

Creating a Fish Sanctuaries Network in Jamaica, West Indies

Creando una Red de Sanctuaries de Pescado en Jamaica, Antillas

En Créant un Réseau de Sanctuaires de Poisson en Jamaïque, Antilles

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ABSTRACT

Jamaica has lagged behind other Caribbean nations in the introduction of fish sanctuaries. This is no longer true, as in 2010 the government introduced nine small fish sanctuaries distributed around the island. The areas selected satisfied ecological and fisheries criteria and importantly, have an associated fishers group who have been chosen to enforce these special protected areas. This is the result of some two years of work by the Fisheries Division and the fishers in conjunction with the Fisheries Advisory Board of Jamaica. The fish sanctuaries include sheltered coastal habitats with mangroves, sea grass beds, sand patches, and coral while having modest fisheries resources, primarily juvenile in size. Close collaboration with and participation of fishers is a key feature of these new sanctuaries. In mid-2011 these fish sanctuaries were partly funded and most were active. A programme of publicity is planned which will continue indefinitely. We recognize in this paper, the interest and encouragement of the Minister of Agriculture & Fisheries, Dr. C. Tufton, who for the first time in many years has shown interest in fisheries matters at the ministerial and policy level and pushed for the introduction of these fish sanctuaries.

KEY WORDS: Fish sanctuaries, Jamaica, Fisheries Advisory Board, reef fishes, conservation

INTRODUCTION

In the mid-1970s, J.L. Munro first promulgated fishery reserves in Jamaica publishing the suggestion in an edited volume slightly later (Munro 1983). Still later, Aiken and Haughton (1987) incorporated this suggestion in their first comprehensive management plan for the fisheries of the island. But the development of fish sanctuaries was only resuscitated in 2008 with the formation of a new Fisheries Advisory Board. As part of its responsibilities, a group was formed to look into setting up Fish Sanctuaries. At the time of writing, there were nine such no-fishing areas around Jamaica. The effort has been a relatively successful collaboration between the Fisheries Division, the University of the West Indies, and a growing number of environmental non-government organizations (NGOs). This paper reviews the background, ecological, legal, and management issues surrounding introduction of fish sanctuaries. Funding, enforcement of these areas, and the introduction of new sanctuaries are some of the challenges presently facing managers. It is our view that the successful introduction of these sanctuaries was a major positive step in sustainable fisheries management in Jamaica.

Fish sanctuaries are widely accepted in the scientific community as a valuable fisheries management tool that, once properly managed, can enhance fisheries resources in areas so designated. They perform this by providing a refuge for fish and other living resources thereby increasing their survival and ultimately their productivity and catches in and around neighbouring fishing grounds (Edgar & Barrett 1999, McLanahan et al. 1999, Cowley et al. 2002, Fisheries Division, 2008). This increase in survival results in a phenomenon known as the “spillover effect” where protected fishes attain maturity and spawn allowing some young fishes within the sanctuary migrate outwards into adjacent fished areas slowly increasing stocks and catches in these areas.

Records of benefits of marine protected areas have been found in various geographic areas worldwide, including South Africa (Cowley et al. 2002), the Philippines (Maliao et al. 2004), Florida and the Bahamas (Chiappone et al. 2000) and New Zealand (Willis et al. 2003), where numbers, biomass and mean sizes of fishable resources within fish sanctuaries were reported to be significantly higher than in adjacent fished zones. Though there are several Caribbean reserves, publications confirming fish stock improvements are few. One of the most significant found however, was the work of Roberts & his colleagues in the Soufriere National Reserve in St. Lucia, eastern Caribbean. They reported that following a history of steadily declining fish trap catches, after five years after sanctuary implementation there were increased catches by fishers of between 46 and 90% as a direct result of the introduction of the sanctuary (Roberts et al. 2001).

DEVELOPMENT OF FISH SANCTUARIES

Jamaica has an unenviable record of high fishing effort and has been considered overfished since the early 1980s (Munro 1983, Aiken and Haughton, Haughton, 1988, and Aiken 1993). This overfishing has resulted in changes in species composition and biodiversity. The top carnivores such as snappers, groupers, and jacks have largely been replaced by lower-valued herbivorous fishes such as parrotfishes and surgeonfishes. After collecting a large database on the biology and population dynamics of Jamaica’s fishable stocks and obtaining the first overall deductions on stock status, Munro (1983)

was the first make recommendations on the introduction of fishery reserves. He stated that Jamaica's fisheries would benefit from the introduction of such areas. However, although the reports and recommendation of Munro and his colleagues were well received by the Government of the time, no reserves were introduced.

