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ABSTRACT

A report detailing the status of fisheries management in Puerto Rico was presented at the 1988 meeting of the Gulf and Caribbean Fisheries Institute. That report stated that fisheries management was not responding to the clear decline in marine resources and identified seven impediments to Puerto Rico's ability to respond adequately to this situation. The report also identified a number of new initiatives with potential for productive change. Here we review the successes and failures of the past six years and express our concerns over the direction and consequences of these events. Local government reorganization and the availability of new funding programs have enhanced the potential scope, flexibility and strength of fisheries programs. Nevertheless, progress toward fishery management has been minimal. In highlighting examples of the above, we suggest where improvements can be made.

INTRODUCTION

At the 1988 annual meeting of the Gulf and Caribbean Fisheries Institute, Kimmel and Appeldoorn (1992) reviewed the impediments and prospects for

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fisheries management in Puerto Rico. That review was presented within the context of the recognized low productive potential of Puerto Rico's insular shelf relative to the demand for seafood, the well-documented state of overfishing, and a sharp decline in total landings from a peak of 7.2 million pounds in 1979 to 2.4 million pounds in 1983. In the past four years this situation changed little, and landings continued to decline to 2.2 million pounds in 1993.

In their review, Kimmel and Appeldoorn (1992) identified seven impediments to the initiation of effective fisheries management in Puerto Rico:

1. unrealistic perceptions concerning the fishery resource potential of Puerto Rican waters
2. the existence of too few trained professionals and too much political influence in government agencies
3. provincialism with respect to the Caribbean region and in dealing with the United States federal government
4. fragmented organizational structure among responsible government agencies, with little inter-communication
5. little communication or direct involvement with fishermen
6. no clear government policy with respect to fisheries
7. no enforcement of existing regulations.

Despite these problems, Kimmel and Appeldoorn (1992) identified a number of new initiatives that, if properly maintained and followed through, held potential for improving the situation. These included the following: an upgrade in the level of expertise at the Fisheries Research Laboratory (FRL); the existence of local funding for the operation of the FRL; the rise of fishermen's organizations and an increase in their activity at public hearings; the initiation in the U.S. Caribbean of the Southeast Area Marine Assessment Program (SEAMAP); a perception of renewed government interest in fisheries matters; and the strong leadership in regional fisheries management provided by the U.S. Virgin Islands.

The purpose of this paper is to review the events of the past six years. In doing so, we seek to determine if progress has been made in removing the impediments to management and whether new initiatives have fulfilled their promise. Our approach is to examine a number of specific events or trends and assess their effects on progress toward effective management. At the same time we suggest where improvements can be made.

RECENT EVENTS AFFECTING FISHERIES MANAGEMENT

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Department of Natural Resources

The Department of Natural Resources (DNR) is the principal agency of the local government responsible for fisheries management. Kimmel and Appeldoorn (1992) argued that its organizational structure was ill designed to develop fisheries management policies. Fisheries matters were divided between a number of entities: policy making was in the Secretary's Office; management was with CODREMAR, a public corporation under DNR; data collection and analysis for commercial fisheries was with the Fisheries Research Laboratory, which was under CODREMAR; recreational fisheries data collection and analysis was patchy and existed under the Division of Investigations of DNR. The principal role of CODREMAR was seen to be fisheries development, which put it at odds with the concepts of fisheries regulation and with the staff of the FRL, whose data showed local stocks to be overfished. Kimmel and Appeldoorn (1992) recommended that the FRL be removed from CODREMAR and placed directly within DNR, that the FRL also assume responsibility for recreational fisheries data collection and management, and that the FRL staff be enhanced to increase their data analysis capabilities.

In the past six years, in fact, such changes have been made. CODREMAR was dissolved, and the FRL was placed within DNR. The fisheries development component of CODREMAR was placed under the Department of Agriculture. Under DNR there is potentially greater access to the Secretary and the policy making echelon of DNR, so that the needs for management can be made known to those with the power to promulgate regulations. Also, the FRL is eligible to receive increased federal funding under the Wallop-Breaux program for recreational fisheries, and in fact the FRL has been aggressive in pursuing and obtaining such funds. This has led to a consolidation of fisheries research within DNR, and, using these funds, the FRL has increased its staff and enhanced its professional capabilities. The latter has also been achieved by increasing the participation of FRL director and staff in local and regional fisheries meetings.

