A Critical Review of Fisheries and Fisheries Management Policy in Puerto Rico

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ABSTRACT

Puerto Rico's fishery is limited due primarily to two factors. The first factor is the island's narrow, shallow-water platform. The second is the naturally low productivity of the geographic region. Shelf resources are clearly overfished and fishing pressure is increasing. Public agencies responsible for fisheries resources and activities have failed to adequately respond. Some of the reasons for this are:

1. Unrealistic perceptions, particularly concerning the availability of resources and their ability to support self sufficiency and/or further development.
2. Few professionals and too much political influence in government agencies.
3. Provincialisms with respect to the Caribbean region and in dealing with the U.S. federal government.
4. Fragmented organizational structure among responsible government agencies, with little communication or coordination between them.
5. Little communication or direct involvement with fishermen, especially with respect to management issues.
6. Unclear fisheries policies, particularly regarding issues of employment, standard of living, and conservation.
7. No enforcement of existing regulations.

It is recommended that government agencies be restructured and they revise the way they interact with the fishermen and serve the public. While the recent situation in Puerto Rico is disheartening, some improvements have been made. These need to be continued and solidified. Current, new initiatives, if properly designed and followed through, offer an opportunity for productive change.

INTRODUCTION

Puerto Rico is located on a relatively small platform, offering a narrow insular shelf. Surrounding waters are generally unproductive in a manner typical of tropical systems. The annual per capita consumption of seafood in a

population of 3.5 million citizens is estimated to be 9.1 kg. Estimates of sustainable production for the Puerto Rican shelf are imprecise, but generally are on the order of five to six million pounds (2300–2700 mt) per year (Caribbean Fishery Management Council, 1985; Suarez Caabro, 1979). Thus, in excess of 90% of seafood consumed in Puerto Rico is imported. The limited potential of Puerto Rico's waters has been recognized by fisheries professionals for some time (Nichols, 1929; Nichols, 1930; Jarvis, 1932; Inigo, 1963; Holmsen, 1967; Suarez Caabro, 1979).

The high rate of seafood consumption, low standard of living, and high unemployment were incentives to increase the productivity of the local fishery. Starting in the early 1940's fishery development was emphasized by the local government. Specific programs included the provision of fishing materials and outboard motors at low cost, construction of port facilities, availability of low cost loans, and training programs (Suarez Caabro, 1979). Substantial gains in catch were reported during the 1950's and early 1960's (Inigo, 1963). Exploratory fishing programs identified shelf–edge/slope resources, which resulted in increased landings.

The problems of unemployment, low economic status and high rate of importation have not changed, and government interest in fishery expansion continues. However, change has occurred in the status of the resources. Concerns of overfishing, by professionals (Kawaguchi, 1974) and fishermen (Suarez Caabro, 1979), were reported in the late 1960's and early 1970's. Subsequent investigations have clearly shown the shelf resources to be overfished (Stevenson, 1978; Boardman and Weiler, 1980; Appeldoorn and Lindeman, 1985; Bohnsack *et al.*, 1986; Appeldoorn *et al.*, 1987; Appeldoorn, 1987; Appeldoorn, 1991; Dennis, in press; 1991) and have questioned the sustainable potential of deep-slope resources (Nelson and Appeldoorn, 1985). Total landings peaked in 1979 at 7.2 million pounds, and have since declined, despite increasing effort, to a present total of 2.4 million pounds. Management is clearly needed for the Puerto Rico fishery. However, severe impediments exist.

The purpose of this paper is to review these impediments. Our efforts here are motivated by several recent events, including personnel changes in key fisheries positions, initiation of new programs, and renewed government interest in fishery programs. In particular, many of the ideas presented here were first discussed during deliberations of the ad hoc Subcommittee on Conservation, Management, and Administration of Fisheries in Puerto Rico. However, we take sole responsibility for the contents of this review.

We have classified the problems of fishery management in Puerto Rico into seven categories. These are addressed individually, but they are not mutually exclusive. For each category specific criticisms are put forth and recommendations made. One of the problems discussed is new. Some of them are peculiar to Puerto Rico, but many are typical of problems faced throughout

the Caribbean, as clearly exemplified by Aiken and Haughton's (1991) review of fishery policy in Jamaica. In Puerto Rico the potential for constructive and rapid change does exist. We conclude with a review of new initiatives, which if properly targeted and carried through, could lead to such change.

