Padre Island area is the only consistent nesting site for this species in the USA. Year after year, more adult Kemp's ridleys wash up dead along North and South Padre Island and vicinity than anywhere else in the USA (Shaver 1999). Half of all dead adult Kemp's ridley sea turtles found stranded in the United States during the last five years were located at Padre Island (Shaver 1999). The proposed reserve would be closed to commercial fishing (but open to recreational fishing) to protect nesting and migrating Kemp's ridleys. The proposed reserve would extend along the coast of North and South Padre Island and vicinity (about 100 miles) out to 20 fathoms or 17 nautical miles.

**Silva, G. S. d.** (1984). Protected areas and turtle eggs in Sabah, East Malaysia. *In: J. McNeely, & K. R. Miller (eds), National Parks, Conservation, And Development. The Role Of Protected Areas In Sustaining Society. Proceedings Of The World Congress On National Parks, Bali, Indonesia, 11-22 October 1982.* (pp. 154-159).

**Abstract:** This case study describes the circumstances which caused the near disappearance of two species of marine turtles from three island rookeries in the Sulu Sea of East Malaysia. It describes how establishing protective measures was able to bring the species back to a productive level. The economic importance of turtle products is discussed, along with the threats such values have caused. Continuing problems lead to the suggestion that international marine sanctuaries need to be established for sea turtles between Sabah and the Philippines.

**Silva, M., Gately, E. M., & Desilvestre, I.** (1986). A bibliographic listing of coastal and marine protected areas: A global survey. (p. 156). Woods Hole, Mass. : Woods Hole Oceanographic Inst. ; Mar. Policy Ocean Manage. Program.

**Abstract:** This document is the result of a survey of over 600 books, articles, technical reports and personal correspondence reviewing approximately 1,000 coastal and marine protected areas in 87 countries and, in turn, was intended to support a larger project that had been undertaken by the Marine Policy and Ocean Management Center of the Woods Hole Oceanographic Institution in conjunction with the Government of Ecuador to consider the establishment of protected status for the marine area of the Galapagos Archipelago. To provide background for this larger project, a review of existing or proposed marine protected areas was initiated. This bibliographic listing is one result of this review. In addition to a short introduction, the listing consists of four parts: (1) Table I - a country-by-county listing of marine protected areas; (2) Table II - a listing of special topics from the bibliography; (3) a numerical listing of sources; and (4) and alphabetical listing of sources.

**Smith, A.** (1995). Community involvement in coral reef monitoring for management in the insular Caribbean. Collaborative And Community-Based Management Of Coral Reefs. Lessons From Experience. (pp. 59-67). West Hartford CT (USA): Kumarian Press.

**Snelson, D.** (1995). Neighbours as Partners of Protected Areas. Part III Partnerships with Communities. Chapter 32. *In: J. McNeely (ed.), Expanding Partnerships in Conservation.* Washington, D. C. ;Covelo, California: Island Press.

**Soegiarto, A., Soewito, N. B., & Salm, R.** (1984). Development of marine conservation in Indonesia. *In: J. McNeely, & K. R. Miller (eds), National Parks, Conservation, And Development. The Role Of Protected Areas In Sustaining Society. Proceedings Of The World Congress On National Parks, Bali, Indonesia, 11-22 October 1982.* (pp. 249-255).

**Abstract:** Two-thirds of Indonesian territory is covered by seas so there is an urgent need to develop a marine protected area system in order to conserve representative examples of Indonesia's valuable and rich marine ecosystems. This paper discusses the concept of marine

conservation in Indonesia, describes progress to present, and outlines a plan for further development of marine conservation. Thirteen areas have been declared as marine protected areas, although there is as yet no fully established management for any of them. In addition, 42 proposed marine protected areas are listed, along with 24 existing terrestrial protected areas which include a marine component. There are four broad activities of Indonesia's marine conservation programme, including strategy formulation, establishment of a team of marine conservation specialists, establishment of protected areas, and establishment of a Sub-Directorate of Marine Conservation within the Directorate of Nature Conservation.

**Souter, D. W., & Linden, O.** (2000). The health and future of coral reef systems. *In: Ocean & Coastal Management*, 43(8-9), 657-688.

**Abstract:** Coral reefs are among the most productive and diverse ecosystems on earth and provide a multitude of valuable ecosystem services. Moreover, the resources derived from coral reefs are essential to the food security of millions of people living within tropical coastal communities. Unfortunately, burgeoning human populations in coastal regions are placing an unsustainable burden on these resources such that degradation of coral reefs is common. In addition, during 1998, El Nino driven increases in sea temperature caused a mass bleaching event that further degraded many of the world's coral reefs. This article provides a brief review of the status of the world's coral reefs and highlights their value to society. Also, the anthropogenic and natural disturbances that threaten the future of coral reefs are discussed and finally, this article offers some potential remedies that promote sustainable use of coral reef resources thus ensuring their future survival.