Despite these successes, the transfer of the FRL to DNR has not yet fulfilled its promise. Much of the problem lies in the organizational structure of DNR. The DNR is a massive bureaucracy that needs extensive restructuring. There are too few professionals and too much political influence. Motivated, well-trained professionals tend to leave, driven away because they cannot be effective, there is little opportunity for promotion, and no professional stimulation. Fiscal mismanagement runs from the cancellation of projects because supplies and equipment cannot be purchased in a timely manner, to the cancellation of federal grants (and loss of personnel) because of gross miscalculations of matching funds. One of the principal problems has been the lack of sustained leadership; in the past

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six years there have been four different Secretaries of DNR.

Within the past year, DNR has undergone a complete reorganization, and is now called the Department of Natural and Environmental Resources (DNER). One of the goals of this reorganization was to alleviate some of the above mentioned bureaucratic problems. The FRL is now within a Division of Fisheries with jurisdiction over both marine and freshwater resources (Figure 1). The Division is within a Bureau of Fish and Wildlife, which itself is under the Director of Living Resources. Both the Division and the Bureau are directed and staffed by professionals, and not political appointees. Of particular note is that the Bureau is joined by the offices responsible for coastal zone management. This allows for equal and coordinated input of these two areas to the policy levels of DNER, thus allowing fisheries management to include directly aspects of habitat conservation, which becomes more important as fisheries become more stressed. Thus, while there are now more organizational levels between the fisheries scientists and the DNER Secretary than before, the reorganization holds the promise of enhancing the the quantity and quality of communication with the Department and flexibility in how it can deal with fisheries related problems. It is hoped that following this reorganization, an organized policy towards fisheries management and enforcement can be developed.

Public Involvement

By 1988 there was a growing involvement of fishermen in fisheries debates. A number of fishermen's organizations had developed and were sending representatives to various public hearings concerning fisheries. Kimmel and Appeldoorn (1992) felt this to be a positive step and hoped the interactions would grow stronger over time with the long-term potential of developing a comanagement situation.

Events in the past six years have prevented the participation of fishermen's organizations from reaching their potential. Fishermen have not become integrated in the management process. This is due to a number of factors. First, the guidelines under which the regional fisheries management councils operate does not encourage comanagement with fishermen, while on the local level no system for management has ever been developed. Internal political struggles have developed within the various fishermen's organizations, which has prevented them from being an effective voice. This has led to a breakdown in the relationship between fishermen and the local government, from a political one to one of patron-client.

During the last six years there has also been an increase in the general public's involvement in fisheries matters. Public meetings now occasionally receive press coverage. In addition, there is a rapidly growing environmental movement in

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Puerto Rico, and this will significantly impact the potential for management in coming years, particularly in the area of habitat conservation and restoration. On the federal and international levels, the environmental movement has become increasingly more involved in fisheries conservation, to the point of suing management agencies for not protecting stocks and invoking the U.S. Endangered Species Act or the international CITES Convention to stop the harvest of endangered stocks. We would expect similar actions to occur in Puerto Rico if the present absence of management continues.

Fisheries in Crisis

In 1987, the Virgin Islands held a “Fisheries in Crisis” conference. The purpose of the conference was to demonstrate to fishermen, managers, politicians, enforcement personnel, etc. the dire condition of the local fisheries, to develop a consensus of the need for management, and to develop a common framework for the discussion of management measures. This conference was a successful call for action; very quickly after the meeting local management groups were formed among the fishermen, management measures were drafted, and these were upheld by politicians who promulgated corresponding laws. These events came about because the leadership within the Division of Fish and Wildlife had an action plan; they knew what they wanted the conference to do and planned it accordingly, and they were prepared to use the momentum gained by the conference to initiate management.

In 1991 Puerto Rico decided to try this approach. A local “Fisheries in Crisis” conference was planned, whose stated goals had the potential of making substantial progress overcoming several impediments: getting policy makers to have realistic perceptions about the fishery, enhancing education and communication among fishermen and managers, developing a fisheries policy with the common understanding of all parties, and stressing the need for enforcement of fishery regulations. The process was led by the Caribbean Fishery Management Council in cooperation with the Puerto Rico DNR, the University of Puerto Rico Sea Grant program, and other supporting groups. That this conference took place must be counted as one of the successes of the last six years; that the conference did not meet its objectives must be equally counted as one of the failures.

