



Flags of Convenience & The Large Pelagic Fishing Industry

By Dr. S. Singh-Renton, CRFM Secretariat

With growing international concern about the status of stocks of tuna and tuna-like fishes within the Atlantic and other oceans, international management bodies, such as the International Commission for Conservation of Atlantic Tunas (ICCAT), have been imposing stricter management regulations to reduce effective fishing effort on these highly prized fish resources. These new regulations have placed considerable pressure on member governments, particularly in those industrialized, developed nations that have operated heavily over-capitalized tuna fisheries for a number of years. Several nations have increased their fishing vessel registration fees and taxes in an effort to encourage a desired number of fishing vessel owners to give up the business. However, some vessel owners have opted to give up the flag of the home state instead.

Developing countries, and countries with open registries, provide alternative vessel registration opportunities that are convenient in more ways than one: avoidance of higher registration fees and taxes, avoidance of regulatory measures in cases where the country of registration is not a member of ICCAT, and avoidance of safety regulations prescribed by international law. The vessels concerned are often referred to as Flag of Convenience (FOC) vessels, because of this general perception of 'eluding increased scrutiny of fishing operations and taxes', associated with changing the country of registration.

Unfortunately, in many CRFM countries, the registration of foreign-owned fishing vessels is not usually managed directly by the Ministry responsible for fisheries matters. Furthermore, until very recently, the national office so involved did not normally consult with the local fisheries authority prior to approving foreign-owned fishing vessel registration applications. In the late 1990s, this arrangement had disastrous consequences for countries with open vessel registries such as Belize and St. Vincent



Fisher in Belize holding a King Fish

and the Grenadines, which were both subjected to international tuna trade sanctions by ICCAT because of illegal, unregulated and unreported (IUU) fishing activities carried out by foreign-owned 'High Seas' vessels flying the flags of these two nations. After considerable effort both at the national and regional levels, the ICCAT trade sanctions against Belize and St. Vincent and the Grenadines were lifted in January 2004.

However, these two countries still have registered a number of large foreign-owned 'High Seas' fishing vessels, and a continued, more extensive effort will be needed to defend against future international allegations of illegal fishing. This is because of the significant resources necessary to enable an adequate Monitoring, Control, and Surveillance (MCS) system for such large-scale and highly mobile vessels that call and trade at ports throughout the world. In the case of ICCAT, MCS measures include establishment of port inspection schemes, at-sea inspection schemes, adequate independent observer coverage of the fleet, and implementation of ICCAT statistical document programmes that report on trade in tuna and tuna products, and the list keeps growing.

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Given that FOC vessel owners usually come from richer nations, it is easy for them to offer attractive joint venture and fisheries development deals to poorer, developing countries. Visions of boosting historical catch statistics and so guaranteeing quota allocations in the future, as well as training for local fishers and employment opportunities, help to make these deals more alluring than ever for countries in urgent need of tangible solutions for resolving national problems pertaining to food security and economic development. However, these deals are coming at a time when many Atlantic large tuna and billfish stocks are severely depleted and stock recovery programmes are underway. It is therefore not a good time to claim, virtually overnight, huge increases in national catches of regulated large tuna and billfish resources, as this would invite negative reactions from international management bodies. Neither is it a good time for developing countries, eager to build new fisheries, to commit to purchasing the FOC vessels after the completion of joint venture deals that may conveniently come to an end when the resources do as well.

In terms of training for fishers and fisheries development opportunities, the FOC vessels are often large-scale industrial vessels requiring substantial operating costs, highly skilled fishers, who are willing to be at sea for months at a time, and an internationally approved MCS system. Not an insurmountable hurdle for our developing countries, but the timing must be right. After we have learned to walk and are ready for the run!

A number of FOC vessels use transshipment ports within the region, easily winning governments' support

through the establishment, in country, of comparatively small processing plants that employ locals. In Trinidad and Tobago, where there is a large transshipment port, the Ministry responsible for fisheries is in the process of establishing a Memorandum of Understanding (MOU) with the main transshipment company operating there. This MOU will be essential for allowing the national fisheries authorities to access the port to monitor the off-loading of catch harvested by vessels, obtain records of landings, monitor operations for IUU fishing and monitor sanitary standards at the off-loading site.

However, without adequate and fully operational MCS systems in CRFM countries, many of which lie so close to each other, illegal fishing by FOC vessels is likely proceeding unhindered, scooping up essential fish resources within national waters, on which the local industry may solely be dependent. The finite gain in employment as a result of allowing FOCs to use ports within the region, and allowing them to traverse national waters, must therefore be weighed carefully against the losses. These could be in the range of employment opportunities afforded by the local fishing industries, that can accommodate a wider range of labour skills, the possible irreversible reduction in or loss of a key contributor of local food production and hence food security, and the loss of tradition and culture. No doubt, large-scale fishing has a role in our present, as well as in our future. Making an informed decision on the nature and extent of that role requires planning, research, and ongoing consultations between stakeholders and managers. Some food for thought!

MANAGEMENT & POLICY

The Fisher Organization Model of Co-Management: The Case of the Belize Fishermen Cooperative Association (BFCA), Ltd.