**Stolton, S., & Dudley, N.** (ed.). (1999). Partnerships for Protection New strategies for planning and management for protected areas. U. K. : Earthscan Publications Ltd.

**Abstract:** How can we successfully conserve what remains of the world's rapidly diminishing natural and semi-natural areas? Although more and more land and water surface is under some form of protection, many vital ecosystems are under-represented, and traditional conservation methods are often quite ineffective. New approaches are urgently needed.

With contributions from over 40 of the world's leading conservation experts, including Adrian Phillips, Kenton Miller, Sue Wells, Custavo Suires de Freitas, Biksham Cujja, Conzalo Oviedo and Jessica Brown, Partnerships for Protection examines how improvements can be made. Itself the result of a collaborative project between IUCN -The World Conservation Union (through its World Commission on Protected Areas) and the World Wide Fund For Nature (WWF), the book sets out ways to safeguard all the major ecosystems and explores innovative management partnerships involving individuals, communities, companies and governments. It draws attention to the importance of building collaboration among those with a stake in the resources, and an incentive to protect them.

This book will be essential reading and a vital tool for all those involved with or studying biodiversity and conservation, and the planning and management of protected areas.

The main editors, Sue Stolton and Nigel Dudley of Equilibrium Consultants, are both members of the IUCN World Commission on Protected Areas and are currently working on a project to produce a system for assessing management effectiveness in protected areas

**Suman, D., Shivlani, M., & Milon, J. W.** (1999). Perceptions and attitudes regarding marine reserves: a comparison of stakeholder groups in the Florida Keys National Marine Sanctuary. *In: Ocean & Coastal Management*, 42(12), 1019-1040.

**Abstract:** The Florida Keys National Marine Sanctuary (FKNMS) developed a zoning plan as part of its overall management plan, fully implemented as of 1997. The plan created several closed areas or harvest refugia in which consumptive activities are prohibited. This research reports results of surveys that we conducted with members of three stakeholder groups in the

Florida Keys: commercial fishers, dive operators, and members of local environmental groups. Surveys requested responses regarding the information sources individuals tapped when learning of the zoning plan and the FKNMS; their degree of public participation; their perceptions and acceptance of the zoning strategy and the process of its design; and the expected outcomes of the zoning strategy. Many responses show significant differences among the three groups. Fishers felt highly alienated from the process of zone designation and displayed a sense of anger and powerlessness with respect to what they considered to be an attempt to exclude their group from the harvest refugia. Dive operators demonstrated the highest levels of participation in the designation process, but were concerned that refugia regulations could limit their activities in the future. Members of environmental groups were the strongest supporters of the harvest refugia concept and the FKNMS. This research suggests numerous ways in which marine resource managers could improve their public outreach and information dissemination strategies when developing future harvest refugia and marine protected areas.

**Thackway, R., & Olsson, K.** (1999). Public/private partnerships and protected areas: selected Australian case studies. *In: Landscape and Urban Planning*, 44(2-3), 87-97.

**Abstract:** The conservation of biodiversity requires a significant commitment by governments, industry sectors and the wider community to encourage cultural change across community and industry sectors which ensures a long-term balance between sustainable land management and biodiversity conservation. At the regional level viable biodiversity conservation requires a range of management strategies that may include the establishment of statutory protected areas, a range of off-park conservation management measures and achievable guidelines for ecologically sustainable land management at the landscape scale. Monitoring the performance of protected areas in achieving biodiversity conservation requires a commitment by government to facilitate involvement and participation of the wider community. Four Australian case studies discuss how public-private conservation partnerships are integrating sustainable land management and biodiversity conservation at the regional level.

**Thiaw, D.** (1997). Pour une gestion participative des aires protégées : Analyse de la périphérie au niveau des réserves de la biosphère du Niokolo Koba et du Delta du Saloum et de la Réserve Naturelle de Popenguine. UCAD, Dakar. Notes: Mémoire de DEA Département de géographie

**Thomas, W. J.** (1985). Fagatele Bay National Marine Sanctuary. *In: Report Of The Third South Pacific National Parks And Reserves Conference Held In Apia, Western Samoa, 1985. Volume 2. Collected Key Issue And Case Study Papers.* Noumea New Caledonia: South Pacific Reg. Environment Programme

**Abstract:** Fagatele Bay, a 163 acre embayment located on the southwest coast of Tutuila Island, American Samoa, was established as a National Marine Sanctuary by the United States Department of Commerce in April 1985. The designation is intended to protect and preserve, through co ordinated research, education and regulatory programs, the natural resources and values of this pristine area. The designation process included co ordination between federal and territorial agencies and an extensive public participation process.

