

Marine Fisheries Reserves Versus Marine Parks: Unity Disguised as Conflict

RICHARD S. APPELDOORN¹ and CONRAD W. RECKSIEK²

¹Department of Marine Sciences

University of Puerto Rico

Mayagüez, PR 00681-9013 USA

²Fisheries, Animal, and Veterinary Science

University of Rhode Island

Kingston, RI 02881 USA

ABSTRACT

Arguments for establishing marine parks are based on the need to conserve and preserve resources, particularly those thought to be particularly rare or threatened. Efforts to establish such areas are often lead by agencies that manage terrestrial parks. Fisheries reserves are concerned with the management of exploitable resources, and efforts to establish them are typically under local fisheries agencies. At first appearance, there are two separate agencies with fundamentally different philosophies: preservation versus extraction. However, unnecessary confusion has been introduced by concentrating on a specific potential benefit of fishery reserves: enhancement of yield through capture of fishes emigration from reserve areas. While this benefit is important, particularly to fishermen, it is secondary to the more fundamental purposes of fishery reserves that are based on conservation (conserving spawning stock & biodiversity, providing control areas, buffers against management failure, maintaining system integrity, diversifying benefits from the resource). Fisheries reserves cannot enhance overall catch except when two conditions are met:

- i) stocks as a whole are overfished, and
- ii) a core area (stock) is then conserved in order to produce fish emigrating to exploitable areas.

Thus, both marine parks and fisheries reserves have conservation as their core philosophy. In fact, a fishery reserve, being “no-take”, has a more restrictive philosophy toward conservation than many marine parks. Agencies concerned with parks and fisheries have common purpose and should unite to establish systems of closed areas. These must adhere to the general principals of representativeness, replication and connectivity, which may be applied using simple habitat mapping.

KEY WORDS: Marine Fishery Reserves, Marine Protected Areas

INTRODUCTION

The marine environment, and coastal areas in particular, are being intensely exploited, with substantial alterations in marine communities as a consequence (Pauly and Christensen 1995). In the Caribbean, serious community alterations began in the 18th and 19th centuries (Jackson 1997) and have reached critical proportions in some areas (e.g., Koslow et al. 1988, Hughes 1994, Beets 1997). Because the marine environment has been largely "out of sight" until recently, it has also been "out of mind". As a consequence, the development of a marine conservation ethic has been delayed in comparison to terrestrial systems. Interest in protecting these exploited communities has increased in response to a number of factors, including increased awareness of the impact of fishing, the development of competing and non-extractive uses of these resources (e.g., tourism, education), and the potential loss of biodiversity (as a natural heritage and potential genetic and pharmacological resource).

Efforts to established protected areas have traditionally arisen from two independent sources. Agencies with jurisdiction over conservation and terrestrial parks are primarily interested in the conservation of marine species and habitats and are usually charged with enforcing compliance related to international conservation treaties, such as the Convention on the International Trade of Endangered Species (CITES) and the Protocol on Special Protected Areas and Wildlife (SPAW). These agencies are also often charged with regulations concerning the availability of these resources for tourism and other non-extractive uses. On the other hand, fisheries agencies are generally concerned with the extraction of commercially valuable species, with emphasis on maintaining, if not optimizing, yield. Philosophically, these two types of agencies have acted as if their interests are in direct conflict. This situation has persisted in the past because each agency has a different constituency, each unconcerned with the goals of the other.

With the recent understanding that intense fishing is impacting the health and productive capacity of marine systems, interest in the establishment of reserve ("no-take") areas as fishery management tools has increased rapidly (e.g., Appeldoorn 1998). Marine Fishery Reserves (MFRs) offer solutions to a number of important fisheries management goals that, quite simply, are not available through other alternatives. These include the following: (1) conservation of spawning stock, (2) conservation of biodiversity, in terms of age and genetic structure, life-histories, behavior, species and species interactions, (3) providing control areas against which the effects of fishing can be assessed, (4) providing buffers against management failure, (5) maintaining system integrity and productivity, and (6) diversifying benefits from the resource. These goals are realized because of the conservation function of reserve areas. For these reasons alone, resource managers should embrace the use of MFRs as