By David N. Brown, Ph. D., CRFM Secretariat

The Belize Fishermen's Cooperatives emerged in the 1960s, some two decades before Belize achieved political independence, as a mass movement that had wrestled lobster processing and exporting rights from foreign monopolists, accused of exploiting the local producers through exploitative producer prices. Each cooperative is owned and managed through an elected management committee. Its umbrella organization, the Belize Fishermen Cooperative Association (BFCA) formed by representatives of the member organizations since 1970, uses the defense of this privilege-turned right of monopoly over the processing and exporting of lobsters, and later on, of conch, as a rallying point for unity against any imagined or real threat from both internal and external sources. At present the mem-

ber cooperatives are National (the largest), Caribena, Placencia and Rio Grande (the most recently formed).

The organizational strength of the movement is primarily dependent on the defense of this monopolistic right; their economic strength is derived from the lucrative trade in lobster and conch products. This significantly enhances their independence and reduces their dependence on government largesse. The BFCA operates from a position of both political and economic strength, and has been successful in warding off any attempts to deprive the members of their hard won rights. The movement embraces the conservation ethic and regularly organizes educational and community awareness programs for its members and

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Belize Fish Market

stakeholders in the fishing communities, thus building their capacities for the responsibilities involved in co-management. The practice of fiscal responsibility and accountability by the leadership makes them above reproach, which contributes to group cohesion.

Through the BFCA, the member cooperatives have the ability of bargaining for concessions from governments, and are able to influence decision-making through dialogue, lobbying, negotiations and effective use of their membership on the National Fisheries Advisory Board. The BFCA's leadership represents the member organizations in all negotiations and consultations with government and other relevant organizations, and has developed networks and alliances to access external funding for projects to the benefit of its member organizations. The BFCA remains the only appropriator organization in the region that

consistently accepts invitations, or invites itself to decision-making fora. It is one of a few that vehemently protest, when decisions are made without their involvement.

Elements of co-management built into the process include supportive surveillance of the fishery, and participatory decision-making in the formulation and application of conservation regulatory measures. This is a classic case of a dynamic partnership between a resource appropriation organization and government functionaries in management relationships, in which the scale of strength and influence seems to weigh in favour of the former. This is a form of open-ended co-management arrangement, not based on any formal agreement, or legal statutes, but recognized and respected by all parties involved in the relationship.

Second Meeting of the Working Group on the Common Fisheries Policy and Regime

by Mr. Terrence Phillips, CRFM Secretariat

In keeping with the mandate initiated at the Fourteenth Inter-Sessional Meeting of the Conference of Heads of Government in Trinidad and Tobago, February 14 – 15, 2003, to establish a Common Fisheries Policy and Regime at the CARICOM level, the CRFM Secretariat, in collaboration with the CARICOM Secretariat, convened the Second Meeting of the Working Group on the Common Fisheries Policy and Regime, in Guyana, from June 9-10, 2004. The aim of the Meeting was to continue the discussions on the establishment of the Common Fisheries Policy and Regime as well as prepare a progress report for the CRFM News, July 2004

Seventeenth Meeting of the Council for Trade and Economic Development (COTED), June 14 – 17, 2004, and for onward submission to the next Conference of Heads of Government (CARICOM) Meeting in July 2004. The Meeting was chaired by Mr. Raymond Ryan, Chief Fisheries Officer, St. Vincent and the Grenadines/Chairman of the FORUM, and had in attendance representatives from Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Guyana, Jamaica, Montserrat, St. Lucia, St. Kitts and Nevis, Suriname, Trinidad & Tobago, Turks and Caicos Islands, CARICOM Secretariat, Organisation of Eastern Caribbean States – EDSU, and CRFM Secretariat.

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Second Meeting of the Working Group (Continued from Page 3)

The Meeting reviewed the two Draft Consultants' Reports entitled: "A Common Fisheries Regime for the Caribbean Sea" and "Delimitation of Maritime Boundaries within CARICOM: Development of Relevant Rules for Delimitation of Maritime Boundaries, including Practical Illustrations of the Operations of Such Rules" and made comments and recommendations. Some member states provided written comments prior to the meeting and others were given the opportunity to provide written comments before the finalization of the Draft Reports.

The Workshop reaffirmed the agreement in principle to the establishment of a Common Fisheries Policy and Regime, and set out the key issues emerging from the Workshop in the format of a Framework for a Regional Fisheries Policy and Regime with a view to highlighting matters that need to be addressed. Included in the Framework for a Regional Fisheries Policy and Regime are a background; vision; goal; objectives; fundamental principles; policies with respect to access to fisheries resources, management, research and data collection and marketing and trade; the zone concept; maritime jurisdiction/delimitation; management of the Common Fisheries Policy and Regime; species to be managed in the zone; powers of the implementing agency; membership/participation; responsibilities of the implementing agency; representational rights of the implementing agency; dispute settlement; accession and withdrawal. The member states accepted that the establishment of a Common Fisheries Policy and Regime was a work in progress requiring policy guidance in many areas, and as such the framework document did not purport to provide agreed or settled positions.

In order to facilitate the establishment of the Common Fisheries Policy and Regime, the Seventeenth Meeting of the Council for Trade and Economic Development

(COTED), June 14 – 17, 2004, and the Twenty-Fifth Meeting of the Conference of Heads of Government of the Caribbean Community, July 4 - 7 July, 2004, approved, with some modification, the activities for the Way Forward as recommended by the Workshop as follows:

(i) The Consultants would refine the draft working reports for circulation to Member States by August 15, 2004, taking on board the inputs of the June 9 – 10, 2004 Workshop and the written submissions received from Member States.