**Thompson, P.** (1999). Theoretical basis for community based fisheries management in Bangladesh. *In: Sustainable inland fisheries management in Bangladesh.* (p. 280). ICLARM-International Center for Living Aquatic Resources Management Danida Ford Foundation Notes: ICLARM contribution n°1530

**Abstract:** Common property resources are characterized by difficulty in excluding users and by users consuming the benefit at the expense of others. Management systems adopted so far for the inland openwaters of Bangladesh all have disadvantages, and policy is now in a state of

change. Developing greater community participation in fisheries management is part of a move towards co-management arrangements, and is seen as a way of overcoming the problems encountered. Community involvement in all management functions is expected to result in more sustainable and equitable use of fishery resources, and in more efficient decision making and compliance with management is more likely to succeed are identified.

**Thorburn, C. C.** (2000). Changing Customary Marine Resource Management Practice and Institutions: The Case of Sasi Lola in the Kei Islands, Indonesia. *In: World Development*, 28(8), 1461-1479.

**Abstract:** Sasi, the spatial and temporal closure of fields, forests, reefs and fishing grounds, is a conspicuous feature of many Moluccan societies. Despite increasing domestic and international awareness and praise of what is considered by many analysts to be an exemplary indigenous resource conservation tradition, the practice is in decline in many parts of the Thousand Island province, and in many villages has disappeared altogether. This study examines the practice of managing *Trochus niloticus* (Topshell) harvests in Ohoirenan, a village on the eastern coast of Kei Besar in the District of Southeast Maluku. *Trochus* is one of the most important sources of cash income for Kei villagers, and until recently, for the district government as well. Since 1987, *trochus* has been classified as a protected species in Indonesia, and regulations have been issued to regulate the cultivation, harvest and transport of this and other protected species. This article briefly introduces Kei customary law and property relations, followed by a description of sasi and its application to reef habitats and *trochus* harvests. Examining a territorial conflict between Ohoirenan and a neighboring village, and more recent contention arising from government efforts to protect the species, the article explores issues of society-nature and state-society relations as pertain to natural resource management in Indonesia. Sasi continues to function as an exemplary common property resource (CPR) management institution in Ohoirenan, assuring equitable distribution of the benefits deriving from controlled extraction of a local resource. But, erratic and uneven enforcement of "one-size-fits-all" centralized conservation policy and law, combined with collusion and self-interest on the part of various parties, combine to threaten both the resource and the institutions that have successfully and sustainably managed it in this region. Within the context of a centralized, state-led natural resource management system, the national species protection precludes the establishment of sensible, mutually beneficial co-management regimes that could serve the interests and employ the inherent knowledge and capabilities of local communities, traders, and government agents

**Tolentino, A. S. J.** (1984). How to protect coastal and marine ecosystems: Lessons from the Philippines. *In: J. McNeely, & K. R. Miller (eds), National Parks, Conservation, And Development. The Role Of Protected Areas In Sustaining Society. Proceedings Of The World Congress On National Parks, Bali, Indonesia, 11-22 October 1982.* (pp. 160-164).

**Abstract:** Using Philippine examples, this paper analyzes the legal and institutional approaches to the effective management of coastal and marine protected areas. It presents the Philippine coastal and marine zone situation, outlines the master plan for managing these areas and discusses the use of law as an environmental management tool. It offers legal and institutional approaches to the effective management of coastal and marine protected areas, including: a well-defined coastal zone policy; serious implementation and strict enforcement of coastal zone legislation; and a coastal zone management programme including a master plan, a coordinating mechanism to ensure implementation of policy with development, use of interagency and multi-disciplinary approach, and a management systems framework.

**Tongilava, S.** (1990). The role of protected areas in sustaining island societies. *In: Parks*, 1(1), 18-20.

**Abstract:** Tonga declared five national marine parks and reserves in 1978. Their primary

purpose is to protect reef organisms and to ensure that they can live and breed undisturbed, so no fishing or collecting is allowed. The reserves have been successful and their diverse and abundant life is a valuable economic resource. The reserves are also valuable for education. One of these, Pangaimotu Reef, was selected as the site of the country's first Coral Reef Trail, which opened on World Environment Day 1989. This paper describes how the trail was set up and what still needs to be done to realize its full educational potential.

**Turner, R. K.** (2000). Integrating natural and socio-economic science in coastal management. *In: Journal of Marine Systems*, 25(3-4), 447-460.