IMPEDIMENTS TO MANAGEMENT

Unrealistic Perceptions

Perhaps the most pervasive problem is that present policy is based on misconceptions about the fisheries potential of Puerto Rican waters, the status of the resource, and the amount and quality of fishing effort currently being expended. As stated above, the potential is low, and the fishery is overfished. Also, the artisanal nature of the fishery is often construed as being low level and inefficient, but this is not the case. Yet, fishery development, with emphasis on increased catch and number of fishermen, is the main goal of current fishery policy. New programs are continually planned without regard of the fact that there exists little resource to support expansion. Again, while these facts have been reported, they are either not being communicated adequately or they are actively being ignored. Politically, these ideas are unpopular when unemployment is high. It is politically easier in the short term to justify the funding of programs designed for development, regardless of the effect, rather than the more demanding task of designing and implementing effective management. The latter takes foresight, moral courage and political will.

In Puerto Rico, the latest fisheries plans were contained in Senate Bill 1591, presented on 6 June 1988. This bill calls for the creation of a new public corporation, the Corporation for the Development of Puerto Rico Fisheries, with substantial funding for the development and expansion of Puerto Rico's fisheries. Again, one of stated goals is to reduce dependence upon imports. In the marine environment it is not clear from where this expansion will come. No specific mention is given to developing a distant water fleet and fishery, although this is what is implied in some of the provisions. The effort is reported to be modeled after the development of industrial fisheries in South Africa and Peru, but does not acknowledge that these countries contain the worlds most productive upwelling systems within their respective EEZ's.

The proposed corporation will be given powers of regulation, and therefore would be capable of initiating and carrying out fishery management, but the bill does not mandate that this be done. Generally, management is given short recognition and no priority in these plans.

We do not claim that there is no room for expansion or development within the marine fisheries of Puerto Rico. However, the areas worthy of attention are rather specific. There appears to be room for expansion among pelagic resources, *e.g.*, sharks, mackerels, tunas, swordfish, squids, etc., but the potential is unknown. Development programs targeted at these resources should be

conservative until resource potential is know. Thus, accurate monitoring should accompany limited, incremental expansion. In no case should funds be allocated for fishery development unless the resource base supporting that development is identified and documented. A special case here are fish attracting devices (FADs) and artificial reefs. If such devices merely attract fish, rather than enhance production, their use for overfished stocks would only exacerbate existing problems.

The area most open to development is processing and marketing. Better handling techniques are needed to improve the quality of fishery products. Coupled with better marketing, including the education of consumers, this would increase the relative value of local fish and return a higher income to the fishermen. Another area worthy of consideration is the processing and marketing of fishes caught in current deep–water fisheries, particularly the longline swordfish and tuna fisheries. Given its good seaport and airport facilities, financial infrastructure, and central location, Puerto Rico has the potential to attract and support these vessels and the international market they serve.

Professionalism and Politics

Fisheries organizations in Puerto Rico suffer from a lack of professionalism regarding fish, fishermen, and fisheries, and a debilitating degree of political influence, which extends all the way down to the day–to–day operations level.

The number of well–trained fisheries personnel are few, and historically were located at the Fisheries Research Laboratory. These professionals generally have no decision making authority. Currently, top officials are typically lawyers, politicians, or non–resource economists. While people with these qualifications are necessary for handling credit programs, etc., they have little expertise with fisheries. Quite often their main concern is in not offending the politicians above them, because their positions are politically appointed, rather than in serving the people of Puerto Rico. The easiest way to not offend anyone is to not do anything. The appearance at times is that the constituency being served is one of politicians, not fishermen. It is difficult to develop any meaningful rapport with fishermen or initiate useful programs if boats or services are shifted without notice to serve the demands of higher administrators. Rarely is concern given to the effect of cancellation of meetings with fishermen, the necessity of the demand of the fishermen, and the resulting budgetary impact.

We recognize that management is by nature a political process, but it must be based on sound biological and socio–economic information. What is needed is a cadre of fishery professionals willing to communicate problems, or reality in general, to higher administrators, and administrators who have the courage to listen to them and support their efforts.

Provincialism

Puerto Rico suffers from two forms of provincialism. First, it must recognize and deal with the fact that Puerto Rico is a small island in a large ocean. Many of the problems and resources themselves are shared by other Caribbean countries. It is possible that much of Puerto Rico's demersal resources are recruited from pelagic larvae released from populations located upstream in the Lesser Antilles. Information exchange and regional coordination would greatly facilitate many aspects of fisheries development, training, analysis, exploration, and management. Intra-regional communication would also enhance the professionalism and moral of fisheries personnel.