(ii) National Consultations, informed by the draft framework for Regional Fisheries Policy and Regime, as adopted by the Second Meeting of the Working Group June 9-10, 2004 and the final Reports of the Consultants, was to be held in Member States from August to October 2004.

(iii) The Third Meeting of the Working Group would be convened in November 2004 to consider the output of the national consultations, the draft framework for the Regional Policy and Regimes, and a discussion paper to be prepared by the CRFM Secretariat on the implementation mechanism for the Common Fisheries Policy and Regime.

(iv) A regional multidisciplinary workshop of the Member States would be convened in January 2005 to consider the output of the third Working Group and refine the Draft Framework for the Regional Fisheries Policy & Regime.

(v) A legal workshop would be convened in January 2005 to develop a working draft of possible legal arrangements for the CFP&R.

(vi) A Progress Report would be prepared for submission to consideration of a Meeting of the COTED with appropriate Legal and Foreign Affairs Ministerial participation, with the recommendations from the COTED going to the Sixteenth Inter-Sessional Meeting of the Conference of Heads of Governments.

National Consultation on the Draft Fisheries Management Plan for the Fisheries of Haiti

By Mr. Michael Salton, Biologist, CRFM Secretariat

The Directorate of Fisheries and Aquaculture, Haiti, in collaboration with the CRFM Secretariat, held a National Consultation on the Draft Fisheries Management Plan (FMP) for the Fisheries of Haiti in Port-Au-Prince, on the 24 & 25 May, 2004. The objectives of the Consultation were to discuss and elaborate the FMP, using the participatory approach, to obtain stakeholder input in its finalisation; to examine the institutional requirements needed for management of the fisheries; and to determine an appropriate mechanism for continued consultation between Resource Managers (Government) and other Stakeholders on the management and development of the fisheries of Haiti. There were about thirty participants at the Consultative meeting, comprised of representatives from the Ministry of Agriculture, Natural Resources and



Rural Development (MARNDR), Fishers Organizations, fish processors and Fish Products Exporters. The Programme Manager, Fisheries Management and Development, Terrence Phillips, and Biologist, Michael Salton, from

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the CRFM Secretariat, served as Resource Persons.

Following the presentation of the Draft Fisheries Management Plan, a participatory problem analysis approach was adopted to identify the main issues/problems affecting the management of the Fisheries of Haiti. These were in the areas of socio-economic and environmental conditions. They included the following:

- Prevalence of acute poverty among the small-scale fishers.
- Lack of employment opportunities in other sectors of the national economy
- Inadequate management regulations and lack of enforcement
- Lack of public awareness and education on matters relating to fisheries management and the preservation of the marine environment
- Inadequate access to credit
- Absence of a policy on investment in the fishing industry
- Inappropriate fishing technology

- Rampant illiteracy among the artisanal fishers
- Inadequate government assistance to the industry
- Paucity of data/information research, hindering informed decision making
- Lack of formal training for human resource development and institutional capacity building

In addition, an overview of the queen conch fishery in the Caribbean was conducted, highlighting the issues needing urgent management action due to the CITES recommendations about the international trade in conch. It was suggested that the Directorate of Fisheries and Aquaculture and the Private Sector should work together in taking the necessary measures to satisfy the CITES' requirements.

After the presentations and discussions, participants broke into four working groups, which reviewed the various sections of the Draft FMP and made recommendations to the plenary for refinement. A follow up action plan that would see the finalization and implementation of the Haiti FMP in early 2005, was developed at the end of the Consultation.

Establishing the Scientific Link in the CRFM Management Chain

By S. Singh-Renton, CRFM Secretariat

The CRFM held its First Annual Scientific Meeting in St. Vincent and the Grenadines during 28-30 June 2004. In the week preceding the meeting, species rapporteurs from five CRFM Fisheries Working Groups worked with international assessment consultants to examine and analyse available fisheries data in an attempt to evaluate the health of a number of fish stocks within the region. Spanish mackerel (*Scomberomorus brasiliensis*), wahoo (*Acanthocybium solandri*), southern pink shrimp (*Farfantepenaeus notialis*), Atlantic seabob (*Xiphopenaeus kroyeri*), spiny lobster (*Panulirus argus*), red hind (*Epinephelus guttatus*) and three small coastal pelagic species (*Selar crumenophthalmus*, *Decapturus macarellus*, and *D. punctatus*) were analysed to the extent made possible by the quality and quantity of available data submitted by CRFM countries. Results were then presented for review and discussion during the formal meeting sessions.

All CRFM countries were represented at the Meeting, which was also attended by fisheries scientists from the neighbouring territories of Cuba and USA, as well as scientists from regional research institutes and organizations (UWI, IOCARIBE), and FAO. Representatives from the local fisherfolk organizations also actively participated in the meeting and contributed greatly to broadening the focus of the discussions held.

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The 2004 assessments of Spanish mackerel, the pink shrimp and Atlantic seabob were completed using data primarily submitted by Trinidad and Tobago. Initial results for the shrimp species, though not conclusive, indicated these stocks to be fully to over-exploited. Other results were less conclusive, due to certain limitations in the data.

The scientists recognized the urgent need to continue to refine the assessment work of the various Working Groups in future years. For each of the established five Fisheries Working Groups, chairpersons and rapporteurs were elected for the 2004-2005 period. Pending specification and formal approval by the CRFM Ministerial Council of the assessment and management directions to be pursued for each of the fisheries concerned, the Meeting compiled a preliminary list of species to be addressed during the 2005 Scientific Meeting. This list would allow the national scientists and Working Group rapporteurs to begin planning for next year's assessments with adequate time for data preparation and preliminary analyses.