A review of the status of fisheries of Pedro Bank and south shelf fisheries was made in the early 1980s (Hartsuijker and Nicholson, 1983) which confirmed their poor status but no reserves were introduced. The first basic fisheries management plan by Aiken and Houghton (1987) set out a number of coastal areas around the island for consideration as fishery reserves. Still, no network of reserves was set aside. In 2003, a Fisheries Advisory Council was created but its activities ceased before any sanctuaries were recommended.

In 2008, the Ministry of Agriculture & Fisheries created a Fisheries Advisory Board which had, as part of its mandate, the consideration of the introduction of fish sanctuaries. The policy was to use them as enhancement tools. That same year, a sub-committee was given the responsibility to shepherd the relevant datasets and to closely collaborate with the Fisheries Division to create and launch a number fish sanctuaries. This step was a key decision. A number of coastal areas were assessed and the process for their introduction initiated. It is important to record that historically, two small "paper" sanctuaries existed before the ones currently the subject of this paper, and were:

- i) Bogue Island Lagoon, St. James, near Montego Bay (introduced in cooperation with Natural Resources Conservation Department in 1972), and,
- ii) Bowden Harbour, St. Thomas (introduced for oyster culture purposes).

These were never properly enforced over the years and were not run by NGOs.

SELECTION OF SANCTUARIES

The criteria used for the assessment and designation of coastal areas for sanctuaries were as follows:

- i) Possess healthy and relatively undamaged coral reefs, which in turn,
- ii) Have relatively moderate to large numbers of coral reef fish and associated species present on a permanent basis (i.e. all times of the calendar year),
- iii) Should ideally be associated with adjoining healthy mangrove growth (not an absolute requirement in all cases),
- iv) Be relatively unpolluted (free from industrial or agricultural chemicals and/or large amounts of suspended matter from terrestrial run-off, or proximity to landfills),
- v) Should not be surrounded by substantial human habitation or physical development in close proximity,

- vi) Ideally, be associated with at least one functioning Non-Government Organizations (NGO) which will operate the sanctuary and enforce the regulations protecting it (this may be considered on an individual basis),
- vii) Should not be an area where the designation of the area as a fish sanctuary will not cause massive and irreparable displacement of large numbers of fishers (who have no alternative location or fishing grounds to turn to),
- viii) Should have significant conservation support for the adjoining fisher community, and
- ix) Should be a minimum area of 10 km² (estimate modifiable).

All marine areas considered for designation as sanctuaries were surveyed by technical experts prior to declaration, in order Sanctuaries sub-committee of the Fisheries Advisory Board, chaired by the first author. If approved, gazetting (printing in government document) and declaration usually followed required due diligence checks.

MANAGEMENT

At first, eight areas were considered but this grew in number to 10 by 2009. Once ecological criteria were satisfied, ground-truthing of boundaries was done by the Fisheries Division. Legislation setting out the description comprising what was termed the Fish Sanctuary Order was then drafted for approval by the Chief Parliamentary Counsel's Office. This approval could take several months. One of the key steps for the management of the new fish sanctuaries was the identification of stakeholder interest and the presence of an organized stakeholder group including fishers among its members. The Fisheries Division would then enter into a formal agreement (Memorandum of Understanding or MOU) with each group for the management of the fish sanctuary prior to the disbursement of start-up funds. As can be determined, a lot of the due diligence was done by the staff of the Fisheries Division.

The role of NGOs is not to be underestimated as these were a key requirement in setting up and approval of each sanctuary. NGO-support was critical for success as responsibility for operation was theirs. Before any handover of start-up funds by the Fisheries Division, NGO attendance was compulsory at a series of training workshops for administrative and enforcement staff organized by the Fisheries Division (Figure 1).

IMPLEMENTATION

A total of 11 sanctuaries were declared in late 2009 and early 2010. A list of these and the NGOs connected with them plus their size in hectares is provided in Table 1 (modified from the Fisheries Division, Jamaica website). For historical perspective, the older "paper" fish sanctuaries are included.