As a example of this, we note that no fisheries personnel were allowed to attend the last two Gulf and Caribbean Fisheries Institute meetings even though such was requested and travel funds budgeted. Yet the GCFI represents the most important regional fisheries forum.

The second problem arises in Puerto Rico's relations with the U.S. federal government. The local government has not developed an operational policy of working in cooperation with agencies of the federal government. For example, many fisheries activities, including all those at the Fisheries Research Laboratory, are supported largely or entirely by federal funds. The fact that with these funds come responsibility to provide certain information (*e.g.*, landings statistics) or carry out certain tasks has, at times, been construed as U.S. interference in Puerto Rican affairs. This situation is exasperated by Puerto Rico's ongoing debate on its political status with the respect to the United States.

A similar situation has existed with respect to Puerto Rico's relations to the Caribbean Fishery Management Council. The Council is not viewed as a regional unit for managing fisheries in federal waters, with the Puerto Rican government as a full partner, but as a federal agency imposing restrictions on local affairs. Here is how such a situation can arise. By contract, landings data collected by the Fisheries Research Laboratory are sent to the U.S. National Marine Fisheries Service (NMFS), where they must await analysis in accordance with federal priorities, and typically, these data do not get fully analyzed. Puerto Rico has little analytical capability of its own, and without such capability, Puerto Rico cannot interact with the federal government as an equal. Hence, the federal government appears to be dictating to Puerto Rico the status of the island's own resources. Puerto Rico cannot respond without its own basis of information, and Puerto Rican officials cannot obtain professional respect. Obviously, interactions become strained and unproductive if mutual respect cannot be maintained. Again, lack of professional staff has a negative impact. If Puerto Rico wishes to exert greater control over its affairs, it must take on the matching responsibilities.

Fragmented Organizational Structure

Four areas have been identified as governmental constraints to effective fisheries administration and management:

1. There is no permanent program for systematic data collection.
2. There is no capacity for proper data analysis.
3. Fisheries programs are split between a number of local and federal programs.
4. There is little coordination between these units.

Governmental fisheries efforts are currently divided among several units and little coordination or communication exists between them. Management programs affecting commercial fisheries development fall within the mandate of CODREMAR, a public corporation. CODREMAR also deals with management programs with respect to commercial fisheries regulation in that it is empowered to design management plans when necessary. However, policy making, a prerequisite to management, lies within the Secretary's Office of the Department of Natural Resources (DNR). In addition to their developmental and regulatory functions, CODREMAR also manages the Fisheries Research Laboratory (FRL). Management programs affecting regulation are also the concern of the DNR, which by law must be in charge of enforcement and of policy planning under the Secretary. The DNR also is in charge of all aspects of recreational fisheries and other fishery related activities, such as, critical habitat conservation. This situation has led to confusion, redundancy of effort, expertise and facilities, and, at times, conflict of interest.

For example, current data collection activities are mandated under federally funded programs: the State/Federal cooperative fisheries statistics program for commercial data, and the Wallop–Breaux program for recreational fisheries. The former has been existent at the FRL for many years, while activities under the latter are sporadic and carried out by the DNR. The FRL has a greater expertise, experience, and capacity for such data collection, but has been inadequately funded and is currently ineligible to receive Wallop–Breaux funds. The DNR has the funding and mandate to collect data and manage recreational fisheries, but lacks the expertise. Neither unit has an appropriate program for data analysis. These programs fluctuate in scope from year to year depending on federal priorities and continually stand in jeopardy of being completely eliminated. The local government needs to recognize this and support the FRL to eliminate potential discontinuity in its data collection programs.

What is needed is a single, permanent structure for collecting and analyzing both commercial and recreational fisheries data. This would help remove duplication of effort, unify fisheries programs, reduce confusion and provide administrators with reliable information for decision making. Moreover, a single

fisheries division should be created that would incorporate the various fisheries efforts such as enforcement, licensing, data collection, planning and policy development, education, etc. The proposed new public corporation is supposed to move significantly in this direction, but many aspects, particularly the split between commercial and recreational fisheries, remain unclear.