The Report of the Scientific Meeting will be presented for review and endorsement at the next meeting of the Caribbean Fisheries Forum. The approved Scientific Meeting Report is then expected to be submitted to the CRFM Ministerial Council, which will be responsible for review of the management advice, and for providing further guidance on the scientific information needs to inform agreed and established management objectives.

NGO-Sponsored Initiative: The Case of the Portland Bight Sustainable Development Area (PDSA), Jamaica

By David N. Brown, Ph. D, CRFM Secretariat

The Caribbean Coastal Zone Management (CCAM) Foundation, formerly known as the South Coast Conservation Foundation (SCCF), became the first NGO, dedicated to the sustainable management of coastal resources, to respond to the serious stock depletion situation in Jamaica. In the 1960s, it established a complex Community-based Coastal Zone Resource Co-Management project in the Portland Bight area of southern Jamaica. The successor organization CCAM, was established in 1983. Portland Bight is the largest embayment in Jamaica, hitherto very rich in fishery resources, with a complex eco-system, including nursery grounds for fish, crustaceans and mollusks. The project is a multi-coastal resource project, going beyond fisheries management to the management of wetlands, forestry, coral reefs and other rare fauna.

The project was established through the provision of technical support for mobilization and formation of Fishers' Associations embodying active fishers and other stakeholder groups in the communities, the building of the capacities of these organizations for co-management through education and awareness building programs, the zoning of marine space among multiple user groups, the establishment of fish sanctuaries, and the establishment of a professional administration with officers responsible for capacity building and surveillance and enforcement of resource use rules and regulations.

It instituted a local resource management council- the Portland Bight Fisheries Management Council (PBFMC) of 32 members drawn from all stakeholder groups, including representatives of fishers' organizations, the local branches of the security forces, the Natural Resource Conservation Authority (NRCA) and CCAM. Among other things, this supreme body is charged with the responsibility of making and enforcing local resource use rules and regulations. The legal backing was provided by the NRCA, the public agency charged with the responsibility of declaring and managing protected areas on behalf of the government, and to transfer the authority to manage particular areas to competent NGOs. By this means, the CCAM became a facilitator of resource co-management in Portland Bight. Management sustenance of the fisheries resources is vested in the PBFMC, government's recognition of CCAM's management responsibilities, and fiscal sustenance of the project, through resource user fees and nature tourism activities in the area.

This co-management arrangement enhances community democracy and empowerment, while acknowledging the duty of the state to be involved in the process. CCAM therefore, functions as a facilitator. Ultimately, as institutional strengthening and capacity building take firm hold, CCAM would withdraw from the project to give way to a direct co-management between government and the communities.

CRFM QUICK FACTS

- An Agreement establishing the CRFM was signed by the Heads of Government of CARICOM on 4th February, 2002.
- Officially launched on March 26th, 2003 as the regional institution responsible for the promotion of the sustainable use and development of the fisheries of the Caribbean
- Strategic Plan (2003 – 2010) Approved May 2003.
- Medium Term Plan (2004-2007) Approved May 2003.

Vision – The sustainable use of the fisheries and aquaculture resources in and among Member States by the development, management and conservation of these resources in collaboration with stakeholders, to the benefit of the people of the Caribbean Region.

Mission – To promote and facilitate the responsible utilization of the region's fisheries and other aquatic resources

for the economic and social benefits of the current and future population of the region.

Full Membership is open to Member State and Associates Members of the Caribbean Community (CARICOM).

Associate Members – any States Territory of the Caribbean region which is able and willing to discharge the obligations required under the Agreement establishing the CRFM

Observers – representation from institutions and bodies such as Fisherfolk Organizations and private Fishing Companies within the Caribbean; Regional bodies and institutions working in the area of fisheries, as well as Non-Governmental Organizations.

** Strategic Plan for the CRFM, CARICOM Fisheries Unit, February 7th, 2003, pp.6-1 to 6-3*

RESEARCH & TECHNOLOGY

The Nassau Grouper Fishery Of The Bahamas

Submitted by Fisheries Department, The Bahamas.

The Nassau grouper (*Epinephelus striatus*) represents the most important finfish resource in The Bahamas. This species is recognized historically as being one of the most commercially important food fishes of the Caribbean and it offers a valuable source of income to local fishermen. During 2003, over 930 kg of Nassau grouper were landed for the commercial market, with an approximate value of \$B 2,760,716. (The statistics presented here do not include subsistence and recreational fishing). 60% of the landings occurred between the months of December and January. It is during these months that the Nassau grouper can be found in abundance due to the fact that they form large schools for the purpose of reproduction.

The Nassau grouper (*Epinephelus striatus*) is widely distributed throughout the tropical western Atlantic Ocean. This species can also be found in the waters of Bermuda, Florida and the northern and central coasts of South America. The life history characteristics of this species contribute to their vulnerability to human exploitation. These fish have a long life span, are slow growing, attain a large size at sexual maturation and aggregate for reproduction. The specific feature that makes the Nassau grouper vulnerable is that the fish aggregate during defined times and specific locations each year. The location of most spawning aggregations throughout the western Atlantic and specifically here in The Bahamas, are known and have been exploited by generations of local fishermen. Within the past 15 – 20 years there have been declines in landings from aggregations, as well as commercial and recreational catches throughout the region. This has made biologists and fisheries managers concerned that the Nassau grouper could become locally or commercially extinct in the western Atlantic. In comparison to the wider Caribbean, The Bahamas is considered to have one of the healthiest stocks of Nassau grouper. An important lesson that can be learned from other countries such as The Dominican Republic, U.S. Virgin Islands and Jamaica is that, once the grouper stocks have been depleted, they are gone forever. Here in The Bahamas, we are in a fortunate

position whereby we still have time to learn from the mistakes of others.