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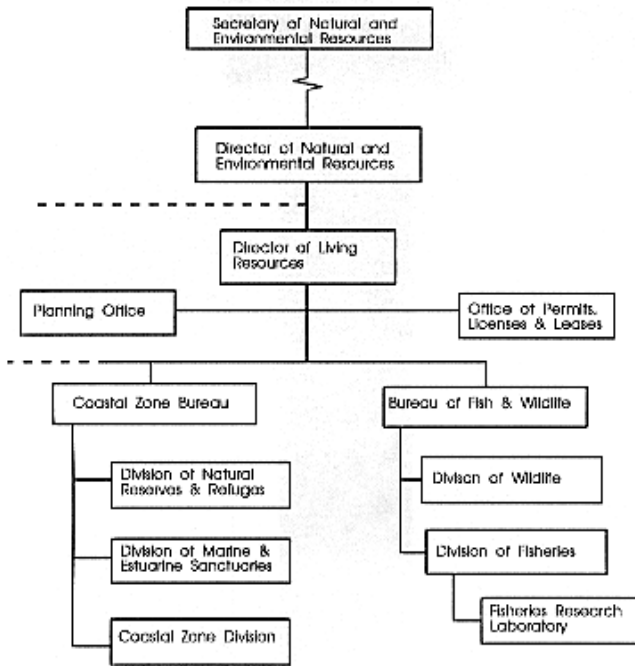


Figure 1. Organizational structure of the

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Puerto Rico Department of Natural and Environmental Resources with respect to Fisheries. Dashed lines indicate connections to non fisheries related offices.

From the first, the objectives of the conference were doomed to fail because no action plan in the larger context was ever developed. Although spearheaded by the Caribbean Council, it is really DNR that has jurisdiction in local waters. While DNR was a partner in name, they were not in spirit. First, the name of the conference had to be changed (i.e. diluted) to the “First Conference on the Marine Fisheries of Puerto Rico” because the former was considered too

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provocative. Secondly, although DNR was a sponsor, they did not encourage their own people to attend (e.g. enforcement personnel, policy makers, etc.). They had no plan to follow up on the meeting and initiate a management process because no policy directed toward fisheries management has ever been developed. Furthermore, although several fishermen's organizations sent representatives to the meeting, few fishermen were actually present. Press coverage was almost nil; pre-meeting publicity was equally as scant. A lack of policy and direction coupled with poor planning reduced this conference to being an isolated event, instead of being the catalyst it was supposed to be.

SEAMAP

SEAMAP-Caribbean is a cooperative program between the U.S. National Marine Fisheries Service, Puerto Rico and the U.S. Virgin Islands, and is headed by a committee composed of representatives of each group plus one from the UPR Sea Grant program, which also covers the Virgin Islands. Its purpose is the collection of fishery independent data on the status of the resources. Kimmel and Appeldoorn (1992) saw in SEAMAP an opportunity to overcome provincialism, provide new data to help overcome unrealistic expectations, and to enhance professionalism by requiring cooperative research. In the past six years the SEAMAP-Caribbean program has been formally organized and now receives federal funding to conduct resource surveys. While the initiation of SEAMAP and subsequent stock monitoring have not been without problems, the program is generally functioning well. We feel this to be a significant advance, but one that has yet to be solidified.

Caribbean Fisheries Management Council

Because almost all of Puerto Rico's insular shelf lies within local waters, the Caribbean Fisheries Management Council has little jurisdiction over Puerto Rico's fisheries resources. However, the Council plays a vital role in the local fisheries management process. As stated above, it is the local forum for discussing fisheries management at a number of levels, from fishermen to top administrators. It provides leadership, stimulation, and management models in the form of its Fisheries Management Plans. Thus, Council activities can have a major impact on local fisheries-management process.

In recent years the Council has developed a number of initiatives that have had, or potentially have had, a beneficial impact in Puerto Rico. These include sponsorship of the First Conference on the Marine Fisheries of Puerto Rico (see above), cooperating in independent efforts to establish a local marine reserve (see below), amending the Fisheries Management Plan for shallow water reef fish, the development of a management plan covering coral, reef-related invertebrates and

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fishes associated with the aquarium trade, protecting grouper spawning aggregations, and assuming leadership and responsibility for data processing and analysis.