**Abstract:** The future more sustainable management of coastal resources is an important policy goal for all governments of countries with coastlines. Coastal areas are under intense environmental change pressure with extensive feedback effects between the natural systems and the human systems. It could be argued that there is just one jointly determined and coevolving system that needs to be studied and managed. Understanding the interactions between the coastal zone and environmental change cannot be achieved by observational studies alone. Modelling of key environmental and socio-economic processes is a vital tool, required to buttress coastal management institutions and practice. Three overlapping procedural stages can be identified in the coastal resource assessment process. The scoping and auditing stage, implemented via a 'pressure state impact response' framework, details, among other things, problems, system boundaries and value conflicts. The framework is itself based on a conceptual model, which lays stress on functional value diversity and the links between ecosystem processes, functions and outputs of goods and services which are deemed 'valuable' by society. The two subsequent stages are integrated modelling, combining natural and social science methodologies, and evaluation of management options and related gains and losses. An overview of a research project, which utilised the pressure state impacts response (PSIR) framework and supporting concepts and methods, is presented in the last section of the paper, together with some generic 'lessons' for interdisciplinary research.

**Unesco.** ([s. d. ]) Gestion des ressources naturelles, socio-économie et renforcement institutionnel de la Réserve de Biosphère du Delta du Saloum, Sénégal. [Web Page]. URL <http://www.unesco.org/mab/ibsica/activiti.htm#africa>.

**Abstract:** This project is being implemented as from January 1997. This project aims to reinforce a) the participation of the population to the management of the natural resources; b) the acquisition of a kind of knowledge fundamental to a proper management of natural resources; c) the institutions in charge of this management; finally, the preservation and sustainable management for the "Delta du Sine-Saloum Biosphere Reserve".

**Uniyal, V. K., & Zacharias, J.** (2001). Periyar Tiger Reserve - building bridges with local communities for biodiversity conservation. *In: Parks*, 11(2), 14-23.

**Valdes Pizzini, M.** (1990). Fishermen associations in Puerto Rico: praxis and discourse in the politics of fishing. *In: Human Organization*, 49(2), 164-173.

**Abstract:** Fishermen associations in Puerto Rico have become lobbying agencies for the fishermen by serving their social, economic, and political interests. As such they are the vehicle by which fishermen participate in the political arena and influence the decision making process. This article documents and discusses the trajectory of the fishermen associations of La Parguera, on the southwestern coast of Puerto Rico, as they opposed the development of a marine sanctuary. The process of opposition to the sanctuary is explored from 1983 onwards in the context of the political environment. This case illustrates the problems and sociopolitical consequences of lack of public participation in the development of management plans. While small scale fishermen are often viewed as unable to develop political strategies and actions, this

case presents a situation in which the fishermen demonstrated the ability for the effective use and manipulation of the political resources, the media and the public opinion. The range of strategies forms of discourse and political praxis featured by these fishermen are also discussed.

**Vallega, A.** (2001). Focus on integrated coastal management -- comparing perspectives. *In: Ocean & Coastal Management*, 44(1-2), 119-134.

**Abstract:** In 1999, the course on Integrated Coastal Management in the Mediterranean and Atlantic Coasts: Focus on Conflicts was held. It was convened by the ECUS Consortium for Transatlantic Cooperation in Marine Policy and Coastal Management Education, and took place in Genoa (Italy) and Seville (Spain) with the participation of students and teachers from various countries. In that context, intense discussions took place by comparing some case studies from the USA and Italy. Discussions led to focusing on different, conceptual and empirical approaches not only to coastal conflicts, but also to coastal management as a whole. This article aims at discussing these subjects considering the concepts of coastal management, and of coastal conflict, that have been adopted in the USA and those that may be drawn by the Italian experience. The USA pragmatic approach, which has led to consider the coastal conflicts in themselves with the aim of finding solutions between users, is compared with the Italian one, which has been more incline to consider conflicts between uses in the framework of coastal planning. Finally, three peculiar arenas of Italian coastal conflicts -- namely, landscape, culture heritage and waterfront revitalisation -- are considered.

**Vallega, A.** (2001). Ocean governance in post-modern society--a geographical perspective. *In: Marine Policy*, 25(6), 399-414.

**Abstract:** The contradiction between the claim for integrated management of the coastal areas by the UN Conference on Environment and Development (UNCED, 1992), on the one hand, and the persistence of analytical epistemological approaches by the scientific community on the other, is discussed. In this context, it is emphasised how the modern approach led to the desegregation of the ocean into two realms, namely the coastal ocean subject to national jurisdiction, and the international ocean, making it difficult to design and operate integrated management. Moreover, the international ocean is vertically subdivided into two realms, namely the water column, having the status of *res nullius*, and the deep seabed, claimed as patrimony of mankind; hence the increasing difficulty in operating the protection of the ocean ecosystem and the efficient use of its resources while the human pressure on the ocean is growing without precedent. A positive feedback is needed between science and policy, the former being encouraged to overcome the analytical, modern approach; the latter being keen to consider the long term humankind-sensitive interest above the national interests. The role of geography in contributing to these prospects is discussed in the final part.