The Department of Fisheries has undertaken various management measures for the Nassau grouper to ensure the sustainability of the fishery. Since 1998, the Department has been implementing closures of specific aggregations during the spawning season (November-January). The areas that are closed to all forms of fishing activities are, High Cay, Andros and two aggregations at Long Island. In addition to closing these aggregation sites, research was conducted at the sites as well as other aggregations. In 1999 a collaborative research project between the Department of Fisheries, The Bahamas (led by Dr. Kathleen Sullivan-Sealey of the University of Miami), was conducted and published. This research investigated the reproductive biology and fecundity of the species landed by fishermen who were targeting spawning aggregations in the Central Bahamas. Other research conducted within The Bahamas on the Nassau Grouper include the following:

- Location and spawning behaviour
- Fish abundance
- Distribution and collection of post-settlement groupers
- Juvenile energetics, and behavioural patterns
- Home range and migration movement

There has been a lot of research done on the Nassau Grouper here in The Bahamas, in the Caribbean region and other parts of the world. In spite of the research conducted there are still a lot of unknowns about the Nassau grouper. Affording protection to Nassau grouper spawning aggregations is a necessary step to ensuring the sustainability of the fishery. However, this is not the only solution. Other factors need to be looked at, such as restricting fishing methods, and size of groupers caught and controlling fishing effort. A lot of factors will have to be considered in the equation if we want to continue to have Nassau grouper in the quantities that we are accustomed to, here in The Bahamas.

GRENADA FISHERIES DIVISION STAFF RECEIVE ASSISTANCE

Assistance in the form of general supplies was provided jointly by the Caribbean Regional Fisheries Mechanism (CRFM) Secretariat, St. Vincent and the Grenadines Fisheries Division and the Goodwill Fisherman's Cooperative to the staff of the Grenada Fisheries Division following the devastating effect of Hurricane Ivan.

Assessment Of Two Shrimp Species In The Trinidad & Tobago Trawl Fishery

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Assessments were conducted for two commercially important shrimp species, *Farfantepenaeus notialis* (southern pink shrimp) and *Xiphopenaeus kroyeri* (Atlantic seabob), in the Trinidad and Tobago trawl fishery at the First Annual CRFM Scientific Meeting held in St. Vincent and the Grenadines in June 2004. Shrimp catch, fishing effort and length frequency data for the artisanal, semi-industrial, and industrial trawl fleets were analysed for an 11-year time series from 1992 to 2002. Gaps in catches by length were estimated using generalized linear models (GLMs). Catch-at-length data were converted to catch-at-age which was then used in a Virtual Population Analysis (VPA) model to estimate selectivity, fishing mortality, and recruitment by trawl fleet. Outputs from the VPA model were used in yield per recruit and biomass per recruit models to determine the status of exploitation of the stocks. The yield per recruit analysis for the two species combined suggests that the stocks are close to full exploitation. The biomass per recruit analysis, done for each species separately, suggests that the *F. notialis* stock is fully exploited while the *X. kroyeri* stock is over-exploited. The stocks are fully exploited at the effort that produces the maximum yield. This is estimated to be 1.4 times the current effort. Some initial exploratory analyses were also conducted to determine any correlations between recruitment and rainfall. The stocks are fully exploited at the effort that produces the maximum yield. This is estimated to be 1.4 times the current effort.

The results of the assessment are considered preliminary due to limitations of the data and models used. One of the main problems was the large gaps in the length frequency dataset due largely to gaps in sampling. Length sampling for the industrial fleet did not begin until October 1998 and hence data on this fleet are only available from this time onwards. Other sources of uncertainty in the assessment were the growth parameters used, which were taken from the available literature in the absence of pa-

rameters from the Trinidad and Tobago fishery and even the Guiana-Brazil shrimp fisheries.

In spite of uncertainties in the assessment results, a precautionary approach should be applied to the management of the trawl fishery based on the best scientific evidence available as outlined in the FAO Code of Conduct for Responsible Fisheries (1995). The recommendation is therefore to control the fishing effort on these stocks by limiting the numbers of trawlers with a view to reduction in fleet size. This will require the implementation of a licensing system for trawlers and updating of the fisheries legislation to facilitate a limited entry fishery. The management objectives for this fishery, as outlined in the national policy document and management plan are very broad. More appropriate and specific reference points for the fishery therefore need to be developed, that is, constraints within which the fishery must operate based on the management objectives. Key issues to be addressed are thus how the fishery will be monitored and how and what controls can be applied to affect the performance. This would help to link the assessments with practical management actions more closely.

The assessments of these two shrimp species will be further developed and refined at the next scientific meeting, planned for 2005. We plan to develop a population model to fit the available raw length frequency data and estimate the missing catches. This will provide better estimates of catches by length class than the GLMs used in the 2004 assessment. An attempt will also be made to improve the growth parameters used in the model by estimating these from the length frequency data. Such an improved model will provide better estimates of selectivity and fishing mortality by trawl type and fishing area. In addition, further exploratory analyses are being considered, to determine any correlations between recruitment and environmental variables such as rainfall, and river outflows from South America. This may assist in determining closed seasons for the fishery in the future.