The latter has been extremely productive. Most of the data collected in Puerto Rico is done under federal contract. In theory, these data are supposed to be analyzed by the National Marine Fisheries Service (NMFS); in practice, NMFS is hard-pressed to fulfill this responsibility. As a result, a large backlog of data existed, and analyses were crude. With the Council taking on this responsibility, a number of things have happened: the backlog of data has largely been removed; the data are now in a form where more sophisticated analyses are possible, which has led to the recognition of weak points in data collection, since corrected; several successful stock assessment workshops have been conducted; and substantial inroads have been made in standardizing data collection and reporting not only in the U.S. Caribbean, but in the Eastern Caribbean in general. Since local agency personnel have been involved in this effort, it has helped breakdown provincial attitudes, increase professionalism, develop a more realistic perception of resource status, and generally improve the working environment of fisheries scientists.

As elsewhere, however, these gains have not been solidified or have been balanced by losses in these or other endeavors. Already mentioned have been the outcome of the First Conference on the Marine Fisheries of Puerto Rico. The Council has lately begun to withdraw on other fronts. This includes choosing not to be involved in the RECFIN program (a federal program for marine recreational fisheries monitoring) and returning to the NMFS all responsibility for data collection, collation, and analysis. The justified reason for these withdrawals has been a reduction in federal funding for the council system, and the inability of the Council to make headway in one of its primary mandates, the development of Fisheries Management Plans. While it is true that streamlining Council activities offers the potential of placing its decreasing resources where they may be needed most, we question the necessity and wisdom of these actions. The Council plays a pivotal role in Puerto Rico and puts pressure, either directly or through cooperative programs, on local agencies to upgrade their capabilities and respond to the declining health of the resource. Withdrawal from the above activities threatens to remove the Council from this role and its role as the forum for fisheries management. These are needed to help pressure the Puerto Rico DNER into action. Furthermore, we doubt that failure to develop necessary management plans results from the time spent on these other activities. Nevertheless, we recommend that the federal government increase funding to the Council so that these additional activities can be continued.

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Virgin Islands Leadership

Much of the progress in the past six years resulted from the leadership given by the U.S. Virgin Islands; this was primarily exercised through Council activities. This leadership role resulted from the hiring of a highly qualified individual as head of the Division of Fish and Wildlife. Under his direction, the Division was reorganized and well-paid, qualified staff were hired free of political interference. A program for management was developed and acted upon, which included the integration of fishermen into the management process, and the planning and follow through of the Virgin Islands "Fisheries in Crisis" conference, which rapidly led to the promulgation of management regulations. The Virgin Islands played a lead role in drafting the charter for SEAMAP-Caribbean, in getting the Council to pass new regulations closing red hind spawning areas in federal waters, and generally encouraging the participation of fishermen and enforcement personnel in Council sponsored activities.

However, in the past few years both the Director of Fish and Wildlife and the Chief of Fisheries have left the Virgin Islands, with the former position still vacant. This has left a leadership void within the Council, and reduced the pressure on the Puerto Rico government to upgrade its capabilities and initiate management in its waters. Nevertheless, the USVI was instrumental in proposing a marine reserve south of St. John, extending from the coast to the shelf edge. Hopefully, this initiative will be recognized by Puerto Rico.

La Parguera Marine Reserve

One of the most significant recent events, one that we feel holds perhaps the best promise of forwarding fisheries management in Puerto Rico, is a movement to establish a small marine reserve in the La Parguera area. This movement is being led by the local fishermen in cooperation with Dr. Garcia of the UPR Department of Marine Sciences. With initial planning support from Sea Grant and the Council a proposal for the development of the reserve has been prepared and presented to the Department of Natural and Environmental Resources. Sea Grant has further supported the effort by initiating a long-term research program on the effectiveness of marine fishery reserves as management tools. The DNR is on record to favor the proposal, but concrete action has not occurred since the change of administrations following the 1992 elections.

It is our hope that this project rapidly gets into place. While the size of the projected reserve is too small to fulfill all the potential benefits offered by management through reserves (PDT 1990), it represents a start. At present, there exists a significant degree of distrust on both sides of the user- regulator fence. The marine reserve has the potential for demonstrating to fishermen the severe impact

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overfishing has had on the local resources, demonstrating to fishermen and managers that fishermen are capable of initiating management and controlling their activities, and demonstrating to managers that management is indeed possible. Considering past distrust and that fishermen throughout Puerto Rico are watching (hopeful of initiating their own management plans), it is important that the initiative of the La Parguera marine reserve not fail. If it did, it is most likely that the atmosphere for meaningful management would be lost for at least the next decade, and by that time it may be too late to save the resource from collapse. If the MFR is successful, it will serve as a model for management for the rest of Puerto Rico and strengthen the role of fisherman's organizations throughout the island. The reserve also offers potential economic advantages to the tourism and diving industries.