Worthy of note is the presence of a Private Sector group, the Sandals Hotels Foundation, which introduced a series of very small fish sanctuaries in front of their hotels in St. Mary on the northern coast. This private group now works closely with the sanctuaries sub-committee.

SANCTUARY NETWORK

It may be said that there is at the time of writing (2011) a network of small fish sanctuaries around Jamaica. These are distributed around the entire island as shown in Figure 2.

A typical fish sanctuary in Jamaica therefore is comprised of: 1. Mangroves, 2. Seagrass beds, 3. Coral reefs, 4. Sandy/muddy areas near to shore, and 5. fishable populations of various marine species. A typical fish sanctuary is illustrated in Figure 3, which follows.

The zone shown outlined in Figure 3 is part of the largest coastal bay in Jamaica which earlier studies had shown was a giant fish nursery (Aiken et al. 2002). This entire area, called Old Harbour Bay (central south coast) was found by these researchers to be an area of high

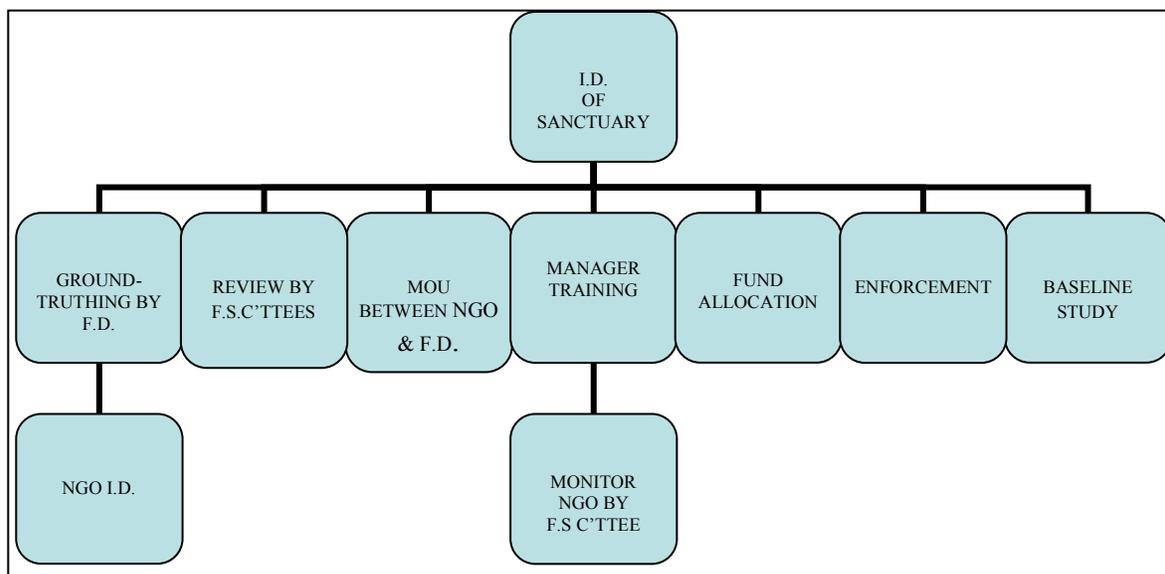


Figure 1. Flow chart showing summary of major steps to implementation of sanctuaries.

Table 1. List of Fish Sanctuaries with responsible NGO and size (ha) for selected sanctuaries.

Names Of Declared Fish Sanctuaries	Parish/ Regions	Year Declared	Managed by	Approximate sizes (Ha)
Three Bays Fish Sanctuary	Helshire, St. Catherine	July 28, 2009	C_CAM Foundation	1211.002
Galleon Harbour Fish Sanctuary	Old Harbour, St Catherine	July 28, 2009	C-Cam Foundation	1668.965
Salt Harbour Fish Sanctuary	Salt River, Clarendon	July 28, 2009	C-CAM Foundation	1031.983
Galleon Fish Sanctuary	Crawford, St Elizabeth	July 28, 2009	The Breds Foundation	253.236
Bluefields Bay Fish Sanctuary	Belmont, Westmoreland	July 28, 2009	Bluefields Bay Fishermans Friendly Society (BBFFS)	1359.409
Orange Bay Fish Sanctuary	Orange Bay, Hanover	July 28, 2009	Negril Area Environmental Protection Trust (NEPT)	535.514
Montego Bay Marine Park Fish Sanctuary	Airport Point, Montego Bay, St James	July 31, 2009	Montego Bay Marine Park Trust (MBMPT)	302.796
Discovery Bay Fish Sanctuary	Discovery Bay, St Ann	July 28, 2009	Alloa Fisherman's Cooperative	168.385
Sandals Boscobel Fish Sanctuary	Boscobel, St Mary	Feb.23, 2010	Sandals Foundation	99.115
Oracabessa Bay Fish Sanctuary	Oracabessa Bay, St Mary	Feb.23, 2010	Oracabessa Bay Foundation/Oracabessa Bay fisherman's Group	
Bowden Harbour Fish Sanctuary	Bowden, St Thomas	May 13, 1986	Fisheries Division	
Bogue Island Lagoon Fish Sanctuary	Bogue, St. James	July 25, 1979	(MBMPT)	