**Vallega, A.** (2001). Urban waterfront facing integrated coastal management. *In: Ocean & Coastal Management*, 44(5-6), 379-410.

**Abstract:** Essentially, this paper aims at discussing the trends of waterfront development in the context of the urbanised coastal areas, and the possible integration between waterfront organisation and integrated management of the coastal area. To deal with this subject, first the external environment influencing waterfront evolution is considered, focusing on global change, the globalisation of economic systems, and geopolitical change. The diffusion of waterfront re-vitalisation programmes is considered in the context of the urban growth of coastal areas concentrating attention on the numerical increase of megacities and proto-megacities. The Ekistics theory, according to which urban growth will lead to the creation of the ecumenopolis (planetary urban system) including the marine ecumenopolis (urbanisation of all the coastal belts), is considered with the aim of foreshadowing the possible role which could be played by maritime waterfronts in the course of the 21st century. The focus then shifts to the

waterfront itself considering the historical triggers for waterfront revitalisation plans. In this context the waterfront functions are incorporated into the coastal use structure by adopting a matrix-based representation. The expanding basis for conflicts between the waterfront functions is emphasised. A framework of options occurring in waterfront development is presented with the aim of responding to two questions: (i) how the waterfront may be designed to be consistent with sustainable development, in that acting as a top rank spatial system conforming to integrated management of the coastal area; (ii) whether and how the waterfront could act as a leading spatial system to carry out integrated management of the coastal area within which it is located. Discussion of the former question leads to designing the optimum choice among the possible objectives of waterfront management, while discussion of the latter question leads to considering the waterfront as the central subsystem of the coastal system, and to reckoning its organisation as including high-rank functions of the coastal area. Reasoning leads to focusing on the design of waterfronts able to optimise their integration into the coastal system, and their development within coastal management. To realise this prospect an international discussion on the waterfront-coastal area integration may be desirable in order to pursue two basic goals: (i) to explore how coastal area management and waterfront planning may usefully interact generating a long-term positive feedback; (ii) to design the optimum waterfront organisation, intended as a planning and management model to be used as a reference basis for integrating the waterfront functions with coastal management strategies.

**van Zoest, J. G. A.** (1992). Doing the right thing for the right reasons developing ecological goals for the Wadden Sea. *In: Present And Future Conservation Of The Wadden Sea. Proceedings Of The 7th International Wadden Sea Symposium, Ameland (Netherlands), 22-26 Oct 1990. Texel Netherlands: NISR*

**Abstract:** Every concept of nature is basically an interpretation or belief. With this in mind, the Dutch Society for Preservation of the Wadden Sea is in the process of developing a new perspective on the Wadden Sea as a natural area. Here, I will present some principles of this perspective, and also our method of developing such a perspective. But first, I will give our reasons why a clear perspective is necessary, not only for the Wadden Society, but also for both other NGOs and government institutions.

**Wells, M., & Brandon, K. E.** (1993). The principles and practice of buffer zones and local participation in biodiversity conservation. *In: Ambio*, 12(2-3), 157-162; 26 ref. Notes: Special issue. Biodiversity: ecology, economics, policy

**Wells, S., & Gawler, M.** (1999). Building stronger alliances with people Involving people in marine protected areas: experiences in Central America and Africa. Part III. *In: S. Stolton, & N. Dudley (ed.), Partnerships for Protection New strategies for planning and management for protected areas.* (pp. 118-126). U. K. : Earthscan Publications Ltd.

**Wells, S., & Gawler, M.** (1999). Involving people in marine protected areas: experiences in Central America and Africa. *In: S. Stolton, & N. Dudley (ed.), Partnerships for Protection New strategies for planning and management for protected areas.* (pp. 118-126). U. K. : Earthscan Publications Ltd.

**Wernick, B. G.** (1994). Community based planning of marine protected areas: The role of environmental non governmental organizations. *In: Coastal Zone Canada '94, Cooperation In The Coastal Zone. Conference Proceedings. Volume 2. Halifax, NS (Canada), 20-23 Sep 1994.* Dartmouth, Ns Canada : Coastal Zone Canada Assoc.