FISH HUMOUR

What do you call a big fish who makes you an offer you can't refuse?

The Codfather

What kind of fish will help you hear better?

A Herring Aid

Special Regional Queen Conch (*Strombus gigas*) Meeting

by Mr. Terrence Phillips, CRFM Secretariat

In keeping with a request by member states seeking to address the CITES recommendations regarding their queen conch fisheries, the CRFM Secretariat held a Special Regional Queen Conch Meeting, in St. Vincent and the Grenadines, from March 11 to 12, 2004. The objective of the Workshop was to review the situation with regard to the management of the queen conch fisheries in CRFM member states, using the latest information on assessment and management measures being taken. Further, to determine a strategy and plan for the effective management of the queen conch through greater networking and partnership, research, regulation and enforcement, and involvement of the stakeholders in the management process, to ensure the long-term sustainable exploitation of the queen conch resources and a better quality of life for the resource users. Representatives from Antigua and Barbuda, The Bahamas, Belize, Dominica, Grenada, Jamaica, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago, the Turks and Caicos Islands and the CRFM Secretariat participated in the Meeting.

Based on a presentation of a Regional Overview of the Queen Conch (*Strombus gigas*) Resources in CARICOM/CARIFORUM Countries, and country presentations on the status of the queen conch fishery in their respective countries, along with the actions being taken to manage the fisheries, participants made a number of recommendations to be undertaken at the national and regional levels. Among these were the following:

(1) The CRFM Secretariat should seek to assist countries in determining the extent of stock sharing and/or the number of queen conch stocks in the region; develop a strategy and plan to get all countries on category III and seek the eventual removal of conch from the CITES¹ list; promote dive safety programmes for commercial fishers and note the location of hyperbaric facilities in the region. CRFM should also seek to provide technical assistance to countries in reviewing and refining their data collection programmes; coordinate the activities and provide technical assistance to countries in the development of model legislation; encourage harmonized approaches to management among neighbouring countries; provide technical assistance to countries in reviewing their monitoring, control and surveillance (MCS) mechanisms and make recommendations for improvement. CRFM should draw on the available expertise of such countries such as Jamaica, Belize, Antigua and Barbuda, Trinidad and Tobago and TCI, while encouraging and funding technical cooperation between developing countries (TCDC) approaches,

in providing assistance to countries undertaking conch abundance studies, etc.; provide assistance in the development and implementation of public awareness programmes at the regional and national levels; and seek to determine the socio-economic importance of the queen conch fisheries in the region, recognising that member states can only expend resources on the management of their respective conch fisheries in proportion to the importance of the fishery in each country.

(ii) Member States should seek to undertake studies to determine the extent, cause and effects of stunting on the management of their respective queen conch fisheries and its implication for trade; undertake studies to determine conversion factors; acquire existing literature on conch research/studies; bring the issues facing the regional conch fisheries, especially the actions taken by CITES, to the attention of the Caribbean Fisheries Forum (FORUM) and the Council for Trade and Economic Development (COTED) with a view to having a coordinated approach to their management; undertake studies to evaluate the effectiveness of the management tools, e.g. Marine Protected Areas (MPAs), quotas, etc. being used in the management of the conch fishery; examine the effects of poaching in the determination of quotas; examine the impact of the CARICOM Single Market and Economy (CSME) on the inter-island trade in conch, especially as it relates to CITES; and promote the inclusion of the queen conch fishery in the Integrated Coastal Zone Management (ICZM) process.

In addition, participants reviewed the CRFM Project Profile, "Rehabilitation and Management of Conch Resources in the CARICOM/CARIFORUM States" and the "Discussion Paper on the Establishment of the Caribbean Regional Lobster and Conch Fishery Management Organisation" and made some recommendations, among which were: (i) the Project Profile should be submitted to the Food and Agriculture Organization (FAO) for consideration as a Technical Cooperation Project; (ii) the Discussion Paper should be presented to the FORUM for further discussion; and (iii) the Regional Fisheries Management Organization (RFMO) (to be established) should look at the management of economically important resources, especially shared resources, and noted that it was better for the CRFM to take the initiative in managing regional/shared fisheries resources.

The CRFM Secretariat, in collaboration with the Member States, will be seeking to implement the recommendations from the Meeting.

¹ CITES – Convention on International Trade in Endangered Species

An Overview Of Aquaculture In Belize

Submitted by Belize Fisheries Department

Aquaculture is expanding in volume and value more rapidly than capture fishery production, terrestrial livestock production and other agro-production activities. In this regard, the contributions of aquaculture to the global supply of fin-fish, crustaceans and molluscs, have increased from 3.9 percent of total fishery production by weight in 1970, to 29 percent in 2001. In 2001, global aquaculture production was 48.2 million MT, with an estimated value of US \$60.9 billion. In general, the growth of the industry over the past ten(10) years has been sustained at a rate of approximately ten percent (10%) per annum. In the case of shrimp farming, which is currently the primary focus of the national aquaculture industry, the production from exporting countries were absorbed by the three(3) main market destinations of: the United States, Japan and the European Union.