essential. In practice, however, fisheries agencies have been slow to adopt this new methodology. Management emphasis is often placed on a single proposed benefit of MFRs: enhancement of yield through capture of fishes emigrating from reserve areas. While the importance of this issue to fishermen is understandable, the ensuing narrow discussion limits consideration of the full benefits to be derived from MFRs and how they originate. Yield enhancement can only occur in situations already overfished and in need of restrictive regulations (Nowlis and Roberts 1997). In reality, in most cases the more immediate management objective should be to protect the stock from further increases in fishing pressure to avoid collapse. Furthermore, enhancement effects come only after the conservation function of MFRs has been met. Without developing and maintaining a core stock within reserve boundaries (i.e., conservation), there would be no excess biomass to export. Thus, to achieve the desired goal of yield enhancement, an MFR must first meet a more restrictive conservation function. In this light, the goals and philosophy of fisheries management should now be more closer to those of conservation agencies.

Scientists are now beginning to describe the biological and social design criteria for establishing MFRs (Ballantine 1995, 1997, Bohnsack 1997, Appeldoorn 1998, Recksiek and Appeldoorn 1998). While it is clear that considerable research will be necessary for optimizing design criteria, it is equally clear that general principles currently exist to guide the establishment of MFRs. Thus, there is no fundamental obstacle to establishing closed areas from a scientific perspective, only a lack of political will and resources. The majority of effort required will be in the form of extensive dialog with various user groups.

What have in the past been separate areas of concern are now areas of mutual concern. Fisheries and conservation issues are being subsumed into a more holistic view of coastal zone management. While core constituencies of each agency remain as before, it is clear that each agency will have to accommodate the goals of the other if they are to achieve their own goals. Thus, there needs to be a strategic alliance between these traditionally independent areas. Much of the burden for realizing an effective policy of marine reserves most likely will fall on fisheries officers. Conservation agencies will need the expertise and contacts of fisheries officers to construct a dialog with fishermen, typically the most vocal opponents to marine reserves. Compounding this effort will be the need for the fisheries officers to shift their operating paradigm and embrace the philosophy and necessity of MFRs. In exchange, conservation agencies must aid in planning, management and funding of future reserve areas.

Proceedings of the 51st Gulf and Caribbean Fisheries Institute

LITERATURE CITED

- Appeldoorn, R.S. 1998. Ecological goals for marine fishery reserve design: workshop summary. *Proc. Gulf Carib. Fish. Inst.* **50**:294-303.
- Ballantine, W.J. 1997. Design principles for systems of 'no-take' marine reserves (Abstract). In: Pitcher, T.J., (ed.) The design and monitoring of marine reserves. University of British Columbia. *Fisheries Centre Res. Rep.* **5**(1):4-5.
- Ballantine, W.J. 1997. 'No-take' marine reserve networks support fisheries. Pages 702-706 in: D.A. Hancock, D.C. Smith, A. Grant and J.P. Beumer (eds.). *Developing and sustaining world fisheries resources: The state of science and management (2nd World Fisheries Congress)*. CSIRO Publishing, Australia.
- Beets, J. 1997. Can coral reef fish assemblages be sustained as fishing intensity increases? *Proc. 8th Int. Coral Reef Sym.* **2**:2009-2014.
- Bohnsack, J.A. 1997. Consensus development and the use of marine reserves in the Florida Keys, U.S.A. *Proc. 8th Int. Coral Reef Sym.* **2**:1927-1930.
- Hughes, T.P. 1994. Catastrophes, phase shifts and large-scale degradation of a Caribbean coral reef. *Science* **265**:1547-1551.
- Koslow, J.A., F. Hanley, and R. Wicklund. 1988. Effects of fishing on reef fish communities at Pedro Bank and Port Royal Cays, Jamaica. *Mar. Ecol. Prog. Ser.* **43**:201-212.
- Jackson, J.B.C. 1997. Reefs since Columbus. *Proc. 8th Int. Coral Reef Sym.* **1**: 97-105.
- Nowlis, J.S., and C.M. Roberts. 1997. You can have your fish and eat it, too: Theoretical approaches to marine reserve design. *Proc. 8th Int. Coral Reef Sym.* **2**:1907-1910.
- Recksiek, C.W., and R.S. Appeldoorn. 1998. In pursuit of design criteria for marine fishery reserves. *Proc. Gulf Carib. Fish. Inst.* **50**:372-384.