The division of fisheries management responsibilities between the federal and local governments is an unavoidable consequence of the U.S. federal system. As such, there is little likelihood that this situation will change. But, because little of Puerto Rico's productive area comes under federal jurisdiction, this division should be of minimal impediment from the point of view of the local government. However, recently it has been the Caribbean Fishery Management Council that has taken the lead in promoting assessment and management of area fisheries, but because of its limited jurisdiction the effective role of the Council is one of advocacy. Thus, any management plans developed, unless co–adopted by the local government, will have little impact because they must rely upon local cooperation, particularly for enforcement. Until the local government takes the lead in managing its own resources, this state of affairs will continue.

Education and Communication

To rapidly effect change in any society requires substantial efforts in education. In fisheries, this requires two things. First, a broad based education effort on the general concerns of natural resource conservation and consumerism, targeted at the population as a whole, from school children to public officials, with the ultimate goal of creating educated consumers, concerned users, and an informed electorate and administration. Second, specific programs are needed to educate fishermen and others concerned with fisheries (*e.g.*, enforcement personnel, marketers), with emphasis on particular aspects of technology, conservation, management, regulations, etc. Currently, there are specific mandates for education within CODREMAR, DNR, the Department of Public Instruction, and Sea Grant. All are substantially under funded for the tasks at hand, some offices exist in name only, and there is little coordination between agencies. We recommend the formation of a Fisheries Education advisory Commission, consisting of fisheries experts and fisheries education/information–transfer specialists from appropriate agencies, to develop a unified effort in fisheries education and coordinate the efforts of various agencies for maximum reach and effectiveness.

Fisheries management is primarily the management of people. It is exceedingly difficult to develop effective management if the people involved are not aware of existing problems, their potential consequences, and possible solutions. Without the participation and cooperation of fishermen, management will be difficult at best, and most likely impossible. At present there are no

established channels for dialogue between fishermen and public officials. Most communication is in one direction, from officials down to fishermen, and there is little follow–up to the infrequent meetings that do occur. There is no central forum, similar on a local scale to the Caribbean Fishery Management Council, where fishermen can have direct input and actively participate in the development of fisheries policy and management measures. This is sorely needed and absolutely essential. Significantly, the pending fisheries development legislation calls for the formation of a Fisheries Industry Governing Council with the majority of members from the private sector. However, since the major concern here is development, it is not clear how this Council will affect fisheries management, and if actual fishermen, particularly the artisanal fishermen currently exploiting local resources, will be represented among those from the private sector. If not, then the Council will be ineffective in this regard.

This same situation exists to some degree in the operation of the Caribbean Fishery Management Council. Council members from the private sector are appointed by the Governor. In its first 12 years of operation, only two actual fishermen have been members of the Caribbean Council. In addition, past practice has been to develop draft management plans before holding public hearings. Recently, fishermen have been asked to provide information and contribute to the formation of management plans from the start, a step we view with the utmost optimism.

We recommend that the fishermen be involved in resource management to the greatest degree possible. Possibly this can be achieved through close coordination of local government fisheries officials with the newly formed Congresso de Pescadores de Puerto Rico. Ideally, fisheries could be managed by the fishermen themselves, both commercial and recreational, with the cooperation, coordination, and technical assistance of the local government.

Unclear Policies

There is no overall, coordinated policy on fisheries in Puerto Rico. The default policy is one of maximizing numbers employed, at the expense of the resource, total economic yield and yield/fisherman, thus relegating fishermen to a low economic stratum. Other concerns, such as resource conservation and sustainable production, cost to consumers, etc., are not expressed. Since there is no overall policy, there cannot be any long term, clearly recognized goals, and no ensuing strategies to meet those goals.

This situation arises from four previously discussed factors: fragmented organization, lack of professionalism, lack of communication with fishermen, and lack of education among fishermen. The overlapping and uncoordinated nature among fisheries agencies, particularly between CODREMAR and the DNR, often results in each agency believing that the other has the mandate for

certain tasks, *e.g.*, developing management plans, collection of statistics, and consequently neither agency assumes responsibility and nothing is done.

Without effective communication with fishermen, no organization can be in a position to understand their problems, receive their ideas, and offer potentially effective solutions. Policy making is a political process. In fisheries, the policy should serve the consumers and fishermen. Thus, they should be active in the political process. To do this effectively, they need to be properly educated.

Again, a centralized division within the government to handle all fisheries concerns is needed, along with a local fisheries management council. And again, it is unclear, and unlikely, that pending legislation will remedy the situation.