The growth of the aquaculture industry in Belize has been even more impressive than the global situation, with annual increases in the volume of farmed shrimp production over the last ten(10) years being approximately 160%.

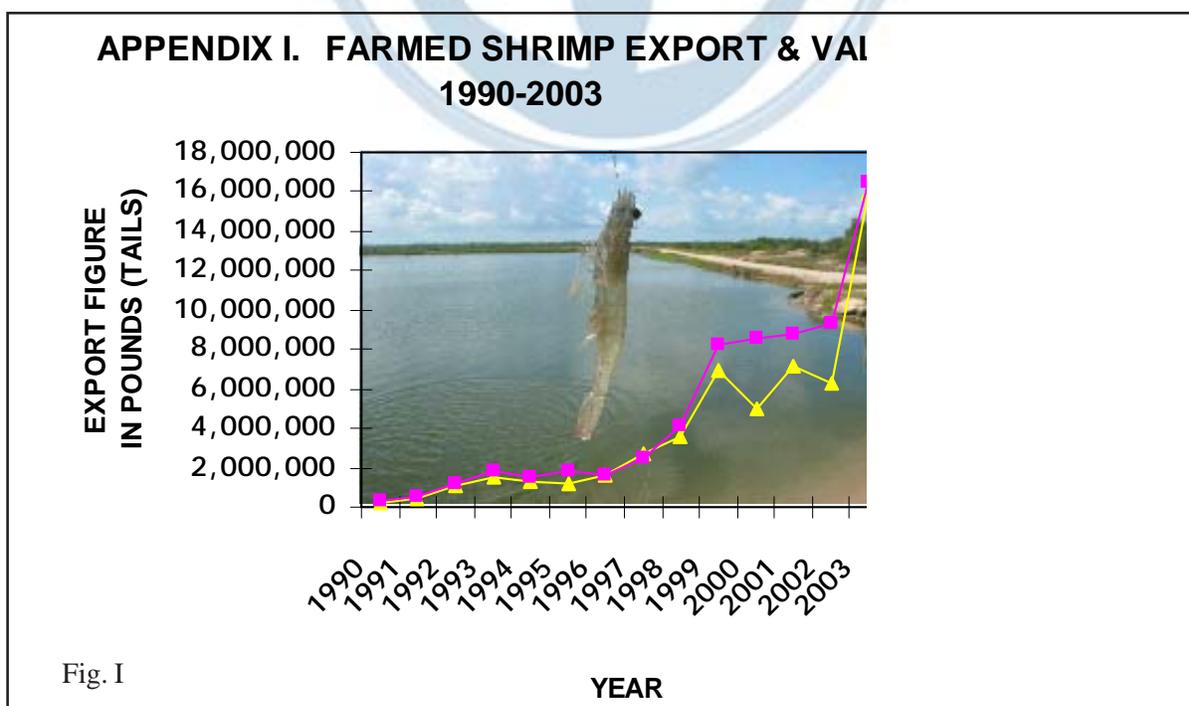
In Belize, the aquaculture industry is primarily based on the production of the Pacific White Shrimp (*Litopenaeus vannamei*). Since the early stages of shrimp farming in Belize, the sector has increased export production and revenues from 189 thousand pounds and Bz \$1.8 million respectively in 1990- to 1.17 million pounds and Bz \$10.4 million respectively in 1995. Since 1995, export production and revenues have expanded to 15.9 million pounds of tails and Bz \$91.8 million respectively in 2003. (see Fig. 1 below).

The significant increases in foreign exchange earnings derived from shrimp farming has elevated the Fisheries Sector from the fifth position between 1995 and 1999, to the third position in 2001 and 2002. Conservative estimates for the 2004 production year have been placed at 21.30 million pounds of processed shrimp tails – this is expected to generate over Bz \$100 million.

Shrimp farming has also made significant contributions to the development of Belize in relation to employment and income generation, especially in rural communities. In relation to employment, there were 810 full-time permanent employees, and 594 temporary or seasonal workers.

In regards to the area devoted for shrimp farming in 2004, there are currently 6,888 acres under production. This represents a 12.5% in the overall area under the tenureship of shrimp farmers in 2004.

Apart from shrimp mariculture, the farming of Tilapia has been seeing some resurgence in commercialization. The only commercial Tilapia farming operation by Fresh Catch Limited, was formally inaugurated in December 2002. The full scope of this project is for the development of 96 - 7,000 M² (0.7 Ha) Ponds and 2.8 hectare reservoirs. These facilities have a production capacity of 4,000 MT per annum. Tilapia exports to the U.S. market were initiated in the month of May, 2004. In relation to small-scale fish farming, there are currently over ten acres of small-scale fish farming operations involved in the husbandry of a number of native finfish cichlids.



SCHOLARS' CORNER

ECONOMIC ANALYSIS OF THE SHRIMP TRAWL FISHERY OF TRINIDAD AND TOBAGO WITH MANAGEMENT IMPLICATIONS

Ferreira, L.A. 1998. Master of Marine Management Graduate Project, Dalhousie University, Canada.

Effective fishery management requires a multidisciplinary approach in order to achieve ecological, socio-economic, community, and institutional sustainability. Management decisions must therefore be based on biological, social and economic information on the fishery. The objective of this study is to contribute to the sustainability of the shrimp trawl fishery of Trinidad and Tobago by providing management recommendations based on an economic analysis of the harvesting operations of the artisanal, semi-industrial and industrial trawler fleets.