CONCLUSIONS

Despite a number of initiatives during the past six years, the impediments to management presented by Kimmel and Appeldoorn (1992) still exist, and no effective progress has been made toward fisheries management in Puerto Rico. In reviewing recent events, there is a recurrent trend of enacting promising new initiatives, but failure to have them fully planned or followed through. Thus, often a step forward is followed by a step backward, which results in increased frustration, cynicism and apathy. We recognize that the reorganization of DNR and the initiative of the La Parguera Marine Fisheries Reserve as two very important recent steps forward, and we hope that in time their promise will be fulfilled.

As the principal agency responsible for the marine resources in Puerto Rican waters, the Department of Natural and Environmental Resources must take responsibility for the poor current state of the resource and the lack of progress in initiating management. Lack of leadership in this area can be seen to result from two factors. First is the high turnover in the position of Secretary of DNER. The track record of four secretaries over the last six years is, in fact, average for the Department; since its inception in 1979 there have been 10 Secretaries. With this track record, there is little continuity in policy making and subsequent follow through. Second, in the way the DNR (now DNER) was set up and functions, responsibility for fisheries management rested with but a few individuals, all at the level of political appointee, and progress depended on their personalities and visions. This limits and controls the action of others who want to make progress, both within the Department and outside. Given these two factors, responsibility for the inactivity during the past 10 years can be placed squarely on these individuals, who have failed to realize the poor condition of the resource and its future consequences, actively blocked any effective move toward management, and

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patronized the fishermen instead of working for their longterm benefit.

As an illustration of the effects fisheries management could have, two examples are presented (Figure 2). To over-accentuate the point, these represent drastic situations. The starting point for both is 1984, when the catch was roughly 2.4 million pounds (down from a maximum of 5.3 million pounds in 1979), and both assume that in that year drastic management was initiated that led to a 38% drop in catch to 1.5 million pounds (roughly the lowest level of harvest in 1988). Under the first scenario a rebuilding program of 5% per year is enacted. Under the second, with more aggressive regulation, enforcement and habitat conservation, a 10% increase in catch per year is achieved. After ten years, the first scenario results in a total catch equal to that observed. Thus, the total catch and income over the eight-year period is similar to that achieved with no management (i.e., the current situation). The difference is that with management, future catches would increasingly be making a profit, while current landings are expected to continue at their present level trend. With a 10% annual increase, the catch over the first three years would be less than that actually observed, but from the fourth year on the annual catch would be greater. The cumulative catch rates would be equal in the seventh year (i.e., the early net loss would have been made up). After ten years, management would have resulted in an annual yield of 3.5 million pounds (a 65% increase over observed) and a 20% increase in cumulative landings, with further increases expected in subsequent years. The point is that, even with what in 1984 would have been considered too drastic a cut in fishing effort, the fishery would now be no worse off than it currently is, but with a positive future, and might actually be much better off.

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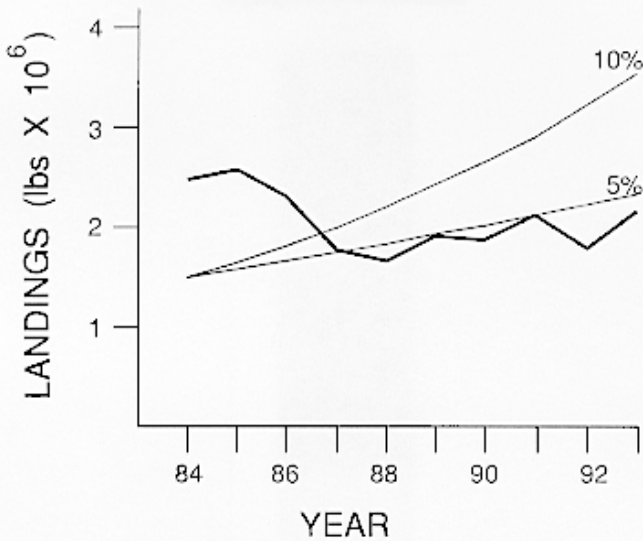


Figure 2. Estimated marine fisheries landings for Puerto Rico and predicted landings following a rebuilding strategy of 5% per year, and 10% per year.

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