Enforcement

Currently, there is virtually no enforcement of fisheries regulations, period. Artisanal fisheries, by nature, are difficult to enforce because of the many small boats and landing sites employed. Fishermen favoring management regulations readily admit that enforcement is necessary. Their fear is that if they restrict their activities, others will take advantage of it unless there is someone to stop it. Thus, they are willing to abide by a set of rules as long as everyone abides by them. Enforcement is generally made easier if fishermen understand and agree with the goals of management and the actual management measures used. This is why it is critical to have them intimately involved in the management process.

NEW INITIATIVES

Despite the problems addressed above, tangible progress has been made. At the Fisheries Research Laboratory the level of professionalism has increased substantially. The position of Director has been successively occupied by scientists at the doctoral level, with backgrounds in fish, fisheries, and marine science, and not by politicians or mere political appointees. The data collection and processing program has been similarly headed by people with professional training at the masters level. Additional research programs, *e.g.*, age and growth of fishes, have been started, bringing in other qualified personnel. These people have helped initiate a healthy – on fisheries matters within CODREMAR, between CODREMAR and the Department of Natural Resources, including specifically the Secretary, and between Puerto Rico and other Caribbean countries. However, these gains remain unsolidified. Laboratory personnel are chosen or approved by the Director of CODREMAR, and as such are subject to considerable political influence. Political insecurity or a change in attitude at this level could rapidly and easily reverse all past progress. Professionalism must also be increased within CODREMAR proper.

Following cuts in federal assistance, CODREMAR has finally obtained local monies to maintain level–funding for activities at the Fisheries Research Laboratory. This will give the laboratory a greater flexibility, and perhaps make

CODREMAR more interested in the results generated. However, we caution that the current level of funding is not sufficient to acquire needed personnel and to upgrade the salaries of key employees to guarantee program continuity and quality. We also caution that without some FRL control of spending authority there is a potential for political abuse if local funds are increased.

Puerto Rico has passed management regulations for the spiny lobster fishery, compatible with those previously passed by the Caribbean Fishery Management Council, and is at least contemplating similar actions for shallow water reef fishes. We note that enforcement of these regulations is still needed.

Fishermen are starting to become organized. Recently, the Congresso de Pescadores de Puerto Rico was formed, which reportedly represents all fishermen in Puerto Rico. This organization can potentially provide a focus for dialogue with fishermen, leading to their greater participation in fisheries matters, *e.g.*, having representation on the Caribbean Fishery Management Council. Ideally, this organization can demand service, thereby directing their proper constituency. We hope, however, that relations with this organization, along with the sport and recreational fishermen, can be one of cooperation, not confrontation.

Recently, the Southeast Area Marine Assessment Program (SEAMAP), has been extended to the U.S. Caribbean. The local program is a joint, cooperative program between Puerto Rico, the U.S. Virgin Islands, and the NMFS, and includes fisheries representatives from each group, plus Sea Grant. The purpose of the program is to generate, in a cooperative and efficient manner, fishery independent data on local resources. This program will bring additional funding to Puerto Rico, force a reduction in provincialism and an increase in professionalism by requiring cooperative research, and provide new information on resource abundance and stock status. If initially successful, this program can lure further federal funding for data analysis.

One of the most important developments in recent years has been the advance of fisheries research and management programs in the U.S. Virgin Islands. Clearly, the U.S.V.I. has taken the lead in advocating management, developing a formal, cooperative management relationship between the government and fishermen, and actualizing management regulations, both within its own jurisdiction and within the Caribbean Fishery Management Council. Hopefully, these actions will serve as models for possible action by Puerto Rico and spur the government to move forward in these areas.

In Puerto Rico, perhaps the most significant new development is the renewed interest within the government towards fisheries. Current plans for the formation of a new public corporation and governing council, if implemented, will have a tremendous impact. We applaud the Senate for their willingness to address fisheries issues, but we are seriously concerned that the proposed legislation will not alleviate present problems of overfishing, low income to

artisanal fishermen, and poor product quality. Moreover, by ignoring these problems they will only get worse. Again, it is the overbearing emphasis on development that is the root of the problem. An agency whose primary mandate is development, with no priority given to management, cannot be an advocate of reducing fishing pressure, because this would undermine its reason for being. Thus, in this case management and development are in conflict of interest. It must be understood that management means planning and control. Deciding to fund development is as much a management decision as regulating a fishery to reduce effort. Managing the local fishery should be given a high priority in any proposed legislation.

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