The shrimp trawl fishery of Trinidad and Tobago is considered one of the country's most valuable with 1996 trawl landings (382t shrimp valued at \$TT6.3m, and 281t by catch valued at \$TT1.2m) from the artisanal and semi-industrial fleets, accounting for approximately 19% by value (shrimp alone comprising 14% by value) of the total annual production of the country's artisanal fleet. Estimated landings for the industrial fleet are 423t in 1995. Trawling also makes a significant contribution to the economy through exports as well as the provision of employment and nutrition and thus offers stability to rural communities.

This report first provides some background on the shrimp trawl fishery in terms of its economic importance to the country, a description of the trawler fleets and their operations, as well as previous and ongoing research initiatives on the fishery. It examines the management issues, the Government's management objectives and the management regime currently in place.

The focus of the study is a costs and earnings survey of the three trawler fleets in order to determine their economic performance. A total of 18 interviews were conducted with trawler owners to obtain information on their investment in the fishery, the costs incurred and revenues earned from trawling operations. The methodologies employed for data collection and analysis are discussed. The results of the costs and earnings analysis and a comparison of the three fleets in terms of contribution to employment and economic efficiency are presented.

Of the vessels surveyed, 33% of the artisanal, 50% of the semi-industrial, and 60% of the industrial were found to be operating at a loss. The results of this analysis suggest that the artisanal boats are more efficient than the larger ones, with the revenue per cost ratio, the benefit to crew and owner per unit of revenue, as well as the returns on investment being higher the smaller the trawler. In addition, the smaller trawlers are more labour intensive as compared to the larger trawlers.

A SCOPING STUDY AIMED AT IDENTIFYING THE CHALLENGES TO THE MANAGEMENT OF THE COASTAL FISHERIES ON THE WEST COAST OF DOMINICA.

*Submitted for M. Sc degree, University of Hull, England
by Harold Bernard Guiste*

Fisheries Officer, Dominica Fisheries Division

This research dissertation examines the findings of a scoping study for the possible adaptation of the co-management concept and the systems management approach as an option for management of the west coast fisheries of the Commonwealth of Dominica. The results suggest that whereas the co-management model itself provides a good opportunity and a possible alternative to the conventional command and control management system that currently obtains, there were significant challenges and problems to be dealt with before such an approach could have any meaningful effect.

The perspectives of fishers and that of some government agencies were sought on the issue and it was generally agreed that a more holistic approach towards management of the coastal resources of Dominica was desirable. Major social, economic and institutional hurdles that could hinder the co-management process were identified. Fishers who were identified as the major stakeholders in the coastal system were in a state of un-preparedness in terms of their level of organization, education and negotiating skills to undertake management roles and to be proactive in the decision making process.

Government agencies were confused over the issue of clearly defined areas of jurisdiction, and lack of collaboration and cooperation among government departments were identified as issues which could be addressed by a co-management arrangement if the political will exists, and the necessary structural, institutional and social adjustments could be made to accommodate it.

The study also identified many private sector entities that operated in the coastal area and even those that operated beyond the coastal zone but impacted on it in one way or the other. The issue of private and state land ownership in the coastal area was also identified as a problem to be addressed. A systems approach was to be adopted, incorporating co-management concepts, as a means of integrating fisheries into the management of the coastal area, for management of the fisheries and coastal resources on the west coast of Dominica.

It was concluded that the mere initiation of a co-management process for the west coast fisheries of Dominica was not sufficient. The system boundaries of which the coastal area forms part, could possibly include the whole island and the usual sectoral planning approach to development of fisheries would have to be considerably reviewed and changed to include the wider whole. Recommendations were made in terms of a road map by which a co-management process might be initiated on the west coast based on the findings of the study.

Upcoming CRFM Events (August 2004-March 2005)

Activities	Proposed Dates
Common Fisheries Policy and Regime - National Consultations	August-October 2004
CRFM Secretariat/CARDI Regional Workshop on Findings of Organizational Needs Assessment of Caribbean Fisherfolk Organization Research	12-14 October, 2004
National Consultation on the Draft Fisheries Management Plan for Belize	November, 2004
Third Meeting of the Working Group on the Common Fisheries Policy and Regime	29-30 November, 2004
Meeting of the Executive Committee of the Caribbean Fisheries Forum	1 December, 2004
National Consultation of the Draft Fisheries Management Plan for St. Vincent and the Grenadines	2-3 December, 2004
CRFM Secretariat, Senior Managers Committee Meeting	7 December, 2004
National Consultation on the Draft Fisheries Management Plan for Guyana	14-15 December, 2004 (Tentative Dates)
Inter-sessional Meeting of the Conch and Lobster Fisheries Working Group (CLWG)	24-28 January, 2005
National Consultation on the Draft Fisheries Management Plan for Antigua and Barbuda	January/February 2005
CRFM Regional Workshop to Review and Refine the Strategy and Project Proposal to Enhance the Effectiveness of MCS at the National, Sub-regional and Regional Levels	February/March 2005
Regional Multidisciplinary Workshop on the Common Fisheries Policy and Regime	2-3 March, 2005
Scoping Mission Meeting with Japanese and Chief Fisheries Officers/ Directors of Fisheries	4 March, 2005
Meeting of Legal Experts on Common Fisheries Policy and Regime	March 2005



FISH HUMOUR

What do you call a dangerous fish who drinks too much?
A beer-a-cuda

What kind of money do fishermen make?
Net Profits



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