Table 2. Problems encountered in establishing fish sanctuaries in Jamaica.

Difficulty	Consequence	Solution
Chief Parliamentary Counsel (CPCO) Office drafting legislation	Serious delays in implementation, repeated re-drafting	Closer collaboration with CPC office
Transport for ground-truthing boundaries	Delays in implementation	Increased sanctuary funding for Fisheries Division (FD)
Intra-NGO difficulties (rare)	Delay in MOA signing & funding	Harmony within NGO
Continuity funding for sanctuaries after start-up	Continuity problems and stalling	Increased dedicated sanctuary funding for FD.

reef-rich oceanic site around the Pedro Cays approximately 160 km southwest of Kingston. This zone is located on the island's largest fishing ground called Pedro Bank, site of the industrial queen conch fishery, Jamaica's most valuable fisheries export. There is presently significant sanctuary support among the large fisher population resident on the tiny cays due to years of conservation sensitization by various organizations led by The Nature Conservancy. Lastly, the Morant wetlands and associated fringing reefs to the farthest east, is a key site to be protected as it would act as a reseeding source for depauperate down-current areas. There is an extensive up-to-date database of bio-physical information from that area already in hand, collected by the Life Sciences Department at the University of the West Indies, Mona.

THE FUTURE

There is presently a continuous process of assessing and evaluating various suggested fish sanctuaries sites that come to the fish sanctuaries sub-committee. The most difficult of the criteria to satisfy is the presence of a supportive NGO to operate the future sanctuary. Nonetheless, there are presently (2011) several sites that are in various stages of evaluation. These sites and their value and evaluation status are summarized in Table 4. The overall final objective is to have approximately 30% of Jamaica's coastline set aside as fish sanctuaries and other types of marine protected areas (MPAs), in keeping with the policy of many other coastal nations around the world.

SUMMARY

Nearly 30 years after the very first suggestions, a network of NGO-supported fish sanctuaries was introduced in 2009/2010 by the Jamaican government. The sanctuaries are scattered around the entire island. Though there were some snags in organizing their introduction, this paper suggests that it was a major first step in the sustaina-

Table 3. Observations on process of sanctuary introduction.

Activity	Comments
Non-implementation of 1980s plan for fish sanctuaries	Lack of political will
Recent positive change in Government attitude towards fish sanctuaries	Further declines in catches, pressure from fishers
Location of new fish sanctuaries	Key inputs from scientists and fishers
Operation of fish sanctuaries	Guarantees from NGOs under terms of Memoranda of Understanding
Final implementation of fish sanctuaries 2009/ 2010	Critical support from fisheries Minister as well as fishers and NGOs.

Table 4. List of proposed future fish sanctuaries, importance and stage of evaluation at end of 2011.

Site & location	Evaluation stage	Comments
Fish Bay (East Polink Point), St. Catherine	To be implemented shortly	Will be added to other run by CCAMF
Pedro Cays (Pedro Bank) offshore	To be implemented shortly	TNC-led effort with Fisheries Division, JDF Coast Gd., & Marine Police
Morant Wetlands, St. Thomas	Boundaries to be marked.	Important up-current eastern site, extensive data collected by UWI, Mona

ble management of the fishable resources of Jamaica. Several additional ones are already planned. It is our opinion that major factors in achieving the recent sanctuary network introduction, were the support from the then Agriculture & Fisheries Minister, Dr. Christopher Tufton, along with growing fisher demand for these sites as well as creation of environmental NGOs to operate the sanctuaries. It is hoped that the momentum attained will be maintained over the next few years.

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