**Abstract:** The Marine Life Sanctuaries Society of British Columbia (MLSS) is a non profit

ENGO that encourages community groups to become involved in preserving ocean resources for future generations. A tool MLSS will be able to use in the near future is Getting Below the Surface: A Guide to Establishing a Marine Protected Area in Your Community, which is based on a class project completed by a group of graduate students at the University of British Columbia. The short term goals for the use of this guide are to begin the process of establishing marine protected areas, to provide working models for future initiatives, and to contribute to the development of government policies. In the long term the use of the guide encourages continued community involvement to complement government initiatives.

**White, A.** (1997). Collaborative and community-based management of coral reef resources: Lessons from Sri Lanka and the Philippines. *In: Workshop on Integrated Reef Resources Management in the Maldives*. Male, Maldives. 16 20 March, 1996. Madras India: BOBP  
**Abstract:** Integrated management of coral reef resources is being tested in several Asian countries with useful lessons for the Integrated Reef Resources Management Programme in the Maldives. In the early 1980's several Philippine projects developed coral reef management regimes on small islands which have continued to the present. These management regimes were developed by and for island residents dependent on their coral reef resources. They set up marine reserves and sanctuaries around their islands which have continued to the present. These management regimes were developed by and for island residents dependent on their coral reef resources. They set up marine reserves and sanctuaries around their islands in a manner which stopped all destructive and illegal fishing and so that sanctuary areas were declared off limits to all fishing. Monitoring of the effects of the sanctuaries documented improvements in the abundance and diversity of fishes on the coral reef and in fish yields to the island fishermen. The process for implementation of the management regime included several steps: integration into the community; education; core resource management group building; and formalizing and strengthening organizations for sustainable resources management. In Sri Lanka, a similar process is being adapted to more comprehensive coastal resources management in "Special Area Management" sites. Communities, local and national government are working together to develop and implement management plans for sustainable use of their coastal resources. "Special Area Management Coordinating Committees" for the site include all stakeholders in the process of planning and taking responsible action for implementation. Monitoring of physical and socio-economic effects on the environment and human community is performed by several research organizations and through local participation. Results from the Philippine and Sri Lankan examples include stewardship of coral reef and other coastal resources, and functioning formal management organizations comprised of both community members and government. Also, both national governments recognize the value of locally-based action and decision-making in coral reef conservation.

**White, A.** (1988). The effect of community-managed marine reserves in the Philippines on their associated coral reef fish populations. *In: Asian Fisheries Science*, 2(1), 27-41.  
**Abstract:** This study measures changes over 2 years in the species richness and abundance of fish on 3 coral reefs associated with new community-managed marine sanctuaries in the Visayas, Philippines.

**White, A.** (1986). Marine reserves: How effective as a management strategy for Philippine, Indonesian and Malaysian coral reef environments ?. *In: Ocean Management*, 10(2), 137-139.  
**Abstract:** This study evaluated the effectiveness of marine reserves as an approach to coral reef management in southeast Asia and isolates the most effective management techniques. Seven reserve areas in the Philippines were compared with two similar management areas in Indonesia and two in Malaysia. Two control areas in the Philippines were also considered. Comparison of the areas included the following: 1) documentation of the status of various reefs

in the three countries, in terms of biology, management approaches, patterns of human use, and the larger environmental setting; 2) examination of the effect of various factors, including formal management schemes, human exploitation, and general setting, on the reef; and 3) a summary of those generalities found among sites in terms of environmental conditions, management and use by humans. The following coral reef parameters were used to evaluate reef condition: substrate cover, density of coral genera, *Acanthaster* and *Tridacna* abundances, chaetodontid diversity, topographic relief, and noticeable damage. Sites were ranked in terms of reef quality and compared to remoteness, human exploitation, destructive uses, and management types. Municipal and national management approaches were contrasted and the effects of local education, scientific and tourist interest were noted at each site. Those sites with active local participation in management showed the greatest potential for environmental maintenance and improvement. At other sites where some form of management exists, except one, the management showed a positive impact and a potential for sustainable use. Control sites and those proposed for management without protection show some form of degradation.

**White, A.** (1984). Vulnerable marine resources, coastal reserves, and pollution: A Southeast Asian perspective. *In: J. McNeely, & K. R. Miller (eds), National Parks, Conservation, And Development. The Role Of Protected Areas In Sustaining Society. Proceedings Of The World Congress On National Parks, Bali, Indonesia, 11-22 October 1982.* (pp. 170-174). [s. l.]: [s. n.].

**Abstract:** The distribution of vulnerable marine resources, coastal reserves and pollution sites in Southeast Asia as compiled for the Marine Policy Atlas of Southeast Asian Seas (Morgan and Valencia, eds. in press) are presented by brief description to accompany the display of maps of scale 1:16,000,000. The vulnerable marine resource distributions include estuaries, beaches, mangroves, coral reefs, sea turtles, crocodiles, seabird colonies, dugong, whales and dolphins. Coastal reserves included all the various designations of marine reserves in the region which border on the coast or have jurisdiction over marine areas. Priority sites for management of marine resources are determined by particularly strong aggregations of vulnerable marine resources, productive fisheries and the presence of marine reserves. This paper focuses on geographical distribution and aggregations which have implications for national and regional marine reserve selection and management programmes.

**White, A., & Vogt, H. P.** (2000). Philippine Coral Reefs Under Threat: Lessons Learned After 25 Years of Community-Based Reef Conservation. *In: Marine Pollution Bulletin*, 40(6), 537-550.

**Abstract:** The Philippine archipelago consists of more than 7000 islands. Most of these islands have extensive coral reefs or coral communities. For centuries, reefs and their associated resources have provided the livelihood for a large portion of the coastal population. However, reefs as sources of income are threatened by over-exploitation and by the use of destructive fishing methods. The scientific community, natural resource managers and many of the small-scale fishermen are aware that catches are falling rapidly while the fast growing population requires increasing amounts of fish. Since the early 1970s, various programs have tried to counter the decline of Philippine coastal resources. This article reports about successful examples of reef conservation in the provinces of Negros Oriental, Batangas and the Tubbataha Reef National Marine Park, Palawan. In all three localities, significant areas of reefs are legally protected and sustainable management regimes are working effectively. In Negros and Batangas this success is partly a result of intensive education programs that contributed to the active involvement of the traditional fishermen and the larger coastal community. Community participation and co-operation of all institutions involved in resource management are regarded as the key elements of sustainable reef management in these areas. This paper presents the objectives, programs and achievements as well as the fruitful networking of the participating

organizations. Particular emphasis is placed on the experiences and lessons emanating from 25 years of reef conservation while showing the overall objective of sustainable use is still far on the horizon. It is suggested that more integrated forms of management, involving various stakeholders, and that address the numerous intertwined issues, will save Philippine reefs.

**Wong, F., & Eittreim, S. L.** (2002). Continental shelf GIS for the Monterey Bay National Marine Sanctuary. *In: Marine Geology*, 181(1-3), 317-321.

**Abstract:** A marine sanctuary is an environment where the interests of science and society meet. Land and marine managers need access to the best scientific data available that describe the environment and environmental processes in sanctuaries. The sidescan sonar imagery, bathymetry, sample analyses and other data discussed in the papers in this volume have been made available as a U. S. Geological Survey CDROM publication

**Wood, E.** (1985). Exploitation of coral reef fishes for the aquarium trade. (p. 121). Ross On Wye Uk : Marine Conservation Society.

**Abstract:** The great majority of ornamental marine fish in the trade, and all marine invertebrates, are collected from the wild. Data on mortalities are not readily available, but it is probable that on average, about 15% of fish die prior to export, and a further 10% in transit to the importing country. Another 5% of fish die while being held in wholesale retail premises, prior to sale. A survey of survival of fish in home aquaria showed that half had died within six months, and 66% within a year, but that some specimens went on to live for four years or more. This report makes several recommendations, among them: the setting up of captive-breeding programs; assessment, by exporting countries, of the status of their reef fish populations, in order to manage this resource properly; licensing of collectors, exporters, importers, and retailers; the setting up to protected areas, species protection and controls on the fishery in the exporting countries

**Yanez-Arancibia, A. et al.** (1999). Integrating science and management on coastal marine protected areas in the Southern Gulf of Mexico. *In: Ocean & Coastal Management*, 42(2-4), 319-344.

**Abstract:** The coastal zone of the State of Campeche have some of the Gulf of Mexico's richest ecosystems characterized by extensive seagrasses, mangrove forests, low-land tidal wetlands, a broad deltaic environment, including the Usumacinta Laguna de Terminos estuarine ecosystem, and extensive low salinities and brackish wetlands in the Petenes region. Commercial and artisanal fishing, maritime transport, agriculture and cattle grazing in low-land areas, urban expansion, building of highways, and tourism, are important economics activities that are increasing in the State of Campeche. However, the growth needs to occur in a sustainable manner with adequate protection of the coastal ecosystems. The theoretical approach and conceptual basis of the integrated coastal management plan are based on 20 years of scientific research in the region; and from 1990 to the present, a number of projects have been completed which serve as case studies of coastal management coupling science, technology, public participation, and policymaking in the southern Gulf of Mexico. After developing seven "study case" integrating science into policymaking, a management approach was developed considering four main actions: promotion of institutional arrangements, so that the multi-sectorial planning approach be considered in coastal resources development; strengthening of public awareness related to coastal resources management policies and capabilities; gathering, analysis and dissemination of information related to coastal resources development; and provision of technical solutions to coastal resources uses in conflict. Finally this is a case study where science played a significant role in the politics of the policy process, both in protecting key estuarine ecosystem and the planning process defining the ICZM plans.

**Yap, H. T.** (2000). The case for restoration of tropical coastal ecosystems. *In: Ocean & Coastal Management*, 43(8-9), 841-851.

**Abstract:** At no time have humans so altered their natural environment than the present. Marine ecosystems have not been spared, and the degradation of coastal habitats has reached severe proportions in many parts of the world. The mere setting aside of areas for protection may not be enough to ensure adequate production and provision of services for a growing global human population. Hence, the active restoration of habitats, in addition to protection and preservation, is probably the more desirable conservation strategy. Accumulated experience over several decades has demonstrated that the rehabilitation or even restoration of damaged coastal ecosystems is feasible. However, the degree of difficulty and expense involved vary, with coral reefs being the most complicated habitats to restore, followed by seagrass beds and then mangrove forests. In ecosystem restoration, a comprehensive strategy based on sound biological and ecological principles, and proven techniques must be developed. A concrete, achievable goal must be articulated. Because of the dynamic nature of ecosystems, and the inability to accurately predict pathways of succession after a community is established through artificial means, subsequent modifications to a project must proceed within a flexible framework of adaptive management. Finally, for restoration efforts to be successful, local communities must participate actively in cooperation with local governments in accordance with the principle of co-management.

**Zann, L.** (1999). A new (old) approach to inshore resources management in Samoa. *In: Ocean & Coastal Management*, 42(6-7), 569-590.

**Abstract:** Increasing populations and development in many of the small Pacific Island nations have placed heavy pressures on coastal environments and on inshore fisheries. The population of Samoa, in the Southwestern Pacific, has increased 5-6-fold in the past 150 years. Wetlands, lagoons and coral reefs have been seriously degraded because of inappropriate land-use and fisheries practices and recent catastrophic cyclones, and many fish and invertebrate stocks have declined in the past 10-15 years. A research program was established in 1990 to determine the status of the coastal and inshore environments, to monitor inshore subsistence and commercial fisheries, to determine the status of stocks, and to identify potential management actions. An inventory of inshore resources was produced using aerial photography and ground and underwater surveys. Fisheries catch and effort were established through a national census, questionnaire surveys in households and schools, and creel and market surveys. A major aid program was commenced in 1995 by the Australian government (AusAID) to assist Samoa to establish an effective inshore fisheries and environment management program. A key strategy was the devolution of powers in inshore fisheries management back from the national government to the villages and local fishers. A culturally appropriate co-management model was developed and tested, and has now been adopted by many villages. An inshore fisheries extension capability was developed within Samoa's Fisheries Division to assist villagers to undertake their own environmental and fisheries surveys; identify major factors affecting fisheries; identify ways of reducing these factors; establish an agreed (between village council and national government) plan of management and regulations; and establish their own fisheries management bodies. By the end of 1997 the Inshore Fisheries Extension Service had been established and trained; 26 villages had entered the co-management program and established their own plans of management; and 20 fisheries reserves had been established. The techniques for inshore environmental and fisheries assessment and management developed for Samoa are applicable, with appropriate modification, to subsistence fishing communities elsewhere in the South Pacific.

**Zobrist, E.** (1999). Coral reef restoration and protection from vessel groundings. *In: Gulf Research Reports*, 10, 85. Notes: Gulf Estuarine Research Society Spring Meeting

1998, Galveston, TX (USA), 26-28 Mar 1998

**Abstract:** Major vessel groundings in the Florida Keys National Marine Sanctuary such as the MV Alec Owen Maitland (Carysfort Reef), the MV Elpis (The Elbow reef) in 1989 and the RV Iselin in 1994 (Looe Key) have demonstrated the need for quick response when restoring injured coral reef habitat. The Maitland and Elpis sites were not restored until 1995. During the intervening period, waves and currents enlarged the injury and required major physical reconstruction of the reefs. While highly successful, the value of quick response was learned. While under litigation with the Iselin Potential Responsible Party (PRP), NOAA directed an operation which removed several hundred tons of loose coral rubble which threatened adjacent undisturbed coral habitat within a year of the grounding. Recently, NOAA had the opportunity to take actions to restore injured coral reef habitat quickly. The 600-foot Contship Houston ran aground near Key West in February, 1997. Coral heads were toppled and scattered on the sea floor generating a large volume of loose rubble. NOAA and the State of Florida were able to work with a cooperative PRP and completed an emergency restoration phase in Spring, 1997 which reattached live coral heads and fragments. Five rubble berms were stabilize with a non-toxic marine epoxy